UTAH POWER & LIGHT COMPANY
HYDROLOGIC MONITORING PROGRAM
ANNUAL REPORT FOR 1983

MARCH 1984

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DIVISION OF
OIL, GAS & MINING

Submitted to: United States Department of the Interior
Office of Surface Mining
Minerals Management Service
Utah Division of Oil, Gas and Mining

Prepared and submitted for Utah Power & Light Company by:

Hydrologic Section of the Power Operation Department

and

Mining and Exploration Department

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INTRODUCTION

This 1983 Water Monitoring Report is hereby submitted in accordance with the U. S. Department of Interior, Office of Surface Mining requirements for hydrologic monitoring in areas of and adjacent to coal mining operations.

This report is the sixth annual hydrologic report submitted by Utah Power & Light Company since the report entitled "Monitoring of the Water Resources in the Mining Areas of East Mountain, Emery County, Utah" was submitted to the U. S. Geological Survey and the Utah Division of Oil, Gas and Mining in December 1977. This report addresses both flow observations as well as water quality characteristics of the water resources adjacent to Utah Power & Light Company (UP&L) mining areas in Emery County (see Figures 1a and 1b).

Information was compiled the past year from in-house as well as from state and federal agencies and private sources as follows:

U. S. Geological Survey
U. S. Forest Service
U. S. Department of Commerce, National Weather Service
Utah Division of Oil, Gas and Mining
Utah Division of Environmental Health
Huntington-Cleveland Irrigation Company
Emery Water Conservancy District
Cottonwood Creek Consolidated Irrigation Company

Information from outside agencies will continue to be utilized each year for as long as their data gathering programs continue. By using this outside information, a cooperative effort is realized and duplication of effort and expense is substantially reduced.

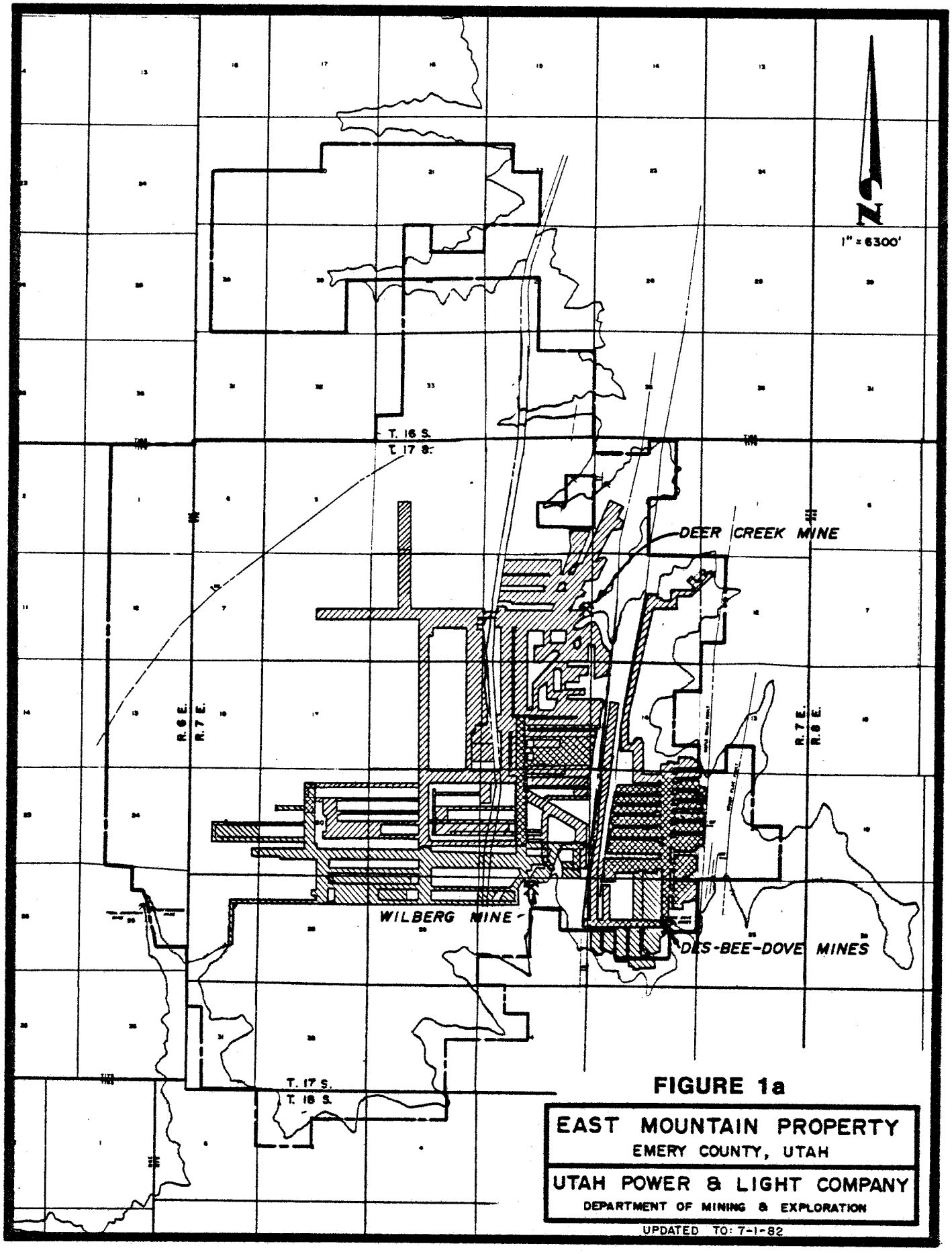


FIGURE 1a

EAST MOUNTAIN PROPERTY
EMERY COUNTY, UTAH

UTAH POWER & LIGHT COMPANY
DEPARTMENT OF MINING & EXPLORATION

UPDATED TO: 7-1-82

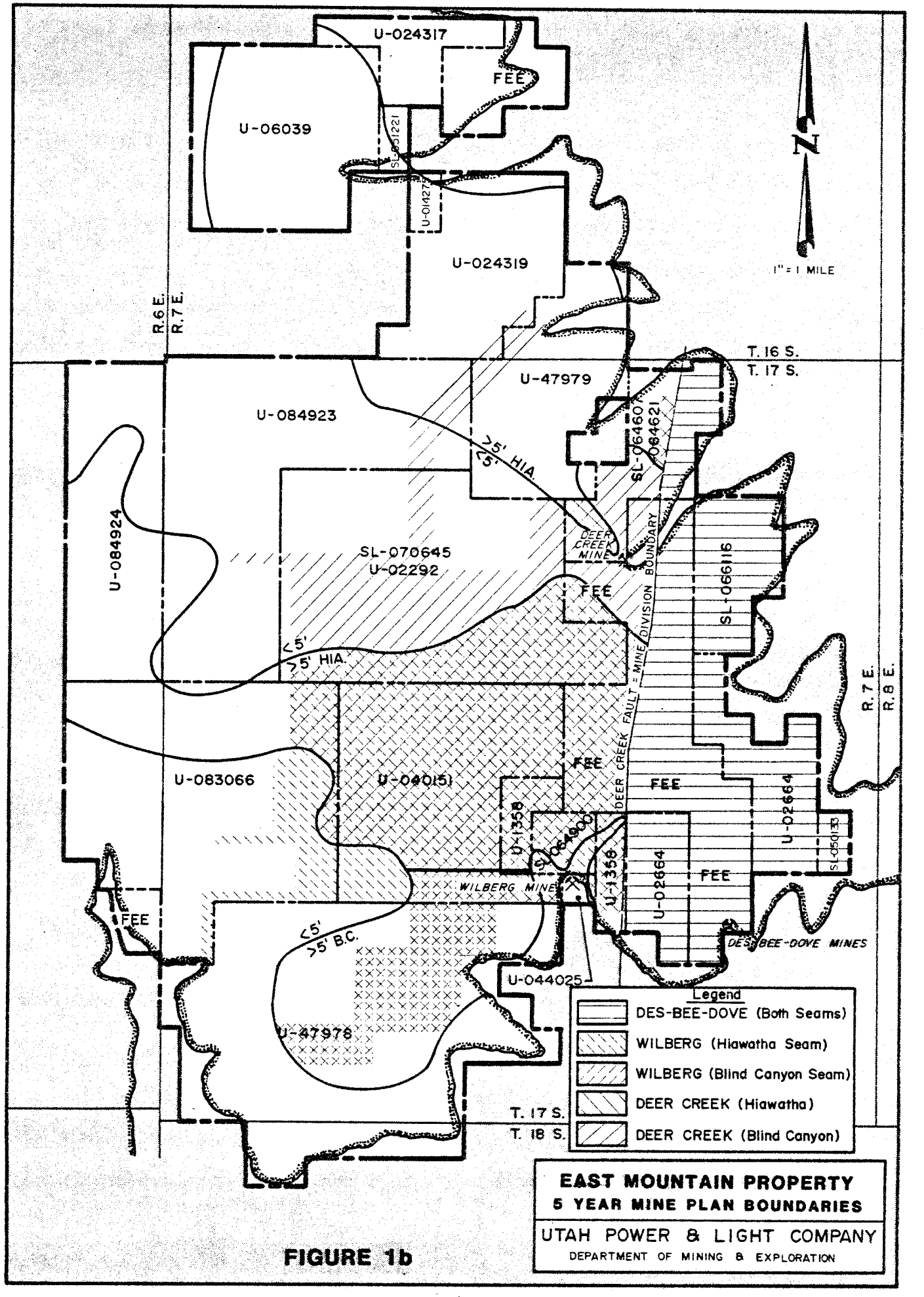

U-024317
FEE
U-06039
SL-051221
U-014275
U-024319
1" = 1 MILE
R.6 E.
R.7 E.
T. 16 S.
T. 17 S.
U-47979
U-084923
>5' HIA.
<5'
SL-064601
064621
U-084924
SL-070645
U-02292
DEER CREEK MINE
FEE
DIVISION BOUNDARY
SL-066116
<5'
>5' HIA.
R.7 E.
R.8 E.
DEER CREEK FAULT = MINE
U-083066
U-040151
FEE
FEE
U-02664
U-1358
U-1356
U-02664
FEE
SL-050133
WILBERG MINE
FEE
<5'
>5' B.C.
DES-BEE-DOVE MINES
U-044025
U-47978
Legend
DES-BEE-DOVE (Both Seams)
WILBERG (Hiawatha Seam)
WILBERG (Blind Canyon Seam)
DEER CREEK (Hiawatha)
DEER CREEK (Blind Canyon)
T. 17 S.
T. 18 S.
EAST MOUNTAIN PROPERTY
5 YEAR MINE PLAN BOUNDARIES
UTAH POWER & LIGHT COMPANY
DEPARTMENT OF MINING & EXPLORATION

FIGURE 1b

CLIMATIC OBSERVATIONS

In general, runoff and subsequent water supplies are a direct function of the climatic conditions in any given area. Furthermore, the significance of the weather affecting the flow characteristics of the East Mountain springs cannot be overemphasized.

Most of the water supply in the Western United States originates in the high mountain ranges as snowfall during winter periods. Snowmelt augmented by spring precipitation produces runoff which is utilized downstream. Fall precipitation influences soil moisture conditions prior to snowpack accumulation and has a bearing upon runoff the following year.

REGIONAL CLIMATOLOGY

Weather patterns during the past four years have been highly variable in the Western United States. During 1980, near record breaking amounts of precipitation and associated snowfall accumulated throughout the Intermountain West. The corresponding runoff during 1980 approached all time highs.

In 1981, the winter weather pattern was a complete reversal of 1980. Winter snowfall was less than 50% in most areas of the West and the corresponding runoff was extremely low. However, in areas with reservoir storage, water supplies were sufficient to meet user needs.

The 1982 weather pattern again changed dramatically from 1981. Winter snowfall and resulting spring runoff in 1982 was extremely heavy, especially in the Central Rocky Mountains.

During 1983 the wet weather conditions continued with heavy precipitation occurring in the late fall of 1982 and spring of 1983. The weather during April and May of 1983 was unusual because heavy snowfall and cold temperatures resulted in all-time record mountain snowpack conditions.

In effect, the snowmelt period, which normally begins on about April 1 did not begin until May 20, thus reducing the runoff period by seven weeks. The resulting 1983 runoff was an all-time record for nearly all rivers in the western United States.

LOCAL CLIMATOLOGY

1) Precipitation

Precipitation in Emery County during 1983 was similar to other intermountain areas. The mountains in the San Rafael Basin received extremely heavy snowfall during the 1982-83 winter. April 1, 1983 snow surveys indicated snow cover at 176% of normal. May 1 snow cover was 209% of normal. The resulting 1983 runoff was one of the highest in the past 60 years.

Precipitation amounts recorded at the Hunter Plant, Huntington Plant, Electric Lake and East Mountain for the 1983 water year (October 1982 to September 1983) will be presented since these sites include low elevation, intermediate elevation and two high elevation observation sites in the immediate vicinity of mining activities. The values are shown in Table 1 on the following page.

TABLE 1: PRECIPITATION IN EMERY COUNTY, UTAH (1983 Water Year)

Month	Hunter Plant (Elev. 5800') Precip. (in.)	Hunter Plant % Of Normal	Huntington Plant (Elev. 6500') Precip. (in.)	Huntington Plant % Of Normal	Electric Lake (Elev. 8350') Precip. (in.)	Electric Lake % Of Normal	East Mountain (Elev. 8985') Precip. (in.)	East Mountain % Of * Normal
1982								
Oct.	.70	26	.20	16	1.88	89	.3	NA
Nov.	1.25	245	.60	102	3.68	198	2.9	NA
Dec.	.45	83	.67	143	2.76	95	.95	NA
1983								
Jan.	.54	126	.16	30	2.41	119	1.3	NA
Feb.	.41	100	.65	191	4.00	230	1.65	NA
Mar.	.84	200	1.87	302	4.30	235	2.15	NA
Apr.	.37	86	.08	15	2.35	140	1.1	NA
May	.51	86	.40	70	2.81	189	.35	NA
June	0	0	0	0	1.35	167	.06	NA
July	2.18	376	1.61	169	1.34	115	2.1	NA
Aug.	1.58	156	.39	57	1.50	176	4.1	NA
Sept.	.88	110	1.15	217	2.88	274	1.65	NA
TOTALS	9.21	132	7.78	104	31.26	159	19.6	NA
Mean Monthly	.77	--	.65	--	2.61	--	1.63	--

*Historical data not sufficient for the East Mountain weather station to make comparison.

A comparison of precipitation for 1982 and 1983 merits consideration in this study. The intent is to develop a correlation between yearly precipitation and spring discharges on East Mountain. Table 2 is a comparison of the 1982-1983 precipitation levels recorded at the four locations.

Table 2: Comparison of 1982 and 1983 Precipitation (inches)

Station	1982 Amount	1982 % of Normal	1983 Amount	1983 % of Normal	1983 As % of 1982
Hunter Plant	5.69	82	9.21	132	161
Huntington Plant	8.10	108	7.78	104	96
Electric Lake	34.42	176	31.26	159	90
East Mountain	14.4	*	19.6	*	136
Average %		122		132	121

*Insufficient data to establish normal precipitation.

Table 2 indicates that while 1982 precipitation at the Hunter and Huntington sites was comparable with 1981 values, mountain precipitation was much greater in 1983, especially at Electric Lake. The overall precipitation at the four stations averaged 21% higher in 1983 than 1982 values.

Tables 3, 4 and 5 indicate monthly precipitation values at Hunter, Huntington, and Electric Lake from the beginning of operation at each site. These tables indicate monthly trends as well as the great fluctuation in yearly totals. Figure 2 shows monthly precipitation at the East Mountain site for the 1982 and 1983.

The correlation of precipitation levels with spring discharges will be discussed in the East Mountain Springs section of this report.

TABLE 3: HUNTER PLANT PRECIPITATION-HISTORICAL
Elevation - 5,800 Feet

Water Year	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	TOTAL
75-76	.13	.25	.19	.02	.40	.00	.89	.84	.03	.31	.08	.70	3.84
76-77	.00	.02	.00	.37	.07	.00	.03	1.28	.07	1.35	.41	.50	4.10
77-78	.01	.18	.00	1.28	1.05	1.74	.34	1.21	.00	.69	1.14	.14	7.78
78-79	.03	2.22	.22	1.43	.53	2.43	.24	.47	.00	.00	.79	.00	8.36
79-80	.00	.00	.41	1.70	1.70	.67	.75	1.11	.00	.02	.51	2.06	8.93
80-81	.66	.06	.02	.00	.07	1.48	.16	.45	.14	.20	.70	2.43	6.37
81-82	.58	.27	.45	.94	.45	.54	.00	.02	.00	.15	1.06	1.23	5.69
82-83	.20	1.25	.45	.54	.41	.84	.37	.51	.00	2.18	1.58	.88	9.21
83-84	.53	.66	1.07										

TABLE 4: HUNTINGTON PLANT PRECIPITATION
Elevation - 6,500 Feet

Water Year	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	TOTAL
70-71	-	-	-	-	-	.08	.29	.16	.11	.57	.63	.43	2.27
71-72	2.26	.59	1.62	.04	.00	.32	.28	.16	.77	.40	.66	1.07	8.17
72-73	4.27	1.28	.34	.49	.80	2.42	.50	.17	.97	1.09	1.94	.12	14.39
73-74	.08	.02	.37	.20	.03	.01	.00	.00	.00	.09	.00	.07	.87
74-75	.68	1.19	.13	1.01	.30	.80	.03	.75	1.44	2.62	.31	.24	9.50
75-76	.23	.95	.03	.20	.23	.00	2.34	.86	.02	.73	.19	.85	6.63
76-77	.56	.00	.00	.35	.00	.00	.00	1.76	.00	2.08	.96	.70	6.41
77-78	.66	.12	.82	1.45	1.00	1.36	.94	.72	.12	.05	.72	.77	8.73
78-79	.02	2.65	.25	1.21	.52	2.50	.00	.84	.05	.09	3.32	.20	11.65
79-80	.17	.14	.15	2.88	3.63	.68	1.13	1.88	.65	.18	.38	2.22	14.09
80-81	1.20	.06	.00	.00	.00	.62	.08	1.75	.48	.00	.58	1.53	6.30
81-82	1.12	.25	1.30	1.63	.20	.73	.00	.17	.00	.08	.71	1.91	8.10
82-83	.20	.60	.67	.16	.65	1.87	.08	.40	.00	1.61	.39	1.15	7.78
83-84	.76	.76	2.13										

TABLE 5: ELECTRIC LAKE PRECIPITATION
Elevation - 8,350 Feet

Water Year	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	TOTAL
70-71	2.46	2.35	6.41	1.13	1.66	.36	1.05	.66	.47	.40	2.15	.78	19.88
71-72	3.49	1.69	4.07	3.35	.58	.70	1.02	.28	1.49	.70	.80	2.91	21.08
72-73	4.18	3.43	3.27	.97	2.09	2.74	3.67	1.42	.85	.82	1.23	1.15	25.82
73-74	.79	1.90	3.52	2.70	1.12	1.52	2.49	.20	.13	2.09	.06	.09	16.61
74-75	2.27	.62	1.73	2.10	2.37	3.42	1.23	3.21	1.08	1.93	.49	.25	20.70
75-76	1.31	2.57	.82	1.44	2.23	1.35	1.47	2.00	1.23	1.07	.54	1.19	17.22
76-77	1.00	.25	.14	.76	1.14	2.00	.05	3.00	.90	2.28	1.31	1.26	14.09
77-78	1.47	2.10	3.20	3.68	2.74	3.16	2.46	1.18	.30	.10	.24	.77	21.40
78-79	.40	3.18	2.66	2.90	2.18	2.53	.72	1.67	.19	.96	2.29	.32	20.00
79-80	1.55	2.23	.37	4.95	6.01	3.34	1.27	3.09	.12	.37	.38	1.80	25.48
10 Year	1.892	2.032	2.619	2.398	2.212	2.112	1.543	1.671	.666	1.072	.949	1.052	20.218
80-81	1.45	.98	.32	1.30	1.04	3.20	1.45	3.06	.39	1.61	2.73	1.44	18.97
81-82	4.18	1.44	4.79	5.26	1.66	5.06	1.11	1.40	.59	1.26	2.29	5.38	34.42
82-83	1.88	3.68	2.76	2.41	4.00	4.30	2.35	2.81	1.35	1.34	1.50	2.88	31.26
83-84	2.15	4.81	7.43										

NOTE: Climatic Station was moved from a point one mile above the dam site to a point 500 feet below dam site on November 15, 1973.

NOTE: October, November, and December 70-71 were estimated by correlation with Clear Creek Weather Station.

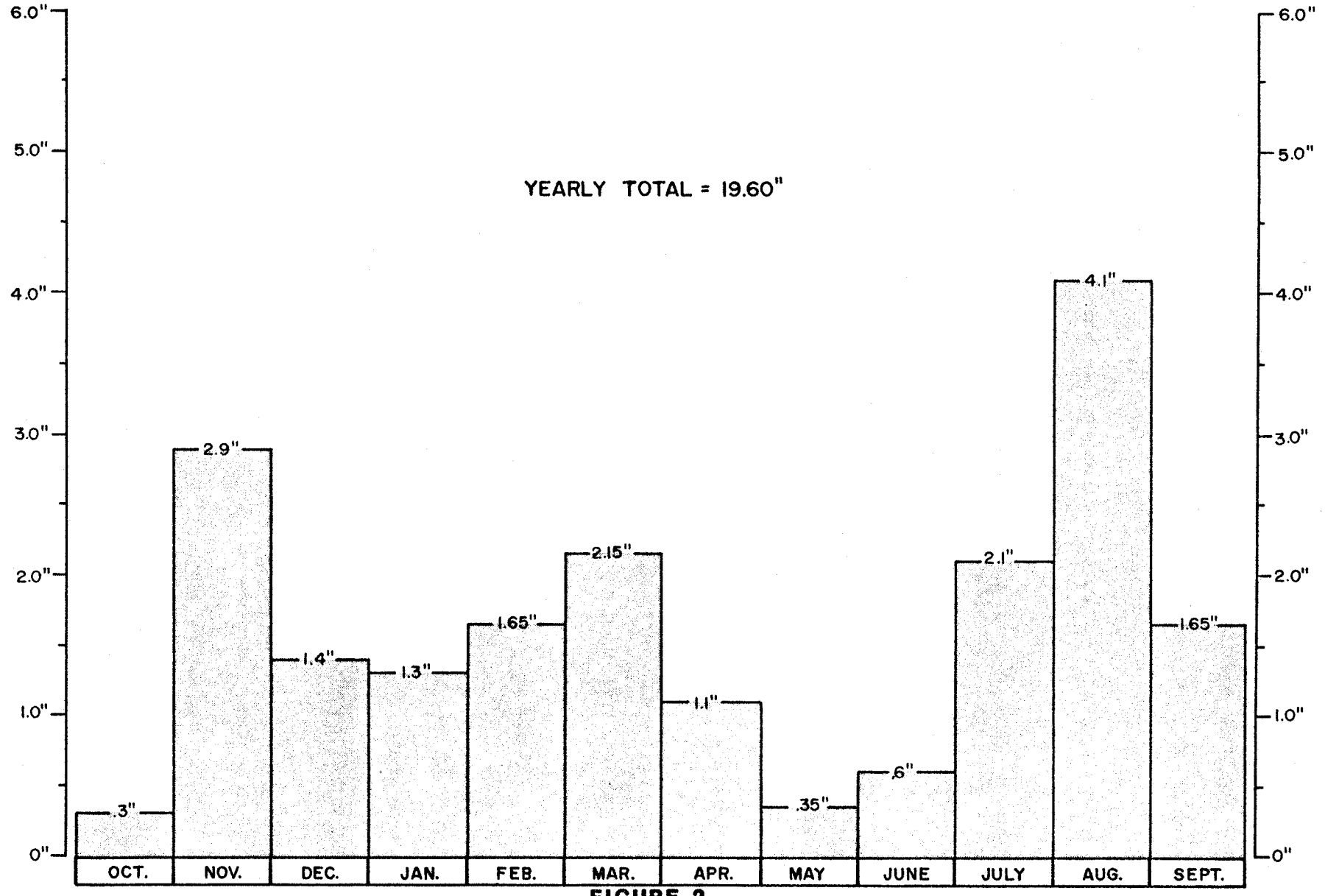


FIGURE 2

EAST MOUNTAIN PRECIPITATION TOTALS
for the
WATER YEAR of OCT. '82 thru SEPT. '83

2) Temperatures

Temperatures within Emery County at the lower elevations were generally higher than normal in the 1983 water year while the higher elevations were generally cooler than normal. At the Hunter Plant station, the only months having temperatures below normal were November, October and April resulting in an average yearly temperature 2.4° above normal. The Huntington Plant station was cooler than normal only during the months of October, November, April and June resulting in an average temperature which is 1.4° above normal. The Electric Lake station was cooler than normal every month but March resulting in a yearly average temperature 3.1° below normal (see Table 6).

TABLE 6: TEMPERATURES IN EMERY COUNTY, UTAH (1983 WATER YEAR)

	Hunter Plant		Huntington Plant		Electric Lake	
Month	Average Temp. (°F)	Departure From Normal	Average Temp. (°F)	Departure From Normal	Average Temp. (°F)	Departure From Normal
1982						
Oct.	45.9	-2.5	47.4	-2.0	31.7	-5.8
Nov.	33.8	-1.4	35.8	-0.2	17.2	-8.5
Dec.	27.7	+1.0	79.2	+1.8	11.7	-4.1
1983						
Jan.	26.8	+2.7	29.8	+6.2	16.7	+2.1
Feb.	31.6	+3.2	32.3	+2.1	17.1	-2.2
Mar.	40.3	+4.5	39.8	+2.1	22.1	+1.3
Apr.	43.8	-0.8	41.7	-3.4	21.1	-7.6
May	54.0	+1.9	55.1	+0.2	32.6	-6.4
June	65.1	+3.7	64.7	-1.1	45.1	-3.5
July	71.7	+3.3	72.6	+0.9	53.4	-2.3
Aug.	73.3	+6.9	74.2	+4.8	53.3	-0.5
Sept.	64.8	+6.1	65.8	+5.4	47.1	-0.4
TOTALS	48.2	+2.4	49.0	+1.4	30.8	- 3.1

A comparison of 1982 and 1983 temperatures for the three stations is addressed since temperatures also influence water supplies from year to year. Table 7 depicts the variation and 1982 to 1983.

TABLE 7: COMPARISON OF 1982 AND 1983 TEMPERATURES

Station	1982 Average Temp. (°F)	1982 Departure From Normal	1983 Average Temp. (°F)	1983 Departure From Normal	1983 Departure From 1982
Hunter Plant	47.0	+1.1	48.2	+2.4	+1.3
Huntington Plant	49.8	+2.2	49.0	+1.4	-0.8
Electric Lake	32.6	-1.3	30.8	-3.1	-1.8
Average Departure From Normal		+0.7		+0.2	-0.4

The monthly temperatures which were recorded at the East Mountain station in 1983 closely followed the temperatures recorded in 1982 with the exception of July, August and September, which were cooler in 1983. A comparison of temperatures recorded in 1981, 1982 and 1983 is shown in Figure 3.

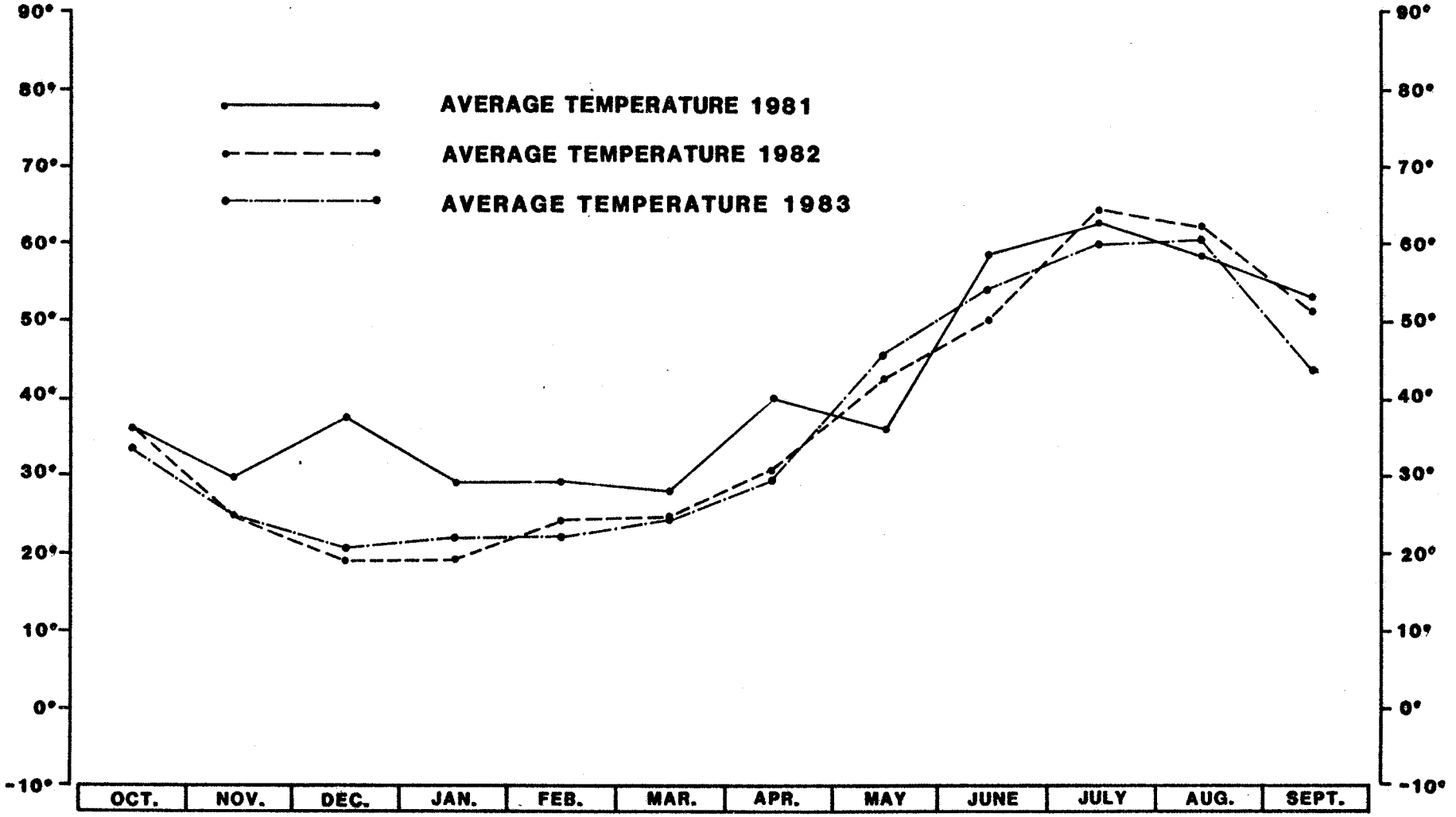


FIGURE 3

EAST MOUNTAIN AIR TEMPERATURE (° F)
COMPARISON FOR 1981, 1982 & 1983

DRAINAGE SYSTEMS

The surface drainage system on East Mountain is divided into two major drainages; the southwest portion forms part of the Cottonwood Creek drainage and the northeast portion of East Mountain contributes to the Huntington Creek drainage (see Map 1). These drainage boundaries, including minor subdivisions to Cottonwood and Huntington Creeks, are designated on the accompanying map. Both Huntington and Cottonwood Creeks flow out of the Wasatch Plateau in a southeasterly direction. The creeks merge with Ferron Creek to form the San Rafael River which is a tributary to the Green River.

Huntington Creek Drainage System

1) Huntington Creek

Flow data are recorded on a continuous basis by Utah Power & Light at two locations; one station is located near the UP&L Huntington Plant, the other is located about 22 miles upstream from the Huntington Plant. Flow records are maintained by Utah Power & Light Company in order to determine water entitlements and reservoir storage allocation for the various users on the river.

The following table (Table 8) shows a summary of actual Huntington Creek flows below Electric Lake, at Huntington Plant, and calculated natural flow at Huntington Plant. The calculated natural flow considers actual flow recorded at the plant, plant diversions, Electric Lake storage change and lake evaporation. The average daily discharges for the 1983 water year (October 1982 - September 1983) at the two stations plus the calculated natural flow are found in Appendix A.

TABLE 8: HUNTINGTON CREEK WATER FLOWS (1983 WATER YEAR)

	Huntington Creek Below Electric Lake	Huntington Creek At Plant	Calc. Natural Flow At Plant
Total Yearly Flow (Ac. Ft.)	38,690	136,600	146,377
% Of Normal	*178	*195	209
Mean Discharge In Cubic Feet Per Second (CFS)	53.4	189	N/A
Maximum Discharge (CFS)	595	1650	N/A
Date of Maximum Discharge	6/12/83	6/11/83	N/A
Minimum Discharge In CFS	10	9.3	N/A
Date Of Minimum Discharge	2/1/83	2/2/83	N/A

* Due to upstream storage in Electric Lake.

During the 1983 spring runoff period (April thru July), approximately 7,781 acre feet of water was impounded behind Electric Lake Dam. During spring runoff the impoundment reached its highest level on June 13. Total storage on this date amounted to 32,178 acre feet which is 906 acre feet higher than full capacity. Inflows to Electric Lake during 1983 were calculated to be 38,000 acre feet which is about the highest inflow since the dam was constructed in 1973. Reservoir releases for the fishery and Huntington Plant needs during the summer period totaled 38,698 acre feet.

A comparison of runoff values from 1982 and 1983 is presented in Table 9.

TABLE 9: COMPARISON OF 1982 AND 1983 RUNOFF VALUES

	1982		1983		
	Amount	% Of Normal	Amount	% Of Normal	1983 As A % Of 1982
Spring Runoff Stored In Electric Lake (Ac. Ft.)	*9,862	97	*7,781	77	79
Calculated Natural Flow At Plant (Ac. Ft.)	93,259	134	93,259	210	157
Actual Maximum **Discharge At Plant (CFS)	430	---	1,650	---	384
	(June 18, 1982)		(June 11, 1983)		

*In addition to 7,781 acre feet of water stored, approximately 24,800 acre feet of water spilled over the spillway during the runoff period.

**Maximum flow is the maximum daily flow recorded during the year.

An examination of Table 2 indicates that precipitation recorded at Electric Lake and Huntington plant during 1983 averaged 92 percent of the 1982 values while natural flow runoff for 1983 was 157 percent of 1982 (Table 9). The much higher runoff in 1983 was due to the fact that the ground was saturated by high precipitation in both 1982 and 1983.

Water quality information on Huntington Creek was compiled on a monthly basis during 1983. Utah Power & Light's Environmental Department conducted the sampling program and the analyses were performed by Standard Labs, Huntington, Utah. The location of water quality sampling stations on

Huntington Creek that were considered for this report are listed as follows (refer to Map #1):

1. Below Electric Lake
2. Above the Forks
3. Above the Power Plant Diversion
4. Below the Power Plant

Specific water quality constituents which were analyzed are shown in Table 10. Values are in milligrams per liter unless otherwise noted. Raw data can be found in Appendix B.

TABLE 10: HUNTINGTON CREEK WATER QUALITY (1983 WATER YEAR)

	Below Electric Lake			Right Fork Above Left Fork			Above Power Plant			Below Power Plant		
Parameter	Ave.	Max.	Min.	Ave.	Max.	Min.	Ave.	Max.	Min.	Ave.	Max.	Min.
pH (N.U.)	7.5	7.8	6.7	8.0	8.2	7.5	7.9	8.5	7.4	8.0	8.4	7.3
Diss. Oxygen	9.4	14.2	4.1	7.1	8.2	6.4	-	-	-	-	-	-
Sulfate	-	-	-	-	-	-	72.0	140.	18.0	82.0	160.	13.0
Susp. Solids	7.1	20.0	0.5	14.2	66.0	2.0	79.0	305.	10.0	35.0	62.5	181.0
Diss. Solids	161.	200.	126.	214.	337.	146.	263.	355.	179.	339.	510.	199.
Spec. Cond. (umhos)	291.	291.	291.	341.	341.	341.	429.	510.	350.	576.	920.	370.
Turbidity (FTU)	6.6	20.0	1.7	9.3	39.0	2.1	-	-	-	-	-	-
Alkalinity (TOT)	-	-	-	-	-	-	196.	238.	157.	223.	325.	[illegible]
Hardness	-	-	-	-	-	-	209.	228.	178.	270.	362.	194.

