Annual Hrdrology Report
2009

PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

ENERGY WEST
MINING COMPANY
A SUBSIDIARY OF PACIFICORP

File in:
☐ Confidential
☒ Shelf Annual Report
☐ Expandable
Date Folder 04/13/2010 C/0150018

See Incoming For additional information

Incoming C0150018
Hard Copy C0150019
C0150017
C0150009

Cottonwood Coal Mine
C/015/019

Deer Creek Mine
C/015/018

Des-Bee-Dove Mines
C/015/017

Trail Mountain Mine
C/015/009

PACIFICORP – ENERGY WEST MINING COMPANY
HYDROLOGIC MONITORING PROGRAM
ANNUAL REPORT FOR 2009

MARCH 2010

Submitted to:
United States Department of the Interior Bureau of Land Management
U.S.D.A. - Forest Service: Manti-LaSal National Forest
Utah Division of Oil, Gas and Mining

Prepared and submitted for PacifiCorp by:

Energy West Mining Company

RECEIVED
APR 13 2010
DIV. OF OIL, GAS & MINING

TABLE OF CONTENTS

LIST OF FIGURES iv
LIST OF TABLES v
LIST OF APPENDICES vii
LIST OF MAPS viii
I. INTRODUCTION 1
II. CLIMATIC OBSERVATIONS 1
A. Regional Climatology 2
B. Local Climatology 2
1. Precipitation 2
2. Temperatures 3
III. DRAINAGE SYSTEMS 4
A. Huntington Creek Drainage System 4
1. Huntington Creek 4
2. Deer Creek 5
3. Meetinghouse Canyon Creek 6
4. Mill Fork Canyon 7
5. Rilda Canyon Creek 8
B. Cottonwood Creek Drainage System 9
1. Cottonwood Canyon Creek 10
2. Grimes Wash 11
3. Indian Creek 12
IV. SPRINGS 13
A. East Mountain 13
1. Flow and Sampling Schedule 14
2. Spring Flow 14
3. Quality 16
B. Rilda Canyon - North Emery Water Users Association (NEWUA) 16
1. Spring Flow 16
2. Quality 17
C. Trail Mountain 18
1. Flow and Sampling Schedule 18
2. Spring Flow 18
3. Quality 18
A. Groundwater and Surface Water Sources in Relation to Mine Workings 19
B. Groundwater Quality and Collection Procedures 19
C. Mine Water 20
1. Deer Creek Mine 20
2. Des-Bee-Dove Mine 21
3. Wilberg/Cottonwood Mine 21
4. Trail Mountain Mine 23
VI. PIEZOMETRIC GRADIENT INFORMATION 24
A. Surface 24
1. Cottonwood Canyon Creek 24

2. Rilda Canyon 25
B. In-Mine 25
1. Deer Creek 25
2. Cottonwood Mine 25
VII. WASTE ROCK WELLS 25
A. Deer Creek Mine - Waste Rock Storage Facility 25
B. Cottonwood/Wilberg Mines - Waste Rock Storage Facility 26
VIII. EFFECTS OF MINING AND SUBSIDENCE ON HYDROLOGY 27
IX. SUMMARY 27

LIST OF FIGURES

Figure	Description
1a	East Mountain Location Map
1b	Trail Mountain Location Map
2	East Mountain Precipitation
3	Spring Discharge vs. Precipitation and Temperature
4a	NEWUA-Rilda Canyon Spring Flow
4b	NEWUA-Rilda Canyon Spring Flow
4c	Castle Valley Special District – Little Bear Spring Flow
5	Long-Term Water Sources
6	Deer Creek Coal Mine Water Sump Areas
7	Deer Creek Mine 2009 Mine Water Discharge
8	Deer Creek Mine Discharge, 1/80 Through 12/09
9	Wilberg/Cottonwood Mine Water Sump Areas
10	Wilberg/Cottonwood Mine Discharge 4/79 Through 12/09
11	Wilberg/Cottonwood 2009 Mine Water Discharge
12	Trail Mountain Mine Water Sump Areas
13	Trail Mountain Mine Discharge 1/97 through 12/09

LIST OF TABLES

Table	Description
1	Precipitation in Emery County, Utah (2009 Water Year)
2	Comparison of 2008 and 2009 Precipitation (Inches)
3	Hunter Plant Precipitation
4	Huntington Plant Precipitation
5	Electric Lake Precipitation
6	East Mountain Precipitation
7	Temperatures in Emery County, Utah (2009 Water Year)
8	Comparison of 2008 and 2009 Temperatures
9	Huntington Creek Water Flows (2009 Water Year)
10	Comparison of 2008 and 2009 Runoff Values
11	Huntington Creek Water Quality - HCC01
12	Huntington Creek Water Quality - HCC02
13	Huntington Creek Water Quality - HCC04
14	Deer Creek Surface Water Quality Above the Mine - DCR01
15	Deer Creek Surface Water Quality Below the Mine - DCR06
16	Meetinghouse Canyon Water Quality Left Fork - MCH01
17	Mill Fork Canyon Water Quality Above Mill Fork Fault - MFU3
18	Mill Fork Canyon Water Quality Above Mine - MFA1
19	Mill Fork Canyon Water Quality Below Mine - MFB2
20	Rilda Canyon Surface Water Quality - RCF1
21	Rilda Canyon Surface Water Quality - RCF3
22	Rilda Canyon Surface Water Quality - RCW4
23	Cottonwood Canyon Creek Water Quality - SW1
24	Cottonwood Canyon Creek Water Quality - SW2
25	Cottonwood Canyon Creek Water Quality - SW3
26	Grimes Wash Surface Quality Right Fork - GWR01
27	Grimes Wash Surface Quality Left Fork - GWR02
28	Grimes Wash Surface Quality Below Mine - GWR03
29	East Mountain Springs Discharge
30	Yearly Spring Discharge Variations (gpm)
31	Modes of Occurrence -East Mountain Springs
32	Temperature Comparison
33	East Mountain Regression Study (Flow/Temperature)
34	East Mountain Springs Water Quality (Historical vs. 2009)
35	NEWUA-Rilda Canyon Spring Flow (Gpm)
36	NEWUA-Rilda Canyon Water Quality
37	Trail Mountain Spring Discharge Recession Study
38	Trail Mountain Yearly Spring Discharge Variations(Gpm)
39	Trail Mountain Springs Water Quality (Historical vs. 2009)
40	Deer Creek In-Mine Water Quality - 2009
41	Deer Creek Mine - Discharge Water Quality
42	Wilberg/Cottonwood In-Mine Water Quality - 20098

Table	Description
43	Wilberg/Cottonwood Discharge Water Quality
44	Trail Mountain In-Mine Water Quality
45	Trail Mountain Discharge Water Quality
46	Wells- Water Quality - 2009

LIST OF APPENDICES

Appendix	Description
A	Huntington Creek Stream Flows
B	Deer Creek Surface Water Flow
C	Meetinghouse Canyon Creek Water Flow
D	Mill Fork Canyon Water Flow
E	Rilda Canyon Creek Water Flow and Well Data
F	Cottonwood Canyon Drainage
	Cottonwood Creek Flow and Well Data
	Straight Canyon (T-19)
	Indian Creek Water Flow
G	Grimes Wash Water Flow
H	East Mountain Springs Cation-Anion Diagrams and Flow
I	Trail Mountain Springs Cation-Anion Diagrams and Flow
J	Deer Creek In-Mine
K	Field Data
L	Water Monitoring Plan

LIST OF MAPS
(Located in Map Section)

Map No.	Description
HM-1	East Mountain Water Monitoring Stations
HM-2	Deer Creek Mine - In-Mine Sampling Locations
HM-3	Wilberg Mine - In-Mine Sampling Locations
HM-4	East Mountain Spring Map
HM-5	Spring Map with 5-Year Mine Plan Overlay and Subsidence Zones
Plate 7-3	Trail Mountain - In-Mine Sampling Locations
Plate 7-2	Trail Mountain Spring Map with Surface Monitoring Sites
MFS1851D	Mill Fork Lease Hydrologic Monitoring

I. INTRODUCTION

The 2009 Hydrologic Monitoring Report is hereby submitted in accordance with the U.S. Department of Interior, Office of Surface Mining requirements and the Utah State Division of Oil, Gas and Mining guidelines for hydrologic monitoring in areas of and adjacent to coal mining operations.

This is the thirty-second annual hydrologic report submitted by PacifiCorp since the report entitled "Monitoring of the Water Resources in the Mining Areas of East/Trail Mountain, Emery County, Utah" was submitted to the U. S. Geological Survey and the Utah Division of Oil, Gas and Mining in December 1977. It addresses flow observations and water quality characteristics of the water resources adjacent to PacifiCorp's mining areas in Emery County. (See Figure 1, A & B)

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

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. As a result, cooperative effort is realized and duplication of effort and expense is substantially reduced.

II. 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/Trail Mountain springs cannot be over-emphasized.

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 the soil moisture conditions prior to snowpack accumulation and has a bearing upon runoff the following year.

A. Regional Climatology

From 1982 to 1984 the Western United States, especially Utah, experienced an unprecedented wet cycle of precipitation. The pattern changed in 1985 with conditions returning to slightly above normal. During the 1986 water year, the extremely wet trend returned, and the upper Colorado River Basin experienced above average precipitation. The 1987 weather pattern changed dramatically with near normal valley precipitation and mountain snowfall much below normal. The resulting 1987 runoff was substantially below normal. The drought continued from 1988 through 1992 with runoff amounts much below normal for six consecutive years. The 1993 runoff improved substantially with above average flow conditions occurring in most river basins. In 1994, drought conditions returned throughout much of the West. From 1995 through 1999, water supplies were much improved with above average runoff in Emery County. In 2000, weather conditions changed dramatically and the resulting runoff was much lower than normal. Precipitation was variable during 2001 and runoff values continued below normal though the year. The drought continued into 2002 with much lower precipitation and runoff was near-record low levels for most streams in Emery County. The 2003 water year was nearly as severe as 2002 with flows less than 40%. The extreme dry trend continued through 2004 with precipitation and runoff much below average although 2004 was much improved over the previous 4 years. Finally, in 2005 wet conditions returned to the West and resulted in improved water supplies in the Huntington Creek drainage. Water supplies continued to improve and runoff in 2006 was substantially higher than in 2005. Most local reservoirs filled to capacity. However, extreme drought returned to the region once again in 2007. Below average precipitation and snowfall coupled with dry and hot conditions in March and April resulted in greatly reduced water supplies which, in turn, severely restricted irrigation water supplies during August and September. During the 2008 and 2009 water years, drought conditions eased in the region, filling the reservoirs to capacity, resulting in more abundant water supplies for agriculture and culinary uses.

B. Local Climatology

1. Precipitation

Precipitation amounts recorded for the 2009 water year will be presented for the Castle Dale, Huntington Plant, and East Mountain weather stations. Weather records were incomplete for Electric Lake during 2009 and therefore, are not included with this report. The values for Castle Dale, Huntington and East Mountain are shown in Table 1.

Precipitation in Emery County during 2009 was variable depending on the location. Precipitation at the valley reporting station at Castle Dale was a mere 59% of average while precipitation at Huntington Plant was 80%. East Mountain precipitation was only 84% of average. It is interesting to note that December recorded two to three times the normal average precipitation at all monitoring stations.

A comparison of precipitation totals for 2008 and 2009 merits consideration in this study.

The intent is to develop a correlation between yearly precipitation and spring discharges on East and Trail Mountains. Table 2 is a comparison of the 2008 and 2009 precipitation levels recorded at the three locations.