The values at the station below Electric Lake do not express the actual natural drainage water quality characteristics above Electric Lake because of the lake effect but it appears that the surface flow in Huntington Canyon is of very high quality in the upper reaches with some natural degradation occurring as the flow proceeds to the canyon mouth.

The comparison of water quality characteristics with the Huntington drainage for 1982 and 1983 is presented in Table 11. This comparison merits consideration in order to evaluate the changes in water quality from year to year. Average values are presented in milligrams per liter unless otherwise noted.

TABLE 11: HUNTINGTON CREEK WATER QUALITY 1982-1983

Parameter	Below Electric Lake		Right Fork Above Left Fork		Above Power Plant		Below Power Plant	
	1982	1983	1982	1983	1982	1983	1982	1983
pH (N.U.)	8.0	7.5	8.5	8.0	8.5	7.9	8.6	8.0
Diss. Oxy.	10.4	9.4	10.5	7.1	11.8	-	11.4	-
Sulfate	-	-	-	-	89.9	72.0	88.1	82.0
T. Susp. Solids	2.4	7.1	21.4	14.2	40.1	79.0	42.8	35.0
T. Diss. Solids	164	161	194	214	239	263	250	339
Spec. Cond. (umhos)	-	291	-	341	358	429	427	576
Turbidity (FTU)	1.9	6.6	9.2	9.3	-	-	-	-
Alkalinity (TOT)	-	-	-	-	194	196	203	223
T. Hardness	-	-	-	-	226	209	250	270

2) Deer Creek

FLOW AND SAMPLING SCHEDULE

Locations: 1) Above the Mine

2) Below the Mine

(See Map No. 1 in pocket)

Flow: Information is collected during the first or second week of each month (see Appendix C).

Water Quality Sampling: Water samples are collected and analyzed during the first or second week of each month throughout the duration of the runoff season. Normal runoff season will be considered from May through October. If runoff persists beyond the month of October, samples will be collected on a quarterly basis until the month of May of the following year.

The results of the 1983 quality analysis are listed in Table 12 and 13. The minimum, maximum and mean values are given for each year in which data were collected along with the historical results. Values are in milligrams per liter unless otherwise noted. Complete raw data can be found in Appendix C. It is apparent from the tables that the quality of the Deer Creek runoff degradates slightly from the upper to the lower sampling point. The quality of the lower sampling point is possibly affected by the Mancos Shale which surrounds the sampling location. An examination of Tables 12 and 13 indicate that the data for 1983 follows closely with the historical data, except for total suspended solids and iron, in which these parameters show a considerable decrease for both locations.

TABLE 12: DEER CREEK SURFACE WATER QUALITY ABOVE THE MINE

1983 Sample Dates	pH (Units)	Conductivity UM HOS/CM	TDS	TSS	Iron Total	Manganese
1-10	7.7	770	566	8.0	0.14	0.07
4-11	8.2	650	370	2.5	0.03	0.06
5-9	8.0	575	319	164.0	0.74	0.05
6-13	8.1	575	340	56.0	0.23	0.03
7-11	8.2	550	287	0.5	0.12	0.01
8-9	8.2	525	280	13.0	0.05	0.01
9-13	8.4	550	310	7.5	0.05	0.01
10-11	8.3	610	330	0.5	0.05	0.01
Min.	7.7	525	280	0.5	0.03	0.01
Max.	8.4	770	566	164.0	0.74	0.07
Mean	8.1	600.6	350.3	31.5	0.18	0.03
1982						
Min.	7.3	490	276	0.5	0.15	0.06
Max.	8.2	640	359	92.0	0.87	0.18
Mean	7.9	526.7	298.8	27.8	0.60	0.13
1981						
Min.	8.3	600	332	0.5	0.09	0.01
Max.	8.3	700	482	3.5	0.20	0.02
Mean	8.3	633.3	384.7	1.7	0.13	0.01
1980						
Min.	7.9	570	337	0.5	0.07	0.01
Max.	8.0	820	533	3592	0.20	0.24
Mean	7.9	695	435	1796.3	0.13	0.13
1979						
Min.	7.7	470	260	4.6	0.32	-
Max.	8.5	470	310	1400	40.1	-
Mean	8.1	470	285	702.3	20.2	-
Historical 1978 - 1982						
Min.	7.0	360	235	0.5	0.07	0.01
Max.	8.5	820	533	3592	40.1	0.24
Mean	7.9	560.0	330.1	406.4	3.2	0.10

TABLE 13: DEER CREEK SURFACE WATER QUALITY BELOW THE MINE

1983 Sample Dates	pH (Units)	Conductivity UM HOS/CM	TDS	TSS	Iron Total	Manganese
1-10	frozen	no flow				
4-11	frozen	no flow				
5-9	8.0	1150	637	557.0	2.12	0.15
6-13	8.1	650	407	183.0	0.66	0.05
7-11	8.3	710	371	7.5	0.30	0.02
8-9	8.6	725	409	15.0	0.06	0.01
9-13	8.5	850	478	6.5	0.05	0.01
10-11	8.45	900	491	9.0	0.11	0.01
Min.	8.0	650	371	6.5	0.05	0.01
Max.	8.6	1150	637	557.0	2.12	0.15
Mean	8.3	830.8	465.5	129.7	0.55	0.04
1982						
Min.	7.7	650	367	2.0	0.10	0.09
Max.	8.3	1380	868	183.0	1.80	0.23
Mean	8.0	951.7	550	46.1	1.01	0.17
1981						
Min.	8.2	1500	959	2.5	0.09	0.01
Max.	8.3	1650	1021	5.5	0.24	0.03
Mean	8.3	1575	990	4.0	0.17	0.02
1980						
Min.	7.9	790	452	9.5	0.16	0.01
Max.	8.0	870	567	396	0.30	0.27
Mean	8.0	830	510	203	0.21	0.14
1979						
Min.	7.4	730	440	40.6	0.65	-
Max.	8.4	730	477	20,540	170	-
Mean	7.9	730	459	10,290	85.3	-
Historical 1978 - 1982						
Min.	6.9	420	273	2.0	0.09	0.01
Max.	8.4	1650	1021	20,540	170	0.27
Mean	7.9	972.5	576.1	1722.7	13.7	0.14

As a result of the higher than average precipitation received during the 1983 water year, the duration of the Deer Creek runoff continued longer than in previously recorded water years.

COTTONWOOD CREEK DRAINAGE SYSTEM

1) Cottonwood Creek

As reported in the 1982 annual hydrologic monitoring report, the Cottonwood Creek baseline study to determine the water quality characteristics was terminated as of January 1, 1983. A letter has been transmitted to the Department of Oil, Gas and Mining (Hydrology Department), which explained reasons for the termination, see Appendix K.

The sediment ponds located in Cottonwood Canyon continued to be monitored by UP&L. During 1983 no water was discharged from the sediment pond structures. As reported in the 1982 annual hydrologic report, in the event that the sediment pond structures located in Cottonwood Canyon discharge, sampling will consist of (1) sediment pond discharge water, (2) Cottonwood Creek 100 feet upstream from the point of discharge, and (3) Cottonwood Creek 100 feet downstream from the point of discharge. The parameters to be performed on both the ambient and discharge water will be those stated in the Wilberg Mine discharge permit.

Flow and Sampling Schedule

2) Grimes Wash

Locations: 1) Right Fork

2) Left Fork

3) Below the Mine

(See Map No. 1 in pocket)

Flow: Information is collected during the first or second week of each month (see Appendix D).

Water Quality Sampling: Water samples are collected and analyzed during the first or second week of each month throughout the duration of the runoff season. Normal runoff season will be considered from May through October. If runoff persists beyond the month of October, samples will be collected on a quarterly basis until the month of May of the following year.

The results of the 1983 quality analysis are listed in Tables 14, 15 and 16. The minimum, maximum and mean values are given for each year in which data was collected along with the historical results. Values are in milligrams per liter unless otherwise noted. Complete raw data can be found in Appendix D.

Grimes Wash drainage quality is greatly affected by the influx of the Right Fork. The Right Fork originates in the North Horn Formation, (interbedded shales, siltstones and sandstones) which is abundant with calcareous material. As a result the Right Fork contributes a relatively high amount of suspended solids to the Grimes Wash drainage. The concentration of solids decreases at the sampling location below the mine as a result of the Left Fork and Wilberg Mine discharge influence.

TABLE 14: GRIMES WASH SURFACE QUALITY
RIGHT FORK

1983 Sample Dates	pH (Units)	Conductivity UM HOS/CM	TDS	TSS	Iron Total	Manganese
1-10	Dry					
4-11	Dry					
5-9	8.3	600	340	474	2.64	0.11
6-13	8.1	650	386	81	0.31	0.05
7-11	8.2	675	348	493	0.84	0.18
8-9	8.6	525	283	18	0.19	0.01
9-13	8.4	600	332	10.5	0.08	0.01
10-10	8.3	610	280	23	0.10	0.01
Min.	8.1	525	386	10.5	0.08	0.01
Max.	8.6	650	280	493	2.64	0.18
Mean	8.3	610.0	328.2	183.3	0.69	0.06
1982						
Min.	7.6	500	280	30.5	0.87	0.08
Max.	8.4	720	435	485	2.02	0.30
Mean	8.1	570	334	175.8	1.54	0.21
1981						
Min.	8.2	600	379	1.5	0.01	0.02
Max.	8.5	700	476	46.5	0.29	0.02
Mean	8.35	650	427	24.0	0.15	0.02
1980						
Min.	8.2	680	339	224.7	0.12	0.11
Max.	8.3	690	410	576	5.3	0.28
Mean	8.25	685	375	400.4	2.7	0.20
1979						
Min.	7.8	-	322	22.2	1.01	-
Max.	8.5	-	700	1860	7.2	-
Mean	8.0	-	523	677.3	3.4	-
Historical 1979 - 1982						
Min.	7.8	500	280	1.5	0.01	0.02
Max.	8.5	720	700	1860	7.2	0.30
Mean	8.2	609.0	407.1	329.5	2.0	0.17

TABLE 15: GRIMES WASH SURFACE QUALITY
LEFT FORK

1983 Sample Dates	pH (Units)	Conductivity UM HOS/CM	TDS	TSS	Iron Total	Manganese
1-10	7.4	720	570	0.5	0.31	0.11
4-11	8.1	650	378	3.5	0.04	0.04
5-9	8.0	700	390	133.0	0.56	0.01
6-13	8.15	650	384	29.0	0.20	0.02
7-11	8.15	685	360	51.0	0.23	0.03
8-9	8.25	650	356	0.5	0.05	0.01
9-13	8.3	675	372	6.5	0.05	0.01
10-10	8.2	680	295	5.0	0.05	0.01
Min.	7.4	720	295	0.5	0.04	0.01
Max.	8.3	650	570	133.0	0.56	0.11
Mean	8.1	676.3	388.1	28.6	0.19	0.03
1982						
Min.	7.8	590	339	0.5	0.20	0.09
Max.	8.2	790	448	23.5	0.36	0.15
Mean	8.05	645	373.5	6.3	0.28	0.12
1981						
Min.	8.7	610	379	0.5	0.07	0.02
Max.	8.3	750	518	8.5	0.30	0.05
Mean	8.2	682.5	453	4.8	0.22	0.03
1979*						
Min.	8.7	-	327	28.2	0.81	-
Max.	8.7	-	327	28.2	0.81	-
Mean	8.7	-	327	28.2	0.81	-
Historical 1978 - 1982						
Min.	7.8	590	327	0.5	0.07	0.02
Max.	8.7	790	518	28.2	0.81	0.15
Mean	8.2	660.0	398.2	7.7	0.31	0.08

* Only one sample collected.

TABLE 16: GRIMES WASH SURFACE QUALITY
BELOW THE MINE

1983 Sample Dates	pH (Units)	Conductivity UM HOS/CM	TDS	TSS	Iron Total	Manganese
1-10	7.7	790	578	9.5	0.10	0.06
4-11	8.2	1000	643	1.0	0.04	0.03
5-9	8.1	800	469	244.0	1.25	0.04
6-13	8.2	700	427	42.5	0.24	0.03
7-11	8.2	800	431	142.5	0.43	0.05
8-9	8.15	825	526	7.5	0.05	0.01
9-13	8.3	900	557	8.0	0.05	0.01
10-10	8.15	1000	544	4.0	0.08	0.02
Min.	7.7	700	427	1.0	0.05	0.01
Max.	8.3	1000	643	244.0	1.25	0.06
Mean	8.13	851.9	521.9	57.4	0.28	0.03
1982						
Min.	7.9	780	435	3.0	0.26	0.09
Max.	8.2	1000	679	171.0	1.20	0.19
Mean	8.0	906.7	554.7	63.92	0.82	0.12
1981						
Min.	8.0	790	434	0.5	0.01	0.01
Max.	8.3	1100	715	19.5	0.06	0.03
Mean	8.15	970.0	609.8	6.34	0.03	0.02
1980						
Min.	8.1	710	363	234.7	0.13	0.09
Max.	8.2	780	448	738.5	4.2	0.30
Mean	8.15	745	405.5	486.6	2.17	0.20
1979						
Min.	7.55	-	172.0	10.0	0.74	-
Max.	8.5	-	382.0	1180	18.90	-
Mean	8.0	-	308.0	407	6.84	-
Historical 1978 - 1982						
Min.	7.6	710.	172	0.5	0.01	0.01
Max.	8.5	1100	715	1180	18.90	0.30
Mean	8.1	900.8	500.1	173.5	1.99	0.10

EAST MOUNTAIN SPRINGS

Flow and Sampling Schedule

Flow: All springs identified on East Mountain are measured during the month of July. At least one spring from each mode of occurrence described in the 1980 annual water report, (a revised version is present as Table 17) is measured a second time during the month of October.

Quality Samples: All springs located within the area covered by the five year mine plan are sampled for water quality characteristics during the month of July. A representative group of springs are sampled again in October to document quality variations.

Spring Identification

The 1983 water reconnaissance program did not identify any new springs. It was recognized during the field measurements that two springs (79-4 and 79-40) were plotted improperly on the spring map. The spring map (Map 2) found in the back cover pocket was updated to include the 1983 observations.

Spring Flow

Due to the higher than normal precipitation received during the 1983 water year, discharge rates in 1983 were considerably higher than the measurements from previous years. Table 18 is a tabulation of the flow data collected during the 1983 season. To record the season variation at least one spring from each mode of occurrence was monitored more than once. The seasonal variation is represented in Table 18 under the column head "Seasonal Net Change". The percentage figures represent the amount of change either positive or negative. The average change reveals a 73.4 percent decrease from the July to the October measurements.

TABLE 17: MODES OF OCCURRENCE I' MOUNTAIN SPRINGS

Stratigraphic Location	Occurrences: Permeable fluvial channels that intersect the land surface	Flow along permeable strata underlain by impermeable mudstone which intersects the land surface	Contact of permeable beds and the Roans Canyon Fault zone	Mode of occurrence not identified
Base of Flagstaff Limestone		79-6, 79-7, 79-35	Sheba Springs 79-1	
North Horn Formation	Teds Tub, Burnt Tree, 79-2, 79-3, 79-8, 79-9, 79-11, 79-12, 79-13, 79-14, 79-15, 79-16, 79-17, 79-21, 79-22, 79-26, 79-27, 79-28, 79-29, 79-34, 79-39, 80-42, 80-43, 80-46, 80-47, 80-48		Elk Springs, 79-10, 79-18, 79-19, 79-20	
Base of North Horn Formation		79-23, 79-25, 79-32, 79-36, 79-37, 79-38	79-30, 79-31	
Other Stratigraphic Horizons			80-49 (Price River) Bear Canyon Fault Zone *82-51	Flagstaff Limestone 79-4, 79-5, Pine Springs Price River Formation 79-24, 79-33, 79-40, 80-41, 80-44, 80-45, *82-52, *Jerk Water Blackhawk Formation 80-50

TABLE 18: EAST MOUNTAIN SPRINGS DISCHARGE

Spring	Date Sampled	Flow (GPM)	Temperature F°	Date Sampled	Flow (GPM)	Temperature F°	Seasonal Net Change %
Sheba	7-12-83	22.9	38°	10-24-83	3.4	38°	-85
Elk Spring	7-13-83	642.3	37°	10-24-83	100.0	38°	-84
Burnt Tree	7-15-83	30.5	39°	10-25-83	20.0	39°	-34
Jerk Water	7-20-83	3.2	40°	10-25-83	2.2	39°	-31
Pine Springs	7-12-83	·17.1	41°	10-24-83	0.5	37°	-97
Pine Springs Trough	7-12-83	20.9	40°	10-24-83	0.4	38°	-98
Ted's Tub	7-20-83	89.0	39°	10-25-83	20.0	42°	-78
79-1	7-13-83	106.7	38°	10-24-83	15.0	38°	-86
79-2	7-14-83	9.1	38°	10-25-83	2.8	38°	-69
79-3	7-15-83	26.7	38°	10-25-83	0.5	33°	-98
79-4	7-12-83	8.0	36°				
79-5	7-29-83	5.7	48°				
79-6	7-12-83	1.2	59°				
79-7	7-12-83	1.8	54°				
79-8	7-12-83	5.9	41°				
79-9	7-12-83	12.3	32°	10-24-83	1.3	39°	-89
79-10	7-12-83	57.1	39°	10-24-83	12.0	36°	-79
79-11	7-14-83	8.3	38°				
79-12	7-20-83	Sheet Flow					
79-13	7-15-83	16.7	37°				
79-14	7-14-83	14.6	48°				
79-15	7-14-83	42.9	37°	10-25-83	6.7	37°	-84
79-16	7-13-83	21.8	48°				
79-17	7-13-83	5.0	38°	10-24-83	0.6	38°	-88
79-18	7-13-83	41.1	38°	10-24-83	13.3	38°	-68
79-19	7-13-83	25.0	38°	10-24-83	Dry		
79-20	7-13-83	4.3	38°	10-24-83	0.87	39°	-80
79-21	7-28-83	Damp					
79-22	7-28-83	1.0	54°				
79-23	7-28-83	20.0	48°	10-25-83	2.2	41°	-89
79-24 (Tom's Spg.)	Still flowing from 79-23						

TABLE 18: EAST MOUNTAIN SPRINGS DISCHARGE (Continued)

Spring	Date Sampled	Flow (GPM)	Temperature F°	Date Sampled	Flow (GPM)	Temperature F°	Seasonal Net Change %
79-25	7-14-83	12.4	42°				
79-26	7-14-83	20.7	42°	10-25-83	2.9	40°	86
79-27	7-14-83	14.1	42°	10-25-83	3.5	40°	75
79-28	7-14-83	16.7	37°	10-25-83	8.6	37°	49
79-29	7-14-83	10.0	38°	10-25-83	5.0	34°	50
79-30	7-12-83	4.2	42°				
79-31	7-12-83	1.0	54°				
79-32	7-14-83	3.3	37°	10-25-83	2.0	38°	39
79-33	7-14-83	4.2	39°				
79-34	7-14-83	56.7	37°	10-24-83	5.0	38°	91
79-35	7-12-83	15.0	38°	10-24-83	3.0	38°	80
79-36	7-15-83	Damp					
79-37	7-15-83	0.73	46°				
79-38	7-28-83	10.9	40°				
79-39							
79-40	7-28-83	15.0	40°				
80-41	7-28-83	10.9	39°				
80-42	7-15-83	27.3	58°				
80-43	7-15-83	24.0	39°	10-25-83	Damp		
80-44	7-28-83	24.0	40°				
80-45	7-28-83	12.0	42°				
80-46	7-27-83	60.0	41°	10-25-83	7.5	39°	88
80-47	7-27-83	20.0	39°	10-25-83	15.0	38°	25
80-48	7-13-83	26.7	37°				
80-49	7-13-83	60.0	38°	10-24-83	5.2	39°	91
80-50	7-26-83	3.5	46°				
82-51	7-29-83	10.0	44°				
82-52	7-20-83	80.0	39°	10-25-83	25.0	36°	69

A four year comparison of spring discharge is shown in Table 19. This table includes a year by year comparison of springs identified from each mode of occurrence (Table 17). The springs utilized in this comparison are underlined in Table 17. The flow values for the individual springs represent the July measurements. October measurements were not utilized due to the winter weather conditions causing some springs to be inaccessible.

Table 19 has then been compared to local climatology to see how closely spring discharge rates follow local annual precipitation. Figure 4 reflects the direct correlation between spring discharge and precipitation. The annual precipitation is an average of the four weather stations reported in the Climatology section, i.e., Hunter Plant, Huntington Plant, Electric Lake and East Mountain. This comparison will be vital in determining mining effects on spring discharge versus general changes in annual precipitation.

QUALITY

To more closely identify springs which are related one with another, samples of their water were analyzed to determine the percentage of cations and anions in solution. These percentages have been graphically represented as cation-anion diagrams (see Appendix E). The purpose of the cation-anion diagrams is to identify groups of related springs by water chemistry. These diagrams clearly show the similarity of water quality of springs originating in the same geologic formation. To better visualize this concept, the cation/anion diagrams are presented by the geologic formation in which it originates.

The quality of the springs sampled in 1983 reveals only a slight variation from historical averages. The sulfate content which showed

TABLE 19: YEARLY SPRING DISCHARGE VARIATIONS (GPM)

Spring	1979	1980	1981	1982	1983
Sheba	12.0	13.0	10.7	15.0	22.9
Burnt Tree	12.0	26.0	9.2	12.0	30.5
Pine Springs	4.1	12.0	2.6	5.3	17.1
Pine Springs Trough	6.6	Dry	6.9	8.6	20.9
Ted's Tub	65.0	78.0	27.3	60.0	89.0
79-1	40.0	130.0	28.3	72.0	106.7
79-2	0.5	7.5	10.0	12.0	9.1
79-3	2.6	15.0	2.6	10.0	26.7
79-5	3.1	1.2	4.6	5.0	5.7
79-6	0.86	Damp	Dry	1.0	1.2
79-7	0.53	Damp	5.0	1.0	1.8
79-8	2.0	1.5	1.7	2.4	5.9
79-11	6.0	5.0	0.5	2.0	8.3
79-15	2.0	5.0	7.2	27.5	42.9
79-17	0.5	0.5	0.2	4.6	5.0
79-18	4.0	17.0	16.0	20.0	25.0
79-19	3.0	Dry	3.5	46.0	41.1
79-20	-	1.0	Dry	4.3	4.3
79-21	-	Dry	Dry	Dry	Damp
79-22	14.0	Dry	Dry	0.5	1.0
79-25	10.0	8.0	4.6	12.0	12.4
79-28	3.0	43.0	4.0	4.6	16.7
79-29	4.0	6.0	1.3	4.0	10.0
79-30	1.5	2.0	Damp	10.0	4.2
79-31	0.6	0.5	0.4	1.0	1.0
79-32	1.4	3.0	0.45	2.1	3.3
79-34	10.0	5.0	2.4	30.0	56.7
Sub-Total	271.69	381.40	152.45	377.20	569.4
80-41		14.0	0.4	1.0	10.9
80-42		5.7	Dry	Dry	27.3
80-43		10.0	Damp	10.0	24.0
80-44		20.0	39.6	12.0	24.0
80-45		12.0	Damp	4.0	12.0
80-46**	40.0	31.0	1.6	12.0	60.0
80-47**	20.0	12.0	4.6	12.0	20.0
80-48		5.0	1.8	1.33	26.7
80-49		4.0	1.3	15.0	60.0
TOTALS (Includes All Springs)	350*	495.10	201.75	444.53	834.3

* Estimated
** In 1979 these springs were monitored as 79-20 and 79-21.

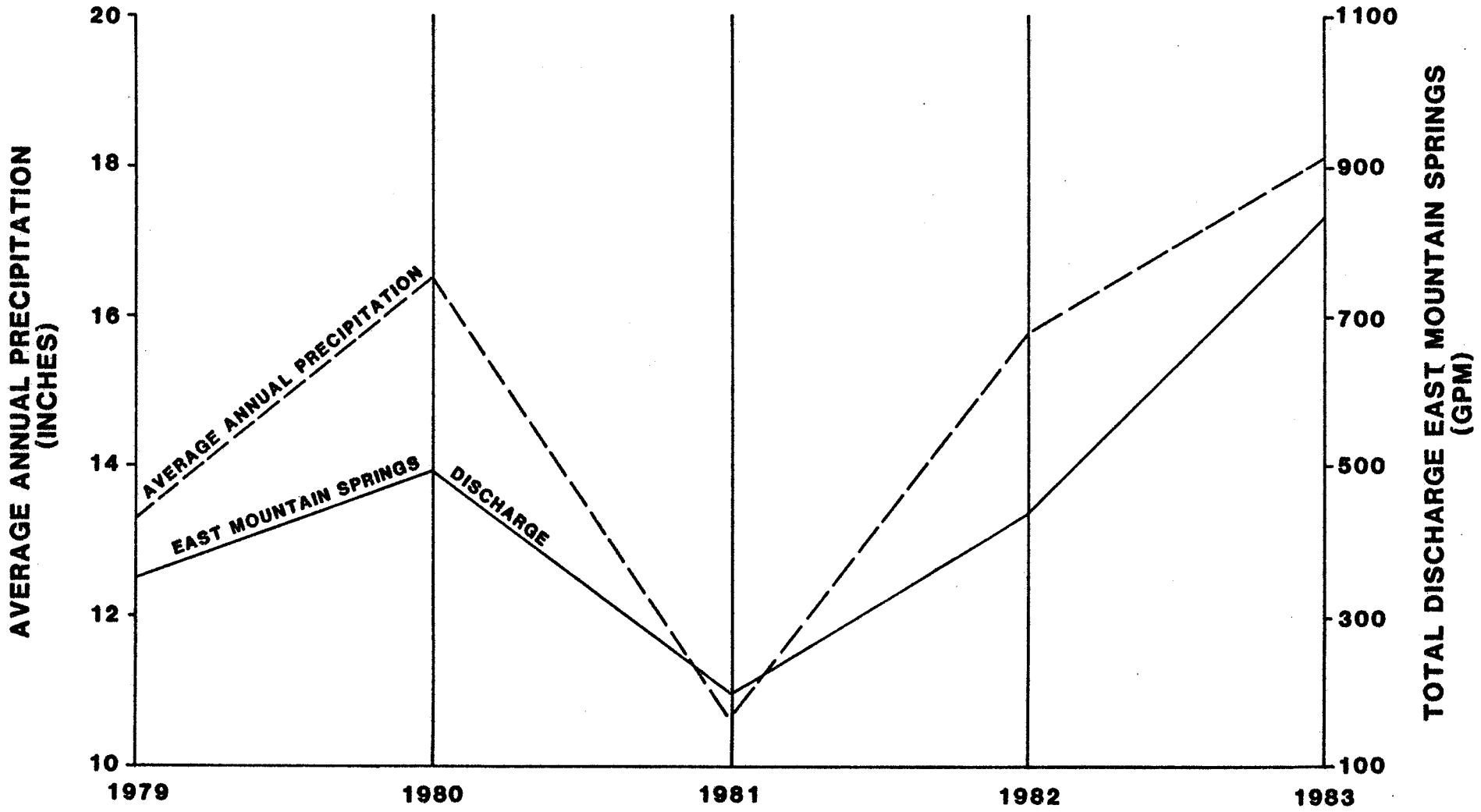


FIGURE 4

AVERAGE ANNUAL PRECIPITATION vs. TOTAL SPRING DISCHARGE

unexplainable increase from 1981 through 1982, declined in 1983 to levels similar to the 1979 and 1980 content. An interesting point of the 1983 analysis is the increase in the sulfate from the July to the October samples. The sulfate concentration increases could possibly be related to the decrease in the spring output from July to October.

A summary of the water quality analysis for a representative group of East Mountain Springs is presented in Table 20. In this table the mean values for 1983 are compared to the historical results for each respective spring. The raw data regarding all springs sampled is contained in Appendix E.

MINE HYDROLOGY

Peizometric Gradient Information

Water level elevations from all available East Mountain drill holes (surface and in-mine), were utilized to construct a piezometric gradient map. The degree of variability between the data points reveal no piezometric trends. Because of this fact, this map has not been included herein. It is probable that in many drill holes, the fluid level elevation was measured at artificial levels created by the drilling process and the data collected fail to show the true piezometric level.

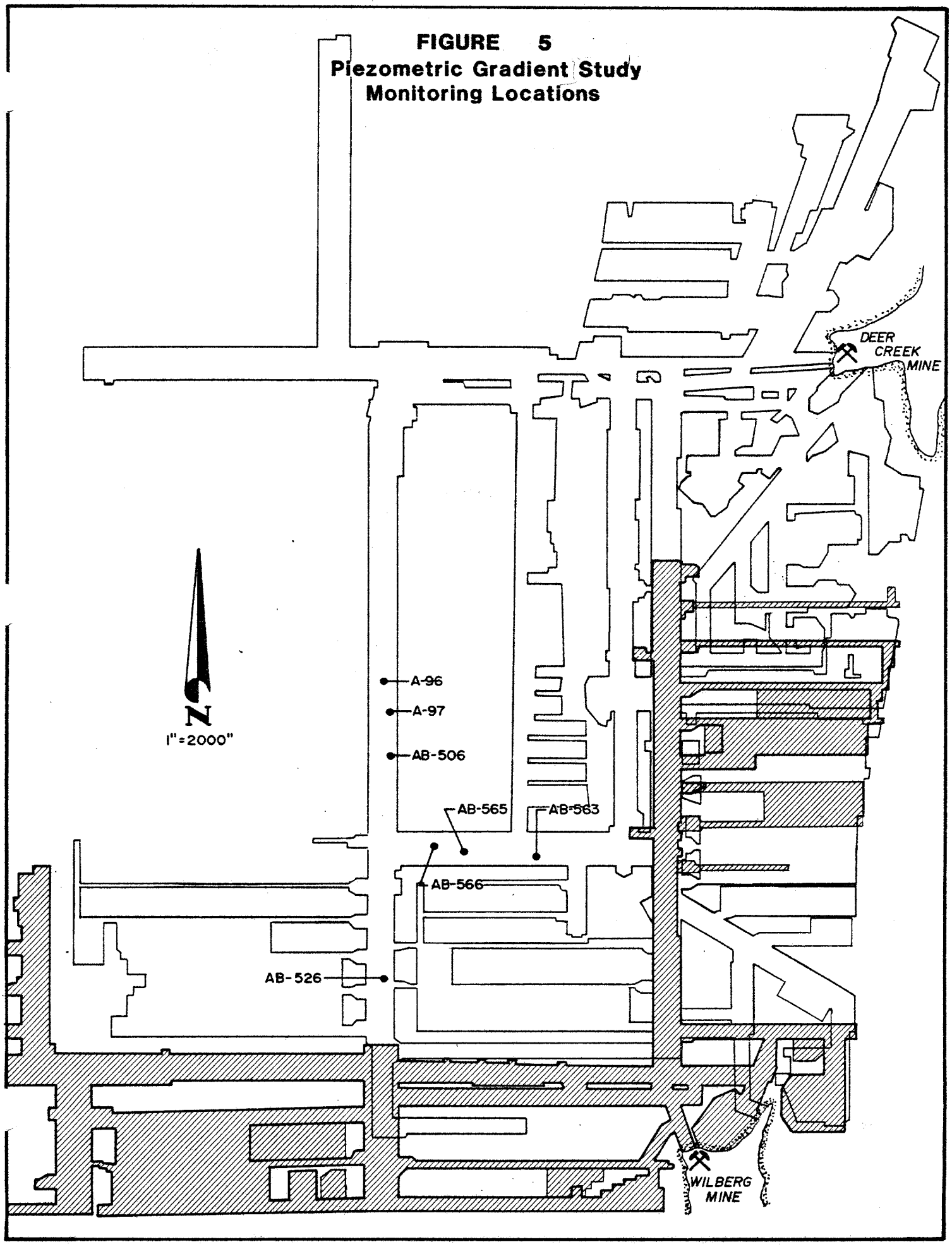
Seven in-mine drill holes completed in the Deer Creek Mine have been developed into water monitoring holes which are measured quarterly, (refer to Figure 5). The drill hole depth and method of casing the holes are shown in Figure 6.

The purpose of this program is to attempt to establish a piezometric gradient map for the area on the west side of the Pleasant Valley

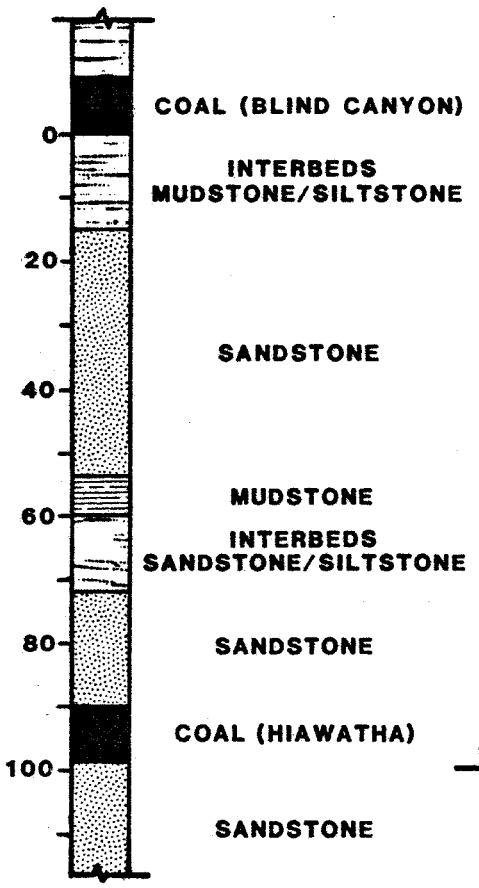
TABLE 20: EAST MOUNTAIN SPRINGS WATER QUALITY (Historical to 1983)

Parameter	Burnt Tree		Ted's Tub		79-15		79-28		80-44		80-49	
	Historical	1983	Historical	1983	Historical	1983	Historical	1983	Historical	1983	Historical	1983
Elevation	9260		9290		9290		9290		8980		9025	
Geologic Formation	TKN		TKN		TKN		TKN		KPR		KPR	
PH	7.6	7.6	7.8	7.6	7.5	7.6	7.6	7.6	8.0	7.7	7.7	7.3
Alkalinity	282.6	265.0	269.0	263.0	303.4	264.0	261.7	274.5	379.7	390.0	338.7	342.0
TSS	1.6	1.3	11.5	1.0	5.7	0.5	64.1	0.5	45.8	0.5	32.0	0.5
TDS	289.9	289.0	300.1	281.0	330.6	275.5	431.4	393.0	507.3	541.0	348.7	391.0
Sulfate	48.9	17.5	59.4	6.0	221.4	6.5	180.9	70.5	184.9	120.0	106.2	34.0
Iron	0.45	0.05	0.19	0.05	0.18	0.05	0.60	0.05	0.23	0.05	0.27	0.05

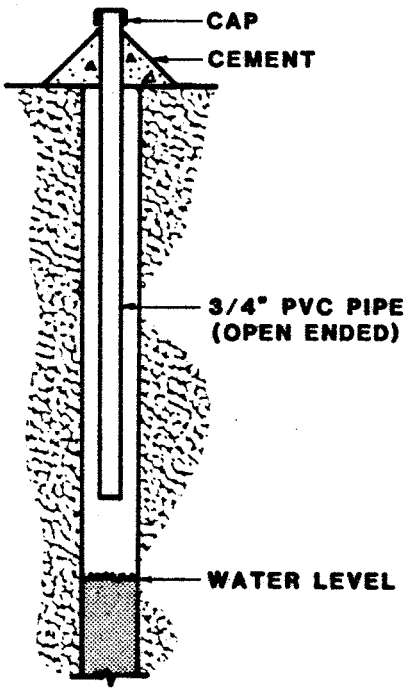
FIGURE 5
Piezometric Gradient Study
Monitoring Locations



DRILL HOLE #	COLLAR ELEVATION	DEPTH (FT.)	CASING DEPTH (FT.)	LOCATION OF HOLE BOTTOM	WATER DEPTH (FT.)	WATER ELEVATION
A-96	7576.0	103.5	20	11.2' Below Top Of Star Point	39.9	7536
A-97	7582.5	111.5	20	18.8' " "	37.2	7545
AB-506	7629.0	94.6	30	10.8' " "	11.0	7579
A-526	7590.0	110.0	80	22.0' " "	16.8	7607
AB-563	7605.0	98.4	20	21.0' " "	47.9	7557
AB-565	7603.0	103.5	20	20.0' " "	40.1	7562
A-566	7602.8	103.6	20	17.0' " "	49.0	7553
B-566	7602.8	75.0	20	12.0' Above Top Of Star Point	49.0	7553



TYPICAL GEOLOGIC SECTION



CASING DETAIL

DEER CREEK COAL MINE
Emery County, Utah

PIEZOMETRIC DRILL HOLE STUDY

UTAH POWER & LIGHT COMPANY
Department of Mining & Exploration

DATE: 15 NOV 1983	BY: A.W.BROW
SCALE: NONE	FIGURE 6

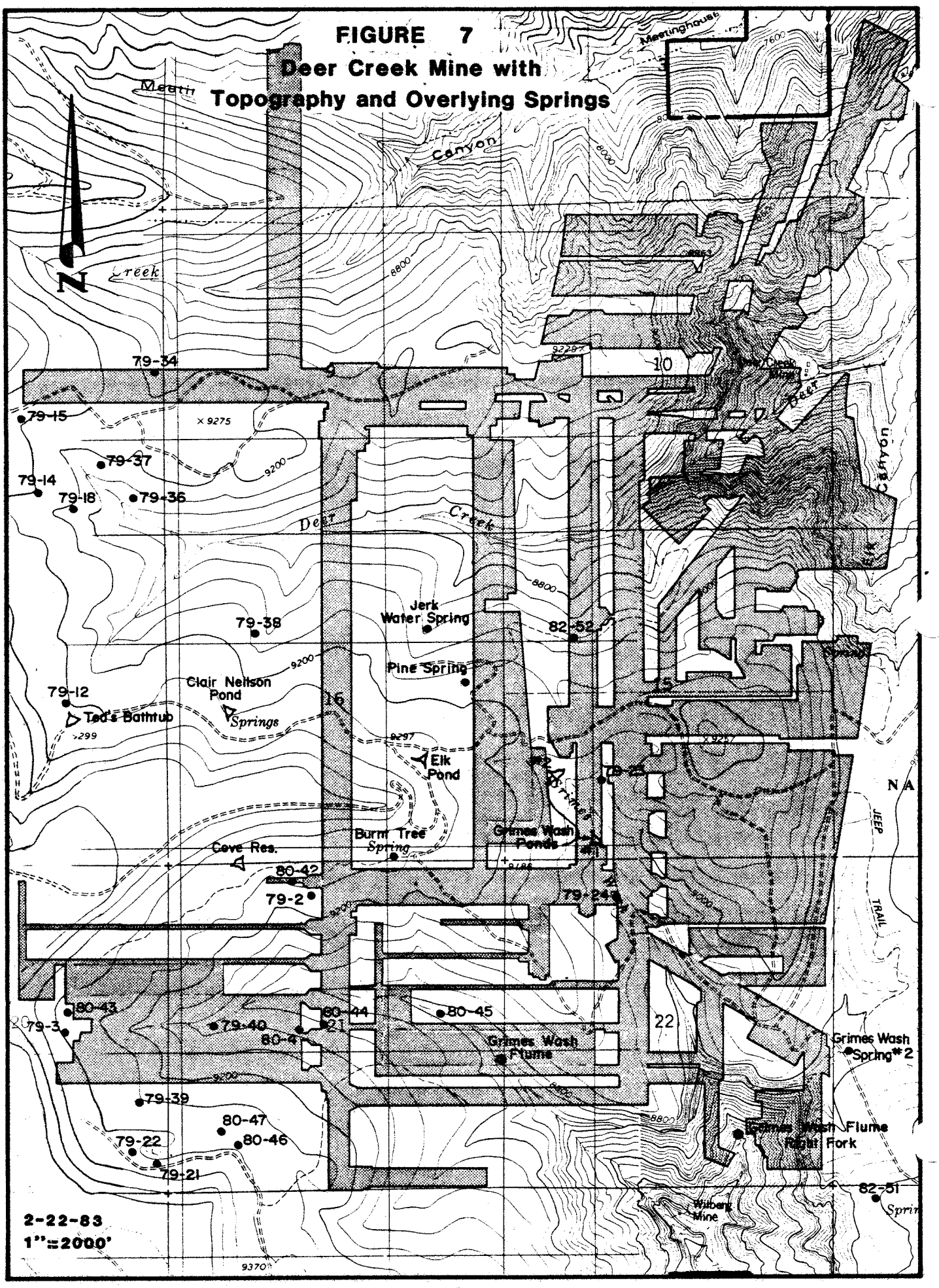
Fault system. The data currently available are insufficient to depict the piezometric gradient.

With available data, it is not possible to compile a piezometric map of the water-bearing strata in the North Horn Formation, the Blackhawk Formation or the Starpoint Sandstone. The data collected from the numerous drill holes completed shows no pattern in the water level of the North Horn Formation water-bearing strata. The data collected in the mine also shows the water level of the sandstone channels in the Blackhawk Formation to be variable and that these strata are rapidly dewatered on mining. Although many drill holes have intersected the Starpoint Sandstone no piezometric level has been observed. Generally when exploration holes are drilled from the surface through the overlying strata into the Starpoint Sandstone, water flows out of the bottom of the hole through fractures which are often present. This indicates that the piezometric level is below the level normally penetrated by the drill holes.

7 = many

SURFACE WATER SOURCES IN RELATION TO MINE WORKINGS

The relationship of the Deer Creek and Wilberg Mine workings with the overlying springs is shown in Figures 7 and 8. Beginning in 1979, UP&L has developed an ambitious spring monitoring program with emphasis to detect changes in the East Mountain hydrologic regime as a result of mining. With the data collected to date, there is no indication of any mine related effects on spring discharge rates. As expected, there is a direct relationship between annual precipitation and spring discharge rates as previously discussed on page 32 and shown in Figure 4.


Meetinghouse
Canyon
Creek
N
79-34
79-15
79-37
79-14
79-18
79-36
Deer
Creek
Jerk
Water Spring
79-38
82-52
Pine Spring
Clair Nelson
Pond
79-12
Ted's Bathtub
Springs
Elk
Pond
79-25
Grimes Wash
Ponds
Burn Tree
Spring
Cove Res.
80-42
79-2
79-24
80-43
79-3
79-40
80-44
80-45
80-4
Grimes Wash
Flume
Grimes Wash
Spring #2
79-39
80-47
80-46
79-22
79-21
Grimes Wash Flume
Right Fork
82-51
Wilberg
Mine
JEEP
TRAIL
10
16
15
22
21
20
2-22-83
1"=2000'

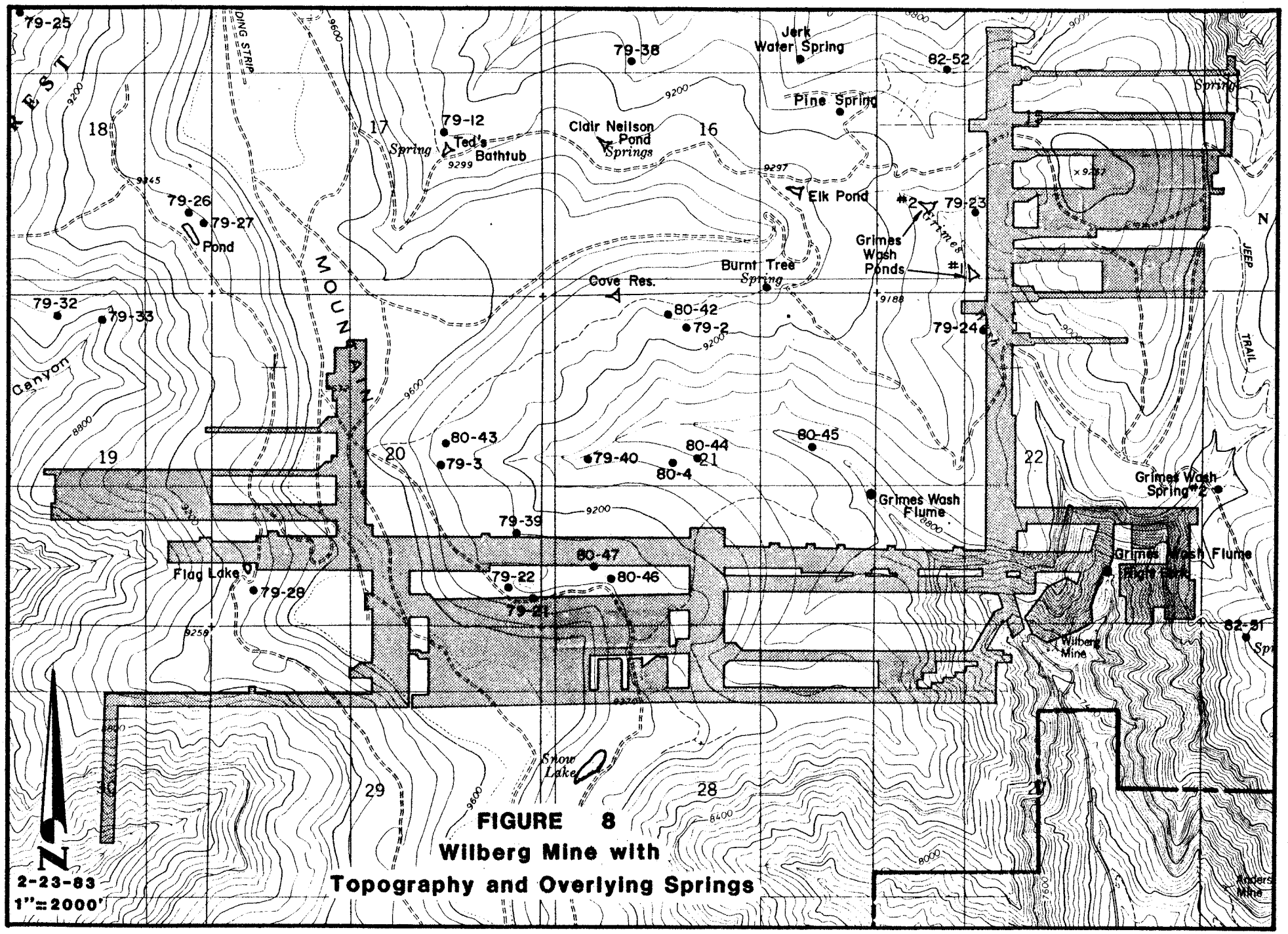


FIGURE 8
Wilberg Mine with Topography and Overlying Springs

GROUNDWATER QUALITY AND COLLECTION PROCEDURES

In-mine quality and quantity measurement began by UP&L in 1977 and have continued through 1983. With the collection of numerous samples throughout the extent of the mine workings, the quality has remained relatively constant. Figure 9 depicts the consistency of the ground water quality by the use of cation and anion diagrams. It also reveals the similarity between Deer Creek Mine and Wilberg Mine.

Collection procedures for ground water quality consist of two grab samples collected and analyzed per quarter at each of the mines which produce measureable quantities of water. Sampling according to this established plan began in the first quarter of 1982.

Long-term monitoring locations have been established at each of the mines which produce measureable quantities of water, i.e., Deer Creek and Wilberg Mines, see Map 3 and 4 in pocket. Four types of occurrences have been recognized to exist within the current mine workings, refer to Figure 10.

They include:

1. Structural rolls with overlying fluvial channels.
2. Pleasant Valley Fault System
3. Fractures and joints (lineaments)
4. Roof bolt and in-mine drill holes.

A collection device was installed at each long-term monitoring location. Flow and temperature information is collected on a quarterly basis. This information will be included as a graph in the 1984 annual report to visualize any annual variations in flow and temperature.

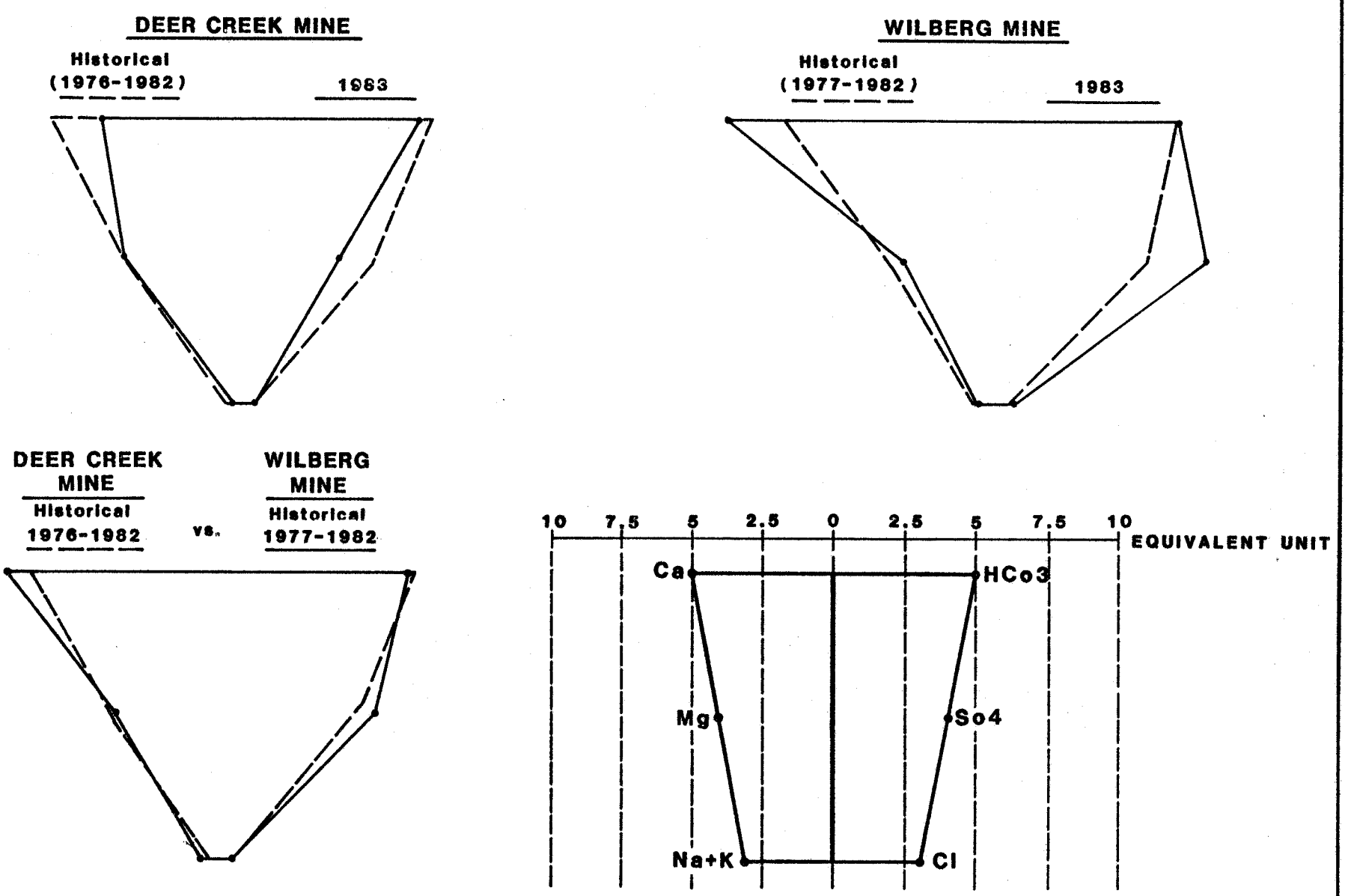
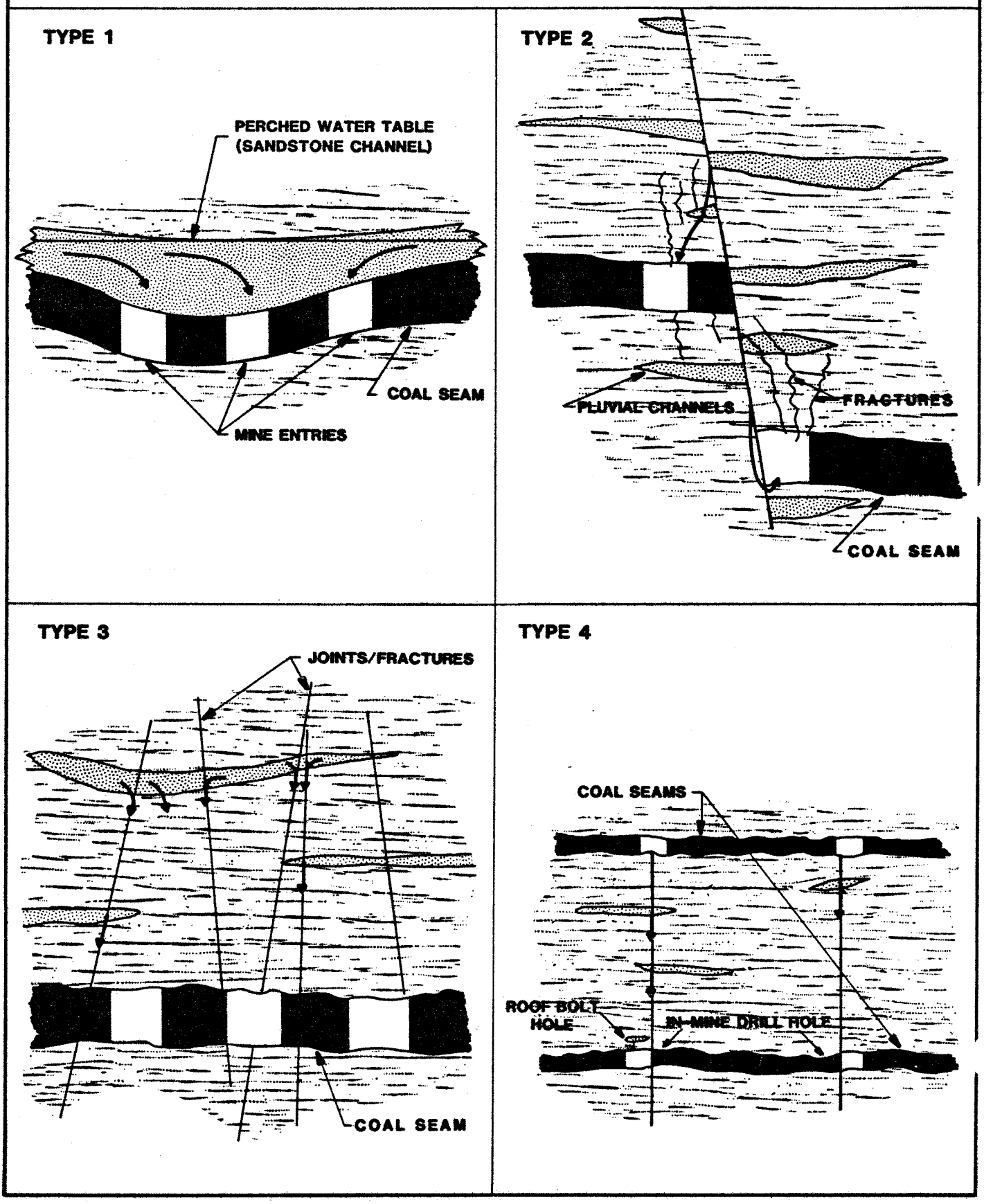


FIGURE 9
GROUND WATER COMPARISON

FIGURE 10
LONG TERM WATER SOURCES



Two long-term sites in Wilberg Mine were reestablished due to incompetent roof conditions experienced at the original sites. The new sites are indicated on Map 4 (in pocket) and described as follows:

	Original Site	New Site	Type
1.	1st N xc-12 3 L	1st N xc-13 2 L	Joints and Fractures (Lineaments)
2.	1st N xc-49 1 R	1st N xc-46 3 R	Sandstone Channel

MINE WATER

DES-BEE-DOVE MINE

The mine workings of the Des-Bee-Dove Mines have been generally dry since the inception of mining. One minor exception existed during 1983, Deseret Mine, 2nd North entry.

As described in the 1982 annual report, the ground water occurrence in 2nd North was of an unusual nature. Fractures in the Starpoint floor began to produce water at an estimated rate of 10 GPM during mid-1982. As in the case of most multiple seam extraction mining of the upper seam (Little Dove Mine), precedes the mining of the lower seam (Deseret Mine). During the Little Dove development, a sump was constructed at crosscut 38, for in-mine water storage. As the mine workings of the Deseret were developed below the area in which Little Dove sump is located, fractures in the Starpoint (Deseret floor) began to produce water. It is felt that water from the Little Dove sump was percolating along fractures associated with the Deer Creek Fault and enters the Deseret Mine through fractures in the Starpoint floor. During 1983 the flow decreased to a point where measureable quantities cease to exist.

Due to the difficulty in collecting accurate quality samples from a floor source, samples were not collected during 1983.

WILBERG MINE

1. In-Mine Water Production. The best estimate of in-mine water production was arrived at by combining the following values:

Wilberg Mine Discharge	141.9 Million Gallons
Des-Bee-Dove Mine Transfer	27.4 Million Gallons
Estimated Evaporation*	19.0 Million Gallons
Domestic Usage	4.6 Million Gallons
Total Discharge	192.9 Million Gallons

* See 1981 Hydrologic Monitoring Report

2. In-Mine Quality. A total of eight samples were collected in the Wilberg Mine in 1983. Table 21 lists the characteristics of the samples collected and compares the mean, minimum, and maximum results of 1983 to the historical values. It is apparent from Table 21 that the average quality of the in-mine water has remained relatively constant. The consistency was also depicted in the stiff diagrams presented as Figure 9. A complete chemical analysis of samples can be found in Appendix G.

TABLE 21: WILBERG IN-MINE WATER QUALITY

Location		pH	Alka.	Ca	Cl	Cond.	Mg	K	Na	SO_4	TDS	TSS
1Nx49,1R		6.8	376	250	21.9	1200	5.6	2.46	21.1	350	837	0.5
1Nx12,3L		7.0	431	214	15.2	1080	5.44	2.76	26.9	200	694	0.5
MWx109,1L		7.5	338	200	9.0	1000	5.7	2.4	22.0	190	550	3.5
2Sx11,1L		7.6	381	330	15.0	1500	5.4	2.39	30.0	490	902	6.0
1Nx12,3L		7.6	429	140	11.0	1190	58.3	3.34	20.1	200	637	0.5
1Nx45,1R		7.25	305	184	15.5	1500	71.7	4.78	34.1	500	1104	0.5
4Ex42,2L		7.1	537	230	16.0	2200	162.9	5.3	25.3	700	1458	0.5
3Nx5,1L		8.5	328	11.2	8.8	1000	5.8	1.5	183.8	185	576	0.5
	Min	6.8	328	11.2	8.8	1000	5.44	1.5	20.1	185	550	0.5
1983	Max	8.5	537	330	21.9	2200	162.9	5.3	183.8	700	1458	6.0
	Mean	7.42	390.6	194.9	14.05	1334	40.1	3.12	42.2	352	844.8	1.56
Hist.	Min	6.6	218	66	1.0	620	13.0	1.0	17.0	78	419	0.1
(1977-	Max	8.2	566	356	17.8	2000	126	19.0	129.0	780	1610	70.1
1982)	Mean	7.37	386.3	156.7	9.4	1053.3	45.8	8.59	41.2	251.7	686.4	4.2

3. Discharge Quality. Water produced in the Wilberg Mine is pumped to a primary sump location within the Wilberg workings by a complex pumping and piping system, Figure 11. The sump, which functions as a settling basin, effectively removes setteable solids from the water. A portion of this water is redistributed to various areas of the mine to be utilized in the mining operations. Water from this sump is also used to supply the water treatment plant at the Wilberg Mine and water to the Des-Bee-Dove mining complex. Excess water is discharged into the Left Fork of Grimes Wash after passing through an oil skimmer in accordance with stipulations of the Wilberg Mine Discharge Permit UT-0022896.

The rate and frequency of discharge is dependent upon the water level in the sump. As the sump approaches its capacity, discharge is initiated until the water is drawn down to a reasonable level.

The total water that was discharged from the Wilberg Mine during 1983 amounted to 435 acre feet or 141.9 million gallons. The recorded flow of 435 acre feet during 1983 is a slight increase over the 1982 discharge of 419 acre feet. The average monthly discharges are shown in Figure 12. Also included is a graph displaying the discharge rates from January 1979 through December 1983, Figure 13. The rapid variations from month to month could possibly be the result of several factors which include: (1) increase in annual coal production, (2) increase in the labor force (higher culinary

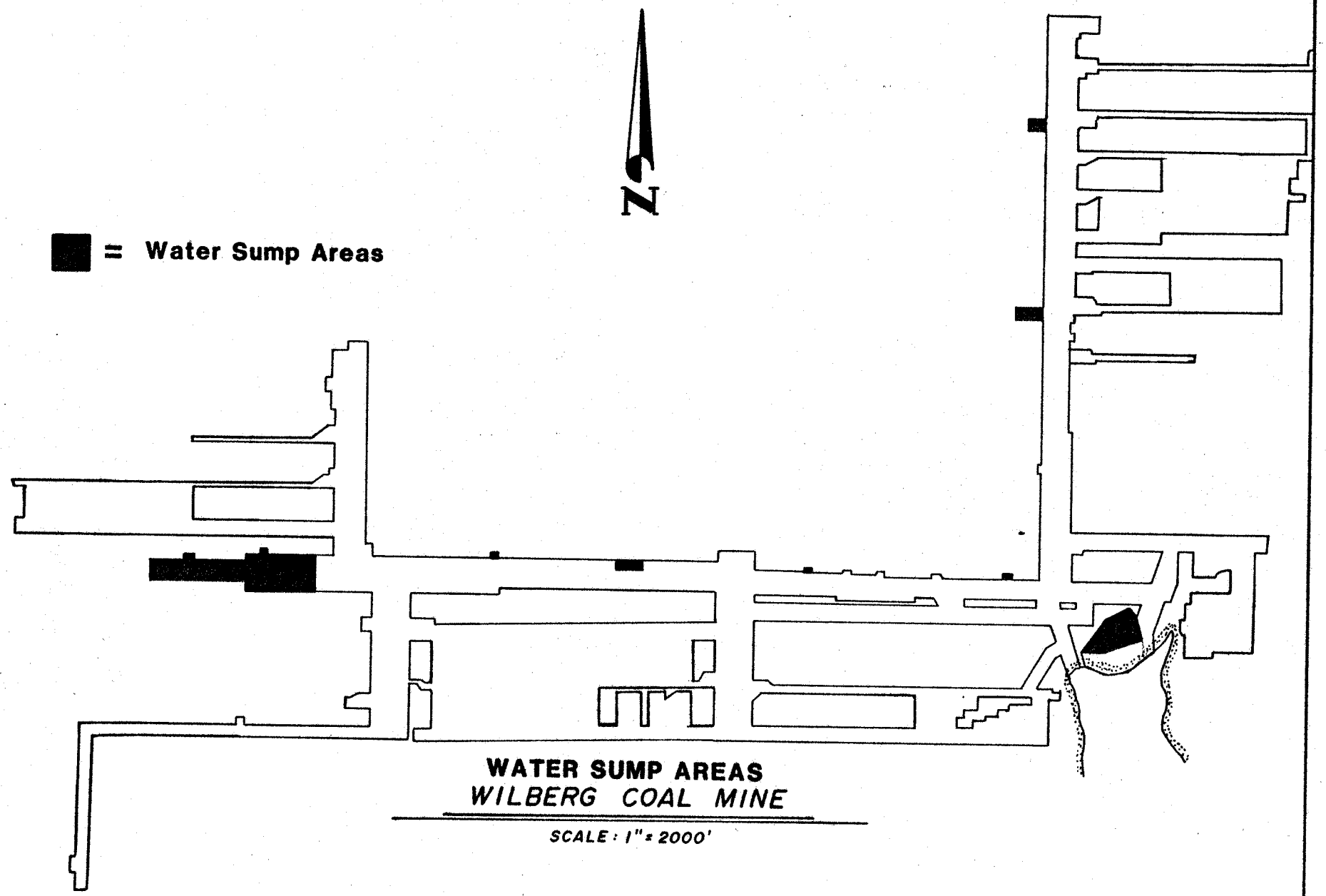

N
= Water Sump Areas
WATER SUMP AREAS
WILBERG COAL MINE
SCALE: 1" = 2000'

FIGURE 11

1983 WILBERG COAL MINE WATER DISCHARGE *

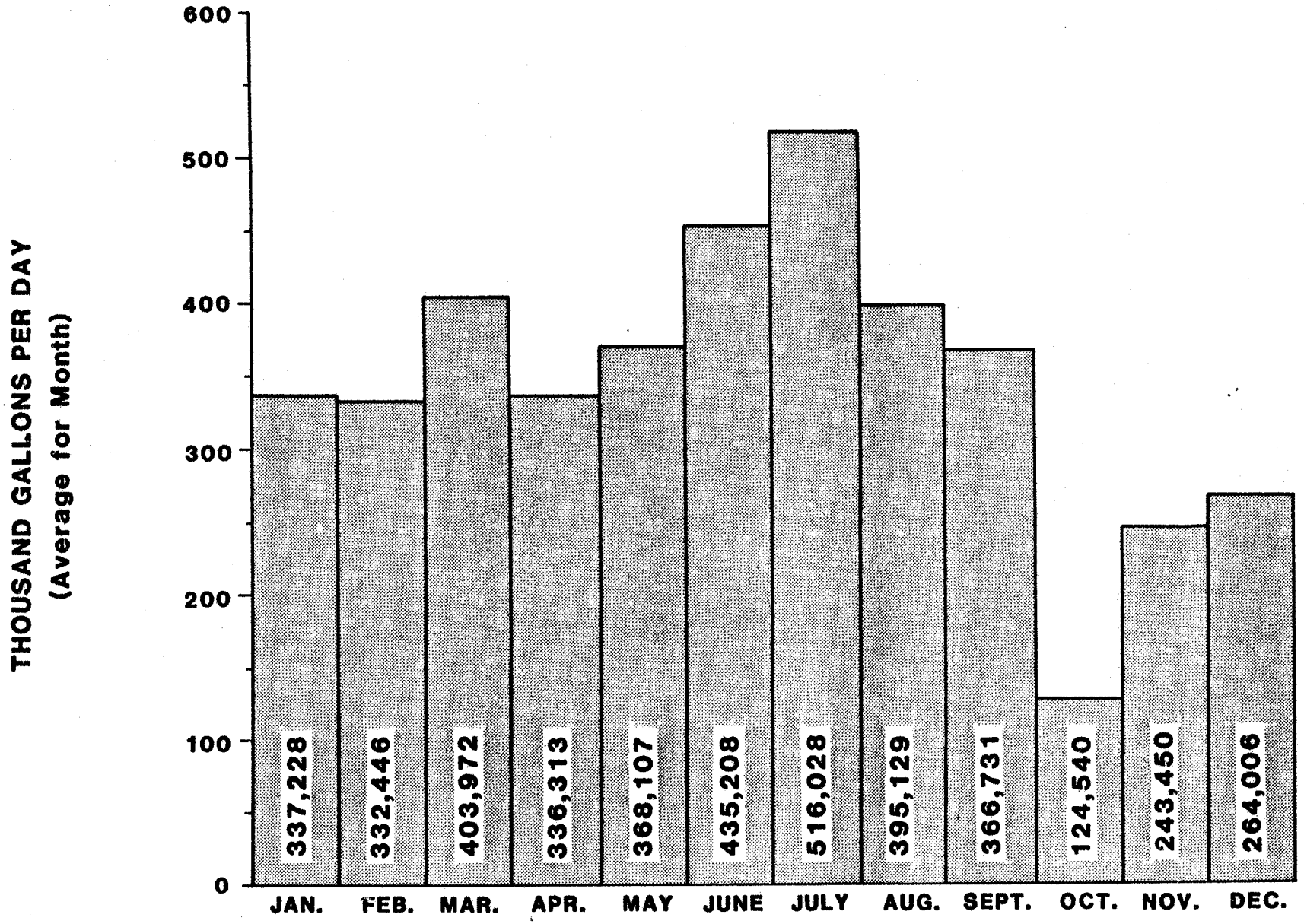


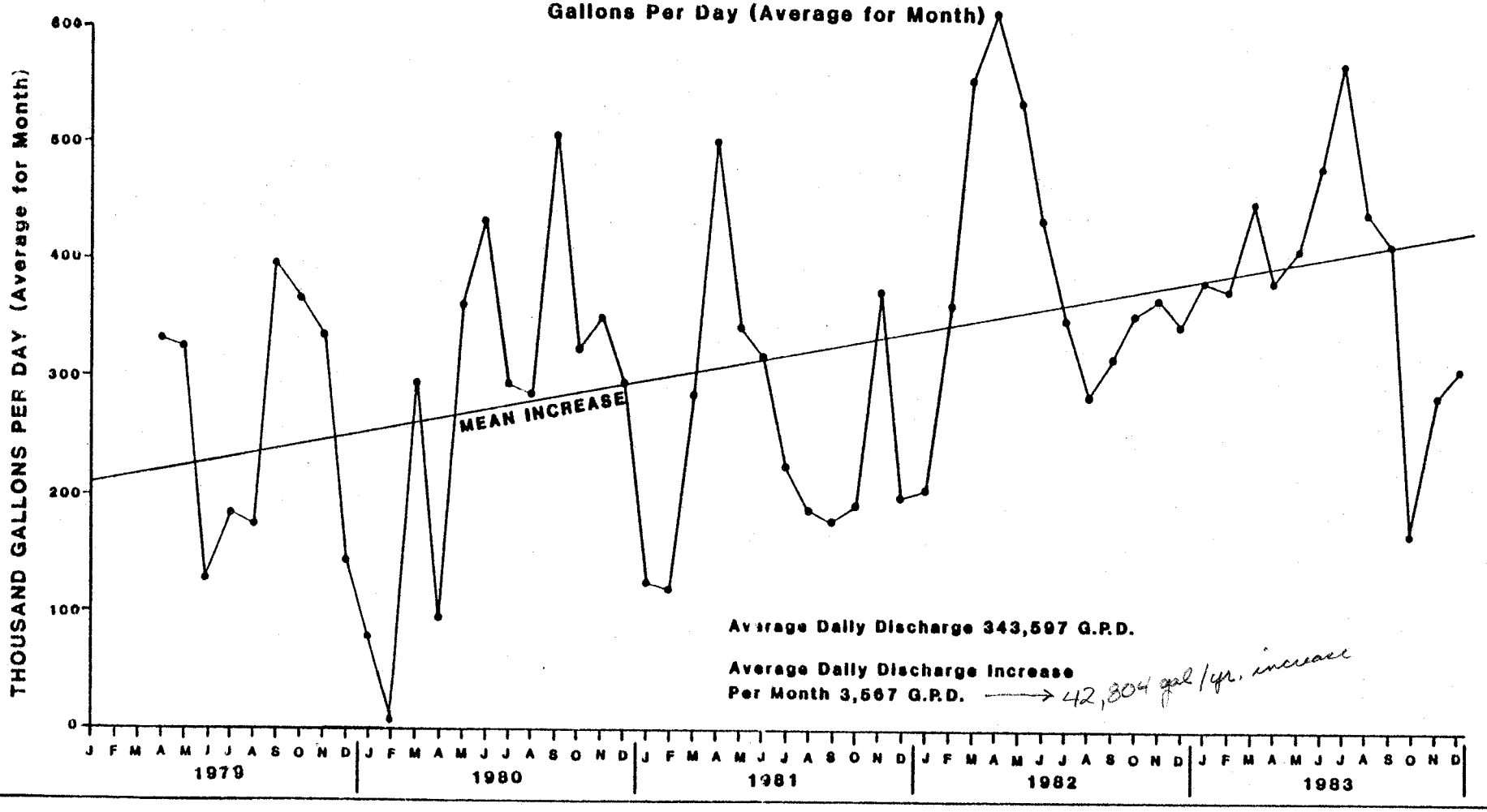
FIGURE 12

*INCLUDES WATER TRANSMITTED TO THE DES-BEE-DOVE MINE

FIGURE 13

WILBERG MINE DISCHARGE 3-79 to 12-83

Gallons Per Day (Average for Month)



use), (3) improved pumping techniques or changes made to sump capacities, and (4) near portal ground water sources freezing during the winter months resulting in an overall decrease in discharge rates during this period. It is thought that the factor of greatest influence on ground water is the increase in the annual coal production especially in areas overlain by sandstone channels.