Tables 3, 4, 5, and 6 indicate monthly precipitation values at Castle Dale, Huntington, Electric Lake, and East Mountain from the beginning of operation at each site. The tables indicate monthly trends as well as the great fluctuation in yearly totals. As previously stated, Electric Lake total annual precipitation was not evaluated due to missing data for the period January through May of 2009. Figure 2 shows monthly precipitation at the East Mountain site for the 2009 water year.

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

2. Temperatures

During the 2009 water year, temperatures were generally above normal at Castle Dale, East Mountain and Huntington Plant. Temperatures at Castle Dale were below normal for June and August and slightly above normal in July. Castle Dale spring and summer temperatures from April to September varied from 1.5 degrees above normal to 1.8 degrees above normal. For the year, the average temperature averaged 1.7 degrees above normal and 0.5 degrees below 2008 temperatures.

At Huntington temperatures were above normal for October and November, but fell to below normal temperatures into spring. March through September temperatures varied widely between -5.1 below normal to 3.7 degrees above normal. For the year the average annual temperature was 0.2 degrees above normal and -1.2 degrees below normal in 2008.

At the East Mountain station, temperatures were above normal for October through February, May and September. March, April, and June through August were all recorded below normal temperatures. For the year, the temperature at East Mountain averaged 2.2 degrees above normal and 3.2 degrees below 2008. Temperatures at the Electric Lake station were not recorded. (See Table 7 for temperature data at the 3 stations.)

A comparison of 2008 and 2009 temperatures for the three stations is addressed since temperatures also influence water supplies from year to year. Table 8 depicts the variation and compares 2008 to 2009.

III. 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 contributes to the Huntington Creek drainage. (See Map HM-1) The drainage boundaries, including minor subdivisions to Cottonwood and Huntington creeks, are designated on the accompanying map. The surface drainage system on Trail Mountain is totally contained within the Cottonwood Creek drainage system, with minor subdivisions flowing to Indian and Cottonwood Canyon creeks. (See Plate 7-2) 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 of the Green River.

A. Huntington Creek Drainage System

Huntington Creek is comprised of many smaller tributary streams that feed the main stream. Deer Creek, Meetinghouse Canyon, Mill Fork Canyon, and Rilda Canyon creeks are the only tributaries to Huntington Creek that emanate from within PacifiCorp's coal mining areas.

1. Huntington Creek

Flow data are recorded on a continuous basis by PacifiCorp at four locations; stations are located on 1) Huntington Creek near PacifiCorp's Huntington Plant, 2)Huntington Plant Diversion, 3) Huntington Creek below Electric Lake about 22 miles upstream from the Huntington Plant, and 4) Electric Lake for elevations and storage. Flow records are maintained by PacifiCorp in order to determine water entitlements and reservoir storage allocation for the various users on the river.

Table 9 shows a summary of actual recorded Huntington Creek flows below Electric Lake and 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 calculation does not include Left Fork Reservoir regulation since new reservoir monitoring equipment was not operational during part of the year. The average daily discharges for the 2009 water year (October 2008 - September 2009) at the two stations and Electric Lake storage are found in Appendix A.

During the 2009 spring runoff period (April through June) 6,240 acre feet was stored in Electric Lake which was 90% of the 2008 stored volume. During spring runoff, the impoundment filled and reached its highest level on May 28th at an elevation of 8,575.32 feet which is 0.32 feet above spill elevation. Total storage on that date amounted to 30,673 acre feet, which is 176 acre feet above full capacity. The total flow of Huntington Creek at the Huntington Plant was 54,360 acre feet or 78% of average. However, because of plant diversions, lake evaporation and the stored runoff at Electric, adjusted flows of the Huntington Creek at Huntington Plant could increase approximately 25%. A comparison of runoff values for previous years has historically been presented in Table 10. However, because this data is no longer available, Table 10 is discontinued.

During 2009, water quality information on Huntington Creek near the Deer Creek confluence was compiled on a quarterly basis. Locations of water quality sampling stations monitored by PacifiCorp-Energy West Mining Company are listed below (refer to Map HM-1).

a. HCC01 - Above Power Plant Bridge
b. HCC02 - Below Deer Creek Confluence
c. HCC04 - Below Bridge @ Research Farm Bridge+
+ Not listed on map due to scale.

Specific water quality constituents analyzed are shown in Tables 11, 12, and 13. Values are in milligrams per liter unless otherwise noted. Raw data is on file at the Energy West Main Office. In general, the water shows a gradual increase in concentration of dissolved minerals as the flow proceeds down Huntington Canyon.

2. Deer Creek

Deer Creek is an ephemeral tributary of Huntington Creek and flows from the same canyon in which the Deer Creek Mine is located. PacifiCorp monitors the characteristics of Deer Creek according to the following flow and sampling schedule (see Hydrologic Monitoring Schedule Appendix L).

a. Flow and Sampling Schedule
   (1) Locations:
      (a) Above the Mine - DCR01
      (b) @ Permit Boundary - DCR04
      (c) Below the Mine - DCR06
      (See Map HM-1)
   (2) Flow: Information is collected during the first or second week of each month.
   (3) Water Quality Sampling:

Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Operational Quality. (See Appendix L) The program was initiated in March 1988 and will continue through 2010 (i.e. sampling conducted in March, June, September, and December). Field measurements including pH, specific conductivity, and temperature will be performed in conjunction with quality measurements. Quantity will be monitored monthly.

b. Flow Information

As stated above, flow information is collected monthly throughout the year with the use of two Parshall flumes. (See Map HM-1 for flume locations.) A hydrograph showing all the data collected for 2009 and 1984-2008 has been generated for each location. (See Appendix B) The hydrographs show that the only flow which occurred in the Deer Creek drainage was the result mine water discharge from Deer Creek Mine. For location DCR01, frozen conditions persisted during the winter months and dry at all other times. Flow at the lower two locations occurred throughout the year as the result of Deer Creek Mine discharge with peak flow occurring in September (DCR04 – 3,081 gpm, DCR06 – 3,000 gpm).

c. Quality Information

In accordance with the Hydrologic Monitoring Plan, baseline quality analysis was performed in 2006. Baseline analysis will be repeated once every five (5) years. The results of the historical operational quality analysis are listed in Tables 14 and 15. The minimum, maximum, and mean values are given for a five-year period along with the historical results. Values are in milligrams per liter unless otherwise noted. It is apparent from historical information in the tables that the quality of the Deer Creek runoff degrades slightly from the upper to the lower sampling point. The quality of the lower sampling point is thought to be affected by the Mancos Shale which outcrops above the lower sampling location. Raw data is on file at the Energy West Main Office.

3. Meetinghouse Canyon Creek

Meetinghouse Canyon Creek is an ephemeral tributary of Huntington Creek and is monitored according to the following schedule (see Hydrologic Monitoring Schedule in Appendix L).

a. Flow and Sampling Schedule
   (1) Location: South Fork of Meetinghouse Canyon (See Map HM-1)
   (2) Flow: Information is collected during the first or second week of each month.
   (3) Water Quality Sampling:

Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed will be those stated in the DOGM Guidelines for Surface Water Operational Quality. (See Appendix L) The program was initiated in March 1984 and will continue through 2010, (i.e. sampling conducted in March, June, September, and December). Field measurements including pH, specific conductivity, and temperature will be performed monthly in conjunction with quality measurements. Quantity will be monitored monthly.

b. Flow Information

A hydrograph comparing 2009 and 1984-2008 can be found in Appendix C. For location MHC01 flow did not occur during 2009.

c. Quality Information

In accordance with the Hydrologic Monitoring Plan, baseline quality analysis was performed in 2006. Baseline analysis will be repeated once every five (5) years. Quality sampling was initiated in 1986. When there is flow at location MHC01, Table 16 will list the minimum, maximum, and mean values along with historical results. Raw data is on file at the Energy West Main Office.

4. Mill Fork Canyon

Mill Fork Canyon is a tributary of Huntington Creek and was included in PacifiCorp's monitoring program starting in 1997. Monitoring of Mill Fork is conducted according to the following schedule (see Appendix L). Mill Fork Canyon is ephemeral from its headwaters to the western border of Section 21, Township 16 South, Range 7 East, and intermittent from that point to the confluence of Huntington Creek.

a. Flow and Sampling Schedule
   (1) Locations:
      (a) Above Mill Fork Fault – MFU03
      (b) Above Old Mines - MFA1
      (c) Mill Fork Canyon Culvert – MFB2
         (See Map HM-1)
   (2) Flow: Information is collected during the first or second week of each month.
   (3) Water Quality Sampling:

Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Operational Quality. (See Appendix L) The program was initiated in 1997, and will continue through 2010 on a quarterly basis, i.e., March, June, September, and December. Field measurements, including pH, specific conductivity, and temperature will be performed quarterly in conjunction with quality measurements. Quantity will be monitored monthly.

b. Flow Information

Flow information is collected monthly throughout the year (See Map HM-1 for locations.) A hydrograph has been generated for each location. (See Appendix D) Locations MFU3, MFA1 and MFB2 flowed during the spring runoff period. For location MFB2 flow occurred during the months of April through November 2009 with a peak flow estimated at 545 gpm in June.

c. Quality Information

Historical monitoring data collected by Beaver Creek Coal Company - No. 4 Mine and the United States Geological Survey (site No. 76: Open File Report 81-539) has been incorporated in PacifiCorp's hydrologic database. Operational water quality monitoring was conducted during 1997 and 1998 (refer to the Quarterly Hydrologic submittals). Baseline quality analysis was initiated in November 1998 (2002 for MFU03). In accordance with the Hydrologic Monitoring Plan, baseline quality analysis was performed in 2006. Baseline analysis will be repeated once every five (5) years.

Results of the samples collected in 2009 are presented in Tables 17, 18 and 19. It is apparent from the data that the quality of the water degrades slightly from the upper reaches of Mill Fork, i.e., MFU3 to the mouth of the canyon, i.e., MFB2. Water quality has remained relatively consistent from year to year. (See Tables 17, 18 and 19). Raw data is on file at the Energy West Main Office.

5. Rilda Canyon Creek

Rilda Canyon Creek is a tributary of Huntington Creek and is monitored according to the following schedule (see Appendix L). Rilda Canyon Creek is ephemeral from its headwaters to the western border of Section 28, Township 16 South, Range 7 East, and perennial from that point to the confluence of Huntington Creek.

a. Flow and Sampling Schedule

(1) Locations:

(a) Right Fork of Rilda - RCF1*
(b) Left Fork of Rilda - RCLF1**
(c) Left Fork of Rilda - RCLF2**
(d) Rilda Canyon - RCF2*
(e) Rilda Canyon - RCF3
(f) Rilda Canyon - RCW4 (See Map HM-1)

* During mining of the North Rilda leases, an additional site was added in 1999 upstream of RCF1 (adjacent to EM-163) to monitor surface/groundwater relationships. Flow will be measured yearly during base flow conditions.