Inspection of Figure 12 reveals a substantially lower discharge rate for the month of October. This was a result of a storage increase in the Main West sump.

4. Discharge Quality. Monthly water quality samples were collected to insure that the water discharged was in compliance with the Wilberg Mine discharge permit. Table 22 compares the minimum, maximum and mean values from an historical standpoint to 1983. An examination of Table 22 shows no significant change in quality between samples collected in 1983 to the historical results. Individual analysis can be found in Appendix H.

TABLE 22: WILBERG MINE - DISCHARGE WATER QUALITY

	1983			Historical - (1976-1982)		
Parameters	Minimum	Maximum	Mean	Minimum	Maximum	Mean
pH	6.9	8.1	7.8	6.98	8.2	7.6
Acidity	1.0	1.0	1.0	0.1	62.0	10.3
Alkalinity	247	350	275.0	216	364	273.7
BOD_5	0.4	4.8	2.0	0.3	11.0	2.1
Chloride	11.7	16.8	13.4	2.7	63.3	14.2
Coliforms:						
Fecal	2.0	2.0	2.0	2.0	30.0	4.5
Total	2.0	4.0	2.4	2.0	9300	529.1
Iron	0.05	0.26	0.09	0.01	3.0	0.36
Oil & Grease	0.5	2.0	0.70	0.2	23.8	2.8
Sulfate	195	340	237.3	29.2	305	181.3
TDS	555	664	609.7	424	705	532.2
TSS	0.5	11.5	2.6	0.5	222	10.3

DEER CREEK MINE

1. In-Mine Monitoring. The amount of water flowing into the Deer Creek Mine is estimated by combining the amount of water leaving the mine with the water used for domestic purposes. The amount discharged from Deer Creek Mine in 1983 was 156.5 million gallons. Estimated water loss due to evaporation was approximately 19 million gallons. Domestic usage for 1983 amounted to approximately 6.8 million gallons. Therefore, the water flowing into the Deer Creek Mine in 1983 was approximately 182.3 million gallons, which equates to an instantaneous flow of 347 gallons per minute.

2. In-Mine Quality. A total of eight samples were collected in the Deer Creek Mine during 1983. Table 23 compares the quality characteristics of the samples collected in 1983 to the historical values. The consistency of the in-mine quality can be recognized both from Table 23

TABLE 23: DEER CREEK IN-MINE WATER QUALITY

Location		pH	Alka.	Ca	Cl	Cond.	Mg	K	Na	SO_4	TDS	TSS
EM-3		7.2	402	110	10	900	53.0	5.0	12.0	135.0	605	0.5
2Lx20		7.2	422	115	10	1020	56.0	4.0	11.0	155.0	676	1.0
5Rx7,1R		7.45	425	115.2	10.5	1000	62.5	3.02	14.95	145.0	636	0.5
5Rx47½,1R		7.3	383	100.8	10.0	910	55.45	3.80	16.12	125.0	589	0.5
3Nx42,1L		7.4	309	74.4	4.27	700	32.1	2.9	15.0	52.0	376	17.0
4Rx14½,1R		7.3	428	128	13.2	1200	63.2	3.0	15.8	255.0	680	6.5
AB-50		7.3	356	100.8	10.0	900	50.6	3.3	20.0	105.0	500	0.5
3Sx33,2L		7.6	338	77.6	8.8	775	5.1	19.0	19.0	60.0	367	0.5
	Min	7.2	338	74.4	4.27	700	32.1	2.9	11.1	52.0	367	0.5
1983	Max	7.6	428	128	13.2	1200	63.2	5.1	20.0	255	680	17.0
	Mean	7.3	383	102.7	9.6	936.9	52.1	3.8	15.5	129.0	553.6	3.4
Hist.	Min	6.8	214	60.8	5.95	470	4.4	1.99	10.22	40.0	421	0.1
(1977-	Max	8.2	554.4	245.0	16.0	1700	79.5	10.0	66.0	1280	982.0	26.1
1982)	Mean	7.4	404.3	138.3	10.8	898.7	51.2	4.7	34.0	216.2	586.8	5.1

and the stiff diagrams presented in Figure 9. The complete chemical analysis of the samples collected in 1983 can be found in Appendix I.

3. Discharge Quantity. Excess water not utilized in the mining operation or for domestic use was either pumped to storage areas or discharged from the mine. The location of the main sump areas within the mine are shown in Figure 14. The largest volume of water is stored in the western part of Main West, an area that has not been actively mined for several years.

The water that is discharged from the mine flows through an oil skimmer and then a recording weir before being piped to UP&L's Huntington Power Plant. None of the discharge water leaving the mine enters any of the natural streams in the region, but instead is used in the cooling towers at the power plant.

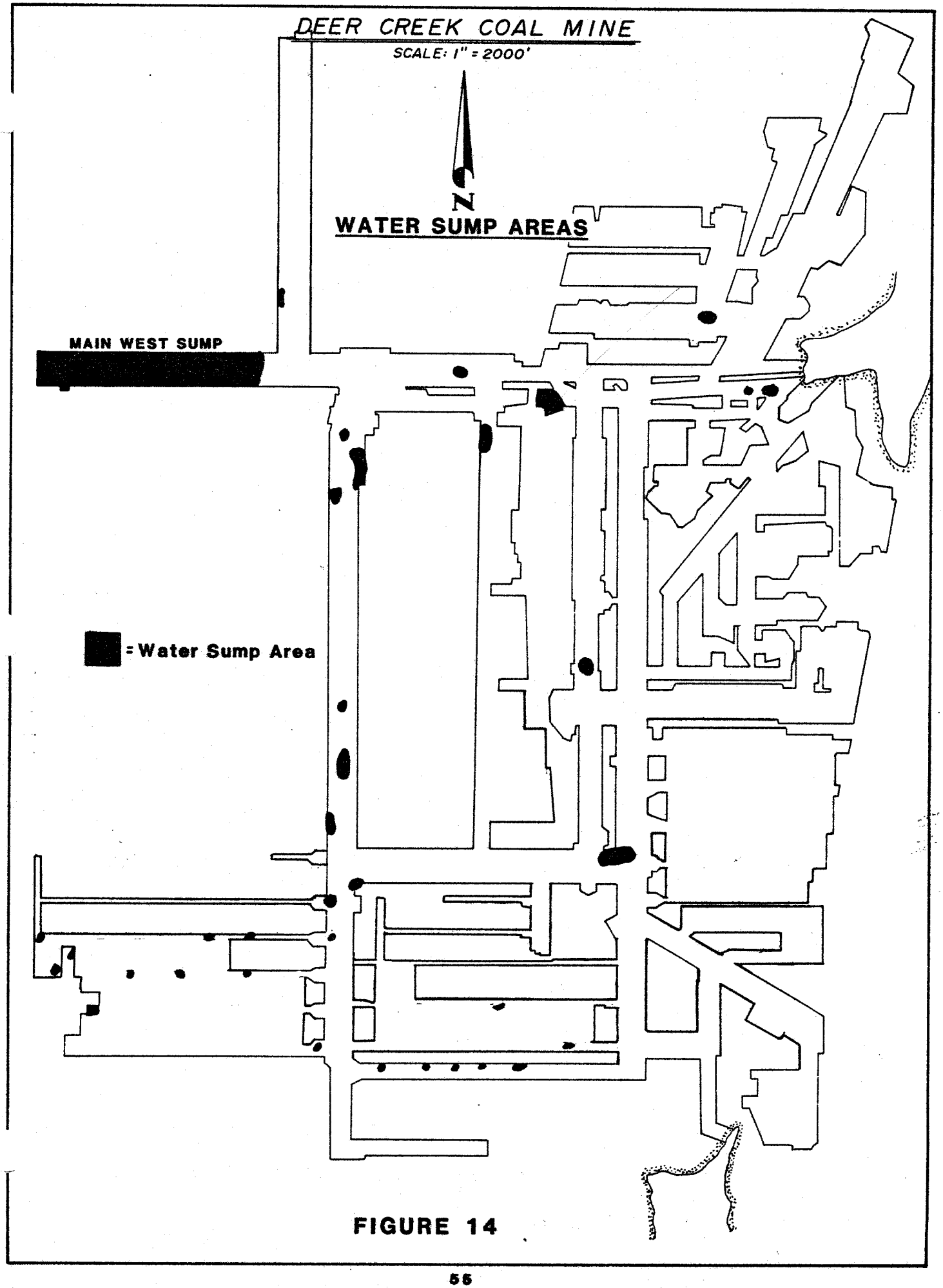

DEER CREEK COAL MINE
SCALE: 1" = 2000'
N
WATER SUMP AREAS
MAIN WEST SUMP
= Water Sump Area

FIGURE 14

The total water that was discharged from the Deer Creek Mine during 1983 amounted to 480 acre feet or 156.5 million gallons. The recorded flow of 480 acre feet during 1983 is slightly higher than the 1982 discharge of 359 acre feet. The average monthly discharges are shown in Figure 15. A graph displaying the historical discharge rates is included as Figure 16. The factors affecting the monthly variations depicted in Figure 16 are consistent with the interpretations made for the same phenomenon occurring with the Wilberg Mine discharge.

4. Discharge Quality. Monthly water quality samples were collected for 1983. Table 24 compares the minimum, maximum and mean values from an historical standpoint to 1983. An examination of Table 24 shows no significant change in quality between samples collected in 1983 to the historical results. Individual analysis can be found in Appendix J.

TABLE 24: DEER CREEK MINE - DISCHARGE* WATER QUALITY

	1983			Historical - (1976-1982)		
Parameters	Minimum	Maximum	Mean	Minimum	Maximum	Mean
pH	7.2	7.9	7.6	6.8	8.1	7.5
Acidity	1.0	1.0	1.0	0.7	52.0	12.2
Alkalinity	280	344	300.7	207	414	300.2
Chloride	10.2	39.1	18.3	2.4	2700	89.5
Conductivity	910	1200	1045.5	480	10,000	1264.6
Iron	0.05	0.57	0.29	0.03	7.53	0.71
Oil & Grease	0.5	2.8	1.0	0.01	8.4	1.55
Sulfate	190	350	250.6	29.8	497.0	189.1
TDS	592	736	640.7	320	5100	724.7
TSS	0.5	45	12.7	0.5	272	25.5

* Used only in the power plant cooling system.

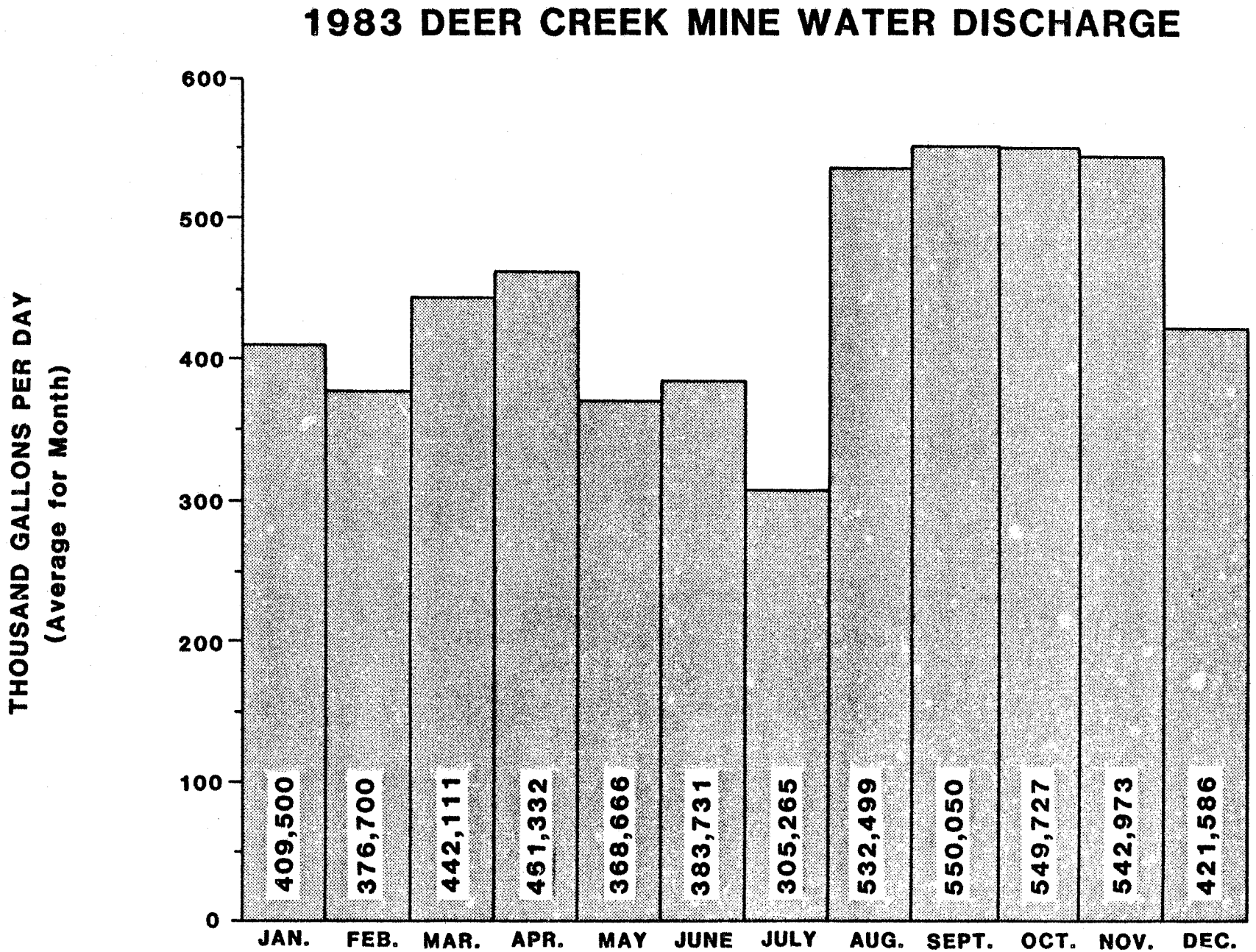
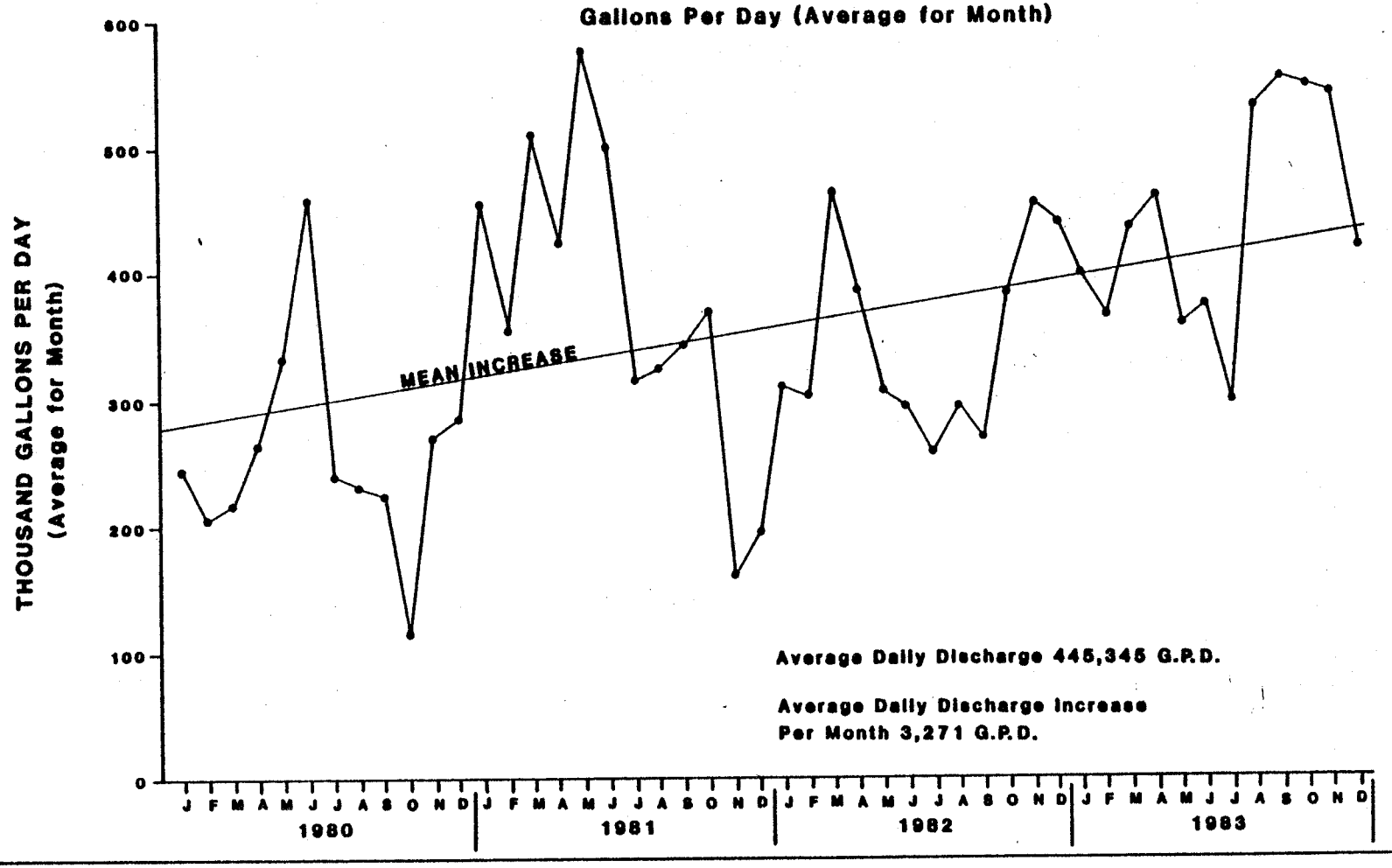

1983 DEER CREEK MINE WATER DISCHARGE
THOUSAND GALLONS PER DAY
(Average for Month)
600
500
400
300
200
100
0
409,500
376,700
442,111
461,332
368,666
383,731
305,265
532,499
550,050
549,727
542,973
421,586
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.

FIGURE 15

FIGURE 16

DEER CREEK MINE DISCHARGE 1-80 to 12-83

Gallons Per Day (Average for Month)



EFFECTS OF MINING AND SUBSIDENCE ON HYDROLOGY

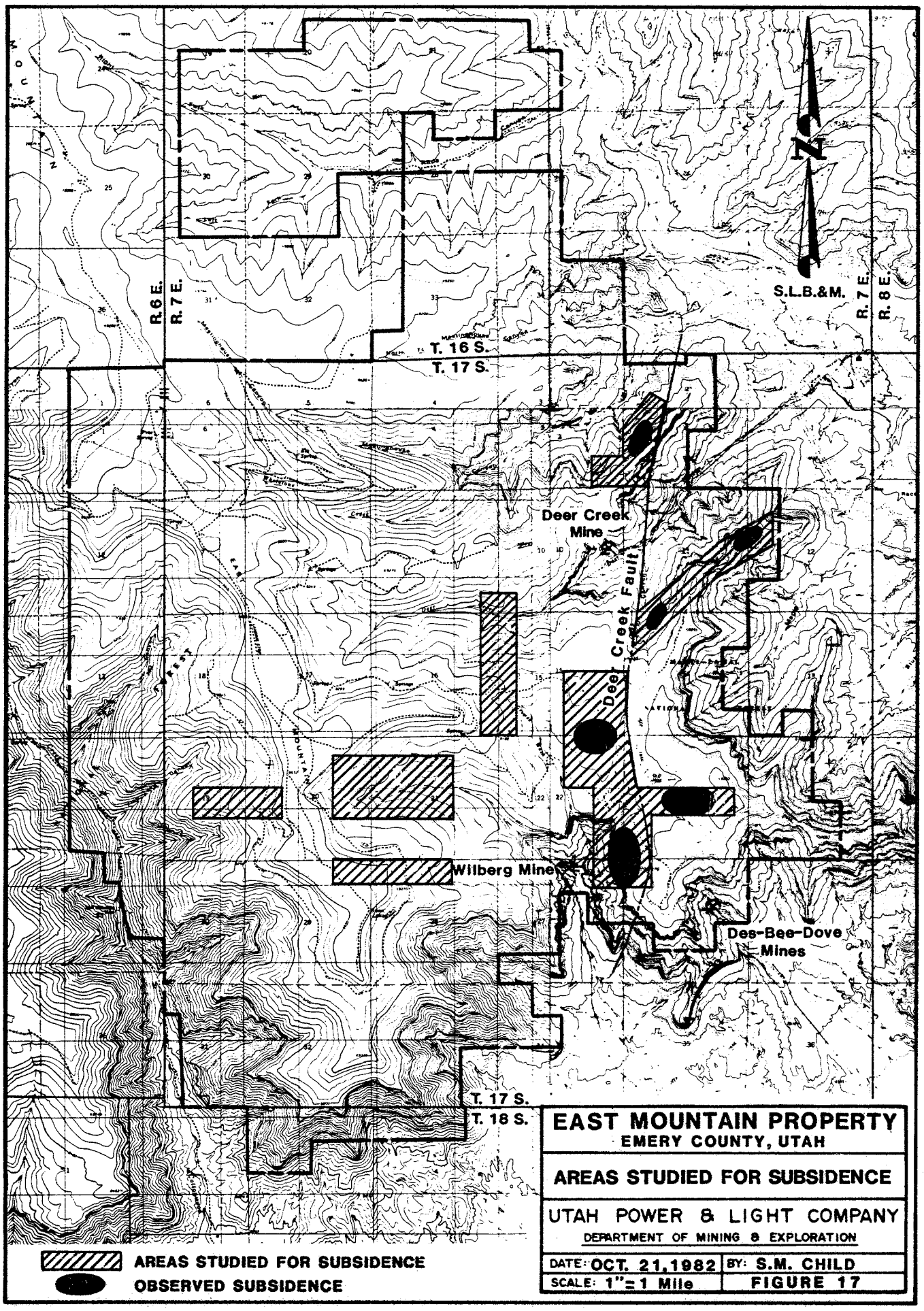
Since the development of the UP&L mining complex on East Mountain, coal in several areas of the property have been extracted causing the partial collapse of the immediate overburden strata. The areas where the partial collapse of roof strata occurs is in areas of retreat mining in room and pillar sections and in areas of longwall mining. The areas of East Mountain where partial roof collapse has occurred and which were inspected for subsidence are shown in Figure 17.

Six areas of subsidence have been observed on East Mountain (see Figure 17). Springs adjacent to these areas were observed to flow at increased rates compared to 1982, which is understandable considering the high precipitation in 1983 water. The areas of subsidence will be discussed in detail in the subsidence monitoring report.

The springs and surface waters above all areas of mine workings are being monitored closely to measure the effects of mining. No mining related changes to the springs or surface waters have been identified in the data collected. The water flowing into the mine workings, although temporarily diverted or detained, has not had an impact on the surface waters of East Mountain or the surrounding area.

Summary

Utah Power & Light Company has been conducting a water monitoring program in the area of their underground coal mines in Emery County, Utah in accordance with federal and state regulations.


R.6E.
R. 7 E.
R. 7 E.
R. 8 E.
S.L.B.&M.
T. 16 S.
T. 17 S.
Deer Creek Mine
Deer Creek Fault
Wilberg Mine
Des-Bee-Dove Mines
T. 17 S.
T. 18 S.
AREAS STUDIED FOR SUBSIDENCE
OBSERVED SUBSIDENCE
EAST MOUNTAIN PROPERTY
EMERY COUNTY, UTAH
AREAS STUDIED FOR SUBSIDENCE
UTAH POWER & LIGHT COMPANY
DEPARTMENT OF MINING & EXPLORATION
DATE: OCT. 21, 1982
BY: S.M. CHILD
SCALE: 1" = 1 Mile
FIGURE 17

This program has been in existence since 1977 and this is the sixth annual report submitted concerning the hydrology.

Unusually high precipitation throughout 1982 and again in 1983 caused record level runoff and spring discharges in 1983.

The springs on East Mountain were studied in detail to determine the geologic conditions affecting each spring. As reported in the 1980 report, four main modes of spring occurrence have been identified on East Mountain. These are: (1) the base of the Flagstaff Limestone, (2) fluvial channels within the North Horn Formation, (3) the base of the North Horn Formation, and (4) the Roans Canyon Fault graben. The chemistry of the spring water was also studied to determine springs which appear to share the same water source. The data collected from 1980 through 1983 clearly shows a similarity of water quality of springs originating in the same geologic formation, i.e., Flagstaff Limestone, North Horn, Price River and the Blackhawk Formations. Cation and anion diagrams were organized by geologic formation occurrence in Appendix E to visualize the relationships which exist.

A modest increase in the discharge of water from both the Deer Creek and Wilberg Mines was experienced in 1983. This increase in discharge is proportional to the increase in area of mine workings.

The data collected in 1983 continued to show the relationship between the variation in surface water quantity and precipitation. Nowhere could the changes to the quantity of surface or groundwater be related to the mining activities or the mining induced subsidence.

or not related

APPENDIX A

UTAH POWER & LIGHT COMPANY
RESERVOIR RECORDS

STATION ELECTRIC LAKE
DATE OCT82-SEPT83

DAILY CONTENTS (ACRE FEET)
MONTHS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	DAY
1	28510.	28458.	27384.	26447.	25752.	25633.	25258.	24527.	28376.	30980.	29869.	28930.	1
2	28506.	28445.	27346.	26419.	25748.	25621.	25235.	24504.	28974.	30759.	29846.	28899.	2
3	28506.	28436.	27309.	26394.	25744.	25609.	25208.	24504.	29598.	30572.	29824.	28873.	3
4	28501.	28423.	27271.	26370.	25740.	25593.	25184.	24554.	29960.	30364.	29806.	28881.	4
5	28514.	28415.	27233.	26350.	25736.	25581.	25161.	24569.	30419.	30138.	29778.	28838.	5
6	28506.	28406.	27196.	26326.	25728.	25569.	25133.	24569.	30792.	29924.	29751.	28798.	6
7	28514.	28397.	27163.	26301.	25724.	25557.	25110.	24596.	31312.	29720.	29724.	28759.	7
8	28523.	28415.	27129.	26277.	25720.	25546.	25087.	24596.	31455.	29607.	29697.	28728.	8
9	28514.	28415.	27100.	26257.	25716.	25534.	25063.	24569.	31599.	29693.	29665.	28671.	9
10	28506.	28441.	27084.	26233.	25712.	25518.	25036.	24531.	31791.	29760.	29634.	28623.	10
11	28497.	28436.	27051.	26208.	25708.	25506.	25013.	24474.	31791.	29778.	29620.	28584.	11
12	28484.	28423.	27017.	26188.	25704.	25494.	24990.	24474.	31791.	29833.	29593.	28540.	12
13	28480.	28415.	26997.	26164.	25700.	25482.	24962.	24474.	32178.	29856.	29557.	28497.	13
14	28471.	28406.	26968.	26140.	25696.	25471.	24939.	24462.	31503.	29874.	29526.	28454.	14
15	28471.	28363.	26939.	26116.	25688.	25459.	24916.	24451.	31479.	29887.	29499.	28410.	15
16	28467.	28272.	26910.	26096.	25684.	25443.	24893.	24435.	31407.	29901.	29481.	28363.	16
17	28462.	28177.	26881.	26071.	25680.	25431.	24866.	24397.	31455.	29906.	29450.	28319.	17
18	28458.	28079.	26852.	26047.	25676.	25419.	24842.	24474.	31503.	29906.	29432.	28276.	18
19	28445.	28006.	26819.	26027.	25672.	25408.	24819.	24608.	31551.	29901.	29405.	28229.	19
20	28436.	27908.	26791.	26003.	25668.	25396.	24792.	24719.	31527.	29901.	29374.	28177.	20
21	28428.	27814.	26762.	25979.	25664.	25384.	24769.	24885.	31479.	29901.	29333.	28126.	21
22	28419.	27725.	26733.	25955.	25660.	25368.	24746.	24966.	31455.	29910.	29298.	28083.	22
23	28410.	27687.	26704.	25935.	25656.	25357.	24723.	24997.	31431.	29937.	29262.	28061.	23
24	28406.	27649.	26676.	25911.	25648.	25345.	24696.	24904.	31383.	29937.	29226.	28023.	24
25	28415.	27611.	26647.	25887.	25645.	25333.	24673.	24684.	31359.	29942.	29191.	27984.	25
26	28445.	27573.	26618.	25867.	25641.	25321.	24650.	25056.	31336.	29942.	29155.	27942.	26
27	28449.	27535.	26590.	25843.	25637.	25309.	24623.	25463.	31312.	29928.	29115.	27925.	27
28	28445.	27497.	26561.	25819.	25633.	25294.	24600.	25931.	31217.	29915.	29084.	27891.	28
29	28436.	27459.	26533.	25795.	0.	25282.	24577.	26668.	31122.	29901.	29053.	27848.	29
30	28458.	27422.	26504.	25776.	0.	25270.	24554.	27539.	31051.	29878.	29018.	27831.	30
31	28462.	0.	26476.	25752.	0.	25258.	0.	28186.	0.	29892.	28978.	0.	31
MONTHLY CHANGE	-52.	-1040.	-946.	-724.	-119.	-375.	-704.	3632.	2865.	-1159.	-914.	-1147.	

OCT82-SEPT83 TOTAL CHANGE -683. MAX CONTENTS 32178. AC FT JUN 13 MIN CONTENTS 24397. AC FT MAY 17

TOTAL CHANGE MAX CONTENTS MIN CONTENTS

REMARKS:

UTAH POWER & LIGHT COMPANY
RESERVOIR RECORDS

STATION ELECTRIC LAKE
DATE OCT82-SEPT83

DAILY GAGE HEIGHT (FEET)
MONTHS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	DAY
1	268.94	268.82	266.30	264.03	262.30	262.00	261.05	259.16	268.63	274.40	272.00	269.90	1
2	268.93	268.79	266.21	263.96	262.29	261.97	260.99	259.10	270.00	273.93	271.95	269.83	2
3	268.93	268.77	266.12	263.90	262.28	261.94	260.92	259.10	271.40	273.53	271.90	269.77	3
4	268.92	268.74	266.03	263.84	262.27	261.90	260.86	259.23	272.20	273.08	271.86	269.79	4
5	268.95	268.72	265.94	263.79	262.26	261.87	260.80	259.27	273.20	272.59	271.80	269.69	5
6	268.93	268.70	265.85	263.73	262.24	261.84	260.73	259.27	274.00	272.12	271.74	269.60	6
7	268.95	268.68	265.77	263.67	262.23	261.81	260.67	259.34	275.10	271.67	271.68	269.51	7
8	268.97	268.72	265.69	263.61	262.22	261.78	260.61	259.34	275.40	271.42	271.62	269.44	8
9	268.95	268.72	265.62	263.56	262.21	261.75	260.55	259.27	275.70	271.61	271.55	269.31	9
10	268.93	268.78	265.58	263.50	262.20	261.71	260.48	259.17	276.10	271.76	271.48	269.20	10
11	268.91	268.77	265.50	263.44	262.19	261.68	260.42	259.02	276.10	271.80	271.45	269.11	11
12	268.88	268.74	265.42	263.39	262.18	261.65	260.36	259.02	276.10	271.92	271.39	269.01	12
13	268.87	268.72	265.37	263.33	262.17	261.62	260.29	259.02	276.90	271.97	271.31	268.91	13
14	268.85	268.70	265.30	263.27	262.16	261.59	260.23	258.99	275.50	272.01	271.24	268.81	14
15	268.85	268.60	265.23	263.21	262.14	261.56	260.17	258.96	275.45	272.04	271.18	268.71	15
16	268.84	268.39	265.16	263.16	262.13	261.52	260.11	258.92	275.30	272.07	271.14	268.60	16
17	268.83	268.17	265.09	263.10	262.12	261.49	260.04	258.82	275.40	272.08	271.07	268.50	17
18	268.82	267.94	265.02	263.04	262.11	261.46	259.98	259.02	275.50	272.08	271.03	268.40	18
19	268.79	267.77	264.94	262.99	262.10	261.43	259.92	259.37	275.60	272.07	270.97	268.29	19
20	268.77	267.54	264.87	262.93	262.09	261.40	259.85	259.66	275.55	272.07	270.90	268.17	20
21	268.75	267.32	264.80	262.87	262.08	261.37	259.79	260.09	275.45	272.07	270.81	268.05	21
22	268.73	267.11	264.73	262.81	262.07	261.33	259.73	260.30	275.40	272.09	270.73	267.95	22
23	268.71	267.02	264.66	262.76	262.06	261.30	259.67	260.38	275.35	272.15	270.65	267.90	23
24	268.70	266.93	264.59	262.70	262.04	261.27	259.60	260.14	275.25	272.15	270.57	267.81	24
25	268.72	266.84	264.52	262.64	262.03	261.24	259.54	259.57	275.20	272.16	270.49	267.72	25
26	268.79	266.75	264.45	262.59	262.02	261.21	259.48	260.53	275.15	272.16	270.41	267.62	26
27	268.80	266.66	264.38	262.53	262.01	261.18	259.41	261.57	275.10	272.13	270.32	267.58	27
28	268.79	266.57	264.31	262.47	262.00	261.14	259.35	262.75	274.90	272.10	270.25	267.50	28
29	268.77	266.48	264.24	262.41	0.0	261.11	259.29	264.57	274.70	272.07	270.18	267.40	29
30	268.82	266.39	264.17	262.36	0.0	261.08	259.23	266.67	274.55	272.02	270.10	267.36	30
31	268.83	0.0	264.10	262.30	0.0	261.05	0.0	268.19	0.0	272.05	270.01	0.0	31