** Flow and field parameters only.

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

(3) Water Quality Sampling:

Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Operational Quality. (See Appendix L) The program was initiated in June 1989 except for RCLF1 and RCLF2, which were initiated in 1990 and 1995,

respectively, and will continue through 2010 on a quarterly basis, i.e., March, June, September, and December. Field measurements, including pH, specific conductivity, temperature, and dissolved oxygen, will be performed at the perennial stream locations, i.e., RCF3 and RCW4, monthly in conjunction with quality measurements. Quantity will be monitored monthly.

b. Flow Information

Flow information is collected monthly throughout the year with the use of three Parshall flumes and one V-notch weir. (See Map HM-1 for locations.) A hydrograph has been generated for each flume-weir location. (See Appendix E) Springs utilized by North Emery Water Users Special Services District (NEWUSSD) for culinary purposes are situated between monitoring locations RCF2 and RCF3. Flow above the spring area is ephemeral and below the stream is perennial. For location RCF1 flow occurred only during the months May through September with a peak flow estimated at 1,042 gpm in May. Location RCLF1 and RCLF2 flow only occurred during the months of May and June with a peak flow in June (RCLF1 - 70 gpm and RCLF2 - 54 gpm). For location RCF2 flow occurred only during the months of May through July with a peak flow estimated at 956 gpm in June. Below the spring area the stream is perennial and increases in flow from RCF3 to RCW4. During 2009 the peak flow for RCF3 was estimated at 927 gpm (June); for RCW4, 1,150 gpm (June). Baseline flow for 2009 at RCF3 and RCW4 was approximately 60 and 110 gpm, respectively. Data suggest that above the NEWUSSD springs the stream loses water to the alluvium and below the spring area the alluvium recharges the stream causing the flow to increase.

c. Quality Information

In accordance with the Hydrologic Monitoring Plan baseline quality analysis was performed in 2006. Thereafter, baseline analysis will be repeated once every five (5) years. Quality sampling was initiated in 1989; results of the samples collected are presented in Tables 20, 21, and 22. It is apparent from the data that the quality of the water degrades from the upper reaches of Rilda Canyon, i.e., RCF1, to the NEWUSSD spring area, and from that point to the mouth of the canyon, i.e., RCW4. Water quality has remained relatively consistent from year to year. (See Tables 20, 21, and 22) Raw data is on file at the Energy West Main Office.

B. Cottonwood Creek Drainage System

The southern portion of East Mountain and the entire Trail Mountain is intersected by Cottonwood Creek and its associated tributaries, including Cottonwood Canyon Creek and Grimes Wash. The Cottonwood Creek drainage is about equal in size to the Huntington drainage, with a total discharge from each of the drainages of about 70,000 acre feet per year. The major cultural feature on Cottonwood Creek is Joe's Valley Reservoir, located about twelve miles west of the town of Orangeville. The 63,000 acre foot reservoir was constructed by the U. S. Bureau of Reclamation and provides storage water for irrigation, industrial, and municipal needs in the Emery County area.

PacifiCorp monitors three of the tributaries of the Cottonwood Creek drainage system, Cottonwood Canyon Creek, Grimes Wash and Indian Creek. (See Maps HM-1 and MFS1851D)

1. Cottonwood Canyon Creek

Based on data collected by PacifiCorp, Cottonwood Canyon Creek is an ephemeral stream from its headwaters to Section 24, Township 17 South, Range 6 East and intermittent from that point to its confluence with Cottonwood Creek. The majority of water moving through Cottonwood Canyon Creek appears to be through the colluvial valley deposits. An extensive hydrogeologic investigation was conducted in Cottonwood Canyon Creek during 1992. Results can be found in Appendix C of the PAP. Four (4) permanent runoff sampling sites have been established along Cottonwood Canyon Creek and sampled as listed below. (See Hydrologic Monitoring Plan in Appendix L).

a. Flow and Sampling Schedule

(1) Locations: (See Map HM-1)

(a) Above Mine - SW-1

(b) Below Mine - SW-2

(c) @ USGS Flume - CCC01 (Flow and field parameters only)

(d) Above Straight Canyon - SW-3

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

(3) Water Quality Sampling:

Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed will be those stated in the DOGM Guidelines for Surface Water Operational Quality. (See Appendix L) The program was initiated in December 1992 and will continue through 2010, i.e. March, June, September, and December. Field measurements including pH, specific conductivity, and temperature will be performed monthly in conjunction with quality measurements. Quantity will be monitored monthly.

b. Flow Information

As stated above, flow information is collected monthly throughout the year. (See Map HM-1 for flume locations.) A hydrograph for 2009 has been generated for each sampling location. (See Appendix F) The hydrographs show the intermittent nature of Cottonwood Canyon Creek. Flow at SW-1, occurred from March through July with a peak of 6 gpm in June. Flow at SW-2 occurred from throughout the entire water year with a peak and average base flow estimated at 27 gpm (March) and 13 gpm, respectively. Flow at SW-3 did not occur in 2009. Flows recorded at SW-2 are influenced by discharge from the Cottonwood Mine (TMA001).

c. Quality Information

In accordance with the Hydrologic Monitoring Plan, baseline quality analysis was performed in 2006. Thereafter, baseline analysis will be repeated once every five (5) years. The results of the historical operational quality analysis are listed in Tables 23, 24, and 25. The minimum, maximum, and mean values are given for a five-year period along with the historical results. Values are in milligrams per liter unless otherwise noted. Raw data is on file at the Energy West Main Office.

The Cottonwood Canyon Creek drainage quality is influenced by the following factors: 1) A relatively high amount of suspended solids during spring runoff from Indian, Roans, Mill, and Marines canyons; 2) Alluvial/colluvial deposit recharge and discharge areas.

2. Grimes Wash

Grimes Wash is an ephemeral tributary of Cottonwood Creek and flows in the same canyon in which the Wilberg/Cottonwood Mine is located. Three permanent runoff sampling sites were established in 1980 and are sampled as listed below (see Hydrologic Monitoring Plan in Appendix L).

a. Flow and Sampling Schedule
   (1) Locations: (See Map HM-1)
      (a) Right Fork - GWR01
      (b) Left Fork - GWR02
      (c) Below the Mine - GWR03
   (2) Flow: Information is collected during the first or second week of each month.
   (3) Water Quality Sampling:

Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed will be those stated in the DOGM Guidelines for Surface Water Operational Quality. (See Appendix L) The program was initiated in March 1988 and will continue through 2010 i.e. March, June, September, and December. Field measurements including pH, specific conductivity, and temperature will be performed in conjunction with quality measurements. Quantity will be monitored monthly.

b. Flow Information

As stated above, flow information is collected monthly throughout the year with the use of two Parshall flumes. (See Map HM-1 for flume locations.) A hydrograph comparing 2009 to the data collected from 1984 through 2008 has been generated for each flume location. (See Appendix G) The Right fork and Left fork monitoring sites remained dry throughout the year. Below the mine (GWR03), flow occurred from March through June with a peak of 0.6 gpm in April. Flow occurred again in October and November with a peak of 0.3 gpm in November. Seeps or dampness at the Below the Mine location was noted throughout most part of the year due to the influence of the springs emanating from the Starpoint Sandstone/Mancos Shale formational contact.

c. Quality Information

In accordance with the Hydrologic Monitoring Plan baseline quality analysis was performed in 2006. Baseline analysis will be repeated once every five (5) years. The results of the 2009 operational quality analysis are listed in Tables 26, 27, and 28. The minimum, maximum, and mean values are given for a five-year period along with the historical results. Values are in milligrams per liter unless otherwise noted. Raw data is on file at the Energy West Main Office.

The Grimes Wash drainage quality is influenced by two factors: 1) Under normal conditions the Right Fork contributes a relatively high amount of suspended solids during spring runoff due to the fact that it is a south facing canyon dominated by argillaceous sediments; 2) Mancos Shale/Starpoint Sandstone interface seeps and springs elevate the TDS at the Below the Mine location.

3. Indian Creek

Indian Creek is a perennial tributary of the Cottonwood Creek and flows in Upper Joes Valley and merges with Lowry Water near the Joes Valley Reservior. Four permanent runoff sampling sites were established in 2001 and are sampled as listed below (see Hydrologic Monitoring Plan in Appendix L).

a. Flow and Sampling Schedule
   (1) Locations: (See Map MFS1851D)
      (a) Above Camp Ground - ICA
      (b) Indian Creek Flume - ICF
      (c) Indian Creek Ditch - ICD
      (d) Below Cross-Over Road - ICB
   (2) Flow: Information is collected during base flow only (October)
   (3) Water Quality Sampling:

Water samples will be collected and analyzed during base flow monitoring. Parameters analyzed will be those stated in the DOGM Guidelines for Surface Water Operational Quality. (See Appendix L) The program was initiated in October 2001 and will continue through 2010. Field measurements including pH, specific conductivity, and temperature will be performed in conjunction with quality measurements.

b. Flow Information

As stated above, flow information is collected during base flow only with the use of portable 90° v-notch weir and one permanent Parshall flume. Flow occurred at all four locations with the highest flow (655 gpm) occurring at ICF. (See Map MFS1851D for monitoring locations.)

c. Quality Information

In accordance with the Hydrologic Monitoring Plan baseline quality analysis was performed in 2006. Baseline analysis will be repeated once every five (5) years. The results of the 2009 quality analysis are tabulated in Appendix F. Values are in milligrams per liter unless otherwise noted. Raw data is on file at the Energy West Main Office.

IV. SPRINGS

A. East Mountain

Between the times where PacifiCorp began monitoring springs on East Mountain and 1986, the number of springs measured increased from less than fifty (50) to nearly eighty (80). PacifiCorp believed that more benefit could be realized by concentrating its monitoring to selective springs in the areas that was undermined within the following five years. (See Map HM-5) A meeting was held on March 25, 1987 with the U. S. Forest Service and the Utah State Division of Oil, Gas and Mining to determine the most effective plan for PacifiCorp's monitoring. A subsequent meeting was held on April 15, 1987 with the State Division of Oil, Gas and Mining to finalize the monitoring plan revisions. In addition to major revisions made in 1987, each year, State and Federal agencies are invited to participate in adjusting the monitoring schedule based on field investigations.

During the meetings it was resolved that the following springs will be monitored. Eight additional springs (denoted with a plus [+] symbol below) were added in 1989 after the annual field verification process jointly conducted by DOGM and PacifiCorp.

*	Burnt Tree Springs		79-40
*	Elk Spring (dev. in 2009)		80-41
*	Sheba Springs		80-43
	Ted's Tub	*	80-44
	79-2	*	80-46
*	79-10		80-47
	79-15	+	80-48
*	79-23		80-50
	79-24		82-51
*	79-26	*	82-52
+	79-28	*	84-56
*	79-29	+	89-60 (Alpine Spring)
	79-32	+	89-61 (dev. in 2009)
	79-34	+	89-65
*	79-35	+	89-66
	79-38	+	89-67
		+	89-68

Of these springs, twelve will be monitored on a monthly basis, weather permitting, and have

been denoted on the above list with asterisks (*).

Mill Fork Springs:

EM-216	EMPOND
GRANTS SPRING	LITTLE BEAR
JV-9	JV-34
MF-7	MF-10
MF-19B	MF-213
MF-219	MFR-10
MFR-30	RR-5
RR-15	RR-23A
SP1-26	SP1-29
UJV-101	UJV-206

1. Flow and Sampling Schedule

a. Flow

All springs on the preceding lists are measured during the months of July and October. In addition, a minimum of twelve springs are monitored to establish a discharge recession curve (denoted with an * above). Generally, measurements are made on a monthly basis during the months of July through October if weather and reasonable access permit; but when historical data indicate that a spring is short-lived, all efforts are made to measure discharge from that spring at least three times, equally spaced, within its flow period.

b. Quality Samples

All springs listed above are sampled for water quality characteristics during the months of July and October. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Operational Quality. (See Appendix L)

2. Spring Flow

Precipitation increased only slightly from 2008 to 2009. However, because of the local isolation of rainfall, spring discharge rates responded unfavorably with the East Mountain - Southern area, Mill Fork and Trail Mountain decreasing in 2009. Drought conditions continued in the region during 2009 water year that reported an average of only 74% of normal over the three monitoring sites. Although April, May, and June were generally well above normal, the rest of the year experienced an extreme lack of precipitation. These lower precipitation months resulted in lower spring flow discharges impacting stream flows within the Huntington Creek drainage system. Temperature, a critical factor on spring discharge rates, was overall only 2.2 degrees higher (East Mountain Station) in 2009 than the historical averages. However, May experienced 6.8 degrees higher than normal temperatures which increased evaporation rates reducing recharge.