MAXIMUM GAGE HEIGHT 276.90 JUN 13 MINIMUM GAGE HEIGHT 258.82 MAY 17

NOTE: ADD 8300 FEET TO GAGE HEIGHT TO OBTAIN ELEVATION

UTAH POWER & LIGHT COMPANY
STREAM DISCHARGE RECORDS

STATION HUNTINGTON CREEK BELOW ELECTRIC LAKE
DATE OCT82-SEPT83

DAILY DISCHARGE (CFS)
MONTHS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	DAY
1	12.00	12.00	28.00	19.00	10.00	13.00	16.00	29.00	179.00	192.00	29.00	30.00	1
2	12.00	12.00	28.00	19.00	10.00	12.00	22.00	29.00	180.00	192.00	30.00	30.00	2
3	12.00	12.00	27.00	19.00	10.00	12.00	22.00	32.00	180.00	192.00	30.00	30.00	3
4	12.00	12.00	27.00	19.00	10.00	12.00	22.00	37.00	181.00	192.00	30.00	30.00	4
5	12.00	12.00	27.00	19.00	10.00	12.00	22.00	37.00	181.00	192.00	30.00	30.00	5
6	12.00	12.00	27.00	20.00	10.00	12.00	22.00	37.00	182.00	192.00	30.00	30.00	6
7	12.00	12.00	28.00	20.00	10.00	12.00	22.00	37.00	200.00	174.00	30.00	30.00	7
8	12.00	12.00	28.00	20.00	10.00	12.00	22.00	37.00	338.00	118.00	30.00	30.00	8
9	12.00	12.00	28.00	20.00	10.00	12.00	22.00	37.00	455.00	29.00	30.00	30.00	9
10	12.00	12.00	24.00	20.00	10.00	12.00	23.00	37.00	518.00	29.00	30.00	30.00	10
11	12.00	12.00	20.00	20.00	10.00	12.00	23.00	36.00	573.00	29.00	30.00	30.00	11
12	12.00	12.00	20.00	20.00	10.00	12.00	23.00	36.00	595.00	29.00	30.00	30.00	12
13	12.00	12.00	20.00	21.00	10.00	12.00	23.00	36.00	507.00	29.00	30.00	30.00	13
14	12.00	12.00	19.00	21.00	10.00	12.00	25.00	36.00	411.00	29.00	30.00	30.00	14
15	11.00	27.00	19.00	21.00	10.00	12.00	29.00	36.00	370.00	30.00	30.00	31.00	15
16	11.00	51.00	19.00	21.00	10.00	12.00	29.00	36.00	355.00	30.00	30.00	31.00	16
17	12.00	54.00	19.00	21.00	11.00	12.00	29.00	47.00	371.00	30.00	30.00	31.00	17
18	12.00	58.00	19.00	21.00	11.00	12.00	29.00	74.00	402.00	30.00	30.00	31.00	18
19	12.00	58.00	19.00	22.00	11.00	12.00	29.00	87.00	428.00	30.00	30.00	31.00	19
20	12.00	58.00	19.00	22.00	11.00	12.00	28.00	86.00	407.00	29.00	29.00	31.00	20
21	12.00	58.00	19.00	23.00	11.00	12.00	28.00	84.00	370.00	29.00	29.00	31.00	21
22	12.00	58.00	19.00	23.00	11.00	12.00	28.00	97.00	333.00	29.00	29.00	31.00	22
23	11.00	42.00	19.00	23.00	11.00	12.00	28.00	103.00	298.00	29.00	29.00	31.00	23
24	11.00	29.00	19.00	23.00	11.00	12.00	28.00	103.00	275.00	29.00	29.00	31.00	24
25	11.00	29.00	19.00	16.00	11.00	12.00	28.00	102.00	255.00	28.00	30.00	31.00	25
26	11.00	28.00	19.00	11.00	11.00	12.00	28.00	102.00	242.00	28.00	30.00	31.00	26
27	11.00	28.00	19.00	11.00	11.00	12.00	28.00	101.00	221.00	28.00	30.00	31.00	27
28	12.00	28.00	19.00	11.00	11.00	12.00	28.00	101.00	200.00	28.00	30.00	31.00	28
29	12.00	28.00	19.00	11.00	0.0	12.00	29.00	100.00	192.00	28.00	30.00	31.00	29
30	12.00	28.00	19.00	11.00	0.0	11.00	29.00	155.00	192.00	28.00	30.00	31.00	30
31	12.00	0.0	19.00	11.00	0.0	11.00	0.0	183.00	0.0	28.00	30.00	0.0	31
MONTHLY													
TOT	365.00	830.00	674.00	579.00	292.00	371.00	764.00	2090.00	9591.00	2109.00	924.00	916.00	
MEA	11.80	27.70	21.70	18.70	10.40	12.00	25.50	67.40	320.00	68.00	29.80	30.50	
MAX	12.00	58.00	28.00	23.00	11.00	13.00	29.00	183.00	595.00	192.00	30.00	31.00	
MIN	11.00	12.00	19.00	11.00	10.00	11.00	16.00	29.00	179.00	28.00	29.00	30.00	
ACR FT	724.00	1650.00	1340.00	1150.00	579.00	736.00	1520.00	4150.00	19020.00	4180.00	1830.00	1820.00	

OCT82-SEPT83 TOTAL 19505.00 MEAN 53.40 MAX 595.00 MIN 10.00 TOT ACR FT 38690.00
TOTAL MEAN MAX MIN TOT ACR FT

MAX UNIT DISCHARGE 617.00 CFS (4.72 FT) DATE JUN 12 MIN UNIT DISCHARGE 10.00 CFS DATE FEB 1

REMARKS:

UTAH POWER & LIGHT COMPANY
STREAM DISCHARGE RECORDS

STATION HUNTINGTON CREEK AT PLANT
DATE OCT82-SEPT83

DAILY DISCHARGE (CFS)
MONTHS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	DAY
1	96.00	123.00	44.00	51.00	25.00	38.00	39.00	73.00	1120.00	669.00	172.00	117.00	1
2	93.00	112.00	44.00	51.00	9.30	38.00	46.00	74.00	1000.00	631.00	159.00	119.00	2
3	95.00	78.00	43.00	51.00	11.00	37.00	47.00	75.00	949.00	628.00	153.00	121.00	3
4	95.00	88.00	43.00	54.00	26.00	37.00	47.00	76.00	922.00	620.00	166.00	129.00	4
5	96.00	91.00	44.00	54.00	29.00	34.00	47.00	77.00	874.00	592.00	151.00	113.00	5
6	86.00	91.00	44.00	53.00	21.00	32.00	50.00	78.00	881.00	571.00	145.00	107.00	6
7	88.00	94.00	44.00	52.00	29.00	34.00	52.00	79.00	889.00	559.00	142.00	102.00	7
8	85.00	99.00	44.00	52.00	29.00	38.00	49.00	80.00	1040.00	538.00	141.00	106.00	8
9	86.00	102.00	45.00	51.00	30.00	37.00	49.00	81.00	1170.00	428.00	141.00	99.00	9
10	86.00	101.00	45.00	51.00	28.00	40.00	49.00	82.00	1300.00	401.00	138.00	96.00	10
11	86.00	101.00	45.00	50.00	24.00	43.00	49.00	83.00	1650.00	328.00	149.00	95.00	11
12	85.00	95.00	45.00	49.00	21.00	44.00	47.00	84.00	1430.00	295.00	155.00	95.00	12
13	81.00	102.00	46.00	49.00	25.00	44.00	47.00	86.00	1140.00	261.00	153.00	96.00	13
14	81.00	55.00	46.00	48.00	24.00	44.00	48.00	87.00	991.00	252.00	141.00	99.00	14
15	84.00	55.00	46.00	48.00	23.00	44.00	49.00	88.00	936.00	241.00	139.00	98.00	15
16	87.00	54.00	47.00	47.00	25.00	44.00	49.00	89.00	933.00	221.00	146.00	98.00	16
17	89.00	53.00	47.00	47.00	23.00	43.00	49.00	90.00	961.00	206.00	142.00	101.00	17
18	88.00	53.00	47.00	46.00	25.00	45.00	49.00	91.00	998.00	196.00	153.00	98.00	18
19	90.00	52.00	47.00	46.00	24.00	45.00	52.00	92.00	1080.00	189.00	147.00	97.00	19
20	90.00	51.00	48.00	46.00	25.00	39.00	53.00	122.00	1030.00	182.00	134.00	105.00	20
21	92.00	51.00	48.00	45.00	28.00	37.00	52.00	201.00	997.00	192.00	130.00	105.00	21
22	94.00	50.00	48.00	43.00	29.00	40.00	57.00	297.00	963.00	199.00	126.00	109.00	22
23	97.00	49.00	48.00	43.00	32.00	39.00	72.00	415.00	914.00	202.00	117.00	116.00	23
24	99.00	49.00	49.00	41.00	31.00	40.00	75.00	549.00	909.00	195.00	113.00	106.00	24
25	102.00	48.00	49.00	41.00	35.00	41.00	70.00	633.00	926.00	198.00	121.00	104.00	25
26	107.00	47.00	49.00	33.00	34.00	43.00	68.00	703.00	915.00	195.00	115.00	114.00	26
27	111.00	47.00	49.00	35.00	36.00	37.00	70.00	785.00	846.00	186.00	115.00	95.00	27
28	117.00	46.00	50.00	38.00	36.00	36.00	73.00	872.00	812.00	174.00	117.00	93.00	28
29	118.00	46.00	50.00	34.00	0.0	36.00	75.00	1020.00	790.00	164.00	125.00	104.00	29
30	121.00	45.00	50.00	31.00	0.0	35.00	72.00	1290.00	732.00	156.00	123.00	109.00	30
31	124.00	0.0	51.00	27.00	0.0	38.00	0.0	1300.00	0.0	175.00	115.00	0.0	31
MONTHLY													
TOT	2949.00	2128.00	1445.00	1407.00	737.30	1222.00	1651.00	9752.00	30098.00	10044.00	4284.00	3146.00	
MEA	95.10	70.90	46.60	45.40	26.30	39.40	55.00	315.00	1003.00	324.00	138.00	105.00	
MAX	124.00	123.00	51.00	54.00	36.00	45.00	75.00	1300.00	1650.00	669.00	172.00	129.00	
MIN	81.00	45.00	43.00	27.00	9.30	32.00	39.00	73.00	732.00	156.00	113.00	93.00	
ACR FT	5850.00	4220.00	2870.00	2790.00	1460.00	2420.00	3270.00	19340.00	59700.00	19920.00	8500.00	6240.00	

OCT82-SEPT83 TOTAL 68863.30 MEAN 189.00 MAX 1650.00 MIN 9.30 TOT ACR FT 136600.00

TOTAL MEAN MAX MIN TOT ACR FT

MAX UNIT DISCHARGE 1930.00 CFS DATE JUN 11 MIN UNIT DISCHARGE 5.50 CFS DATE FEB 2
(5.68 FT)

REMARKS:

APPENDIX B

UTAH POWER & LIGHT COMPANY

WATER QUALITY DATA

Station UPL-3 LOC 03
Location HUNTINGT CREEK BELOW EL K LAKE

DATE	TIME	FLOW CFS	TEMPERATURE AIR °C	TEMPERATURE WATER °C	FIELD pH	COLIFORM TOTAL MPN	COLIFORM FECAL MPN	FECAL STREP MPN	C.O.D. MG/L	B.O.D. MG/L	T.O.C. MG/L	CHLOROPHYLL-a MG/L	DISSOLVED OXYGEN MG/L	OIL & GREASE MG/L	PHENOL MG/L
1-7-83	1415			4.4	7.2	<2	<2	<2					12.8		
2-3-83				2.2	7.5	<2	<2	<2							
3-7-83	245			4.2	7.8								14.2		
4-11-83					7.7	<2	<2	<2							
6-20-83					7.50	<2	<2	<2					7.75		
8-4-83					6.7								4.1		
9-6-83					7.55	<2	<2	<2					8.15		
11-8-83					7.7	<2	<2	<2							

DATE	NITROGEN AMMONIA AS NH_3-N MG/L	NITROGEN NITRATE AS NO_3-N MG/L	NITROGEN NITRITE AS NO_2-N MG/L	NITROGEN TOTAL KJELDAHL MG/L	NITROGEN ORGANIC MG/L	PHOSPHATE TOTAL AS PO_4-P MG/L	PHOSPHATE ORTHO AS PO_4-P MG/L	SULFATE AS SO_4 MG/L	HYDROXIDE AS OH MG/L	SURFACTANT AS MBAS MG/L	SOLIDS TSS MG/L	SOLIDS TOTAL SETTLEABLE SOLIDS MG/L	SOLIDS T.D.S. MG/L	SOLIDS TOTAL SOLIDS MG/L	SOLIDS TOTAL VOLATILE SOLIDS MG/L	SOLIDS VOLATILE SUSPENDED SOLIDS MG/L	SPECIFIC COND. µMHOS CM	TURBIDITY NTU	CARBONATE ALK AS CO_3 MG/L	BICARBONATE ALK AS HCO_3 MG/L	TOTAL ALK AS $CaCO_3$ MG/L	TOTAL HARDNESS AS $CaCO_3$ MG/L	ACIDITY AS $CaCO_3$ MG/L	ALPHA RADIOACTIVITY pCi/L	BETA RADIOACTIVITY pCi/L
1-7-83		0.105	<0.01			<0.01	<0.01				0.5		181					2.5							
2-3-83		0.62	0.03			<0.01	<0.01				1.0		200					1.7							
3-7-83		0.130	<0.01			<0.01	<0.01				17.5		179				291	7.9							
4-11-83		0.140	<0.01			<0.01	<0.01				0.5		156					3.0							
6-20-83		<0.001	<0.001			0.270	0.158				15.5		126					20.0							
8-4-83		0.23	0.09			0.32	<0.01				20.0		160					10.0							
9-6-83		0.64	0.020			<0.01	<0.01				<0.5		158					5.3							
11-8-83		0.24	0.02			0.065	<0.01				1.0		127					2.5							

DATE	ALUMINUM TOTAL MG/L	ANTIMONY TOTAL MG/L	ARSENIC TOTAL MG/L	BARIUM TOTAL MG/L	BERYLLIUM TOTAL MG/L	BORON TOTAL MG/L	CADMIUM TOTAL MG/L	CALCIUM TOTAL MG/L	CHLORIDE DISS. MG/L	CHROMIUM AS CR. MG/L	COBALT TOTAL MG/L	COPPER TOTAL MG/L	CYANIDE AS CN MG/L	FLUORIDE DISS. MG/L	GERMANIUM TOTAL ME/L	IRON DISS. MG/L	IRON TOTAL MG/L	LEAD TOTAL MG/L	MAGNESIUM TOTAL MG/L	MANGANESE TOTAL MG/L	MERCURY TOTAL MG/L	MOLYBDENUM TOTAL MG/L	NICKEL TOTAL MG/L	POTASSIUM TOTAL MG/L	SELENIUM TOTAL MG/L	SILICA AS SiO_2 MG/L	SILVER TOTAL MG/L	SODIUM TOTAL MG/L	ZINC TOTAL MG/L	VANADIUM TOTAL MG/L	COMMENTS
1-7-83																															
2-3-83																															
3-7-83																															
4-11-83																															
6-20-83																															
8-4-83																															
9-6-83																															
11-8-83																															

UTAH POWER & LIGHT COMPANY

WATER QUALITY DATA

Station [illegible]
Location RIGHT FORK, HUNTINGTON CREEK ABOVE LEFT FORK

DATE	TIME	FLOW CFS	TEMPERATURE AIR °C	TEMPERATURE WATER °C	FIELD pH	COLIFORM TOTAL MPN	COLIFORM FECAL MPN	FECAL STREP MPN	C.O.D. MG/L	B.O.D. MG/L	T.O.C. MG/L	CHLOROPHYLL-a MG/L	DISSOLVED OXYGEN MG/L	OIL & GREASE MG/L	PHENOL MG/L	NITROGEN AMMONIA OS NH_3-N MG/L	NITROGEN NITRATE OS NO_3-N MG/L	NITROGEN NITRITE OS NO_2-N MG/L	NITROGEN TOTAL KJELDAHL MG/L	NITROGEN ORGANIC MG/L	PHOSPHATE TOTAL OS PO_4-P MG/L	PHOSPHATE ORTHO OS PO_4-P MG/L	SULFATE OS SO_4 MG/L	HYDROXIDE OS OH MG/L	SURFACTANT OS MBAS MG/L	SOLIDS TSS MG/L	SOLIDS TOTAL SETTLEABLE SOLIDS MG/L	SOLIDS T.D.S. MG/L	SOLIDS TOTAL SOLIDS MG/L	SOLIDS TOTAL VOLATILE SOLIDS MG/L	SOLIDS VOLATILE SUSPENDED SOLIDS MG/L	SPECIFIC COND. µ MHOS CM	TURBIDITY NTU	CARBONATE ALK. OS CO_3 MG/L	BICARBONATE ALK OS HCO_3 MG/L	TOTAL ALK OS $CaCO_3$ MG/L	TOTAL HARDNESS OS $CaCO_3$ MG/L	ACIDITY OS $CaCO_3$ MG/L	ALPHA RADIOACTIVITY pCi/L	BETA RADIOACTIVITY pCi/L
1-5-83						Frozen																																		
2-3-83				1.1	7.5	<2	<2	<2									0.59	0.04			0.04	0.01				2.0		337					4.1							
3-7-83	330			1.6	8.2												0.140	<0.01			0.040	<0.01				2.5		216				341	3.4							
4-11-83					8.2	<2	<2	<2									0.193	<0.01			0.030	<0.01				8.0		193					2.1							
6-20-83					7.60	170	<2	<2					6.40				<0.001	<0.001			0.359	0.179				66.0		146					39.0							
8-4-83					8.1								6.7				0.22	0.06			0.18	<0.01				13.5		192					8.0							
9-6-83					8.2	37	<2	<2					8.2				0.620	0.020			<0.01	<0.01				2.5		218					5.8							
11-8-83					8.2	<2	<2	<2									0.14	0.02			0.185	<0.01				5.0		199					2.5							

DATE	ALUMINUM TOTAL MG/L	ANTIMONY TOTAL MG/L	ARSENIC TOTAL MG/L	BARIUM TOTAL MG/L	BERYLLIUM TOTAL MG/L	BORON TOTAL MG/L	CADMIUM TOTAL MG/L	CALCIUM TOTAL MG/L	CHLORIDE DISS. MG/L	CHROMIUM HEX OS CR. MG/L	COBALT TOTAL MG/L	COPPER TOTAL MG/L	CYANIDE OS CN MG/L	FLUORIDE DISS. MG/L	GERMANIUM TOTAL MG/L	IRON DISS. MG/L	IRON TOTAL MG/L	LEAD TOTAL MG/L	MAGNESIUM TOTAL MG/L	MANGANESE TOTAL MG/L	MERCURY TOTAL MG/L	MOLYBDENUM TOTAL MG/L	NICKEL TOTAL MG/L	POTASSIUM TOTAL MG/L	SELENIUM TOTAL MG/L	SILICA OS SiO_2 MG/L	SILVER TOTAL MG/L	SODIUM TOTAL MG/L	ZINC TOTAL MG/L	VANADIUM TOTAL MG/L	COMMENTS
1-5-83																															
2-3-83																															
3-7-83																															
4-11-83																															
6-20-83																															
8-4-83																															
9-6-83																															
11-8-83																															

UTAH POWER & LIGHT COMPANY

WATER Q(TY DATA

Station H-1 LOC 15
Location HUNTIN N CREEK
ABOVE H NGTON PLANT
DIVERSION

DATE	TIME	FLOW CFS	TEMPERATURE AIR °C	TEMPERATURE WATER °C	FIELD pH	COLIFORM TOTAL MPN	COLIFORM FECAL MPN	FECAL STREP MPN	C.O.D. MG/L	B.O.D. MG/L	T.O.C. MG/L	CHLOROPHYLL-a MG/L	DISSOLVED OXYGEN MG/L	OIL & GREASE MG/L	PHENOL MG/L	NITROGEN AMMONIA AS NH_3-N MG/L	NITROGEN NITRATE AS NO_3-N MG/L	NITROGEN NITRITE AS NO_2-N MG/L	NITROGEN TOTAL KJELDAHL MG/L	NITROGEN ORGANIC MG/L	PHOSPHATE TOTAL AS PO_4-P MG/L	PHOSPHATE ORTHO AS PO_4-P MG/L	SULFATE AS SO_4 MG/L	HYDROXIDE AS OH MG/L	SURFACTANT AS MBAS MG/L	SOLIDS TSS MG/L	SOLIDS TOTAL SETTLEABLE SOLIDS MG/L	SOLIDS T.D.S. MG/L	SOLIDS TOTAL SOLIDS MG/L	SOLIDS TOTAL VOLATILE SOLIDS MG/L	SOLIDS VOLATILE SUSPENDED SOLIDS MG/L	SPECIFIC COND. µMHOS CM	TURBIDITY NTU	CARBONATE ALK. AS CO_3 MG/L	BICARBONATE ALK. AS HCO_3 MG/L	TOTAL ALK AS $CaCO_3$ MG/L	TOTAL HARDNESS AS $CaCO_3$ MG/L	ACIDITY AS $CaCO_3$ MG/L	ALPHA RADIOACTIVITY pCi/L	BETA RADIOACTIVITY pCi/L
1-5-83	1454			0.4	7.4									0.5			0.099				0.05	<0.01	120			12.0		228				402			239	196	213			
2-3-83				0.8	7.5												0.14				0.05	<0.01	34			10.0		283				510			290	238	203			
3-7-83	430				7.6												0.100				0.057	<0.01	140			19.5		355				425			240	197	223			
4-11-83					8.1									<0.5			0.098				0.060	<0.01	80			305		271				475			246	202	206			
7-12-83					8.5									<0.5			1.35				0.440	0.163	18			50.5		179				350		<1.0	191	157	178			
11-7-83					8.3									<0.5			0.28				0.06	<0.01	40.0									410			229	188	228			

DATE	ALUMINUM TOTAL MG/L	ANTIMONY TOTAL MG/L	ARSENIC TOTAL MG/L	BARIUM TOTAL MG/L	BERYLLIUM TOTAL MG/L	BORON TOTAL MG/L	CADMIUM TOTAL MG/L	CALCIUM TOTAL MG/L	CHLORIDE DISS. MG/L	CHROMIUM ~~HEX~~ ~~OR~~ CR. MG/L	COBALT TOTAL MG/L	COPPER TOTAL MG/L	CYANIDE AS CN MG/L	FLUORIDE DISS. MG/L	GERMANIUM TOTAL MG/L	IRON DISS. MG/L	IRON TOTAL MG/L	LEAD TOTAL MG/L	MAGNESIUM TOTAL MG/L	MANGANESE TOTAL MG/L	MERCURY TOTAL MG/L	MOLYBDENUM TOTAL MG/L	NICKEL TOTAL MG/L	POTASSIUM TOTAL MG/L	SELENIUM TOTAL MG/L	SILICA AS SiO_2 MG/L	SILVER TOTAL MG/L	SODIUM TOTAL MG/L	ZINC TOTAL MG/L	VANADIUM TOTAL MG/L	COMMENTS
1-5-83			<0.001		<0.005	0.090	<0.005	73.0	3.66	<0.05		<0.02					0.49	<0.05	7.50	0.05	<0.0002	<0.1	<0.04	4.00	0.0003			36.0	0.047		
2-3-83			<0.001		<0.005	0.086	<0.003	73.0	8.31	<0.05		<0.02					0.53	<0.05	5.00	0.05	<0.0002		<0.04	4.50	0.0004			37.0	0.050		
3-7-83			<0.001		<0.005	0.085	0.005	80.0	4.10	<0.05		<0.02					0.51	<0.05	8.00	0.05	<0.0002		<0.04	5.00	0.003			40.0	0.043		
4-11-83			<0.001		0.006	0.090	<0.005	48.0	6.86	<0.05		<0.02					0.05	<0.05	21.0	0.08	<0.0002	<0.1	<0.04	1.18	0.0009			9.50	0.044		
7-12-83			<0.001		<0.005	0.260	<0.005	44.0	3.10	<0.05		<0.02					<0.05	<0.05	16.5	<0.01	<0.2	0.1	<0.04	0.92	<0.0003			2.88	<0.005		
11-7-83	<0.05	<0.2	<0.001	<0.1	<0.005	0.10	<0.005	54.4	7.05	<0.05		<0.02					0.21	<0.05	22.4	0.02	<0.2	<0.1	<0.04	1.3	<0.003		<0.1	5.7	0.047		

UTAH POWER & LIGHT COMPANY

WATER QUALITY DATA

Station UPL-9 Loc 10
Location HUNTINGTON CREEK ABOVE FISH CREEK

DATE	TIME	FLOW CFS	TEMPERATURE AIR °C	TEMPERATURE WATER °C	FIELD pH	COLIFORM TOTAL MPN	COLIFORM FECAL MPN	FECAL STREP MPN	C.O.D. MG/L	B.O.D. MG/L	T.O.C. MG/L	CHLORO-PHYLL -a MG/L	DISSOLVED OXYGEN MG/L	OIL & GREASE MG/L	PHENOL MG/L
1-5-83	1534			0.1	7.3										
2-3-83				1.0	7.5										
3-7-83	445				8.3										
4-11-83					8.3										
7-12-83					8.4										

DATE	NITROGEN AMMONIA OS NH_3-N MG/L	NITRATE OS NO_3-N MG/L	NITRITE OS NO_2-N MG/L	NITROGEN TOTAL KJELDAHL MG/L	NITROGEN ORGANIC MG/L	PHOSPHATE TOTAL OS PO_4-P MG/L	PHOSPHATE ORTHO OS PO_4-P MG/L	SULFATE OS SO_4 MG/L	HYDROXIDE OS OH MG/L	SURFACTANT OS MBAS MG/L	SOLIDS TSS MG/L	SOLIDS TOTAL SETTLEABLE SOLIDS MG/L	SOLIDS T.D.S. MG/L	SOLIDS TOTAL SOLIDS MG/L	SOLIDS TOTAL VOLATILE SOLIDS MG/L	SOLIDS VOLATILE SUSPENDED SOLIDS MG/L
1-5-83		0.082				0.040	<0.01	98.0			48.0		290			
2-3-83		0.74	0.04			0.03	<0.01	160			27.0		510			
3-7-83		0.085				0.047	<0.01	70.0			18.0		411			
4-11-83		0.080				0.050	<0.01	70			21.0		285			
7-12-83		1.38				0.320	0.06	13			62.5		199			

DATE	SPECIFIC COND. µMHOS CM	TURBIDITY JTU	CARBONATE ALK. CO_3 MG/L	BICARBONATE ALK. HCO_3 MG/L	TOTAL ALK OS $CaCO_3$ MG/L	TOTAL HARDNESS OS $CaCO_3$ MG/L	ACIDITY OS $CaCO_3$ MG/L	ALPHA RADIOACTIVITY pCi/L	BETA RADIOACTIVITY pCi/L
1-5-83	490			238	195	273			
2-3-83	920			283	232	287			
3-7-83	590			397	325	362			
4-11-83	510			244	200	236			
7-12-83	370		<1.0	198	162	194			

DATE	ALUMINUM TOTAL MG/L	ANTIMONY TOTAL MG/L	ARSENIC TOTAL MG/L	BARIUM TOTAL MG/L	BERYLLIUM TOTAL MG/L	BORON TOTAL MG/L	CADMIUM TOTAL MG/L	CALCIUM TOTAL MG/L	CHLORIDE DISS. MG/L	CHROMIUM HEX—OS CR. MG/L	COBALT TOTAL MG/L	COPPER TOTAL MG/L	CYANIDE OS CN MG/L	FLUORIDE DISS. MG/L	GERMANIUM TOTAL MG/L
1-5-83		<0.001		<0.005		0.411	0.005	93.0	7.17	<0.05		<0.02			
2-3-83		<0.001		<0.005		0.370	0.005	95.0	43.4	<0.05		<0.02			
3-7-83		<0.001		<0.005		0.413	0.005	130	8.30	<0.05		<0.02			
4-11-83		<0.001		0.009		0.390	<0.005	55.0	8.90	<0.05		<0.02			
7-12-83		<0.001		<0.005		0.210	<0.005	44.8	4.25	<0.05		<0.02			

DATE	IRON DISS. MG/L	IRON TOTAL MG/L	LEAD TOTAL MG/L	MAGNESIUM TOTAL MG/L	MANGANESE TOTAL MG/L	MERCURY TOTAL MG/L	MOLYBDENUM TOTAL MG/L	NICKEL TOTAL MG/L	POTASSIUM TOTAL MG/L	SELENIUM TOTAL MG/L	SILICA OS SiO_2 MG/L	SILVER TOTAL MG/L	SODIUM TOTAL MG/L	ZINC TOTAL MG/L	VANADIUM TOTAL MG/L	COMMENTS
1-5-83		0.79	<0.05	10.0	0.08	<0.0002	<0.1	<0.04	2.00	0.0003			29.0	0.063		
2-3-83		0.81	<0.05	12.0	0.07	<0.0002		<0.04	1.50	0.0003			73.0	0.066		
3-7-83		0.70	<0.05	9.00	0.09	<0.0002		<0.04	5.00	0.002			36.0	0.072		
4-11-83		0.07	<0.05	24.0	0.04	<0.0002	<0.1	<0.04	1.18	0.0010			13.5	0.034		
7-12-83		<0.05	<0.05	19.9	<0.01	<0.2	<0.1	<0.04	0.92	0.004			4.53	<0.005		

APPENDIX C

DEER CREEK: FLOW INFORMATION
(Gallons Per Minute)

	Above	Below
January	5-10 Est: Frozen Over	Frozen - No Flow
February	20-25 Est: Frozen Over	Frozen - No Flow
March	5-10 Est: Frozen Over	5 Est. (Gravel Filled-Frozen)
April	10-15 Est: Frozen Over	Damp - No Flow
May	Over Capacity: + 500	Over Capacity: + 500
June	Over Capacity: 1000-1500	Over Capacity: 1000-1500
July	Over Capacity: + 500	Over Capacity: + 500
August	480.3	480.3
September	250 Est. (Stream Channel-Gravel Filled)	239.7
October	152.2	152.2
November	196.6	196.6
December	72.7	92.0

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3503
Date Rec'd 1-11-83
Date Sampled 1-10-83
Time Sampled

Client: Utah Power & Light Co.
P.O. Box 1005
Mining & Exploration Field Office
Huntington, Utah 84528

Sample ID: Deer Creek
Above the Mine
Flow 5.0 GPM Estimate
Temp. 36°

Acidity		mg/l $CaCO_3$
Alkalinity, Total		mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride		mg/l
Coliform, Fecal		MPN/100 ml
Coliform, Total		MPN/100 ml
Conductivity	770	umhos/cm
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
Nitrogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease		mg/l
pH	7.7	Units
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	566	mg/l
Solids, Total Suspended	8.0	mg/l
Sulfate		mg/l
Sulfide		mg/l
Turbidity		NTU

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.14	mg/l
Lead		mg/l
Magnesium		mg/l
Manganese	0.07	mg/l
Mercury		ug/l
Nickel		mg/l
Potassium		mg/l
Selenium		mg/l
Silica		mg/l
Sodium		mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3806
Date Rec'd 4-12-83
Date Sampled 4-11-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Runoff
Above the Mine

Flow >5GPM EST. Temp. 32°

Acidity		mg/l $CaCO_3$
Alkalinity, Total		mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride		mg/l
Coliform, Fecal		MPN/100 ml
Coliform, Total		MPN/100 ml
Conductivity	650	umhos/cm 4/12
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
Nitrogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease		mg/l
pH	8.2	Units 4/12
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	370	mg/l 4/12
Solids, Total Suspended	2.5	mg/l 4/12
Sulfate		mg/l
Sulfide		mg/l
Turbidity		NTU

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.03	mg/l 4/14
Lead		mg/l
Magnesium		mg/l
Manganese	0.06	mg/l 4/14
Mercury		ug/l
Nickel		mg/l
Potassium		mg/l
Selenium		mg/l
Silica		mg/l
Sodium		mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted [signature] 4-15-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3928
Date Rec'd 5-9-83
Date Sampled 5-9-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek
Above the Mine
Flow + 500
Temp 36°
Run-off

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	575	umhos/cm	5/10
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.0	Units	5/9
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	319	mg/l	5/13
Solids, Total Suspended	164	mg/l	5/13
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.74	mg/l	5/16
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.05	mg/l	5/16
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 5-11-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3929
Date Rec'd 5-9-83
Date Sampled 5-9-83
Time Sampled

Client: Utah Power & LIght Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek
Below the Mine
Flow + 500
Temp 50°
Run-off

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1150	umhos/cm	5/10
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.0	Units	5/9
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	637	mg/l	5/13
Solids, Total Suspended	557	mg/l	5/13
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	2.12	mg/l	5/16
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.15	mg/l	5/16
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 5-12-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4027
Date Rec'd 6-14-83
Date Sampled 6-13-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Run-Off
Above the Mine

Temp. 48° 1500GPM EST.

Acidity		mg/l $CaCO_3$	Aluminum		mg/l
Alkalinity, Total		mg/l $CaCO_3$	Arsenic		mg/l
Alkalinity, Bicarbonate		mg/l $CaCO_3$	Barium		mg/l
Alkalinity, Carbonate		mg/l $CaCO_3$	Beryllium		mg/l
Chloride		mg/l	Boron		mg/l
Coliform, Fecal		MPN/100 ml	Cadmium		mg/l
Coliform, Total		MPN/100 ml	Calcium		mg/l
Conductivity	575	umhos/cm 6/14	Chromium		mg/l
Fluoride		mg/l	Copper		mg/l
Hardness, Total		mg/l $CaCO_3$	Iron	0.23	mg/l 6/14
Nitrogen, Ammonia		mg/l	Lead		mg/l
Nitrogen, Nitrate		mg/l	Magnesium		mg/l
Nitrogen, Nitrite		mg/l	Manganese	0.03	mg/l 6/14
Oil & Grease		mg/l	Mercury		ug/l
pH	8.05	Units 6/14	Nickel		mg/l
Phosphorus, Ortho		mg/l	Potassium		mg/l
Phosphorus, Total		mg/l	Selenium		mg/l
Solids, Total Dissolved	340.0	mg/l 6/14	Silica		mg/l
Solids, Total Suspended	56.0	mg/l 6/14	Sodium		mg/l
Sulfate		mg/l	Vanadium		mg/l
Sulfide		mg/l	Zinc		mg/l
Turbidity		NTU			

Respectfully submitted [signature] 6-15-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4026
Date Rec'd 6-14-83
Date Sampled 6-13-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Run-Off
Below the Mine

Temp. 48° 1500GPM EST.

Acidity		mg/l $CaCO_3$
Alkalinity, Total		mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride		mg/l
Coliform, Fecal		MPN/100 ml
Coliform, Total		MPN/100 ml
Conductivity	650	umhos/cm 6/14
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
gen, Ammonia		mg/l
Nitrogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease		mg/l
pH	8.10	Units 6/14
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	407.0	mg/l 6/14
Solids, Total Suspended	183.0	mg/l 6/14
Sulfate		mg/l
Sulfide		mg/l
Turbidity		NTU

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.66	mg/l 6/14
Lead		mg/l
Magnesium		mg/l
Manganese	0.05	mg/l 6/14
Mercury		ug/l
Nickel		mg/l
Potassium		mg/l
Selenium		mg/l
Silica		mg/l
Sodium		mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted [signature] 6-15-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4133

Date Rec'd 7-12-83

Date Sampled 7-11-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Runoff
Above the Mine

Temp. 52° Flow +500 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	550	umhos/cm	7/12
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.15	Units	7/12
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	287.0	mg/l	7/13
Solids, Total Suspended	< 0.5	mg/l	7/13
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.12	mg/l	7/12
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.01	mg/l	7/12
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 7-14-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4134
Date Rec'd 7-12-83
Date Sampled 7-11-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Runoff
Below the Mine

Temp. 62° Flow +500 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	710	umhos/cm	7/12
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
gen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.3	Units	7/12
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	371.0	mg/l	7/13
Solids, Total Suspended	7.5	mg/l	7/13
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.30	mg/l	7/12
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.02	mg/l	7/12
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 7-14-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4310
Date Rec'd 8-9-83
Date Sampled 8-9-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Runoff
Above the Mine
Temp. 57°
1.05/480.3 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	525	umhos/cm	8/10
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.2	Units	8/10
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	280	mg/l	8/11
Solids, Total Suspended	13.0	mg/l	8/11
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	< 0.05	mg/l	8/10
Lead		mg/l	
Magnesium		mg/l	
Manganese	< 0.01	mg/l	8/10
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4311
Date Rec'd 8-9-83
Date Sampled 8-9-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Runoff
Below the Mine
Temp. 74°
1.05/480.3 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	725	umhos/cm	8/10
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.6	Units	8/10
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	409	mg/l	8/11
Solids, Total Suspended	15.0	mg/l	8/11
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.06	mg/l	8/10
Lead		mg/l	
Magnesium		mg/l	
Manganese	< 0.01	mg/l	8/10
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4459
Date Rec'd 9-13-83
Date Sampled 9-13-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Runoff
Above the Mine
Temp. 44°
Est. 250 GPM

Acidity		mg/l $CaCO_3$
Alkalinity, Total		mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride		mg/l
Coliform, Fecal		MPN/100 ml
Coliform, Total		MPN/100 ml
Conductivity	550	umhos/cm 9/13
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
Nitrogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease		mg/l
pH	8.4	Units 9/13
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	310	mg/l 9/15
Solids, Total Suspended	7.5	mg/l 9/15
Sulfate		mg/l
Sulfide		mg/l
Turbidity		NTU

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	< 0.05	mg/l 9/14
Lead		mg/l
Magnesium		mg/l
Manganese	< 0.01	mg/l 9/14
Mercury		ug/l
Nickel		mg/l
Potassium		mg/l
Selenium		mg/l
Silica		mg/l
Sodium		mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted [signature] 9-16-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4460
Date Rec'd 9-13-83
Date Sampled 9-13-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Runoff
Below the Mine
Temp. 57°
.68/239.7 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	850	umhos/cm	9/13
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
gen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.5	Units	9/13
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	478	mg/l	9/15
Solids, Total Suspended	6.5	mg/l	9/15
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	< 0.05	mg/l	9/14
Lead		mg/l	
Magnesium		mg/l	
Manganese	< 0.01	mg/l	9/14
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 9-16-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4585
Date Rec'd 10-11-83
Date Sampled 10-11-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Runoff
Above the Mine
Temp. 44°
152.2 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	610	umhos/cm	10/12
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.3	Units	10/12
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	330	mg/l	10/12
Solids, Total Suspended	< 0.5	mg/l	10/12
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	< 0.05	mg/l	10/12
Lead		mg/l	
Magnesium		mg/l	
Manganese	< 0.01	mg/l	10/12
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 10/13/83

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CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4586
Date Rec'd 10-11-83
Date Sampled 10-11-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, utah 84528

Sample ID: Deer Creek Runoff
Below the Mine
Temp. 52°
152.2 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	900	umhos/cm	10/12
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
[illegible]en, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.45	Units	10/12
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	491	mg/l	10/12
Solids, Total Suspended	9.0	mg/l	10/12
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.11	mg/l	10/12
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.01	mg/l	10/12
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 10/13/83

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APPENDIX D

GRIMES WASH: FLOW INFORMATION
(Gallons Per Minute)

	Right	Left (Est. Measurements)		Below (Difference Due to Wilberg Mine Discharge Est. Measurements)
January	Dry	10-15	250	265
February	Dry	5-10	225	235
March	Dry	10-15	230	245
April	Dry	5-10	190	200
May	181.3	125	425	550
June	Over Capacity +500	Over Capacity +1000	~800 ~~600~~	1800
July	212.7	500	350	850
August	80.3	400	275	675
September	50 Est. (Stream Channel Gravel Filled)	150	250	400
October	16.6	75	275	350
November	16.6	75	250	325
December	8.9	50	285	335
			~300 gpm	

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STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3506
Date Rec'd 1-11-83
Date Sampled 1-10-83
Time Sampled

Client: Utah Power & Light Co.
P. O. Box 1005
Mining & Exploration Field Office
Huntington, Utah 84528

Sample ID: Grimes Wash
Left Fork
Flow 15 GPM Estimate
Temp. 34°

Acidity		mg/l $CaCO_3$
Alkalinity, Total		mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride		mg/l
Coliform, Fecal		MPN/100 ml
Coliform, Total		MPN/100 ml
Conductivity	720	umhos/cm
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
rogen, Ammonia		mg/l
Nitrogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease		mg/l
pH	7.4	Units
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	570	mg/l
Solids, Total Suspended	0.5	mg/l
Sulfate		mg/l
Sulfide		mg/l
Turbidity		NTU

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.31	mg/l
Lead		mg/l
Magnesium		mg/l
Manganese	0.11	mg/l
Mercury		ug/l
Nickel		mg/l
Potassium		mg/l
Selenium		mg/l
Silica		mg/l
Sodium		mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted

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STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3504
Date Rec'd 1-11-83
Date Sampled 1-10-83
Time Sampled

Client: Utah Power & Light Co.
P.O. Box 1005
Mining & Exploration Field Office
Huntington, Utah 84528

Sample ID: Wilberg Grimes Wash
Below the Mine
Flow 265 GPM Estimate
Temp. 40°

Acidity		mg/l $CaCO_3$
Alkalinity, Total		mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride		mg/l
Coliform, Fecal		MPN/100 ml
Coliform, Total		MPN/100 ml
Conductivity	790	umhos/cm
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
Nitrogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease		mg/l
pH	7.7	Units
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	578	mg/l
Solids, Total Suspended	9.5	mg/l
Sulfate		mg/l
Sulfide		mg/l
Turbidity		NTU

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.10	mg/l
Lead		mg/l
Magnesium		mg/l
Manganese	0.06	mg/l
Mercury		ug/l
Nickel		mg/l
Potassium		mg/l
Selenium		mg/l
Silica		mg/l
Sodium		mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted

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STANDARD LABORATORIES, INC.
). Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3805
Date Rec'd 4-12-83
Date Sampled 4-11-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Grimes Wash Runoff.
Left Fork

Flow-Est. 5-10GPM Temp. 32°

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	650	umhos/cm	4/12
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
rogen, Ammonia		mg/l	
itrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.1	Units	4/12
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	378	mg/l	4/12
Solids, Total Suspended	3.5	mg/l	4/12
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.04	mg/l	4/14
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.04	mg/l	4/14
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 4-15-83

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CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3807
Date Rec'd 4-12-83
Date Sampled 4-11-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg Runoff
Below the Mine

Flow - Est. 200GPM Temp. 38°

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1000	umhos/cm	4/12
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.2	Units	4/12
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	643	mg/l	4/12
Solids, Total Suspended	1.0	mg/l	4/12
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.04	mg/l	4/14
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.03	mg/l	4/14
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 4-15-83

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CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3925
Date Rec'd 5-9-83
Date Sampled 5-9-83
Time Sampled

Client: Utah Power & LIght Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Grimes Wash
Right Fork
Flow 181.3
Temp. 36°
Run-off

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	600	umhos/cm	5/10
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
rogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.3	Units	5/9
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	340	mg/l	5/13
Solids, Total Suspended	474	mg/l	5/13
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	2.64	mg/l	5/16
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.11	mg/l	5/16
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 5-18-83

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CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3926
Date Rec'd 5-9-83
Date Sampled 5-9-83
Time Sampled

Client: Utah Power & LIght Co.
Fielld Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Grimes Wash
Left Fork
EST Flow 125
Temp 36°
Run-off

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	700	umhos/cm	5/10
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.0	Units	5/9
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	390	mg/l	5/13
Solids, Total Suspended	133	mg/l	5/13
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.56	mg/l	5/16
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.01	mg/l	5/16
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 5-18-83

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STANDARD LABORATORIES, INC.

O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3927
Date Rec'd 5-9-83
Date Sampled 5=9-83
Time Sampled

Client: Utah Power & LIght Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Grimes Wash
Below the Mine
EST Flow 550
Temp 44°
Run-off

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	800	umhos/cm	5/10
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
'rogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.1	Units	5/9
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	469	mg/l	5/13
Solids, Total Suspended	244	mg/l	5/13
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	1.25	mg/l	5/16
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.04	mg/l	5/16
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 5-18-83

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CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4030
Date Rec'd 6-14-83
Date Sampled 6-13-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Grimes Wash
Right Fork

Temp. 48° 550GPM EST.

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	650.	umhos/cm	6/14
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.10	Units	6/14
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	386.0	mg/l	6/14
Solids, Total Suspended	81.0	mg/l	6/14
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.31	mg/l	6/14
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.05	mg/l	6/14
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 6-15-83

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CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4029
Date Rec'd 6-14-83
Date Sampled 6-13-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Grimes Wash
Left Fork

Temp. 44° 1000GPM EST.

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	650.	umhos/cm	6/14
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
ogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.15	Units	6/14
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	384.0	mg/l	6/14
Solids, Total Suspended	29.0	mg/l	6/14
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.20	mg/l	6/14
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.02	mg/l	6/14
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 6-15-83

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CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4028

Date Rec'd 6-14-83

Date Sampled 6-13-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Grimes Wash
Below The Mine

Temp. 48° 1800GPM EST.

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	700.	umhos/cm	6/14
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.20	Units	6/14
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	427.0	mg/l	6/14
Solids, Total Suspended	42.5	mg/l	6/14
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.24	mg/l	6/14
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.03	mg/l	6/14
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 6-15-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4122
Date Rec'd 7-11-83
Date Sampled 7-11-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg Runoff
Grimes Wash - Right Fork
Temp 46° Flow .62/212.7 GPM

Acidity		mg/l $CaCO_3$
Alkalinity, Total		mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride		mg/l
Coliform, Fecal		MPN/100 ml
Coliform, Total		MPN/100 ml
Conductivity	675	umhos/cm 7/12
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
ogen, Ammonia		mg/l
Nitrogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease		mg/l
pH	8.2	Units 7/12
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	348.	mg/l 7/13
Solids, Total Suspended	493.	mg/l 7/13
Sulfate		mg/l
Sulfide		mg/l
Turbidity		NTU

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.84	mg/l 7/12
Lead		mg/l
Magnesium		mg/l
Manganese	0.18	mg/l 7/12
Mercury		ug/l
Nickel		mg/l
Potassium		mg/l
Selenium		mg/l
Silica		mg/l
Sodium		mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted [signature] 7-14-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4123
Date Rec'd 7-11-83
Date Sampled 7-11-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg Runoff
Left Fork

FLOW: 500 GPM (Estimated)
TEMP: 48°F

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	685	umhos/cm	7/12
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.15	Units	7/12
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	360.0	mg/l	7/13
Solids, Total Suspended	51.0	mg/l	7/13
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.23	mg/l	7/12
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.03	mg/l	7/12
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 7-14-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
). Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4124
Date Rec'd 7-11-83
Date Sampled 7-11-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg Runoff
Grimes Wash
Below the Mine

Temp. 54° Flow est. 850 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	800	umhos/cm	7/12
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
ogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.2	Units	7/12
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	431.0	mg/l	7/13
Solids, Total Suspended	142.5	mg/l	7/13
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.43	mg/l	7/12
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.05	mg/l	7/12
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 7-14-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4308
Date Rec'd 8-9-83
Date Sampled 8-9-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Grimes Wash
Right Fork
temp 66°
.33/80.3 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	525	umhos/cm	8/10
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.6	Units	8/10
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	283	mg/l	8/11
Solids, Total Suspended	18.0	mg/l	8/11
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.19	mg/l	8/10
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.01	mg/l	8/10
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted David X Janney
12/29/83

Certified Environmental Laboratory

STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington Utah 84528 801-653-2314

Lab. No. 4307
Date Rec'd 8-9-83
Date Sampled 8-9-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Grimes Wash
Left Fork
Temp. 62°
Est. 400.0 GPM

Acidity	mg/l $CaCO_3$	
Alkalinity, Total	mg/l $CaCO_3$	
Alkalinity, Bicarbonate	mg/l $CaCO_3$	
Alkalinity, Carbonate	mg/l $CaCO_3$	
Chloride	mg/l	
Coliform, Fecal	MPN/100 ml	
Coliform, Total	MPN/100 ml	
Conductivity	650 umhos/cm	8/10
Fluoride	mg/l	
Hardness, Total	mg/l $CaCO_3$	
Nitrogen, Ammonia	mg/l	
Nitrogen, Nitrite	mg/l	
Nitrogen, Nitrate	mg/l	
Oil & Grease	mg/l	
pH	8.25 Units	8/10
Phosphorus, Ortho	mg/l	
Phosphorus, Total	mg/l	
Solids, Total Dissolved	350 mg/l	8/11
Solids, Total Suspended	< 0.5 mg/l	8/11
Sulfate	mg/l	
Sulfide	mg/l	
Turbidity	NTU	

Aluminum	mg/l	
Arsenic	mg/l	
Barium	mg/l	
Beryllium	mg/l	
Boron	mg/l	
Cadmium	mg/l	
Calcium	mg/l	
Chromium	mg/l	
Copper	mg/l	
Iron	< 0.05 mg/l	8/10
Lead	mg/l	
Magnesium	mg/l	
Mercury	< 0.01 mg/l	
Manganese	mg/l	
Nickel	mg/l	
Potassium	mg/l	
Selenium	mg/l	
Silica	mg/l	
Sodium	mg/l	
Vanadium	mg/l	
Zinc	mg/l	

Respectfully submitted

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4309
Date Rec'd 8-9-83
Date Sampled 8-9-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Grimes Wash
Below the Mine
Temp. 62°
Est. 675.0 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	825	umhos/cm	8/10
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.15	Units	8/10
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	526	mg/l	8/11
Solids, Total Suspended	7.5	mg/l	8/11
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	< 0.05	mg/l	8/10
Lead		mg/l	
Magnesium		mg/l	
Manganese	< 0.01	mg/l	8/10
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4457
Date Rec'd 9-13-83
Date Sampled 9-13-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Grimes Wash
Right Fork
Temp. 50°
Est. 50 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	600	umhos/cm	9/13
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
rogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.4	Units	9/13
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	332	mg/l	9/15
Solids, Total Suspended	10.5	mg/l	9/15
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.08	mg/l	9/14
Lead		mg/l	
Magnesium		mg/l	
Manganese	< 0.01	mg/l	9/14
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 9-16-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4456

Date Rec'd 9-13-83

Date Sampled 9-13-83

Time Sampled

Client: Utah Power & Light co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Grimes Wash
Left Fork
Temp. 48°
Est. 150 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	675	umhos/cm	9/13
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.3	Units	9/13
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	372	mg/l	9/15
Solids, Total Suspended	6.5	mg/l	9/15
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	< 0.05	mg/l	9/14
Lead		mg/l	
Magnesium		mg/l	
Manganese	< 0.01	mg/l	9/14
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 9-16-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

). Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4458

Date Rec'd 9-13-83

Date Sampled 9-13-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Grimes Wash
Below the Mine
Temp. 52°
Est. 400 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	900	umhos/cm	9/13
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
·ogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.3	Units	9/13
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	557	mg/l	9/15
Solids, Total Suspended	8.0	mg/l	9/15
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	< 0.05	mg/l	9/14
Lead		mg/l	
Magnesium		mg/l	
Manganese	< 0.01	mg/l	9/14
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 9-16-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4583
Date Rec'd 10-11-83
Date Sampled 10-10-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Grimes Wash
Right Fork
Temp. 53°
16.6 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	610	umhos/cm	10/12
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.3	Units	10/12
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	280	mg/l	10/12
Solids, Total Suspended	23.0	mg/l	10/12
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.10	mg/l	10/12
Lead		mg/l	
Magnesium		mg/l	
Manganese	< 0.01	mg/l	10/12
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 10/13/83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4582
Date Rec'd 10-11-83
Date Sampled 10-10-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Grimes Wash
Left Fork
Temp. 48°
Est. 75 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	680	umhos/cm	10/12
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
ogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.2	Units	10/12
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	295	mg/l	10/12
Solids, Total Suspended	5.0	mg/l	10/12
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	< 0.05	mg/l	10/12
Lead		mg/l	
Magnesium		mg/l	
Manganese	< 0.01	mg/l	10/12
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 10/13/83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4584
Date Rec'd 10-11-83
Date Sampled 10-10-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Grimes Wash
Below the Mine
Temp. 52°
Est. 350 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total		mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride		mg/l	
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1000	umhos/cm	10/12
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.15	Units	10/12
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	544	mg/l	10/12
Solids, Total Suspended	4.0	mg/l	10/12
Sulfate		mg/l	
Sulfide		mg/l	
Turbidity		NTU	

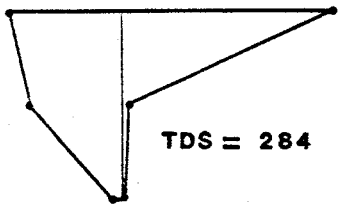
Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.08	mg/l	10/12
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.02	mg/l	10/12
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 10/13/83

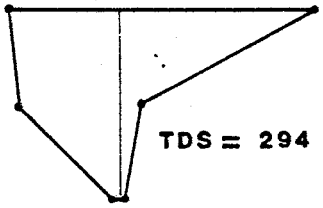
Certified Environmental Laboratory

APPENDIX E

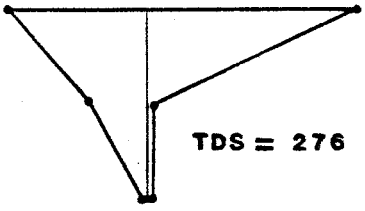
CATION-ANION DIAGRAMS
NORTH HORN FORMATION



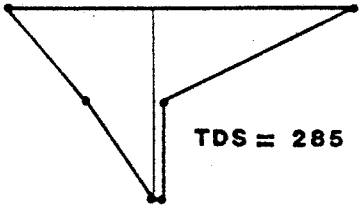
BURNT TREE
7/15/83



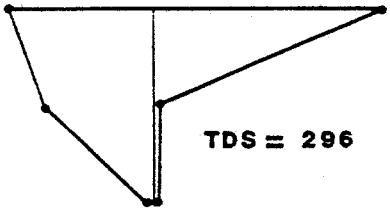
BURNT TREE
10/25/83



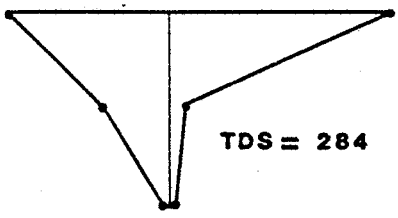
TED'S TUB
7/20/83



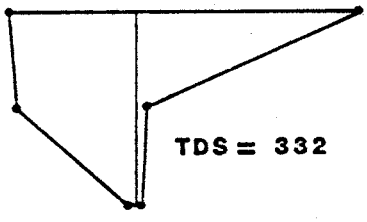
TED'S TUB
10/25/83



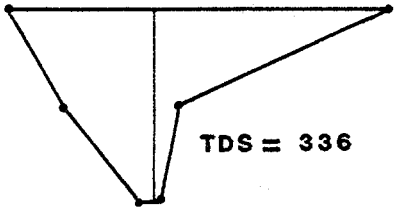
79-2
7/15/83



79-2
10/25/83

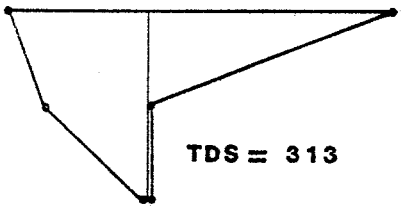


79-3
7/15/83

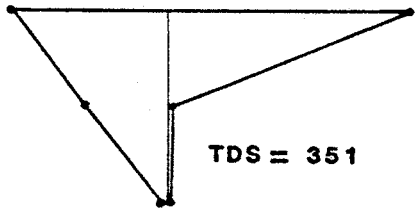


79-3
10/25/83

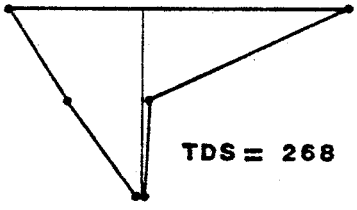
CATION-ANION DIAGRAMS
NORTH HORN FORMATION



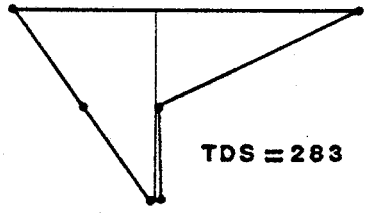
79-13
7/15/83



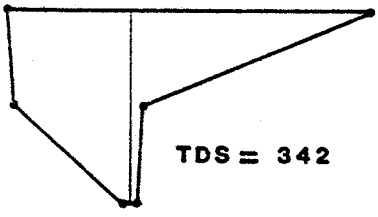
79-14
7/15/83



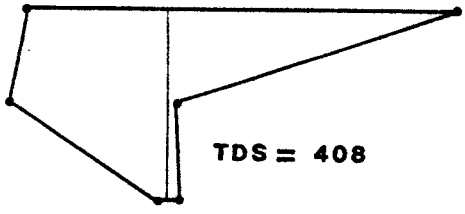
79-15
1/14/83



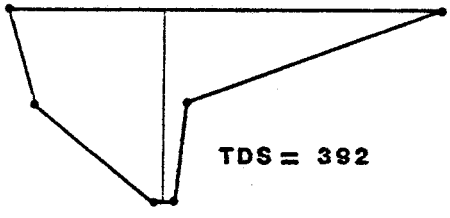
79-15
10/25/83



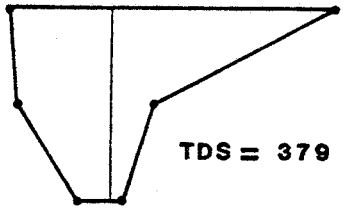
79-22
7/28/83



79-23
7/28/83

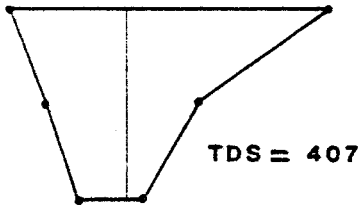


79-23
10/25/83

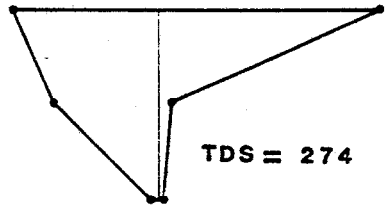


79-28
7/14/83

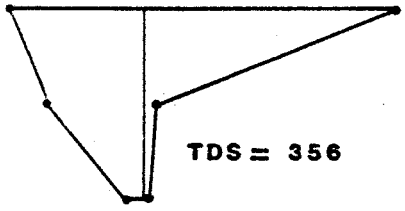
CATION-ANION DIAGRAMS
NORTH HORN FORMATION



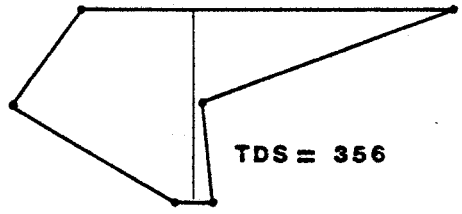
79-28
10/25/83



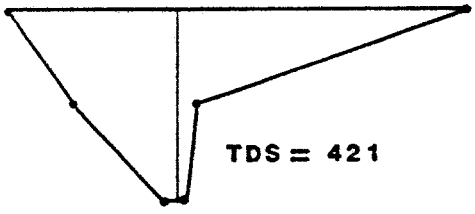
79-34
7/14/83



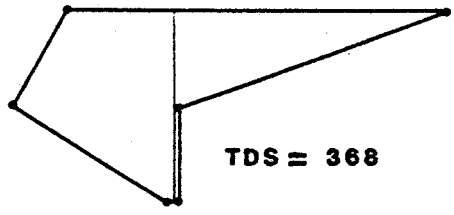
79-37
7/15/83



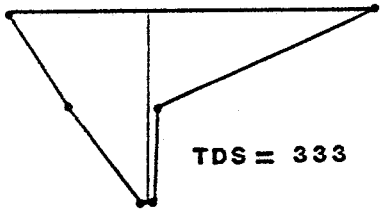
79-38
7/29/83



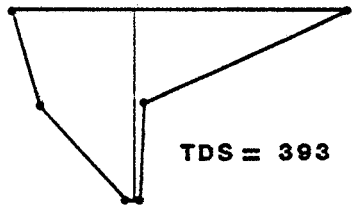
79-40
7/28/83



80-42
7/15/83

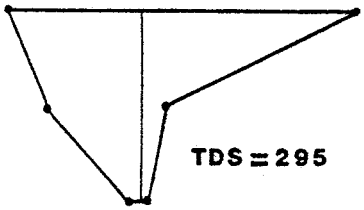


80-43
7/15/83

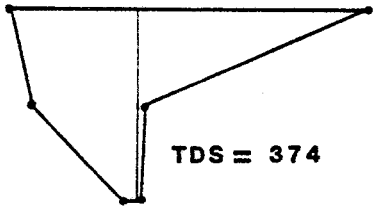


80-46
7/27/83

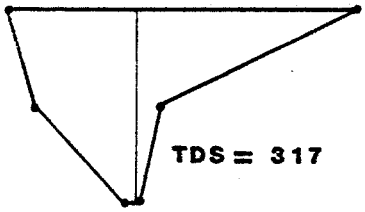
CATION-ANION DIAGRAMS
NORTH HORN FORMATION



80-46
10/25/83

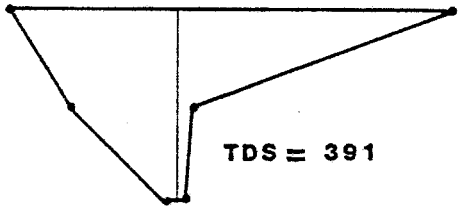


80-47
7/27/83

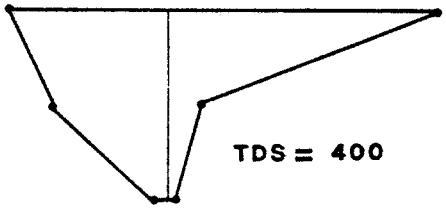


80-47
10/25/83

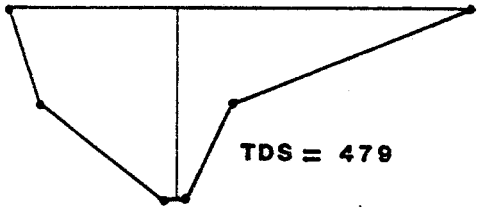
CATION-ANION DIAGRAMS
PRICE RIVER FORMATION



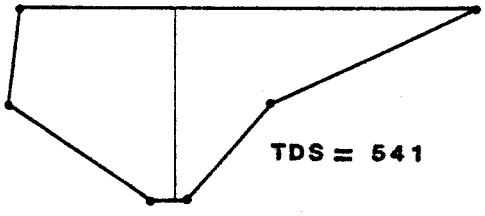
JERK WATER
7/20/83



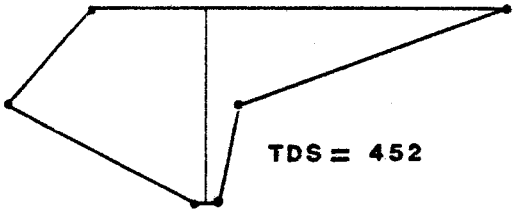
JERK WATER
10/25/83



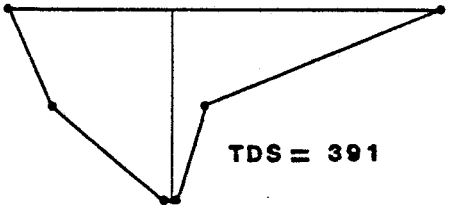
80-41
7/28/83



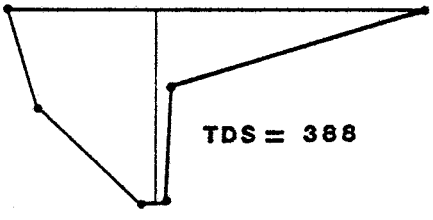
80-44
7/28/83



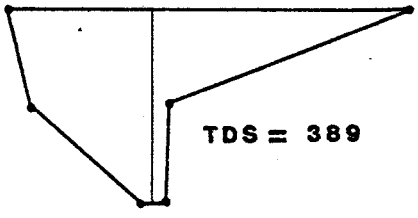
80-45
7/28/83



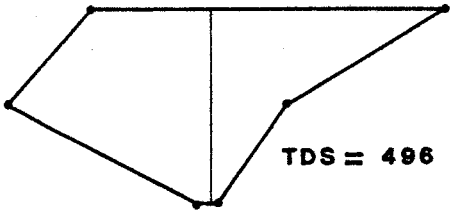
80-49
7/13/83



82-52
7/20/83



82-52
10/25/83



82-51
7/29/83

APPENDIX F

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4180

Date Rec'd 7-18-83

Date Sampled 7-15-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: EMS Burnt Tree
Temp. 39°
30.5 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	273	mg/l $CaCO_3$	7/19
Alkalinity, Bicarbonate	333	mg/l $CaCO_3$	7/19
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	4.41	mg/l	7/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	590	umhos/cm	7/19
Fluoride	0.212	mg/l	7/19
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.6	Units	7/19
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	284	mg/l	7/18
Solids, Total Suspended	2.0	mg/l	7/18
Sulfate	10	mg/l	7/21
Sulfide		mg/l	
Turbidity	1.5	NTU	7/19
Cation, Total	5.73	meq/l	
Anion, Total	5.79	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	56.8	mg/l	7/21
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	<0.05	mg/l	7/21
Lead		mg/l	
Magnesium	28.6	mg/l	7/21
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.68	mg/l	7/22
Selenium		mg/l	
Silica		mg/l	
Sodium	12.10	mg/l	7/22
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 7-22-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4636
Date Rec'd 10-27-83
Date Sampled 10-25-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mtn. Springs
Burnt Tree
Temp. 38°
20.0 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	257	mg/l $CaCO_3$	10/25
Alkalinity, Bicarbonate	313	mg/l ~~Ca~~ CO_3	10/25
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	4.8	mg/l	10/31
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	550	umhos/cm	10/28
Fluoride	0.22	mg/l	11/1
Hardness, Total		mg/l $CaCO_3$	
gen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.5	Units	10/28
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	294	mg/l	10/31
Solids, Total Suspended	< 0.5	mg/l	10/31
Sulfate	25.0	mg/l	10/31
Sulfide		mg/l	
Turbidity	1.0	NTU	10/28
Cation, Total	5.82	meq/l	
Anion, Total	5.80	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	56.0	mg/l	10/28
Chromium		mg/l	
Copper		mg/l	
Iron, Sol.	< 0.05	mg/l	10/31
Lead		mg/l	
Magnesium	30.6	mg/l	10/31
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.5	mg/l	10/31
Selenium		mg/l	
Silica		mg/l	
Sodium	11.3	mg/l	10/31
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 11-1-83

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4198

Date Rec'd 7-21-83

Date Sampled 7-20-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mountain Springs
Jerk Water
Temp. 40°
3.2 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	354	mg/l $CaCO_3$	7/22
Alkalinity, Bicarbonate	432	mg/l ~~$CaCO_3$~~ HCO_3	7/22
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	7.90	mg/l	7/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	750	umhos/cm	7/22
Fluoride	0.230	mg/l	7/28
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.35	Units	7/22
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	391	mg/l	7/27
Solids, Total Suspended	1.0	mg/l	7/27
Sulfate	17	mg/l	7/22
Sulfide		mg/l	
Turbidity	0.30	NTU	7/22
Cation, Total	7.76	meq/l	
Anion, Total	7.66	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	84.0	mg/l	7/28
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	<0.05	mg/l	7/28
Lead		mg/l	
Magnesium	33.1	mg/l	7/28
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.64	mg/l	7/22
Selenium		mg/l	
Silica		mg/l	
Sodium	19.2	mg/l	7/28
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted Ray A. S. / 7-28-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4643
Date Rec'd 10-27-83
Date Sampled 10-25-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mtn. Springs
Jerk Water
Temp. 39°
2.2 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	342	mg/l $CaCO_3$	10/28
Alkalinity, Bicarbonate	417	mg/l ~~Ca~~ CO_3	10/28
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	8.3	mg/l	10/31
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	750	µmhos/cm	10/28
Fluoride	0.23	mg/l	11/1
Hardness, Total		mg/l $CaCO_3$	
rogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.4	Units	10/28
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	400	mg/l	10/31
Solids, Total Suspended	0.5	mg/l	10/31
Sulfate	40.0	mg/l	10/31
Sulfide		mg/l	
Turbidity	0.4	NTU	10/28
Cation, Total	7.84	meq/l	
Anion, Total	7.91	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	82.4	mg/l	10/28
Chromium		mg/l	
Copper		mg/l	
Iron, Sol.	< 0.05	mg/l	10/31
Lead		mg/l	
Magnesium	35.0	mg/l	10/31
Manganese		mg/l	
Mercury		µg/l	
Nickel		mg/l	
Potassium	0.6	mg/l	10/31
Selenium		mg/l	
Silica		mg/l	
Sodium	18.8	mg/l	10/31
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 11-1-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4197
Date Rec'd 7-21-83
Date Sampled 7-20-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mountain Springs
Ted's Tub
Temp. 39°
89.0 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	270	mg/l $CaCO_3$	7/28
Alkalinity, Bicarbonate	329	mg/l ~~$CaCO_3$~~ HCO_3	7/28
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	2.95	mg/l	7/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	600	umhos/cm	7/27
Fluoride	0.148	mg/l	7/28
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.4	Units	7/22
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	276	mg/l	7/27
Solids, Total Suspended	< 0.5	mg/l	7/27
Sulfate	7	mg/l	7/22
Sulfide		mg/l	
Turbidity	0.45	NTU	7/22
Cation, Total	5.45	meq/l	
Anion, Total	5.63	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	72.8	mg/l	7/28
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	< 0.05	mg/l	7/27
Lead		mg/l	
Magnesium	18.5	mg/l	7/28
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.33	mg/l	7/22
Selenium		mg/l	
Silica		mg/l	
Sodium	6.4	mg/l	7/28
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted Ray A. Smith 7-28-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4645
Date Rec'd 10-27-83
Date Sampled 10-25-83
Time Sampled

Client: Utah Power & LIght Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mtn. Springs
Ted's Tub
Temp. 38°
20.0 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	256	mg/l $CaCO_3$	10/28
Alkalinity, Bicarbonate	312	mg/l $CaCO_3$	10/28
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	4.2	mg/l	10/31
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	550	umhos/cm	10/28
Fluoride	0.19	mg/l	11/1
Hardness, Total		mg/l $CaCO_3$	
rogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.75	Units	10/28
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	285	mg/l	10/31
Solids, Total Suspended	1.5	mg/l	10/31
Sulfate	5.0	mg/l	10/31
Sulfide		mg/l	
Turbidity	2.0	NTU	10/28
Cation, Total	5.73	meq/l	
Anion, Total	5.35	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	76.0	mg/l	10/28
Chromium		mg/l	
Copper		mg/l	
Iron, Sol.	< 0.05	mg/l	10/31
Lead		mg/l	
Magnesium	20.4	mg/l	10/31
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.6	mg/l	10/31
Selenium		mg/l	
Silica		mg/l	
Sodium	5.7	mg/l	10/31
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 11-1-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4179
Date Rec'd 7-18-83
Date Sampled 7-15-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: EMS
79-2
Temp. 38°
9.1 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	290	mg/l $CaCO_3$	7/19
Alkalinity, Bicarbonate	354	mg/l $CaCO_3$	7/19
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	3.00	mg/l	7/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	600	umhos/cm	7/19
Fluoride	0.198	mg/l	7/19
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.5	Units	7/19
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	296	mg/l	7/18
Solids, Total Suspended	< 0.5	mg/l	7/18
Sulfate	8	mg/l	7/21
Sulfide		mg/l	
Turbidity	0.35	NTU	7/19
Cation, Total	6.05	meq/l	
Anion, Total	6.05	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	76.0	mg/l	7/21
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	< 0.05	mg/l	7/21
Lead		mg/l	
Magnesium	22.3	mg/l	7/21
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.32	mg/l	7/22
Selenium		mg/l	
Silica		mg/l	
Sodium	9.22	mg/l	7/22
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 7-22-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4646
Date Rec'd 10-27-83
Date Sampled 10-25-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, utah 84528

Sample ID: East Mtn. Springs
79-2
Temp. 38°
2.8 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	282	mg/l $CaCO_3$	10/28
Alkalinity, Bicarbonate	344	mg/l ~~$CaCO_3$~~ HCO_3	10/28
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	3.3	mg/l	10/31
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	600	umhos/cm	10/28
Fluoride	0.19	mg/l	11/1
Hardness, Total		mg/l $CaCO_3$	
›gen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.5	Units	10/28
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	284	mg/l	11/1
Solids, Total Suspended	< 0.5	mg/l	11/1
Sulfate	17.0	mg/l	10/31
Sulfide		mg/l	
Turbidity	1.0	NTU	10/28
Cation, Total	6.18	meq/l	
Anion, Total	6.09	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	81.6	mg/l	10/28
Chromium		mg/l	
Copper		mg/l	
Iron, Sol.	< 0.05	mg/l	10/31
Lead		mg/l	
Magnesium	20.4	mg/l	10/31
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.2	mg/l	10/31
Selenium		mg/l	
Silica		mg/l	
Sodium	9.5	mg/l	10/31
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted: [signature] 11-2-83