Precipitation received at East Mountain weather station and spring discharge rates set an all time low for the 2002 water year and only improved slightly in 2003 and 2004. Table 29, is a tabulation of the flow data collected during the 2009 monitoring season. To record the season variation, all springs measured in July are measured again in October. The seasonal variation is represented in Table 29, under the column heading "Seasonal Net Change." The percentage figures represent the amount of change, either positive or negative. The average change reveals a forty-six percent (46%) [fifty-seven percent (57%) by volume] decrease from the July to the October measurements for Southern East Mountain and a forty-six percent (46%) [thirty percent (30%) by volume] decrease from the July to the October measurements for the Mill Fork Area. One resulting factor influencing this decrease has been caused by the development of Elk Spring and spring 89-61. These springs have been developed for culinary usage by North Emery Water Users Special Services District early in 2009. The flow from these sources has been diverted to their treatment plant located in the mouth of Meetinghouse Canyon.

A twenty-seven year comparison of spring discharge is shown in Table 30. The table includes a year by year comparison of springs identified from each mode of occurrence (Table 31). The springs utilized in the comparison are underlined in Table 31. The flow values for the individual springs represent the July measurements. October measurements were not utilized because winter weather conditions caused some springs to become inaccessible.

Table 30 has been compared to East Mountain climatology to see how closely spring discharge rates follow local annual precipitation. Figure 3 reveals good correlation between spring discharge and precipitation. Along with precipitation, temperature plays a critical role in yearly discharge variations, especially during the early stages of the runoff period. Listed in Table 32 is a comparison of January through June temperature data from surrounding weather stations for the period 1982-2009 versus departure from normal. The comparison is vital in determining mining effects on spring discharge versus general changes in annual precipitation.

Table 32 clearly demonstrates near average temperatures between 1982 and 1984, but starting in 1985 and continuing through 2000 (except for 1991 and 2001) positive departure from normal has been significant. In 2009 the temperatures averaged -1.8 degrees departure from normal. Comparison between spring discharge rate and general changes in annual precipitation patterns correlated well in the past due to relatively normal temperatures experienced during the early runoff period (January through June). Figure 3 not only includes a comparison of spring discharge rate and precipitation as in the past, but also temperature departure due to the critical influence temperature has on peak discharge occurrence.

An additional flow information study was initiated during the summer of 1985. The purpose of the program was to establish flow recession curves for the following springs: (1) Burnt Tree, (2) Elk Springs (developed in 2009), (3) Sheba, (4) 79-10, (5) 79-23, (6) 79-26, (7) 79-29, (8) 79-35, (9) 80-44, (10) 80-46, (11) 82-52, (12) 84-56. The flow information collected during 2009 is shown in Table 33; corresponding spring recession curves comparing 2009 to historical values are located in Appendix H.

3. Quality

To more closely identify springs which are related one with another, water samples were analyzed to determine the percentage of cations and anions in solution. The percentages have been graphically represented as cation-anion diagrams. (See Appendix H) The purpose of the cation-anion diagrams is to identify groups of related springs by water chemistry. To better visualize the concept, the cation-anion diagrams are presented by the geologic formation in which the spring originates. A general pattern for the Flagstaff and Price River formations can be recognized for each year in which the cations/anions were analyzed. A consistent pattern for the North Horn is less obvious due to the complex geology of the formation itself. One aspect the cation-anion diagrams demonstrate is that, even though the quality varies slightly from individual sites as well as from different formations, seasonal variations do not exist.

The quality of the springs sampled in 2009 reveals an excellent correlation with historical averages. A summary of the water quality analysis for a representative group of East Mountain Springs is presented in Table 34. In the table, the mean values for 2009 are compared to the historical results for each respective spring. Raw data is on file at the Energy West Main Office.

B. Rilda Canyon - North Emery Water Users Special Services District (NEWUSSD)

Of concern to PacifiCorp, Energy West is in the proximity with mining activities in Rilda Canyon to the Rilda Canyon Springs. Rilda Canyon Springs currently serve as a culinary water source to the North Emery Water Users Special Services District (NEWUSSD). The NEWUSSD spring system consists of a series of collection lines extending westward up Rilda Canyon and southward up a small side drainage (shown on Map HM-8 in Volume 9 of the PAP). The NEWUSSD spring system is metered at four locations. Meter 1 (Side Canyon Spring) is located at the downstream end of a collection line which enters Rilda Canyon from the South. Meter 2 (Side Canyon Spring plus South Spring) is located near the bottom of the main east-west trending collection line which lies to the south of Rilda Canyon Creek at a point just upstream (west) of the main spring collection box. Meter 2 records combined flows from both the Side Canyon (Meter 1) as well as additional inflows known as South Spring which enter the system below Meter 1. Meter 3 (North Spring) records flows for the east-west central collection line which was constructed through the central portions of the valley near Rilda Canyon Creek. Meter 4 (North Spring) collects data from the north collection line located on the north side of Rilda Canyon Creek. During 1995 flow from the north collection line was combined with the central collection system. As a result Meter 4 was terminated.

1. Spring Flow

Through the cooperative efforts of PacifiCorp and NEWUSSD, flow meters were installed in September 1990 to isolate individual spring areas for quantity and quality (see Map HM-8 in Volume 9 of the PAP). Table 35 lists the individual flow rates for meters 2 and 3 (flow from Meter 1 is included in Meter 2). Accurate data for the past two years has been hampered by

operational problems with the diversion valves and meters.

The seasonal variation of the monthly average flow from NEWUSSD's Rilda Canyon Springs is shown in Figure 4. With the installation of flow meters, individual spring contribution to the total flow can be plotted over time.

In early 2009, North Emery Water Users Special Service District and Energy West Mining Company completed a spring development and pipeline project (called the Elk Springs Project). This project involved developing and piping of water from two springs, Elk Spring and Spring 89-61 on top of East Mountain down a ridge in a subsurface trench 7,000 feet, to a cliff face (the Castlegate Sandstone escarpment), behind the cliff face for 2,500 linear feet and a 700-foot elevation drop in a subsurface borehole constructed using directional drilling, and another 15,300 feet in a subsurface trench in a canyon bottom (Meetinghouse Canyon) to the slow-sand water treatment plant in Huntington Canyon operated by NEWUSSD. Total length of the pipeline is 4.7 miles. Total elevation drop of the entire pipeline is about 2,900 feet.

The purpose of this project is to provide NEWUSSD with a long-term dependable source of water supply to the water treatment plant in Huntington Canyon that cannot be interrupted or affected by surface activities in the vicinity of the springs, or possibly by underground coal mining activities that have been common in the area. NEWUSSD and Energy West committed to mitigation work to offset the taking of water from the Elk and 89-61 springs in the form of improvements to 4 other springs nearby on East Mountain. A commitment was also made on the part of NEWUSSD to keep a minimum flow to the surface from Elk and 89-61 springs at all times to preserve the wetlands around those springs.

Development of these springs rendered the continued collection of data useless, since the major quantity of waters issuing from these springs is piped to the NEWUSSD treatment plant. No data for Elk Spring or 89-61 has been included with the 2009 report; however, the historical data will remain intact.

2. Quality

Baseline quality sampling of the individual springs was performed in 2006. The minimum, maximum, and mean results of the 2009 spring flow compared to historical quality analysis are listed in Table 36. Values are in milligrams per liter unless otherwise noted. Raw data is on file at the Energy West Main Office. As stated in Volume 9 of the PAP, differences in the groundwater quality data reflect differences in the groundwater source or the origin of groundwater for the various springs issuing within the Rilda Springs area. The higher sulfate and TDS concentrations from the Meter 2 samples are characteristic of waters associated with the Blackhawk Formation. Waters issuing from the North Spring collection system (Meters 3 and 4) area are of a better quality than waters from the Side Canyon and South Spring collection areas. Water issuing from the North Spring originates primarily from water moving within the alluvial valley sediments and fracture systems of the Starpoint Sandstone and is not derived from the Blackhawk Formation.

C. Trail Mountain

PacifiCorp began monitoring springs on Trail Mountain in 1993. Monitoring prior to 1993 was completed by the previous lease holders. The nine (9) springs listed below are monitored.

T-6 (18-2-1)	T-14 (17-25-1)
T-8 (17-21-1)	T-14A (17-26-5)
T-9 (17-22-1)	T-15 (17-35-1
T-10 (17-26-4)	T-16 (17-35-2)
TM-23 (17-14-4)	

1. Flow and Sampling Schedule

a. Flow

All springs on the preceding list are measured during the months of July through October if weather and reasonable access permit.

b. Quality Samples

All springs listed above are sampled for water quality characteristics during the months of July and October. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Operational Quality. (See Appendix L)

2. Spring Flow

As indicated earlier, precipitation and spring flow rates slightly increased from 2008 to 2009. Table 37 is a tabulation of the flow data collected during the 2009 monitoring season. The seasonal variation is represented in Table 37 under the column heading "Seasonal Net Change %." The percentage figures represent the amount of change, either positive or negative. The average change reveals a thirty-eight percent (38%) decrease from July to the October measurements. The only Trail Mountain spring that flowed during the 2009 water year was spring 17-22-1.

A twenty-two year comparison of spring discharge is shown in Table 38. The flow values for the individual springs represent the July measurements. October measurements were not utilized because winter weather conditions caused some springs to become inaccessible.

3. Quality

To more closely identify springs which are related one with another, water samples were analyzed to determine the percentage of cations and anions in solution. The percentages have been graphically represented as cation-anion diagrams. (See Appendix I) The purpose of the cation-anion diagram is to identify groups of related springs by water chemistry. To better visualize the concept, the cation-anion diagrams are presented by the geologic formation in which the spring

originates. A general pattern for the geologic formations can be recognized for each year in which the cations/anions were analyzed. A consistent pattern for the North Horn Formation is less obvious due to the complex geology of the formation itself. One aspect the cation-anion diagrams demonstrate is that, even though the quality varies slightly from individual sites as well as from different formations, seasonal variations do not exist.

The quality of the springs sampled in 2009 reveals an excellent correlation with historical averages. A summary of the water quality analysis for springs monitored on Trail Mountain is presented in Table 39. In the table, the mean values for 2009 are compared to the historical results for each respective spring. Raw data is on file at the Energy West Main Office.

V. MINE HYDROLOGY

A. Groundwater and Surface Water Sources in Relation to Mine Workings

The relationship of the Deer Creek, Cottonwood/Wilberg, and Trail Mountain mine workings with the overlying springs is shown in Map HM-5. Beginning in 1979 (Trail Mountain - 1992), PacifiCorp has developed an ambitious spring monitoring program with emphasis to detect changes in the East and Trail Mountain hydrologic regime as a result of mining. The data collected to date reveal no indication of any mine-related effects on spring discharge or surface flow rates. Figure 3 shows a close correlation between spring discharge rates compared to precipitation and temperature.

B. Groundwater Quality and Collection Procedures

PacifiCorp began in-mine quality and quantity measurements in 1977 and has continued monitoring through 2009. With the collection of numerous samples throughout the extent of the mine workings, the quality has remained relatively constant. (Refer to Cation/Anion diagrams in Appendix J). In-mine monitoring was discontinued at Cottonwood and Trail Mountain during 2001 due mine sealing/temporary cessation of operations.