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4182
Date Rec'd 7-18-83
Date Sampled 7-15-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: EMS
79-3
Temp. 38°
26.7 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	283	mg/l $CaCO_3$	7/19
Alkalinity, Bicarbonate	345	mg/l $CaCO_3$	7/19
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	3.37	mg/l	7/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	610	umhos/cm	7/19
Fluoride	0.176	mg/l	7/19
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.5	Units	7/19
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	332	mg/l	7/18
Solids, Total Suspended	25.0	mg/l	7/18
Sulfate	11	mg/l	7/21
Sulfide		mg/l	
Turbidity	8.5	NTU	7/19
Cation, Total	6.12	meq/l	
Anion, Total	5.98	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	64.0	mg/l	7/21
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	< 0.05	mg/l	7/21
Lead		mg/l	
Magnesium	30.1	mg/l	7/21
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.51	mg/l	7/22
Selenium		mg/l	
Silica		mg/l	
Sodium	10.25	mg/l	7/22
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 7-22-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4644
Date Rec'd 10-27-83
Date Sampled 10-25-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mtn. Springs
EMS 79-3
Temp. 33o
0.5 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	302	mg/l $CaCO_3$	10/28
Alkalinity, Bicarbonate	368	mg/l ~~Ca~~ H CO_3	10/28
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	5.1	mg/l	10/31
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	650	umhos/cm	10/28
Fluoride	0.20	mg/l	11/1
Hardness, Total		mg/l $CaCO_3$	
·ogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.65	Units	10/28
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	336	mg/l	10/31
Solids, Total Suspended	12.0	mg/l	10/31
Sulfate	31.0	mg/l	10/31
Sulfide		mg/l	
Turbidity	3.5	NTU	10/28
Cation, Total	6.70	meq/l	
Anion, Total	6.82	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	72.8	mg/l	10/28
Chromium		mg/l	
Copper		mg/l	
Iron, Sol.	<0.05	mg/l	10/31
Lead		mg/l	
Magnesium	27.2	mg/l	10/31
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.6	mg/l	10/31
Selenium		mg/l	
Silica		mg/l	
Sodium	18.5	mg/l	10/31
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted 11-1-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4177
Date Rec'd 7-18-83
Date Sampled 7-15-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: EMS
79-13
Temp 37°
16.7 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	315	mg/l $CaCO_3$	7/19
Alkalinity, Bicarbonate	384	mg/l $CaCO_3$	7/19
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	3.06	mg/l	7/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	650	umhos/cm	7/19
Fluoride	0.189	mg/l	7/19
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.4	Units	7.19
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	313	mg/l	7/18
Solids, Total Suspended	16.0	mg/l	7/18
Sulfate	5	mg/l	7/21
Sulfide		mg/l	
Turbidity	6.1	NTU	7/19
Cation, Total	6.53	meq/l	
Anion, Total	6.49	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	72.0	mg/l	7/21
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	< 0.05	mg/l	7/21
Lead		mg/l	
Magnesium	32.5	mg/l	7/21
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.81	mg/l	7/22
Selenium		mg/l	
Silica		mg/l	
Sodium	5.85	mg/l	7/22
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 7-22-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4183

Date Rec'd 7-18-83

Date Sampled 7-15-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: EMS
79-14
Temp. 48°
14.6 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	315	mg/l $CaCO_3$	7/19
Alkalinity, Bicarbonate	384	mg/l $CaCO_3$	7/19
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	3.00	mg/l	7/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	610	umhos/cm	7/19
Fluoride	0.185	mg/l	7/19
Hardness, Total		mg/l $CaCO_3$	
ogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.85	Units	7/19
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	351	mg/l	7/18
Solids, Total Suspended	8.0	mg/l	7/18
Sulfate	5	mg/l	7/21
Sulfide		mg/l	
Turbidity	1.8	NTU	7/19
Cation, Total	6.25	meq/l	
Anion, Total	6.49	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	79.2	mg/l	7/21
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	< 0.05	mg/l	7/21
Lead		mg/l	
Magnesium	24.8	mg/l	7/21
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.40	mg/l	7/22
Selenium		mg/l	
Silica		mg/l	
Sodium	5.58	mg/l	7/22
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 7-22-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4176
Date Rec'd 7-15-83
Date Sampled 7-14-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mountain Spring
79-15
Temp. 37°
42.9 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	264	mg/l $CaCO_3$	7/15
Alkalinity, Bicarbonate	322	mg/l HCO_3	7/15
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	3.70	mg/l	7/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	510	umhos/cm	7/15
Fluoride	0.190	mg/l	7/19
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.6	Units	7/15
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	268	mg/l	7/18
Solids, Total Suspended	< 0.5	mg/l	7/18
Sulfate	8	mg/l	7/21
Sulfide		mg/l	
Turbidity	1.5	NTU	7/15
Cation, Total	5.55	meq/l	
Anion, Total	5.55	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	68.8	mg/l	7/21
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	< 0.05	mg/l	7/21
Lead		mg/l	
Magnesium	22.8	mg/l	7/21
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.48	mg/l	7/22
Selenium		mg/l	
Silica		mg/l	
Sodium	5.07	mg/l	7/22
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 7-22-83

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4638
Date Rec'd 10-27-83
Date Sampled 10-25-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mtn. Springs
79-15
Temp. 37°
6.7 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	264	mg/l $CaCO_3$	10/28
Alkalinity, Bicarbonate	322	mg/l $CaCO_3$	10/28
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	4.6	mg/l	10/31
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	550	umhos/cm	10/28
Fluoride	0.20	mg/l	11/1
Hardness, Total		mg/l $CaCO_3$	
gen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.5	Units	10/28
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	283	mg/l	10/31
Solids, Total Suspended	0.5	mg/l	10/31
Sulfate	5.0	mg/l	10/31
Sulfide		mg/l	
Turbidity	0.6	NTU	10/28
Cation, Total	5.80	meq/l	
Anion, Total	5.62	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	74.4	mg/l	10/28
Chromium		mg/l	
Copper		mg/l	
Iron, Sol.	< 0.05	mg/l	10/31
Lead		mg/l	
Magnesium	22.4	mg/l	10/31
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.4	mg/l	10/31
Selenium		mg/l	
Silica		mg/l	
Sodium	5.5	mg/l	10/31
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 11-1-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4260
Date Rec'd 8-1-83
Date Sampled 7-28-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mountain Springs
79-22
Temp. 54°
1.0 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	311	mg/l $CaCO_3$	8/2
Alkalinity, Bicarbonate	379	mg/l ~~$CaCO_3$~~ HCO_3	8/2
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	4.7	mg/l	8/9
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	710	umhos/cm	8/2
Fluoride	0.181	mg/l	8/2
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.0	Units	8/2
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	342	mg/l	8/4
Solids, Total Suspended	3.0	mg/l	8/4
Sulfate	15	mg/l	8/2
Sulfide		mg/l	
Turbidity	2.0	NTU	8/2
Cation, Total	6.55	meq/l	
Anion, Total	6.67	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	64.0	mg/l	8/4
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	<0.05	mg/l	8/5
Lead		mg/l	
Magnesium	35.5	mg/l	8/4
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.62	mg/l	8/9
Selenium		mg/l	
Silica		mg/l	
Sodium	9.5	mg/l	8/9
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 8-9-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4261
Date Rec'd 8-1-83
Date Sampled 7-28-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mountain Springs
79-23
Temp. 48°
20.0 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	371	mg/l $CaCO_3$	8/2
Alkalinity, Bicarbonate	453	mg/l ~~$CaCO_3$~~ HCO_3	8/2
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	10.5	mg/l	8/9
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	900	umhos/cm	8/2
Fluoride	0.251	mg/l	8/2
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.6	Units	8/2
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	408	mg/l	8/4
Solids, Total Suspended	<0.5	mg/l	8/4
Sulfate	11	mg/l	8/2
Sulfide		mg/l	
Turbidity	1.4	NTU	8/2
Cation, Total	8.15	meq/l	
Anion, Total	7.96	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	71.2	mg/l	8/4
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	<0.05	mg/l	8/5
Lead		mg/l	
Magnesium	48.1	mg/l	8/4
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.59	mg/l	8/9
Selenium		mg/l	
Silica		mg/l	
Sodium	14.3	mg/l	8/9
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted Ray A Sin/DH 8-9-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4639
Date Rec'd 10-27-83
Date Sampled 10-25-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mtn. Springs
79-23
Temp. 41°
2.2 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	355	mg/l $CaCO_3$	10/28
Alkalinity, Bicarbonate	433	mg/l ~~Ca~~ CO_3	10/28
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	11.8	mg/l	10/31
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	750	umhos/cm	10/28
Fluoride	0.27	mg/l	11/1
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.7	Units	10/28
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	392	mg/l	10/31
Solids, Total Suspended	1.0	mg/l	10/31
Sulfate	30.0	mg/l	10/31
Sulfide		mg/l	
Turbidity	6.5	NTU	10/28
Cation, Total	7.93	meq/l	
Anion, Total	8.06	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	79.2	mg/l	10/28
Chromium		mg/l	
Copper		mg/l	
Iron, Sol.	< 0.05	mg/l	10/31
Lead		mg/l	
Magnesium	40.4	mg/l	10/31
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.5	mg/l	10/31
Selenium		mg/l	
Silica		mg/l	
Sodium	14.8	mg/l	10/31
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 11-1-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4175
Date Rec'd 7-15-83
Date Sampled 7-14-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mountain Spring
79-28
Temp. 37°
16.7 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	289	mg/l $CaCO_3$	7/15
Alkalinity, Bicarbonate	352	mg/l $CaCO_3$	7/15
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	13.20	mg/l	7/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	700	umhos/cm	7/15
Fluoride	0.359	mg/l	7/19
Hardness, Total		mg/l $CaCO_3$	
gen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.5	Units	7/15
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	379	mg/l	7/18
Solids, Total Suspended	< 0.5	mg/l	7/18
Sulfate	55	mg/l	7/21
Sulfide		mg/l	
Turbidity	1.2	NTU	7/15
Cation, Total	7.33	meq/l	
Anion, Total	7.30	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	52.8	mg/l	7/21
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	< 0.05	mg/l	7/21
Lead		mg/l	
Magnesium	29.6	mg/l	7/21
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	1.55	mg/l	7/22
Selenium		mg/l	
Silica		mg/l	
Sodium	51.00	mg/l	7/22
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 7-22-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4642
Date Rec'd 10-27-83
Date Sampled 10-25-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mtn. Springs
79-28
Temp. 37°
8.6 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	260	mg/l $CaCO_3$	10/28
Alkalinity, Bicarbonate	317	mg/l ~~Ca~~ H CO_3	10/28
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	14.7	mg/l	10/31
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	725	umhos/cm	10/28
Fluoride	0.32	mg/l	11/1
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.6	Units	10/28
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	407	mg/l	10/31
Solids, Total Suspended	< 0.5	mg/l	10/31
Sulfate	86.0	mg/l	10/31
Sulfide		mg/l	
Turbidity	0.8	NTU	10/28
Cation, Total	7.52	meq/l	
Anion, Total	7.41	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	50.4	mg/l	10/28
Chromium		mg/l	
Copper		mg/l	
Iron, Sol.	< 0.05	mg/l	10/31
Lead		mg/l	
Magnesium	23.8	mg/l	10/31
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	1.5	mg/l	10/31
Selenium		mg/l	
Silica		mg/l	
Sodium	69.3	mg/l	10/31
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 11-1-83

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4174
Date Rec'd 7-15-83
Date Sampled 7-14-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mountain Spring
79-34
Temp 37°
56.7 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	289	mg/l $CaCO_3$	7/15
Alkalinity, Bicarbonate	352	mg/l ~~Ca~~ H CO_3	7/15
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	5.91	mg/l	7/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	610	umhos/cm	7/15
Fluoride	0.210	mg/l	7/19
Hardness, Total		mg/l $CaCO_3$	
gen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.2	Units	7/15
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	274	mg/l	7/18
Solids, Total Suspended	<0.5	mg/l	7/18
Sulfate	16	mg/l	7/21
Sulfide		mg/l	
Turbidity	1.5	NTU	7/15
Cation, Total	6.55	meq/l	
Anion, Total	6.27	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	72.0	mg/l	7/21
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	<0.05	mg/l	7/21
Lead		mg/l	
Magnesium	31.6	mg/l	7/21
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.78	mg/l	7/22
Selenium		mg/l	
Silica		mg/l	
Sodium	8.23	mg/l	7/22
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 7-22-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4181
Date Rec'd 7-18-83
Date Sampled 7-15-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P O Box 1005
Huntington, Utah 84528

Sample ID: EMS
79-37
Temp. 46°
0.73 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	323	mg/l $CaCO_3$	7/19
Alkalinity, Bicarbonate	394	mg/l ~~Ca~~ H CO_3	7/19
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	5.60	mg/l	7/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	700	umhos/cm	7/19
Fluoride	0.228	mg/l	7/19
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.0	Units	7/19
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	356	mg/l	7/18
Solids, Total Suspended	233.5	mg/l	7/18
Sulfate	17	mg/l	7/21
Sulfide		mg/l	
Turbidity	68.0	NTU	7/19
Cation, Total	7.12	meq/l	
Anion, Total	6.97	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	68.0	mg/l	7/21
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	<0.05	mg/l	7/21
Lead		mg/l	
Magnesium	29.6	mg/l	7/21
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	1.41	mg/l	7/22
Selenium		mg/l	
Silica		mg/l	
Sodium	25.90	mg/l	7/22
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4262

Date Rec'd 8-1-83

Date Sampled 7-29-83

Time Sampled

Client: Utah Power & LIght Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mountain Springs
79-38
Temp. 40°
10.9 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	336	mg/l $CaCO_3$	8/2
Alkalinity, Bicarbonate	410	mg/l ~~$CaCO_3$~~ HCO_3	8/2
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	17.0	mg/l	8/9
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	750	umhos/cm	8/2
Fluoride	0.233	mg/l	8/2
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.5	Units	8/2
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	356	mg/l	8/4
Solids, Total Suspended	18.0	mg/l	8/4
Sulfate	12	mg/l	8/2
Sulfide		mg/l	
Turbidity	9.0	NTU	8/2
Cation, Total	7.50	meq/l	
Anion, Total	7.46	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	56.0	mg/l	8/4
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	< 0.05	mg/l	8/5
Lead		mg/l	
Magnesium	55.9	mg/l	8/9
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.82	mg/l	8/9
Selenium		mg/l	
Silica		mg/l	
Sodium	23.1	mg/l	8/9
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted Ray A. S. / [illegible] 8-9-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4258
Date Rec'd 8-1-83
Date Sampled 7-28-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mountain Springs
79-40
Temp. 40°
15.0 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	370	mg/l $CaCO_3$	8/2
Alkalinity, Bicarbonate	451	mg/l ~~$CaCO_3$~~ HCO_3	8/2
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	7.1	mg/l	8/9
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	900	umhos/cm	8/2
Fluoride	0.185	mg/l	8/2
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.5	Units	8/2
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	421	mg/l	8/4
Solids, Total Suspended	< 0.5	mg/l	8/4
Sulfate	23	mg/l	8/2
Sulfide		mg/l	
Turbidity	0.45	NTU	8/2
Cation, Total	7.72	meq/l	
Anion, Total	8.09	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	85.6	mg/l	8/4
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	< 0.05	mg/l	8/5
Lead		mg/l	
Magnesium	31.8	mg/l	8/4
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.79	mg/l	8/9
Selenium		mg/l	
Silica		mg/l	
Sodium	18.4	mg/l	8/9
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted Ray A Sin /~~By~~ 8-9-83

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4256

Date Rec'd 8-1-83
Entered as 7/28/83 ?
Date Sampled

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mountain Springs
80-41
Temp. 39°
10.9 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	378	mg/l $CaCO_3$	8/2
Alkalinity, Bicarbonate	461	mg/l ~~$CaCO_3$~~ HCO_3	8/2
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	9.4	mg/l	8/9
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1000	umhos/cm	8/2
Fluoride	0.205	mg/l	8/2
Hardness, Total		mg/l $CaCO_3$	
gen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.8	Units	8/2
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	479	mg/l	8/4
Solids, Total Suspended	< 0.5	mg/l	8/4
Sulfate	70	mg/l	8/2
Sulfide		mg/l	
Turbidity	1.0	NTU	8/2
Cation, Total	8.51	meq/l	
Anion, Total	9.29	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	84.8	mg/l	8/4
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	< 0.05	mg/l	8/5
Lead		mg/l	
Magnesium	42.1	mg/l	8/4
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.70	mg/l	8/9
Selenium		mg/l	
Silica		mg/l	
Sodium	18.3	mg/l	8/9
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted Ray A Sim/OH 8-9-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4178
Date Rec'd 7-18-83
Date Sampled 7-15-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Hunitngton, Utah 84528

Sample ID: EMS
80-42
Temp. 58°
27.3 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	351	mg/l $CaCO_3$	7/19
Alkalinity, Bicarbonate	428	mg/l $CaCO_3$	7/19
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	2.08	mg/l	7/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	690	umhos/cm	7/19
Fluoride	0.205	mg/l	7/19
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.8	Units	7.19
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	368	mg/l	7/18
Solids, Total Suspended	<0.5	mg/l	7/18
Sulfate	5	mg/l	7/21
Sulfide		mg/l	
Turbidity	0.35	NTU	7/19
Cation, Total	7.18	meq/l	
Anion, Total	7.18	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	55.2	mg/l	7/22
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	<0.05	mg/l	7/21
Lead		mg/l	
Magnesium	49.6	mg/l	7/21
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	1.00	mg/l	7/22
Selenium		mg/l	
Silica		mg/l	
Sodium	7.35	mg/l	7/22
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4184

Date Rec'd 7-18-83

Date Sampled 7-15-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: EMS
80-43
Temp. 39°
24.0 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	291	mg/l $CaCO_3$	7/19
Alkalinity, Bicarbonate	355	mg/l $CaCO_3$	7/19
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	2.90	mg/l	7/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	600	umhos/cm	7/19
Fluoride	0.177	mg/l	7/19
Hardness, Total		mg/l $CaCO_3$	
gen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.5	Units	7/19
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	333	mg/l	7/18
Solids, Total Suspended	<0.5	mg/l	7/18
Sulfate	10	mg/l	7/21
Sulfide		mg/l	
Turbidity	1.0	NTU	7/19
Cation, Total	5.92	meq/l	
Anion, Total	6.11	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	72.0	mg/l	7/21
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	<0.05	mg/l	7/21
Lead		mg/l	
Magnesium	24.3	mg/l	7/21
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	1.23	mg/l	7/22
Selenium		mg/l	
Silica		mg/l	
Sodium	6.75	mg/l	7/22
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 7-22-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4257
Date Rec'd 8-1-83
Date Sampled 7-28-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mountain Springs
80-44
Temp. 40°
24.0 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	390	mg/l $CaCO_3$	8/2
Alkalinity, Bicarbonate	476	mg/l ~~$CaCO_3$~~ HCO_3	8/2
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	9.5	mg/l	8/9
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1100	umhos/cm	8/2
Fluoride	0.210	mg/l	8/2
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.65	Units	8/2
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	541	mg/l	8/4
Solids, Total Suspended	<0.5	mg/l	8/4
Sulfate	120	mg/l	8/2
Sulfide		mg/l	
Turbidity	1.0	NTU	8/2
Cation, Total	10.23	meq/l	
Anion, Total	10.58	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	79.2	mg/l	8/4
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	<0.05	mg/l	8/5
Lead		mg/l	
Magnesium	52.8	mg/l	8/4
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.82	mg/l	8/9
Selenium		mg/l	
Silica		mg/l	
Sodium	44.0	mg/l	8/9
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 8-9-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4259
Date Rec'd 8-1-83
Date Sampled 7-28-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mountain Springs
80-45
Temp. 42°
12.0 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	389	mg/l $CaCO_3$	8/2
Alkalinity, Bicarbonate	474	mg/l ~~$CaCO_3$~~ HCO_3	8/2
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	10.7	mg/l	8/9
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	990	umhos/cm	8/2
Fluoride	0.177	mg/l	8/2
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.5	Units	8/2
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	452	mg/l	8/4
Solids, Total Suspended	6.0	mg/l	8/4
Sulfate	40	mg/l	8/2
Sulfide		mg/l	
Turbidity	4.2	NTU	8/2
Cation, Total	8.89	meq/l	
Anion, Total	8.92	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	58.4	mg/l	8/4
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	<0.05	mg/l	8/5
Lead		mg/l	
Magnesium	61.3	mg/l	8/4
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	1.38	mg/l	8/9
Selenium		mg/l	
Silica		mg/l	
Sodium	20.8	mg/l	8/9
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted Ray L. Sim 8-9-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4241
Date Rec'd 7-28-83
Date Sampled 7-27-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mountain Springs
80-46
Temp 41°
60.0 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	275	mg/l $CaCO_3$	7/29
Alkalinity, Bicarbonate	335	mg/l ~~$CaCO_3$~~ HCO_3	7/29
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	4.06	mg/l	8/1
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	650	umhos/cm	7/29
Fluoride	0.210	mg/l	8/2
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.4	Units	7/29
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	393	mg/l	8/3
Solids, Total Suspended	1.5	mg/l	8/3
Sulfate	11	mg/l	8/1
Sulfide		mg/l	
Turbidity	1.30	NTU	7/29
Cation, Total	5.91	meq/l	
Anion, Total	5.85	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	62.4	mg/l	7/29
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	< 0.05	mg/l	8/1
Lead		mg/l	
Magnesium	28.7	mg/l	7/29
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.58	mg/l	8/1
Selenium		mg/l	
Silica		mg/l	
Sodium	9.98	mg/l	8/1
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted Ray A Smith

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4641

Date Rec'd 10-27-83

Date Sampled 10-25-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mtn. Springs
80-46
Temp. 39°
7.5 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	280	mg/l $CaCO_3$	10/28
Alkalinity, Bicarbonate	341	mg/l $CaCO_3$	10/28
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	4.8	mg/l	10/31
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	600	umhos/cm	10/28
Fluoride	0.20	mg/l	11/1
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.6	Units	10/28
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	295	mg/l	10/31
Solids, Total Suspended	0.5	mg/l	10/31
Sulfate	30.0	mg/l	10/31
Sulfide		mg/l	
Turbidity	1.1	NTU	10/28
Cation, Total	6.22	meq/l	
Anion, Total	6.36	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	67.2	mg/l	10/28
Chromium		mg/l	
Copper		mg/l	
Iron, Sol.	< 0.05	mg/l	10/31
Lead		mg/l	
Magnesium	29.2	mg/l	10/31
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.5	mg/l	10/31
Selenium		mg/l	
Silica		mg/l	
Sodium	10.4	mg/l	10/31
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 11-1-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4242
Date Rec'd 7-28-83
Date Sampled 7-27-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mountain Springs
80-47
Temp. 39°
20.0 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	298	mg/l $CaCO_3$	7/29
Alkalinity, Bicarbonate	363	mg/l ~~$CaCO_3$~~ HCO_3	7/29
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	4.52	mg/l	8/1
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	700	umhos/cm	7/29
Fluoride	0.196	mg/l	8/2
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.5	Units	7/29
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	374	mg/l	8/3
Solids, Total Suspended	12.0	mg/l	8/3
Sulfate	12	mg/l	8/1
Sulfide		mg/l	
Turbidity	1.50	NTU	7/29
Cation, Total	6.36	meq/l	
Anion, Total	6.35	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	64.0	mg/l	7/29
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	< 0.05	mg/l	8/1
Lead		mg/l	
Magnesium	31.6	mg/l	7/29
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.75	mg/l	8/1
Selenium		mg/l	
Silica		mg/l	
Sodium	13.00	mg/l	8/1
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted Ray A Simpson

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4640
Date Rec'd 10-27-83
Date Sampled 10-25-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mtn. Springs
80-47
Temp. 38°
15.0 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	284	mg/l $CaCO_3$	10/28
Alkalinity, Bicarbonate	346	mg/l $CaCO_3$	10/28
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	4.7	mg/l	10/31
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	600	umhos/cm	10/28
Fluoride	0.21	mg/l	11/1
Hardness, Total		mg/l $CaCO_3$	
gen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.6	Units	10/28
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	317	mg/l	10/31
Solids, Total Suspended	7.0	mg/l	10/31
Sulfate	30.0	mg/l	10/31
Sulfide		mg/l	
Turbidity	1.5	NTU	10/28
Cation, Total	6.40	meq/l	
Anion, Total	6.44	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	65.6	mg/l	10/28
Chromium		mg/l	
Copper		mg/l	
Iron, Sol.	< 0.05	mg/l	10/31
Lead		mg/l	
Magnesium	30.6	mg/l	10/31
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.6	mg/l	10/31
Selenium		mg/l	
Silica		mg/l	
Sodium	13.6	mg/l	10/31
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 11-1-83

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4163
Date Rec'd 7-11-83
Date Sampled 7-13-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mountain Springs
80-49
Temp. 38°
60 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	342	mg/l $CaCO_3$	7/15
Alkalinity, Bicarbonate	417	mg/l $CaCO_3$	7/15
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	6.15	mg/l	7/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	800	umhos/cm	7/15
Fluoride	0.182	mg/l	7/19
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.3	Units	7/15
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	391	mg/l	7/18
Solids, Total Suspended	< 0.5	mg/l	7/18
Sulfate	34	mg/l	7/21
Sulfide		mg/l	
Turbidity	0.3	NTU	7/15
Cation, Total	7.71	meq/l	
Anion, Total	7.72	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	84.0	mg/l	7/21
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	< 0.05	mg/l	7/21
Lead		mg/l	
Magnesium	36.9	mg/l	7/21
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	1.02	mg/l	7/22
Selenium		mg/l	
Silica		mg/l	
Sodium	10.40	mg/l	7/22
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 7-22-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4263
Date Rec'd 8-1-83
Date Sampled 7-29-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mountain Springs
82-51
Temp. 44°
10.0 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	302	mg/l $CaCO_3$	8/2
Alkalinity, Bicarbonate	368	mg/l ~~$CaCO_3$~~ HCO_3	8/2
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	7.9	mg/l	8/9
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	980	umhos/cm	8/2
Fluoride	0.200	mg/l	8/2
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.0	Units	8/2
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	496	mg/l	8/4
Solids, Total Suspended	66.5	mg/l	8/4
Sulfate	95	mg/l	8/2
Sulfide		mg/l	
Turbidity	23.0	NTU	8/2
Cation, Total	8.58	meq/l	
Anion, Total	8.25	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	51.2	mg/l	8/4
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	<0.05	mg/l	8/5
Lead		mg/l	
Magnesium	62.2	mg/l	8/4
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.62	mg/l	8/9
Selenium		mg/l	
Silica		mg/l	
Sodium	20.9	mg/l	8/9
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted Ray A Si /DH 8-9-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4199
Date Rec'd 7-21-83
Date Sampled 7-20-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mountain Springs
82-52
Temp. 39°
80.0 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	341	mg/l $CaCO_3$	7/22
Alkalinity, Bicarbonate	416	mg/l $CaCO_3$	7/22
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	9.58	mg/l	7/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	750	umhos/cm	7/22
Fluoride	0.240	mg/l	7/28
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.4	Units	7/22
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	388	mg/l	7/27
Solids, Total Suspended	<0.5	mg/l	7/27
Sulfate	17	mg/l	7/22
Sulfide		mg/l	
Turbidity	0.30	NTU	7/22/83
Cation, Total	7.59	meq/l	
Anion, Total	7.45	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	74.4	mg/l	7/28
Chromium		mg/l	
Copper		mg/l	
Iron, Dissolved	<0.05	mg/l	7/27
Lead		mg/l	
Magnesium	36.5	mg/l	7/28
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.87	mg/l	7/22
Selenium		mg/l	
Silica		mg/l	
Sodium	19.6	mg/l	7/28
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 8-2-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4637

Date Rec'd 10-27-83

Date Sampled 10-25-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: East Mtn. Springs
82-52
Temp. 36°
25.0 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	326	mg/l $CaCO_3$	10/28
Alkalinity, Bicarbonate	398	mg/l $CaCO_3$	10/28
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	10.1	mg/l	10/31
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	750	umhos/cm	10/28
Fluoride	0.26	mg/l	11/1
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
...gen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.4	Units	10/28
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	389	mg/l	10/31
Solids, Total Suspended	0.5	mg/l	10/31
Sulfate	41.0	mg/l	10/31
Sulfide		mg/l	
Turbidity	0.6	NTU	10/28
Cation, Total	7.78	meq/l	
Anion, Total	7.66	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	75.2	mg/l	10/28
Chromium		mg/l	
Copper		mg/l	
Iron, Sol.	< 0.05	mg/l	10/31
Lead		mg/l	
Magnesium	38.4	mg/l	10/31
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	0.7	mg/l	10/31
Selenium		mg/l	
Silica		mg/l	
Sodium	19.4	mg/l	10/31
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 11-1-83

Certified Environmental Laboratory

APPENDIX G

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3558

Date Rec'd 1-27-83

Date Sampled 1-27-83

Time Sampled

Client: Utah Power & Light Co.
Mining & Exploration Field Office
P.O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg
In Mine
In X C 49 1 R
0.17 GPM
Temp. 52°

Acidity		mg/l $CaCO_3$
Alkalinity, Total	376	mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$ (459)
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride	21.9	mg/l
Coliform, Fecal		MPN/100 ml
Coliform, Total		MPN/100 ml
Conductivity	1200	umhos/cm
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
Nitrogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease		mg/l
pH	6.8	Units
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	837	mg/l
Solids, Total Suspended	< 0.5	mg/l
Sulfate	350	mg/l
Sulfide		mg/l
Turbidity		NTU

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium	250	mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Magnesium	5.60	mg/l
Manganese		mg/l
Mercury		ug/l
Nickel		mg/l
Potassium	2.46	mg/l
Selenium		mg/l
Silica		mg/l
Sodium	21.1	mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted 2/11/83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3559

Date Rec'd 1-27-83

Date Sampled 1-27-83

Time Sampled

Client: Utah Power & Light Co.
Mining & Exploration Field Office
P.O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg
In Mine
Flow 0.04 GPM
In X C 12
Temp. 50°

Acidity		mg/l $CaCO_3$
Alkalinity, Total	431	mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride	15.2	mg/l
Coliform, Fecal		MPN/100 ml
Coliform, Total		MPN/100 ml
Conductivity	1080	umhos/cm
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
gen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease		mg/l
pH	7.0	Units
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	694	mg/l
Solids, Total Suspended	<0.5	mg/l
Sulfate	200	mg/l
Sulfide		mg/l
Turbidity		NTU

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium	214	mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Magnesium	5.44	mg/l
Manganese		mg/l
Mercury		ug/l
Nickel		mg/l
Potassium	2.76	mg/l
Selenium		mg/l
Silica		mg/l
Sodium	26.9	mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted 2/11/83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Client: Utah Power & LIght Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg Mine
MW X C 109 (B-129)
Flow 0.02 GPM

In Mine

Lab. No. 3922
Date Rec'd 5-6-83
Date Sampled 5-6-83
Time Sampled

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	338	mg/l $CaCO_3$	5/6
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	9.00	mg/l	5/9
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1000	umhos/cm	5/6
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.5	Units	5/6
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	550	mg/l	5/12
Solids, Total Suspended	3.5	mg/l	5/12
Sulfate	190	mg/l	5/9
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	200	mg/l	5/16
Chromium		mg/l	
Copper		mg/l	
Iron		mg/l	
Lead		mg/l	
Magnesium	5.70	mg/l	5/[illegible]
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	2.40	mg/l	5/16
Selenium		mg/l	
Silica		mg/l	
Sodium	22.0	mg/l	5/16
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 5-14-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3923
Date Rec'd 5-6-83
Date Sampled 5-6-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg Mine
2nd So X C 11-1L (B-124)
Flow 0.02 GPM
In-Mine

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	381	mg/l $CaCO_3$	5/6
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	15.0	mg/l	5/9
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1500	umhos/cm	5/6
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
N[illegible]en, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.6	Units	5/6
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	902	mg/l	5/12
Solids, Total Suspended	6.0	mg/l	5/12
Sulfate	490	mg/l	5/9
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	330	mg/l	5/16
Chromium		mg/l	
Copper		mg/l	
Iron		mg/l	
Lead		mg/l	
Magnesium	5.40	mg/l	5/16
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	2.39	mg/l	5/16
Selenium		mg/l	
Silica		mg/l	
Sodium	30.0	mg/l	5/16
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4192

Date Rec'd 7-20-83

Date Sampled 7-19-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg
In-Mine
1N X C 12 3 L
Temp. 54°
0.03 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	429	mg/l $CaCO_3$	7/21
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	11.0	mg/l	7/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1190	umhos/cm	7/21
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.6	Units	7/21
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	637	mg/l	7/21
Solids, Total Suspended	0.5	mg/l	7/21
Sulfate	200	mg/l	7/21
Sulfide		mg/l	
Turbidity		NTU	
Cation, Total	12.75	meq/l	
Anion, Total	13.06	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	140.0	mg/l	7/21
Chromium		mg/l	
Copper		mg/l	
Iron		mg/l	
Lead		mg/l	
Magnesium	58.3	mg/l	7/21
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	3.34	mg/l	7/22
Selenium		mg/l	
Silica		mg/l	
Sodium	20.10	mg/l	7/22
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 7-22-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P. O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4191

Date Rec'd 7-20-83

Date Sampled 7-19-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg
In-Mine
1st N X C 45 1 R
Temp 58°
0.4 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	305	mg/l $CaCO_3$	7/21
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	15.5	mg/l	7/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1500	umhos/cm	7/21
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.25	Units	7/21
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	1104	mg/l	7/21
Solids, Total Suspended	<0.5	mg/l	7/21
Sulfate	500	mg/l	7/21
Sulfide		mg/l	
Turbidity		NTU	
Cation, Total	16.70	meq/l	
Anion, Total	16.95	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	184.0	mg/l	7/21
Chromium		mg/l	
Copper		mg/l	
Iron		mg/l	
Lead		mg/l	
Magnesium	71.7	mg/l	7/21
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	4.78	mg/l	7/22
Selenium		mg/l	
Silica		mg/l	
Sodium	34.10	mg/l	7/22
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 7-22-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4680

Date Rec'd 10-31-83

Date Sampled 10-28-83

Time Sampled

Client: Utah Power & LIght Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg
In-Mine
4th E x C-42 2L
0.06 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	537	mg/l $CaCO_3$	11/
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	16.0	mg/l	11/1
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	2200	umhos/cm	11/1
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.1	Units	11/1
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	1458	mg/l	11/1
Solids, Total Suspended	< 0.5	mg/l	11/1
Sulfate	700	mg/l	11/2
Sulfide		mg/l	
Turbidity		NTU	
Cation, Total	26.13	meq/l	
Anion, Total	25.78	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	230.0	mg/l	11/2
Chromium		mg/l	
Copper		mg/l	
Iron		mg/l	
Lead		mg/l	
Magnesium	162.9	mg/l	11/2
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	5.3	mg/l	11/2
Selenium		mg/l	
Silica		mg/l	
Sodium	25.3	mg/l	11/2
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 11-2-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4681
Date Rec'd 10-31-83
Date Sampled 10-28-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1105
Huntington, Utah 84528

Sample ID: Wilberg
In-Mine
3rd N xC-5 1L
0.1 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	328	mg/l $CaCO_3$	11/1
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	8.8	mg/l	11/2
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1000	umhos/cm	11/1
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
N n, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	8.5	Units	11/1
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	576	mg/l	11/1
Solids, Total Suspended	0.5	mg/l	11/1
Sulfate	185	mg/l	11/2
Sulfide		mg/l	
Turbidity		NTU	
Cation, Total	9.07	meq/l	
Anion, Total	10.66	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	11.2	mg/l	11/2
Chromium		mg/l	
Copper		mg/l	
Iron		mg/l	
Lead		mg/l	
Magnesium	5.8	mg/l	11/2
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	1.5	mg/l	11/2
Selenium		mg/l	
Silica		mg/l	
Sodium	183.8	mg/l	11/2
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 11-2-83

APPENDIX H

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3505
Date Rec'd 1-11-83
Date Sampled 1-10-83
Time Sampled

Client: Utah Power & Light Co.
P.O. Box 1005
Mining & Exploration Field Office
Huntington, Utah 84528

Sample ID: Wilberg Discharge

Acidity	< 1.0	mg/l $CaCO_3$
Alkalinity, Total	262	mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride	15.7	mg/l
Coliform, Fecal	< 2	MPN/100 ml
Coliform, Total	< 2	MPN/100 ml
Conductivity		umhos/cm
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
Nitrogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease	2.0	mg/l
pH	7.6	Units
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	570	mg/l
Solids, Total Suspended	4.0	mg/l
Sulfate	210	mg/l
Sulfide		mg/l
Turbidity		NTU
BOD5	1.4	mg/l

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.17	mg/l
Lead		mg/l
Magnesium		mg/l
Manganese	0.04	mg/l
Mercury		ug/l
Nickel		mg/l
Potassium		mg/l
Selenium		mg/l
Silica		mg/l
Sodium		mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3602

Date Rec'd 2-9-83

Date Sampled 2-9-83

Time Sampled

Client: Utah Power & Light Co.
Mining & Exploration
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg Discharge

Acidity	< 1.0	mg/l $CaCO_3$	2/9
Alkalinity, Total	350	mg/l $CaCO_3$	2/9
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	13.7	mg/l	2/11
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity		umhos/cm	
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	1.6	mg/l	2/11
pH	6.9	Units	2/9
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	620	mg/l	2/10
Solids, Total Suspended	4.0	mg/l	2/10
Sulfate	200	mg/l	2/10
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.24	mg/l	2/14
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.11	mg/l	2/14
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 2/14/83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3736
Date Rec'd 3-16-83
Date Sampled 3-15-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg Discharge

Acidity	< 1.0	mg/l $CaCO_3$	3/16
Alkalinity, Total	285	mg/l $CaCO_3$	3/16
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	13.0	mg/l	3/18
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity		umhos/cm	
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	< 0.5	mg/l	3/18
pH	8.1	Units	3/16
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	555	mg/l	3/18
Solids, Total Suspended	3.5	mg/l	3/18
Sulfate	250	mg/l	3/17
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.26	mg/l	3/21
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.12	mg/l	3/21
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 3/21/83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3804
Date Rec'd 4-12-83
Date Sampled 4-11-83
Time Sampled 2:00 PM

Client: Utah Power & Light Co.
P. O. Box 899
Salt Lake City, Utah 84110

Sample ID: Wilberg Discharge
Quarterly

Acidity	< 1.0	mg/l $CaCO_3$	4/12
Alkalinity, Total	348	mg/l $CaCO_3$	4/12
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	16.8	mg/l	4/12
Coliform, Fecal	< 2	MPN/100 ml	4/13
Coliform, Total	< 2	MPN/100 ml	4/13
Conductivity		umhos/cm	
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
gen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	< 0.5	mg/l	4/13
pH	8.0	Units	4/12
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	622	mg/l	4/12
Solids, Total Suspended	< 0.5	mg/l	4/12
Sulfate	220	mg/l	4/13
Sulfide		mg/l	
Turbidity		NTU	
BOD_5	1.2	mg/l	4/18

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.06	mg/l	4/14
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.04	mg/l	4/14
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature]
4-18-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3924
Date Rec'd 5-9-83
Date Sampled 5-9-83
Time Sampled

Client: Utah Power & LIght Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg Discharge

Acidity	< 1.0	mg/l $CaCO_3$	5/10
Alkalinity, Total	277	mg/l $CaCO_3$	5/10
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	15.0	mg/l	5/16
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity		umhos/cm	
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	< 0.5	mg/l	5/16
pH	7.9	Units	5/9
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	616	mg/l	5/13
Solids, Total Suspended	< 0.5	mg/l	5/13
Sulfate	260	mg/l	5/10
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	< 0.05	mg/l	5/16
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.01	mg/l	5/16
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 5-18-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4034

Date Rec'd 6-15-83

Date Sampled 6-14-84

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg Discharge

Acidity	< 1.0	mg/l $CaCO_3$	6/15
Alkalinity, Total	268.	mg/l $CaCO_3$	6/15
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	12.80	mg/l	6/15
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity		umhos/cm	
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	< 0.50	mg/l	6/17
pH	7.70	Units	6/15
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	664.	mg/l	6/16
Solids, Total Suspended	0.50	mg/l	6/16
Sulfate	240.	mg/l	6/15
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	< 0.05	mg/l	6/15
Lead		mg/l	
Magnesium		mg/l	
Manganese	< 0.01	mg/l	6/15
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4125
Date Rec'd 7-11-83
Date Sampled 7-11-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg Discharge

Acidity	< 1.0	mg/l $CaCO_3$	7/12
Alkalinity, Total	260	mg/l $CaCO_3$	7/12
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	12.0	mg/l	7/13
Coliform, Fecal	< 2	MPN/100 ml	7/18
Coliform, Total	< 2	MPN/100 ml	7/18
Conductivity	1050	umhos/cm	7/12
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	< 0.5	mg/l	7/13
pH	8.0	Units	7/12
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	621.0	mg/l	7/13
Solids, Total Suspended	2.5	mg/l	7/13
Sulfate	240	mg/l	7/12
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.07	mg/l	7/12
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.05	mg/l	7/12
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4306
Date Rec'd 8-9-83
Date Sampled 8-9-83
Time Sampled

Client: Utah Power & Light Co.
Environmental Division
P. O. Box 899
Salt lake City, Utah 84110

Sample ID: Wilberg Discharge
U. S. G. S.