Collection procedures for groundwater quality consist of two grab samples collected and analyzed per quarter at each of the mines which produces measurable quantities of water. Sampling according to this established plan began in the first quarter of 1982. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Operational Quality except when new sites are established. In that case, baseline information will be collected for two (2) years. (See Appendix L)

Long-term monitoring locations have been established at each of the mines which produce measurable quantities of water, i.e., Deer Creek, Cottonwood/Wilberg, and Trail Mountain mines. (See Maps HM-2, HM-3, and Plate 7-3) As stated earlier, in-mine monitoring at Cottonwood and Trail Mountain during 2001 was discontinued due mine sealing/temporary cessation of operations. Four types of occurrences have been recognized to exist within the current mine workings. (Refer to Figure 5)

1. Structural rolls with overlying fluvial channels,
2. Fault systems (Pleasant Valley and Roans Canyon),
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 temperatures collected on a quarterly basis from the long-term sites in both mines were fairly consistent. (See appendix J for the Deer Creek In-Mine hydrographs.)

C. Mine Water

1. Deer Creek Mine

a. In-Mine Water Production

The best estimate of in-mine water production was arrived at by combining the following values:

Deer Creek Discharge	495.3 Million Gallons
Estimated Evaporation*	37.8 Million Gallons
Domestic Usage	10.0 Million Gallons
Total Discharge	543.1 Million Gallons

*See 1981 Hydrologic Monitoring Report (revised for two mine fans)

b. In-Mine Quality

Eight samples were collected in the Deer Creek Mine in 2009 (See Map HM-2 for locations.) Parameters analyzed in 2009 are those listed in the DOGM Guidelines for Groundwater Baseline or Operational Quality. (See Appendix L)

Table 40 lists the characteristics of the samples collected and compares the mean, minimum, and maximum results of 2009 to the historical values for each location. It is apparent from Table 40 that the average quality of the in-mine water has remained relatively constant. (Refer to Cation/Anion diagrams in Appendix J) Raw data is on file at the Energy West Main Office.

c. 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 locations of the main sump areas within the mine are shown in Figure 6. The largest volume of water is stored in the western part of Main West, which has not been actively mined for several years.

In-line flow meters are utilized to record the amount of water discharged from the mine, after which it passes through underground sedimentation sumps. Discharge from Deer Creek is either

shipped directly to Huntington Power Plant or to the Deer Creek drainage in accordance with stipulations of the Deer Creek UPDES Discharge Permit UT-0023604-002.

The total water discharged from the Deer Creek Mine during 2009 was estimated at 1,666.8 acre feet, or 212.8 million gallons. The recorded flow of 1,666.8 acre feet during 2009 is a 28.8% decrease from the corrected 2008 discharge of 2,146.8 acre feet. The average monthly discharges are shown in Figure 7.

A graph displaying the historical discharge rates is included as Figure 8. The volume of water discharged from the mine has increased at a significant rate from 1988 through 1991 due to at least five factors. First, in previous years water discharged was measured with a Stevens Recorder installed in a Parshall flume. It was difficult to maintain calibration of the recorder and, in 1985, in-line flow meters (totalizer and instantaneous flow) were installed, allowing for a more accurate measurement of discharge. Second, mining has progressed into areas largely dominated by sandstone roof. The inflow from those areas is greater per acre of exposed area than areas of mudstone top. Third, mining has progressed into the bottom of the Straight Canyon Syncline, the lowest part of the mine, where a significant amount of water has been intersected. Fourth, mining has intersected the Roans Canyon Fault Graben which has released additional water into the mine workings. Last, prior to 1985, water used in mining was pumped directly from the in-mine sumps. Since that time, all water has been pumped from the mine through the metering system. Mining water is then pumped back into the mine through a high-pressure steel line to the mining faces where it is utilized. Water production decreased significantly in 1992 with the sealing of the 4th South area. The decrease flow recorded during 2002 was related to two factors; 1) replacement of the main discharge flow meter suspect of inaccurate readings (reduction of approximately 50%), and 2) development of a new in-mine sump. Mine discharge rates have remained relatively constant since 2002.

d. Discharge Quality

Monthly water quality samples were collected for 2009. Table 41 compares the minimum, maximum, and mean values from an historical standpoint to 2009. An examination of Table 41 reveals excellent correlation with historical results. Raw data is on file at the Energy West Main Office.

2. Des-Bee-Dove Mine

Production at the Des-Bee-Dove Mine was terminated indefinitely as of February 14, 1987. The portals were sealed and underground hydrologic monitoring was discontinued. The entire mine site has been reclaimed and no longer requires hydrologic monitoring.

3. Wilberg/Cottonwood Mine

The mine fire, which occurred in late 1984, altered normal hydrologic monitoring at the Wilberg Mine. Normal hydrologic monitoring was reinstated in late 1985 and continued through

May 2001. Energy West Mining Company notified the Division of temporary cessation of coal mining operations at the Cottonwood/Wilberg Mine effective May 29, 2001. Coal mining at the Trail Mountain Mine/coal transfer to Cottonwood Tipple ceased as of March 15, 2001. In preparation of temporary cessation, all associated mining equipment including; belt haulage (drives and headrollers), dewatering (pumps and control boxes) and electrical (transformers/rectifiers) were removed from the mine. Verification of equipment removal was conducted on May 4, 2001 with Division of Oil, Gas and Mining (Pete Hess) participating in the review. Bureau of Land Management was notified but was unable to attend. A plan to construct permanent seals was submitted to and approved by Mine Safety Health Administration. Sealing of the mine portals was completed on May 28, 2001.

a. In-Mine Water Production

In previous reports, the in-mine water production was arrived at by combining mine discharge, domestic use, and evaporation. Due to the fire, normal coal production and usage were not experienced. Pre-fire coal production resumed during late 1985. A large part of the mine workings have been sealed since the fire. The locations of the sealed areas and sumps are shown on Figure 9. As reported in the 1984 Annual Report, water discharged from the Wilberg Mine complex includes the area designated as the Cottonwood Mine. (See Figure 10) Consistent with previous years, the following table lists the factors involved in estimating in-mine water production.

Wilberg/Cottonwood Discharge

Grimes Wash*	0.0 Million Gallons
TMA	11.2 Million Gallons
Miller Canyon**	0.0 Million Gallons
Estimated Evaporation***	0.0 Million Gallons
Domestic Usage	0.0 Million Gallons
Total Discharge	11.2 Million Gallons

* Discharge Outfall 001 re-located from Grimes Wash to Cottonwood Canyon Creek TMA Portal - July 2001
** Sealed ventilation breakout which intermittently discharges.
*** See 1981 Hydrologic Monitoring Report.

b. In-Mine Quality

In-mine monitoring was discontinued during 2001 due sealing of the mine. Refer to previous Annual Hydrologic Reports for comparison of samples collected to the historical values.

c. Discharge Quantity

Prior to temporary cessation, water produced in the Wilberg Mine gravity flowed to the northern area of 1st North. At that point it can either be pumped by a vertical turbine located in the Deer Creek Mine which picks up the water and pumps it back to the south and down to the Wilberg Mine main sump or pumped directly to the main sump utilizing submersible pumps. Water produced in the Cottonwood Mine (2nd North area) is transferred to the Wilberg Mine sump. The sump, which functioned as a settling basin, effectively removes settleable solids from the water. A portion of the water was redistributed to various areas of the mine to be utilized in the mining operations. A total of 11.2 million gallons was discharged to Cottonwood Canyon Creek (TMA portal) during 2009. No discharge occurred in 2009 at the Miller Canyon breakouts, which were developed for ventilation purposes but sealed in 1987. (See Figure 11) The portal breakouts at Miller Canyon were reclaimed in 1999. Minor seeps occur through a french drain system installed at each portal, but groundwater production is insufficient for measurement. Discharge from Cottonwood Mine is monitored in accordance with stipulations of the Wilberg Mine Discharge UPDES Permit UT-0022896.

d. Discharge Quality

Samples are collected each month from the TMA Portals and Miller Canyon breakouts whenever discharge occurs. Monthly samples were collected from TMA during 2009. Tables 43 compares the minimum, maximum, and mean values from 2009 to the historical values.

4. Trail Mountain Mine

Energy West Mining Company notified the Division of temporary cessation of coal mining operations at the Trail Mountain Mine effective May 4, 2001. Coal mining at the Trail Mountain Mine ceased as of March 15, 2001. In preparation of temporary cessation, all mining equipment including; production (longwall and continuous miner), belt haulage and electrical were removed from the mine. Verification of equipment removal was conducted on April 6, 2001 with Bureau of Land Management (Steve Falk) and Division of Oil, Gas and Mining (Pete Hess) participating in the review. A plan to construct permanent seals was submitted to and approved by Mine Safety Health Administration. Sealing of the mine portals was completed on May 2, 2001.

a. In-Mine Water Production

The best estimate of in-mine water production was arrived at by combining the following values:

Trail Mountain Discharge	0.0 Million Gallons
Estimated Evaporation*	0.0 Million Gallons
Domestic Usage	0.0 Million Gallons
Total Discharge	0.0 Million Gallons

* See 1981 Hydrologic Monitoring Report

b. In-Mine Quality

In-mine monitoring was discontinued during 2001 due sealing of the mine. Refer to previous Annual Hydrologic Reports for comparison of samples collected to the historical values.

c. Discharge Quantity

Prior to cessation, water produced in the Trail Mountain Mine either is pumped or gravity flows to a sump located in 4th Left, 5th Left, and 3rd South. (See Figure 12) A portion of the water is redistributed to various areas of the mine to be utilized in the mining operations. Excess water not used in the mining operations is stored in sealed areas of the mine or discharged to Cottonwood Canyon Creek. No water was discharged to Cottonwood Canyon Creek during 2009. (See Figure 13) Discharge from Trail Mountain is monitored in accordance with stipulations of the Trail Mountain Mine UPDES Discharge Permit UTG040003-002.

d. Discharge Quality

No water was discharged to Cottonwood Canyon Creek during 2009.

VI. PIEZOMETRIC GRADIENT INFORMATION

A. Surface

1. Cottonwood Canyon Creek

Eight (8) wells located along the extent of Cottonwood Canyon Creek are monitored monthly. The following table lists the zone isolated with each well.

Well I.D.	Monitoring Zone
CCCW-1A	Alluvial Deposits
CCCW-1S	Starpoint Sandstone
CCCW-2A	Alluvial Deposits
CCCW-3A	Alluvial Deposits
CCCW-3S U	Blackhawk - Fluvial Sandstone
CCCW-3S L	Starpoint Sandstone
EM-31	Lower Blackhawk/Starpoint Sandstone
TM-1B	Starpoint Sandstone
TM-3	Starpoint Sandstone (Straight Canyon)

2. Rilda Canyon

Six (6) wells located in Rilda Canyon are monitored monthly when accessible. The following table lists the zone isolated with each well.

Well I.D.	Monitoring Zone
P-1	Alluvial Deposits
P-4	Alluvial Deposits
P-5	Alluvial Deposits
P-6	Alluvial Deposits
P-7	Alluvial Deposits
EM-47	Lower Blackhawk/Starpoint Sandstone

Information collected during 2009 correlated well with historical information. As a result of mining in the western portion of the Trail Mountain Mine Well TM-3 in Straight Canyon decreased in level due to depressurization of the Star Point Sandstone. As mining proceeded north and the southern portion of the mine was sealed, the aquifer began to recharge (see chart in Appendix F). Hydrographs for the individual wells can be found in Appendix E - Rilda Canyon, Appendix F - Cottonwood Canyon.

B. In-Mine

1. Deer Creek

Four (4) long-term monitoring wells were completed during 1989. (See Map HM-2 for well locations.) Due to changes in the mine layout the last of the remaining wells was destroyed by mining activity during the fourth quarter 2003.

2. Cottonwood Mine

During 1989 four holes were drilled in the Cottonwood Mine. Monitoring of the long-term wells, WCP 1-3, was discontinued in 1992 due to the sealing of the 3rd South area.

VII. WASTE ROCK WELLS

A. Deer Creek Mine - Waste Rock Storage Facility

The Deer Creek Waste Rock Storage Facility is located on the northeast side of State Highway 31 approximately six (6) miles west of Huntington, Utah.

The geology of the Deer Creek Waste Rock Storage Facility is fairly simple and straightforward. The site is located on the southern flanks of Gentry Mountain in the area just south of Wild Horse Ridge. Rocks exposed in the area are marine-derived mudstones in the lower portion of the Masuk member of the Mancos Shale. The Masuk Shale on the bench which adjoins the proposed site on the east and west is covered by a five- to twenty-foot thick layer of terrace gravel of Quaternary age. North-south trending normal faults have disrupted the strata in the region; however, no faults are known to exist within the area of the Deer Creek Waste Rock Storage Facility.

The test wells completed prior to construction identified the existence of a limited quantity of groundwater locally in the Masuk Shale. The water is most likely flowing along fractures in the strata. The rate of water migration has been shown to be extremely slow (<100 feet per year); therefore, the operations to be conducted at the waste rock site should not impact the hydrology of the area. The weathered Masuk Shale present on and near the ground surface will act as an effective barrier to prevent the surface waters from migrating to depths and intersecting groundwater.

The groundwater present in the terrace gravels should not be impacted by the waste rock site because it is located at a higher elevation than the proposed site.

In order to identify the groundwater quality characteristics of the waste rock storage facility one of the test wells completed prior to the construction of the site was developed into a long-term water monitoring well. (See Map HM-1 for location.)

Four samples were collected in 2009. The analysis, along with water depth, is listed in Table 46. Values are in milligrams per liter unless otherwise noted. Raw data is on file at the Energy West Main Office. It is a well known fact that the Mancos Shale typically contains large quantities of soluble minerals such as gypsum; therefore, any water passing through it will be naturally high in dissolved solids. Samples at the waste rock well verify this condition.

B. Cottonwood/Wilberg Mines - Waste Rock Storage Facility

The Cottonwood/Wilberg Waste Rock Storage Facility is located on the west side of the Wilberg Mine road approximately 1.5 miles south of the Wilberg Mine. The geology of the proposed waste rock site is fairly simple and straightforward. The site is located on the southern flank of East Mountain to the south of Newberry Canyon. Rocks exposed in the area are marine-derived mudstones in the lower portion of the Masuk member of the Mancos Shale. The Masuk Shale on the bench which adjoins the proposed site on the north and east is covered by a five- to twenty-foot thick layer of terrace gravel of Quaternary age. North-south trending normal faults have disrupted the strata in the region; however, no faults are known to exist within the area of the waste rock site.

In order to identify the groundwater quality characteristics of the waste rock storage facility one of the test wells completed prior to the construction of the site was developed into a long-term water monitoring well. (See Map HM-1 for location.)

Four samples were collected in 2009. The analysis, along with water depth, is listed in Table 46. Values are in milligrams per liter unless otherwise noted. Raw data is on file at the Energy West Main Office. It is a well known fact that the Mancos Shale typically contains large quantities of soluble minerals such as gypsum; therefore, any water passing through it will be naturally high in dissolved solids. Samples at the waste rock well verify this condition.

VIII. EFFECTS OF MINING AND SUBSIDENCE ON HYDROLOGY

Since the development of the PacifiCorp mining complex on East and Trail mountains, coal has been extracted causing the partial collapse of the immediate overburden strata and, ultimately, surface subsidence. This occurs in areas of retreat mining in room and pillar sections and in areas of longwall mining. All areas with potential for subsidence are monitored annually. (See annual Subsidence Monitoring reports.)

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 and Trail mountains or the surrounding area.

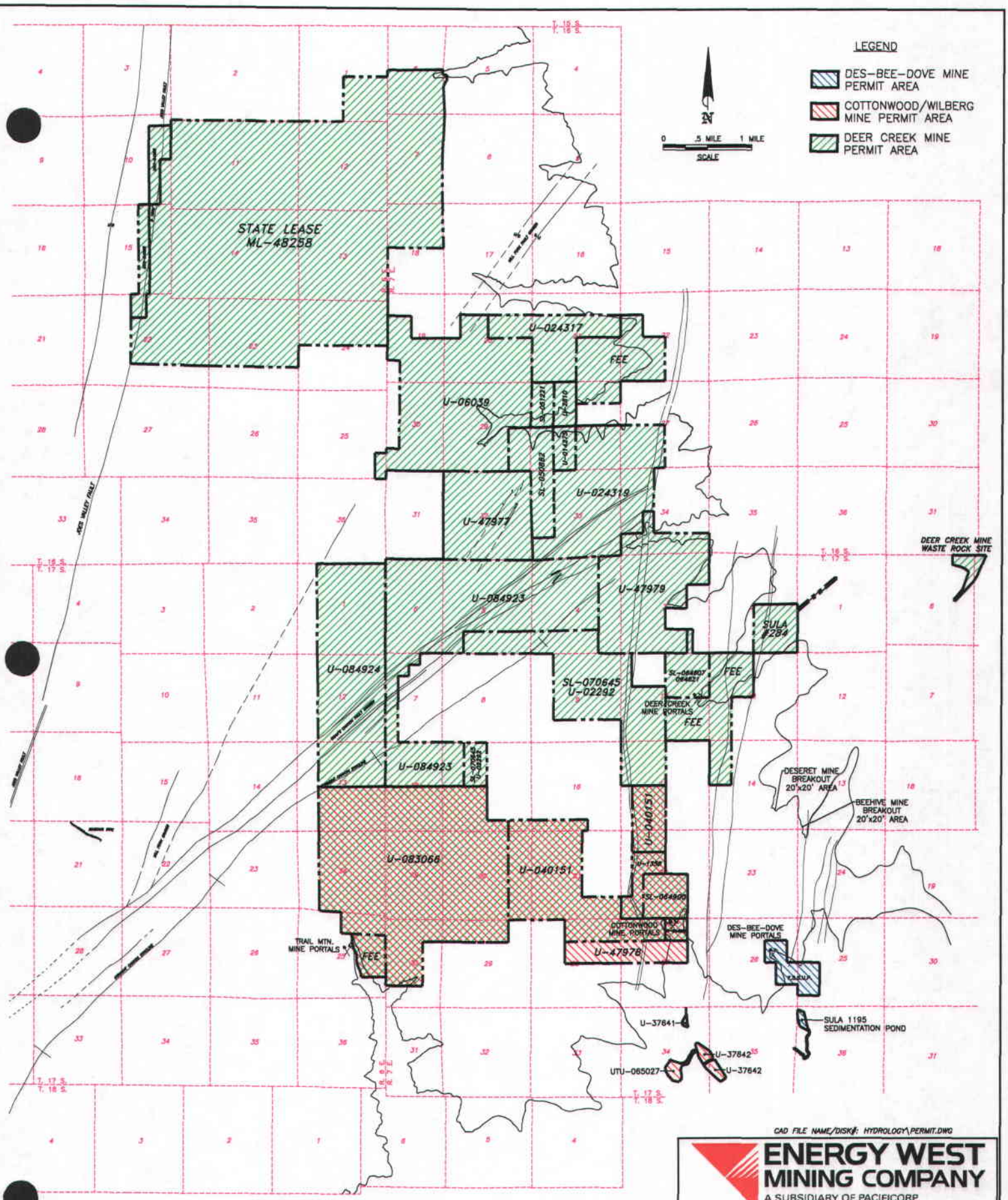
IX. SUMMARY

PacifiCorp has been conducting a water monitoring program in the area of its underground coal mines in Emery County, Utah in accordance with federal and state regulations. The program has been in existence since 1977, and this is the thirty-second annual report submitted concerning the hydrology.

From 1982 to 1984 the Western United States, especially Utah, experienced an unprecedented wet cycle of precipitation. The pattern changed in 1985 with conditions returning to slightly above normal. During the 1986 water year, the extremely wet trend returned, and the upper Colorado River Basin experienced above average precipitation. The 1987 weather pattern changed dramatically with near normal valley precipitation and mountain snowfall much below normal. The resulting 1987 runoff was substantially below normal. The drought continued from 1988 through 1992 with runoff amounts much below normal for six consecutive years. The 1993 runoff improved substantially with above average flow conditions occurring in most river basins. In 1994, drought conditions returned throughout much of the West. From 1995 through 1999, water supplies were much improved with above average runoff in Emery County. In 2000, weather conditions changed dramatically and the resulting runoff was much lower than normal. Precipitation was variable during 2001 and runoff values continued below normal though the year. The drought continued into

2002 with much lower precipitation and runoff was near-record low levels for most streams in Emery County. The 2003 water year was nearly as severe as 2002 with flows less than 40%. The extreme dry trend continued through 2004 with precipitation and runoff much below average although 2004 was much improved over the previous 4 years. Finally, in 2005 wet conditions returned to the West and resulted in improved water supplies in the Huntington Creek drainage. Water supplies continued to improve and runoff in 2006 was substantially higher than in 2005. Most local reservoirs filled to capacity. However, extreme drought returned to the region once again in 2007. Below average precipitation and snowfall coupled with dry and hot conditions in March and April resulted in greatly reduced water supplies which, in turn, severely restricted irrigation water supplies during August and September. During the 2008 and 2009 water years, drought conditions eased in the region, filling the reservoirs to capacity, resulting in more abundant water supplies for agriculture and culinary uses.

The data collected in 2009 continued to show the relationship between the variation in surface water quantity and precipitation, but the hydrologic monitoring completed on East and Trail mountains to date has failed to identify any change in the quantity or quality of ground or surface water which can be attributed to mining on the East and Trail Mountain properties.