Acidity	< 1.0	mg/l $CaCO_3$	8/10
Alkalinity, Total	267	mg/l $CaCO_3$	8/10
Alkalinity, Bicarbonate	325	mg/l $CaCO_3$	8/10
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	13.7	mg/l	8/11
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1100	umhos/cm	8/10
Fluoride	0.240	mg/l	8/11
Hardness, Total		mg/l $CaCO_3$	
gen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite	< 0.001	mg/l	8/17
Oil & Grease	< 0.5	mg/l	8/11
pH	8.0	Units	8/10
Phosphorus, Ortho		mg/l	
Phosphorus, Total	0.03	mg/l	8/11
Solids, Total Dissolved	613	mg/l	8/10
Solids, Total Suspended	< 0.5	mg/l	8/10
Sulfate	240	mg/l	8/11
Sulfide		mg/l	
Turbidity		NTU	
Oxygen, Dissolved	7.8	mg/l	8/10
TK.N	0.25	mg/l	8/19
BOD	4.8	mg/l	8/15

Aluminum		mg/l	
Arsenic	< 0.001	mg/l	8/15
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium	< 0.005	mg/l	8/12
Calcium	92	mg/l	8/10
Chromium		mg/l	
Copper		mg/l	
Iron	< 0.05	mg/l	8/10
Lead	< 0.05	mg/l	8/12
Magnesium	64.4	mg/l	8/10
Manganese	< 0.01	mg/l	8/10
Mercury		ug/l	
Nickel		mg/l	
Potassium	4.6	mg/l	8/15
Selenium	0.001	mg/l	8/12
Silica	0.80	mg/l	8/17
Sodium	38.2	mg/l	8/19
Vanadium		mg/l	
Zinc	< 0.005	mg/l	8/12
Cation, Total	11.67	meq/l	
Anion, Total	10.72	meq/l	

Respectfully submitted [signature] 8-14-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Client: Utah Power & Light
Field Office
Huntington, Utah 84528

Sample ID: Wilberg Raw

Lab. No. 4302
Date Rec'd 8-8-83
Date Sampled 8-8-83
Time Sampled

Acidity		mg/l $CaCO_3$
Alkalinity, Total		mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride		mg/l
Coliform, Fecal (8/12)	< 2	MPN/100 ml
Coliform, Total (8/12)	4	MPN/100 ml
Conductivity		umhos/cm
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
Nitrogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease		mg/l
pH		Units
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved		mg/l
Solids, Total Suspended		mg/l
Sulfate		mg/l
Sulfide		mg/l
Turbidity		NTU

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium		mg/l
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Magnesium		mg/l
Manganese		mg/l
Mercury		ug/l
Nickel		mg/l
Potassium		mg/l
Selenium		mg/l
Silica		mg/l
Sodium		mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted [signature] 8-15-83

Certified Environmental Laboratory

Ford Chemical
LABORATORY, INC.
Bacteriological and Chemical Analysis
40 WEST LOUISE AVENUE
SALT LAKE CITY, UTAH 84115
PHONE 466-8761

DATE: 08/15/83

CERTIFICATE OF ANALYSIS

UTAH POWER & LIGHT
FIELD OFFICE
P.O. 1005
HUNTINGTON, UT 84528

83-005981

SAMPLE: WATER SAMPLES COLLECTED 8-9-83 RECEIVED 8-10-83 FOR ANALYSIS.

	DEER CREEK DISCHARGE	WILBERG MINE
Gross Alpha pci/l	<2.0	<2.0
Gross Beta pci/l	<.1	<.1
Total Organic Carbon mg/l	11.50	4.30

FORD CHEMICAL LABORATORY, INC.

All reports are submitted as the confidental property of clients. Authorization for publication of our reports, conclusions, or, extracts from or regarding them, is reserved pending our written approval as a mutual protection to clients, the public and ourselves.

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4461
Date Rec'd 9-13-83
Date Sampled 9-13-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg Discharge

Acidity	< 1.0	mg/l $CaCO_3$	9/13
Alkalinity, Total	249	mg/l $CaCO_3$	9/13
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	12.0	mg/l	9/14
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1000	umhos/cm	9/13
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	< 0.5	mg/l	9/16
pH	8.0	Units	9/13
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	615	mg/l	9/15
Solids, Total Suspended	11.5	mg/l	9/15
Sulfate	220	mg/l	9/16
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.07	mg/l	9/14
Lead		mg/l	
Magnesium		mg/l	
Manganese	< 0.01	mg/l	9/14
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 9-16-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4484

Date Rec'd 9-21-83

Date Sampled 9-20-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg Discharge
State Split

SAMPLED BY DICK NORTHRUP - EMC

Acidity	< 1.0	mg/l $CaCO_3$	9/22
Alkalinity, Total	250	mg/l $CaCO_3$	9/22
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	12.0	mg/l	9/27
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1100	umhos/cm	9/22
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
N[illegible]n, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	< 0.5	mg/l	9/23
pH	8.1	Units	9/22
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	599	mg/l	9/23
Solids, Total Suspended	4.0	mg/l	9/23
Sulfate	220	mg/l	9/22
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	< 0.05	mg/l	9/22
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.01	mg/l	9/22
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 9-27-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4581
Date Rec'd 10-11-83
Date Sampled 10-10-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg Mine Discharge
Quarterly

Acidity	< 1.0	mg/l $CaCO_3$	10/12
Alkalinity, Total	247	mg/l $CaCO_3$	10/12
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	11.7	mg/l	10/13
Coliform, Fecal	< 2	MPN/100 ml	10/12
Coliform, Total	< 2	MPN/100 ml	10/12
Conductivity	1000	umhos/cm	10/12
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	< 0.5	mg/l	10/14
pH	7.9	Units	10/12
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	562	mg/l	10/12
Solids, Total Suspended	< 0.5	mg/l	10/12
Sulfate	340	mg/l	10/12
Sulfide		mg/l	
Turbidity		NTU	
BOD 5	0.41	mg/l	10/12

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	< 0.05	mg/l	10/12
Lead		mg/l	
Magnesium		mg/l	
Manganese	< 0.01	mg/l	10/12
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 10-17-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4760

Date Rec'd 11-15-83

Date Sampled 11-15-83

Time Sampled

Client: Utah Power & LIght Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg Discharge
(State Split)

Acidity	< 1.0	mg/l $CaCO_3$	11/16
Alkalinity, Total	259	mg/l $CaCO_3$	11/16
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	12.0	mg/l	11/16
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1000	umhos/cm	11/16
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
I en, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	< 0.5	mg/l	11/21
pH	7.9	Units	11/16
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	626	mg/l	11/21
Solids, Total Suspended	1.0	mg/l	11/21
Sulfate	*195	mg/l	11/22
Sulfide		mg/l	
Turbidity		NTU	

* Revised 11/22

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.05	mg/l	11/21
Lead		mg/l	
Magnesium		mg/l	
Manganese	< 0.01	mg/l	11/21
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 11-23-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4860
Date Rec'd 12-12-83
Date Sampled 12-12-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Wilberg Discharge

Acidity	< 1.0	mg/l $CaCO_3$	12/13
Alkalinity, Total	253	mg/l $CaCO_3$	12/13
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	13.2	mg/l	12/13
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1010	umhos/cm	12/13
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	< 0.5	mg/l	12/13
pH	7.8	Units	12/13
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	643	mg/l	12/13
Solids, Total Suspended	< 0.5	mg/l	12/13
Sulfate	250	mg/l	12/13
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	< 0.05	mg/l	12/13
Lead		mg/l	
Magnesium		mg/l	
Manganese	< 0.01	mg/l	12/13
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted

Certified Environmental Laboratory

APPENDIX I

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3785

Date Rec'd 3-30-83

Date Sampled 3-29-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek In Mine
EM-3
FLOW: 3.0 GPM (estimated)

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	402	mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	10	mg/l	4/6
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	990	umhos/cm	3/30
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.2	Units	3/30
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	605	mg/l	3/31
Solids, Total Suspended	<0.5	mg/l	3/31
Sulfate	135	mg/l	4/1
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	110	mg/l	4/5
Chromium		mg/l	
Copper		mg/l	
Iron		mg/l	
Lead		mg/l	
Magnesium	53	mg/l	4/5
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	5	mg/l	4/5
Selenium		mg/l	
Silica		mg/l	
Sodium	12	mg/l	4/5
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 4-7-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3784
Date Rec'd 3-30-83
Date Sampled 3-29-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek In Mine
2 L XC 20

Flow .75 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	422	mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	10	mg/l	4/6
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1020	umhos/cm	3/30
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.3	Units	3/30
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	676	mg/l	3/31
Solids, Total Suspended	1.0	mg/l	3/31
Sulfate	155	mg/l	4/1
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	115	mg/l	4/5
Chromium		mg/l	
Copper		mg/l	
Iron		mg/l	
Lead		mg/l	
Magnesium	56	mg/l	4/5
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	4	mg/l	4/5
Selenium		mg/l	
Silica		mg/l	
Sodium	11	mg/l	4/5
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted 4-7-83

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4108

Date Rec'd 7-1-83

Date Sampled 6-30-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek
In-Mine
5 R X C 7 1 R

Flow 0.03 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	425	mg/l $CaCO_3$	7/5
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	10.50	mg/l	7/6
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1000	umhos/cm	7/5
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
gen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.45	Units	7/5
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	636	mg/l	7/5
Solids, Total Suspended	<0.5	mg/l	7/5
Sulfate	145	mg/l	7/5
Sulfide		mg/l	
Turbidity		NTU	
Cation, Total	11.62	meq/l	
Anion, Total	11.81	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	115.2	mg/l	7/6
Chromium		mg/l	
Copper		mg/l	
Iron	0.11	mg/l	7/5
Lead		mg/l	
Magnesium	62.5	mg/l	7/6
Manganese	0.05	mg/l	7/5
Mercury		ug/l	
Nickel		mg/l	
Potassium	3.02	mg/l	7/6
Selenium		mg/l	
Silica		mg/l	
Sodium	14.95	mg/l	7/6
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted Ray A Sin / [illegible] 7-6-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4109
Date Rec'd 7-1-83
Date Sampled 6-30-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek
In-Mine
5 R X C47 ½ 1 R
Flow 0.1GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	383	mg/l $CaCO_3$	7/5
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	10.00	mg/l	7/6
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	910	umhos/cm	7/5
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.3	Units	7/5
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	589	mg/l	7/5
Solids, Total Suspended	<0.5	mg/l	7/5
Sulfate	125	mg/l	7/5
Sulfide		mg/l	
Turbidity		NTU	
Cation, Total	10.39	meq/l	
Anion, Total	10.55	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	100.8	mg/l	7/6
Chromium		mg/l	
Copper		mg/l	
Iron	0.07	mg/l	7/5
Lead		mg/l	
Magnesium	55.45	mg/l	7/6
Manganese	0.01	mg/l	7/5
Mercury		ug/l	
Nickel		mg/l	
Potassium	3.80	mg/l	7/6
Selenium		mg/l	
Silica		mg/l	
Sodium	16.12	mg/l	7/6
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [illegible] 7-6-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4499
Date Rec'd 9-27-83
Date Sampled 9-26-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek
In-Mine
3rd North X C 42 1L
Flow 0.45 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	309	mg/l $CaCO_3$	9/28
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	4.27	mg/l	9/28
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	700	umhos/cm	9/28
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
gen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.4	Units	9/28
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	376	mg/l	9/28
Solids, Total Suspended	17.0	mg/l	9/28
Sulfate	52	mg/l	9/28
Sulfide		mg/l	
Turbidity		NTU	
Cation, Total	7.08	meq/l	
Anion, Total	7.39	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	74.4	mg/l	9/28
Chromium		mg/l	
Copper		mg/l	
Iron		mg/l	
Lead		mg/l	
Magnesium	32.1	mg/l	9/28
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	2.9	mg/l	9/28
Selenium		mg/l	
Silica		mg/l	
Sodium	15.0	mg/l	9/28
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 9-29-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4515
Date Rec'd 9-29-83
Date Sampled 9-28-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, utah 84528

Sample ID: Deer Creek
In-Mine

Flow 0.21 GPM
4th Right, xc-14½ 1 Right

Acidity	< 1.0	mg/l $CaCO_3$	10/4
Alkalinity, Total	428	mg/l $CaCO_3$	9/30
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	13.2	mg/l	10/4
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1200	umhos/cm	9/30
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.3	Units	9/30
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	680	mg/l	10/3
Solids, Total Suspended	6.5	mg/l	10/3
Sulfate	255	mg/l	10/3
Sulfide		mg/l	
Turbidity		NTU	
Cation, Total	12.37	meq/l	
Anion, Total	13.02	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	128.0	mg/l	9/30
Chromium		mg/l	
Copper		mg/l	
Iron		mg/l	
Lead		mg/l	
Magnesium	63.2	mg/l	9/30
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	3.0	mg/l	10/4
Selenium		mg/l	
Silica		mg/l	
Sodium	15.8	mg/l	10/4
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4888

Date Rec'd 12-19-83

Date Sampled 12-19-83

Time Sampled

Client: Utah Power & LIght Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek
In-Mine
AB-50

0.58 GPM

Acidity		mg/l $CaCO_3$	
Alkalinity, Total	356	mg/l $CaCO_3$	12/20
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	10.0	mg/l	12/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	900	umhos/cm	12/20
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
gen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease		mg/l	
pH	7.3	Units	12/20
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	500	mg/l	12/21
Solids, Total Suspended	<0.5	mg/l	12/21
Sulfate	105	mg/l	12/21
Sulfide		mg/l	
Turbidity		NTU	
Cation, Total	10.14	meq/l	
Anion, Total	9.75	meq/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium	100.8	mg/l	12/21
Chromium		mg/l	
Copper		mg/l	
Iron		mg/l	
Lead		mg/l	
Magnesium	50.6	mg/l	12/21
Manganese		mg/l	
Mercury		ug/l	
Nickel		mg/l	
Potassium	3.3	mg/l	12/21
Selenium		mg/l	
Silica		mg/l	
Sodium	20.0	mg/l	12/21
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4891
Date Rec'd 12-20-83
Date Sampled 12-22-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek
In-Mine
3rd S xc 33 2L

Acidity		mg/l $CaCO_3$
Alkalinity, Total	338	mg/l $CaCO_3$ 12/21
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride	8.8	mg/l 12/22
Coliform, Fecal		MPN/100 ml
Coliform, Total		MPN/100 ml
Conductivity	775	umhos/cm 12/21
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
Nitrogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease		mg/l
pH	7.6	Units 12/21
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	367	mg/l 12/21
Solids, Total Suspended	< 0.5	mg/l 12/21
Sulfate	60	mg/l 12/21
Sulfide		mg/l
Turbidity		NTU
Cation, Total	8.45	meq/l
Anion, Total	8.40	meq/l

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium	77.6	mg/l 12/21
Chromium		mg/l
Copper		mg/l
Iron		mg/l
Lead		mg/l
Magnesium	44.0	mg/l 12/21
Manganese		mg/l
Mercury		ug/l
Nickel		mg/l
Potassium	5.1	mg/l 12/21
Selenium		mg/l
Silica		mg/l
Sodium	19.0	mg/l 12/21
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted

Certified Environmental Laboratory

APPENDIX J

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3538
Date Rec'd 1-24-83
Date Sampled 1-24-83
Time Sampled

Client: Utah Power & Light Co.
Mining & Exploration Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Discharge

Acidity	<1.0	mg/l $CaCO_3$
Alkalinity, Total	297	mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride	16.6	mg/l
Coliform, Fecal		MPN/100 ml
Coliform, Total		MPN/100 ml
Conductivity	1010	umhos/cm
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
;en, Ammonia		mg/l
Nitrogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease	<0.5	mg/l
pH	7.4	Units
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	601	mg/l
Solids, Total Suspended	1.0	mg/l
Sulfate	220	mg/l
Sulfide		mg/l
Turbidity		NTU
Dissolved, Oxygen	9.4	mg/l

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.57	mg/l
Lead		mg/l
Magnesium		mg/l
Manganese	0.14	mg/l
Mercury		ug/l
Nickel		mg/l
Potassium		mg/l
Selenium		mg/l
Silica		mg/l
Sodium		mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted 2/11/83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3668
Date Rec'd 2-22-83
Date Sampled 2-22-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Discharge

Acidity	< 1.0	mg/l $CaCO_3$
Alkalinity, Total	344	mg/l $CaCO_3$
Alkalinity, Bicarbonate		mg/l $CaCO_3$
Alkalinity, Carbonate		mg/l $CaCO_3$
Chloride	35.6	mg/l
Coliform, Fecal		MPN/100 ml
Coliform, Total		MPN/100 ml
Conductivity	910	umhos/cm
Fluoride		mg/l
Hardness, Total		mg/l $CaCO_3$
Nitrogen, Ammonia		mg/l
Nitrogen, Nitrate		mg/l
Nitrogen, Nitrite		mg/l
Oil & Grease	< 0.5	mg/l
pH	7.2	Units
Phosphorus, Ortho		mg/l
Phosphorus, Total		mg/l
Solids, Total Dissolved	665	mg/l
Solids, Total Suspended	2.5	mg/l
Sulfate	190	mg/l
Sulfide		mg/l
Turbidity		NTU
D. O.	9.3	mg/l

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.34	mg/l
Lead		mg/l
Magnesium		mg/l
Manganese	0.09	mg/l
Mercury		ug/l
Nickel		mg/l
Potassium		mg/l
Selenium		mg/l
Silica		mg/l
Sodium		mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted Ray A. Simpson

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

F 3ox 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3783

Date Rec'd 3-30-83

Date Sampled 3-29-83

Time Sampled _____

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Discharge

Acidity	< 1.0	mg/l $CaCO_3$	4/1
Alkalinity, Total	328	mg/l $CaCO_3$	
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	18	mg/l	4/6
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1050	umhos/cm	3/30
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
N en, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	<0.5	mg/l	4/5
pH	7.7	Units	3/30
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	736	mg/l	3/31
Solids, Total Suspended	10.5	mg/l	3/31
Sulfate	265	mg/l	4/1
Sulfide		mg/l	
Turbidity		NTU	
D. O.	7.8	mg/l	3/30

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.26	mg/l	4/5
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.19	mg/l	4/5
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 4-7-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3876
Date Rec'd 4-25-83
Date Sampled 4-25-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Staff Reading
Discharge

Flow 2.0

Acidity	<1.0	mg/l $CaCO_3$	4/25
Alkalinity, Total	299	mg/l $CaCO_3$	4/25
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	39.1	mg/l	4/29
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1080	umhos/cm	4/25
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	2.8	mg/l	4/27
pH	7.2	Units	4/25
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	610	mg/l	4/26
Solids, Total Suspended	7.0	mg/l	4/26
Sulfate	270	mg/l	4/26
Sulfide		mg/l	
Turbidity		NTU	
Dissolved Oxygen	6.8	units	4/25

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.26	mg/l	5/3
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.04	mg/l	5/3
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted Ray A Simpson 5-4-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 3960
Date Rec'd 5-23-83
Date Sampled 5-23-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Discharge

Acidity	<1.0	mg/l $CaCO_3$	5/24
Alkalinity, Total	309	mg/l $CaCO_3$	5/24
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	11.6	mg/l	5/25
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity		umhos/cm	
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
gen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	1.5	mg/l	5/31
pH	7.6	Units	5/23
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	646	mg/l	5/27
Solids, Total Suspended	13.3	mg/l	5/27
Sulfate	260	mg/l	5/24
Sulfide		mg/l	
Turbidity		NTU	
D. O.	8.3		5/23

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.12	mg/l	5/27
Lead		mg/l	
Magnesium		mg/l	
Manganese	< 0.01	mg/l	5/27
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted 6/1/83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4110
Date Rec'd 7-1-83
Date Sampled 6-30-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Discharge

Acidity	< 1.0	mg/l $CaCO_3$	7/5
Alkalinity, Total	290	mg/l $CaCO_3$	7/5
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	12.30	mg/l	7/6
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1000	umhos/cm	7/5
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	< 0.5	mg/l	7/5
pH	7.5	Units	7/5
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	698	mg/l	7/5
Solids, Total Suspended	< 0.5	mg/l	7/5
Sulfate	220	mg/l	7/5
Sulfide		mg/l	
Turbidity		NTU	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.55	mg/l	7/5
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.01	mg/l	7/5
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 7-6-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4210
Date Rec'd 7-26-83
Date Sampled 7-26-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Discharge

Acidity	< 1.0	mg/l $CaCO_3$	7/27
Alkalinity, Total	303	mg/l $CaCO_3$	7/27
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	10.2	mg/l	8/1
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1100	umhos/cm	7/27
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	1.12	mg/l	8/1
pH	7.9	Units	7/27
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	627	mg/l	8/3
Solids, Total Suspended	19.5	mg/l	8/3
Sulfate	200	mg/l	8/1
Sulfide		mg/l	
Turbidity		NTU	
Dissolved Oxygen	7.80	mg/l	7/27

Aluminum		mg/l
Arsenic		mg/l
Barium		mg/l
Beryllium		mg/l
Boron		mg/l
Cadmium		mg/l
Calcium		mg/l
Chromium		mg/l
Copper		mg/l
Iron	0.24	mg/l
Lead		mg/l
Magnesium		mg/l
Manganese	< 0.01	mg/l
Mercury		ug/l
Nickel		mg/l
Potassium		mg/l
Selenium		mg/l
Silica		mg/l
Sodium		mg/l
Vanadium		mg/l
Zinc		mg/l

Respectfully submitted Ray A. Sipes

Certified Environmental Laboratory

Ford Chemical
LABORATORY, INC.
Bacteriological and Chemical Analysis
40 WEST LOUISE AVENUE
SALT LAKE CITY, UTAH 84115
PHONE 466-8761

DATE: 08/15/83

CERTIFICATE OF ANALYSIS

UTAH POWER & LIGHT
FIELD OFFICE
P.O. 1005
HUNTINGTON, UT 84528

83-005981

SAMPLE: WATER SAMPLES COLLECTED 8-9-83 RECEIVED 8-10-83 FOR ANALYSIS.

	DEER CREEK DISCHARGE	WILBERG MINE
Gross Alpha pci/l	<2.0	<2.0
Gross Beta pci/l	<.1	<.1
Total Organic Carbon mg/l	11.50	4.30

FORD CHEMICAL LABORATORY, INC.

All reports are submitted as the confidental property of clients. Authorization for publication of our reports, conclusions, or, extracts from or regarding them, is reserved pending our written approval as a mutual protection to clients, the public and ourselves.

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4406
Date Rec'd 9-1-83
Date Sampled 8-31-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Hunitngton, Utah 84528

Sample ID: Deer Creek Discharge
USGS Annual

Acidity	< 1.0	mg/l $CaCO_3$	9/2
Alkalinity, Total	285	mg/l $CaCO_3$	9/2
Alkalinity, Bicarbonate	348	mg/l ~~$CaCO_3$~~ HCO_3	9/2
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	11.0	mg/l	9/2
Coliform, Fecal	< 2	MPN/100 ml	
Coliform, Total	< 2	MPN/100 ml	
Conductivity	1150	umhos/cm	9/2
Fluoride	0.326	mg/l	9/19
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite	0.018	mg/l	9/7
Oil & Grease	2.1	mg/l	9/7
pH	7.85	Units	9/2
Phosphorus, Ortho		mg/l	
Phosphorus, Total	0.14	mg/l	9/8
Solids, Total Dissolved	592	mg/l	9/19
Solids, Total Suspended	5.0	mg/l	9/19
Sulfate	238	mg/l	9/8
Sulfide		mg/l	
Turbidity		NTU	
B.O.D.	0.55	mg/l	9/7
TKN	2.80		9/16
Oxygen, Dissolved	7.5	mg/l	9/2

Aluminum		mg/l	
Arsenic	< 0.001	mg/l	9/8
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium	< 0.005	mg/l	9/8
Calcium	91.2	mg/l	9/6
Chromium		mg/l	
Copper		mg/l	
Iron	0.15	mg/l	9/6
Lead	< 0.05	mg/l	9/8
Magnesium	68.6	mg/l	9/6
Manganese	< 0.01	mg/l	9/6
Mercury		ug/l	
Nickel		mg/l	
Potassium	6.9	mg/l	9/6
Selenium	0.019	mg/l	9/19
Silica	4.4	mg/l	9/8
Sodium	21.9	mg/l	9/6
Vanadium		mg/l	
Zinc	< 0.005	mg/l	9/8
Cation, Total	11.32	meq/l	
Anion, Total	10.98	meq/l	

Respectfully submitted [signature] 9-20-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4516
Date Rec'd 9-29-83
Date Sampled 9-28-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Discharge

Acidity	< 1.0	mg/l $CaCO_3$	10/4
Alkalinity, Total	302	mg/l $CaCO_3$	9/30
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	13.3	mg/l	10/4
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1200	umhos/cm	9/30
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	< 0.5	mg/l	10/3
pH	7.65	Units	9/30
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	648	mg/l	10/3
Solids, Total Suspended	17.5	mg/l	10/3
Sulfate	350	mg/l	10/3
Sulfide		mg/l	
Turbidity		NTU	
Oxygen, Dissolved	7.8	mg/l	9/29

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.22	mg/l	10/4
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.01	mg/l	10/4
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
O. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4682
Date Rec'd 10-31-83
Date Sampled 10-28-83
Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Discharge

Acidity	< 1.0	mg/l $CaCO_3$	11/1
Alkalinity, Total	291	mg/l $CaCO_3$	11/1
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	12.3	mg/l	11/2
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1000	umhos/cm	11/1
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	< 0.5	mg/l	11/2
pH	7.9	Units	11/1
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	629	mg/l	11/1
Solids, Total Suspended	45.0	mg/l	11/1
Sulfate	305	mg/l	11/2
Sulfide		mg/l	
Turbidity		NTU	
Oxygen, Dissolved	7.9	mg/l	

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.39	mg/l	11/3
Lead		mg/l	
Magnesium		mg/l	
Manganese	< 0.01	mg/l	11/3
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 11-3-83

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.
P.O. Box 1140, Huntington, Utah 84528 801-653-2314

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Discharge

Lab. No. 4806
Date Rec'd 11-29-83
Date Sampled 11-29-83
Time Sampled

Acidity	< 1.0	mg/l $CaCO_3$	11/30
Alkalinity, Total	280	mg/l $CaCO_3$	11/30
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	27.0	mg/l	11/30
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1000	umhos/cm	11/30
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
Nitrogen, Ammonia		mg/l	
Nitrogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	0.9	mg/l	11/30
pH	7.9	Units	11/30
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	619	mg/l	11/30
Solids, Total Suspended	12.0	mg/l	11/30
Sulfate	249	mg/l	11/30
Sulfide		mg/l	
Turbidity		NTU	
Oxygen, Dissolved	6.9	mg/l	11/29

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.33	mg/l	11/
Lead		mg.	
Magnesium		mg/l	
Manganese	0.01	mg/l	11
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted [signature] 11-30-83

Certified Environmental Laboratory

CERTIFICATE OF ANALYSIS

STANDARD LABORATORIES, INC.

. Box 1140, Huntington, Utah 84528 801-653-2314

Lab. No. 4889

Date Rec'd 12-19-83

Date Sampled 12-19-83

Time Sampled

Client: Utah Power & Light Co.
Field Office
P. O. Box 1005
Huntington, Utah 84528

Sample ID: Deer Creek Discharge

Acidity	<1.0	mg/l $CaCO_3$	12/20
Alkalinity, Total	280	mg/l $CaCO_3$	12/20
Alkalinity, Bicarbonate		mg/l $CaCO_3$	
Alkalinity, Carbonate		mg/l $CaCO_3$	
Chloride	12.0	mg/l	12/22
Coliform, Fecal		MPN/100 ml	
Coliform, Total		MPN/100 ml	
Conductivity	1000	umhos/cm	12/20
Fluoride		mg/l	
Hardness, Total		mg/l $CaCO_3$	
[illegible]gen, Ammonia		mg/l	
[illegible]ogen, Nitrate		mg/l	
Nitrogen, Nitrite		mg/l	
Oil & Grease	<0.5	mg/l	12/21
pH	7.7	Units	12/20
Phosphorus, Ortho		mg/l	
Phosphorus, Total		mg/l	
Solids, Total Dissolved	617	mg/l	12/21
Solids, Total Suspended	19.0	mg/l	12/21
Sulfate	240	mg/l	12/21
Sulfide		mg/l	
Turbidity		NTU	
Oxygen, Dissolved	8.3	mg/l	12/19

Aluminum		mg/l	
Arsenic		mg/l	
Barium		mg/l	
Beryllium		mg/l	
Boron		mg/l	
Cadmium		mg/l	
Calcium		mg/l	
Chromium		mg/l	
Copper		mg/l	
Iron	0.05	mg/l	12/21
Lead		mg/l	
Magnesium		mg/l	
Manganese	0.01	mg/l	12/21
Mercury		ug/l	
Nickel		mg/l	
Potassium		mg/l	
Selenium		mg/l	
Silica		mg/l	
Sodium		mg/l	
Vanadium		mg/l	
Zinc		mg/l	

Respectfully submitted

Certified Environmental Laboratory

APPENDIX K

UTAH POWER & LIGHT COMPANY
1407 WEST NORTH TEMPLE STREET
P. O. BOX 899
SALT LAKE CITY, UTAH 84110

February 17, 1984

State of Utah
DOGM Hydrologist
4241 State Office Building
Salt Lake City, Utah 84114

Dear Sir:

This letter serves as notification that Utah Power & Light Company will no longer conduct the baseline hydrologic monitoring study on Cottonwood Creek. The study was to determine water quality characteristics for the proposed Cottonwood portal. A property acquisition was made by Utah Power & Light Company during 1981 (Cottonwood Tract) which has resulted in mine plan changes. The current Wilberg Mine site will be utilized to access the Cottonwood reserves. The excavation site, Cottonwood Canyon, may be used as a ventilation fan site sometime in the future.

Sampling was initiated in 1979 and was terminated at the end of 1982, with a total of 23 sample sets collected. Appendix D of the 1982 Annual Hydrologic Report contains the minimum, maximum and mean values on a year-by-year basis, along with historical values for all four sampling sites.

In the event the Cottonwood Creek sediment pond discharge samples will be taken consisting of (1) sediment pond discharge water, (2) Cottonwood Creek 100 feet upstream from the point of discharge, and (3) Cottonwood Creek 100 feet downstream from the point of discharge. The parameters to be performed on both the ambient and discharge water will be those stated in the Wilberg Mine discharge permit.

The baseline hydrologic monitoring conducted on Cottonwood Creek was not specified in regulations set forth in Section 30 CFR 211 of the Coal Mining Operation Regulations of 1977, but was performed on a cooperative effort by Utah Power & Light for DOGM representatives and a mutual decision to terminate the study was agreed upon.

If there are any questions concerning Cottonwood Creek Hydrologic Monitoring, please contact Chris Shingleton at 535-4225 or Chuck Semborski at 653-2312.

Sincerely,

C. E. Shingleton

C. E. Shingleton
Director of Permitting
Compliance & Services
Mining and Exploration

CES:CS:bb:4279

cc: R. C. Fry
C. Semborski