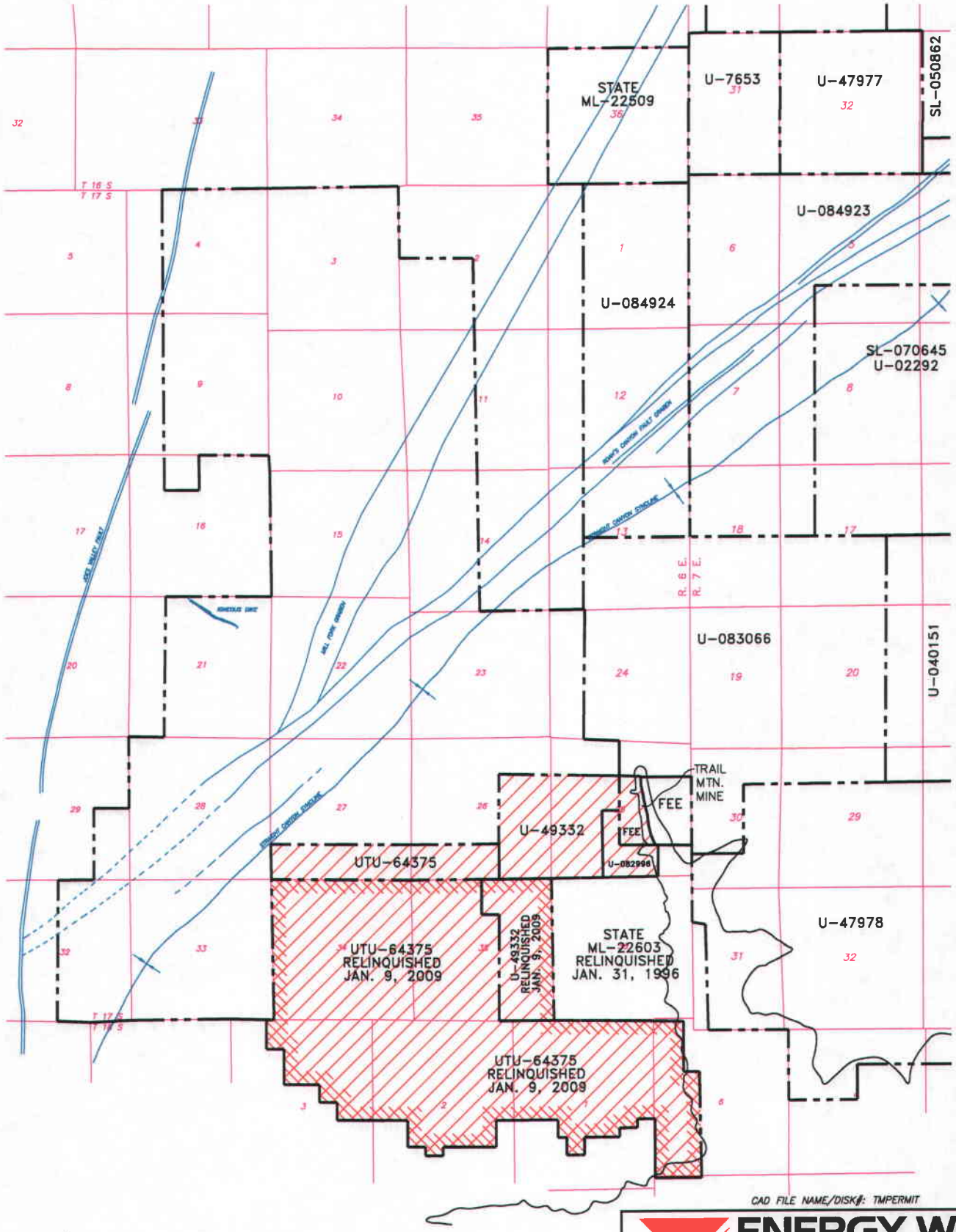


CAD FILE NAME/DISK#: HYDROLOGY\PERMIT.DWG

ENERGY WEST MINING COMPANY
A SUBSIDIARY OF PACIFICORP

MINE PERMIT BOUNDARIES

DRAWN BY: K. LARSEN		FIGURE 1
SCALE: AS NOTED		DRAWING #:
DATE: MARCH 31, 2010	SHEET 1 OF 1	REV. ___



CAD FILE NAME/DISK#: TMPERMIT

ENERGY WEST
MINING COMPANY
A SUBSIDIARY OF PACIFICORP

TRAIL MOUNTAIN MINE
MINE PERMIT BOUNDARY

N

SCALE: 1"=1 MILE

TRAIL MOUNTAIN MINE PERMIT AREA

LEASE RELINQUISHMENT AREA

DRAWN BY: K. LARSEN	FIGURE 1B	
SCALE: 1"=1 MILE	DRAWING #:	
DATE: MARCH 31, 2010	SHEET 1 OF 1	REV.

FIGURE 2

EAST MOUNTAIN PRECIPITATION
2009 WATER YEAR

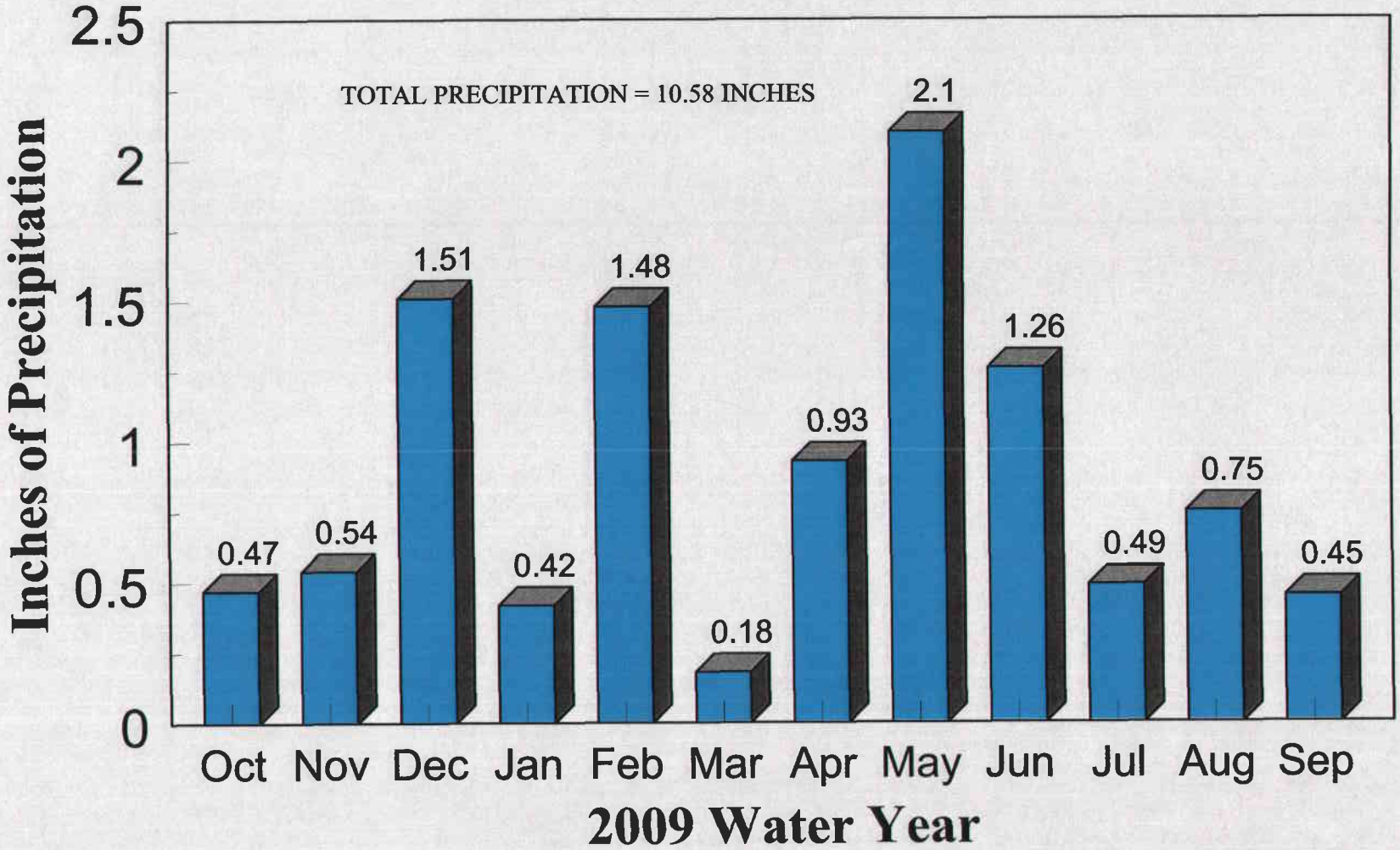
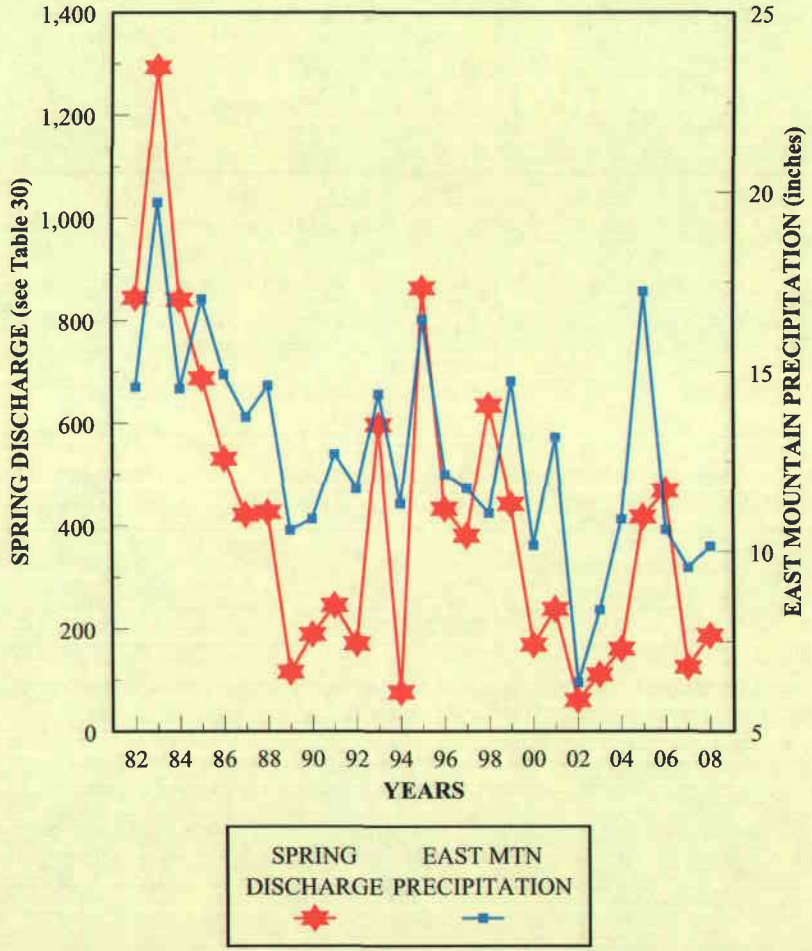


FIGURE 3a
EAST MOUNTAIN
SPRING DISCHARGE vs. PRECIPITATION & TEMPERATURE



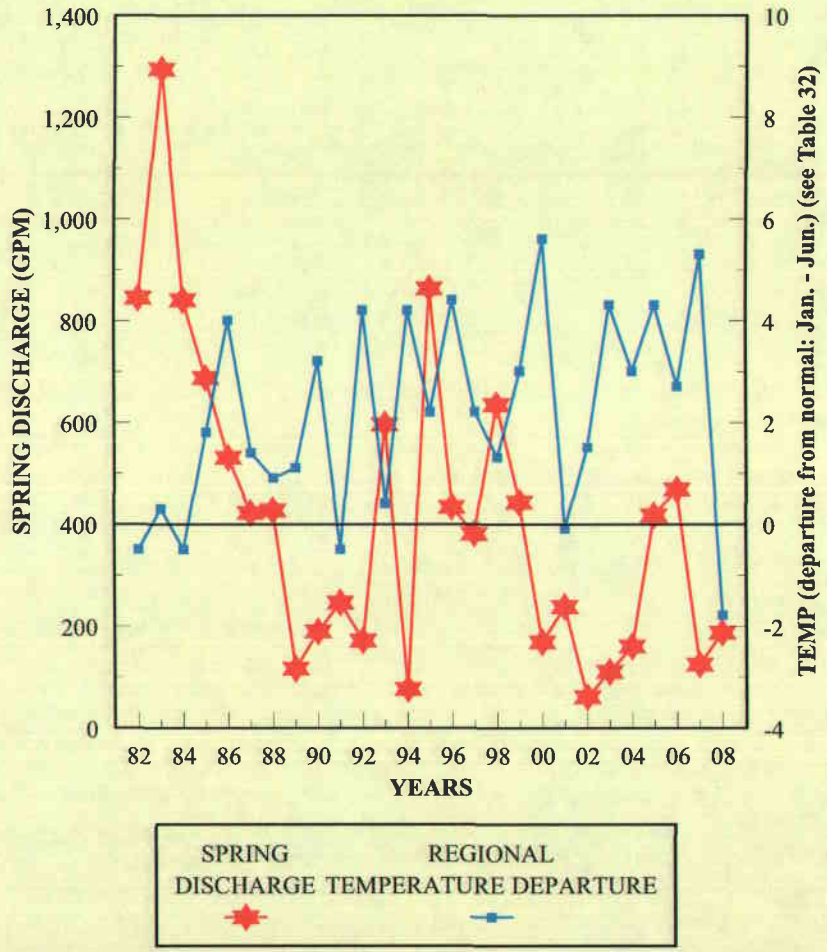


FIGURE 3b
EAST MOUNTAIN
SPRING DISCHARGE vs. PALMER DROUGHT INDEX
(Palmer Data - Average of Region 4 & 5)

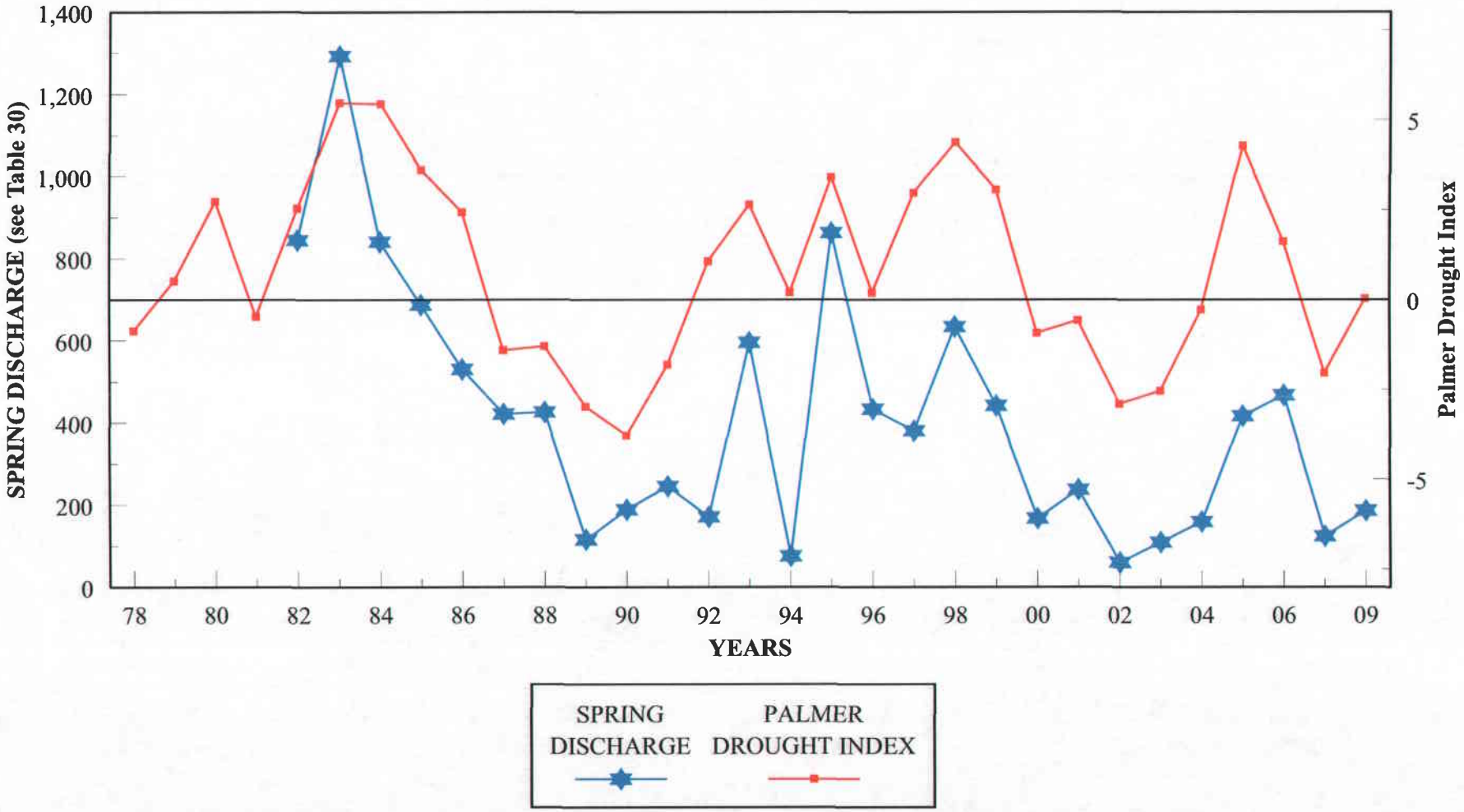


FIGURE 3c
TRAIL MOUNTAIN
SPRING DISCHARGE vs. PALMER DROUGHT INDEX
(Palmer Data - Average of Region 4 & 5)

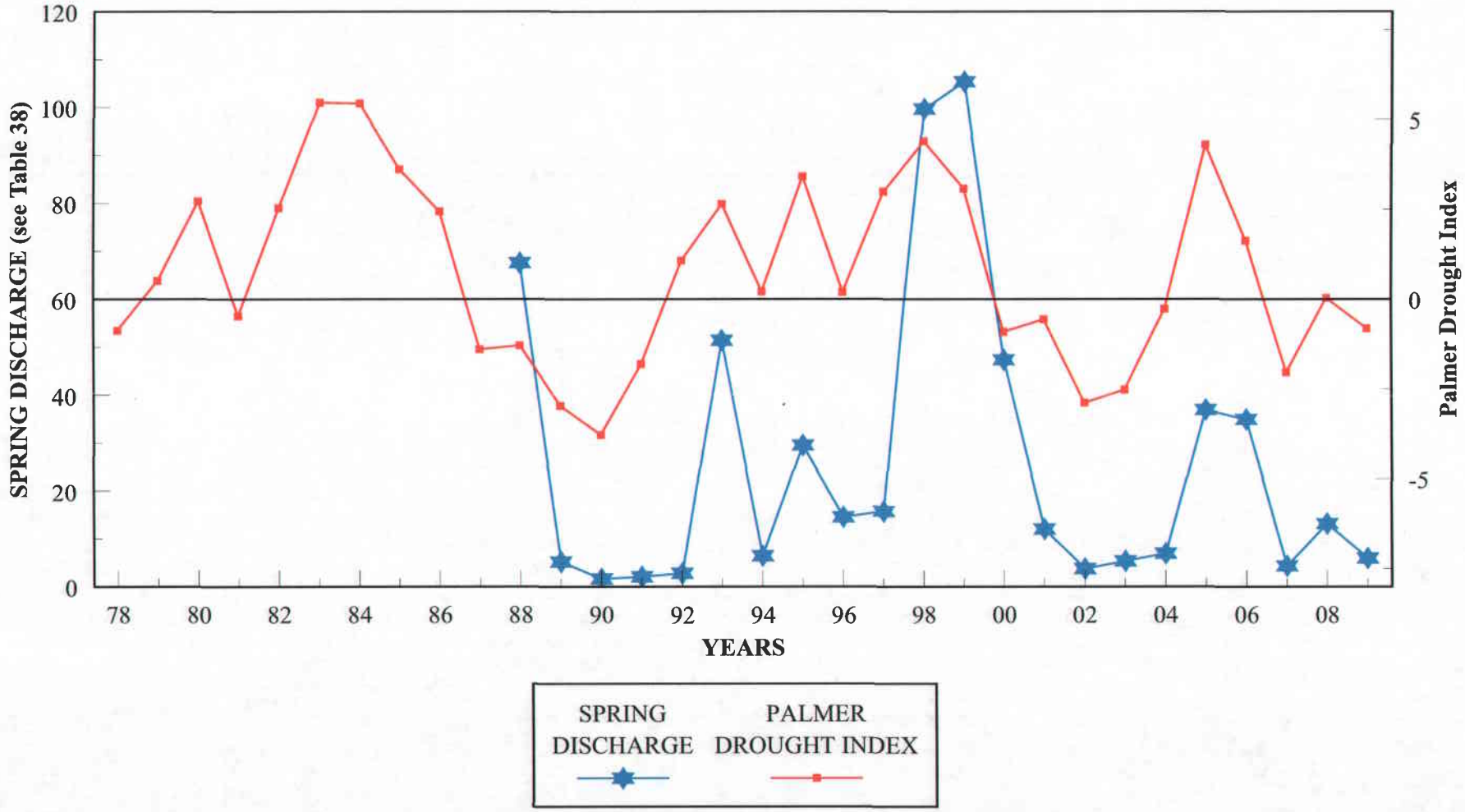


FIGURE 4 (a)

NORTH EMERY WATER USERS ASSOCIATION
RILDA CANYON SPRINGS

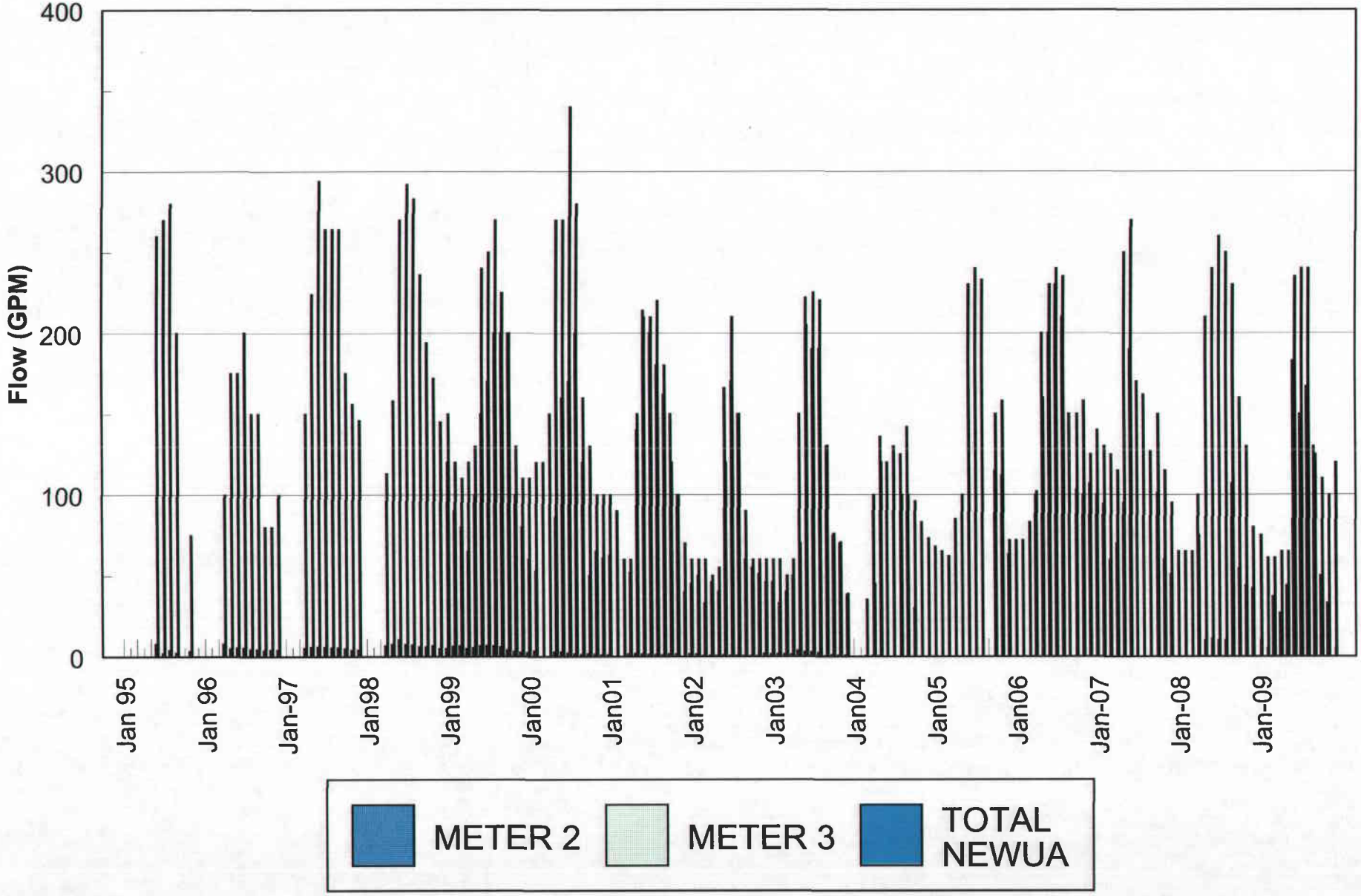
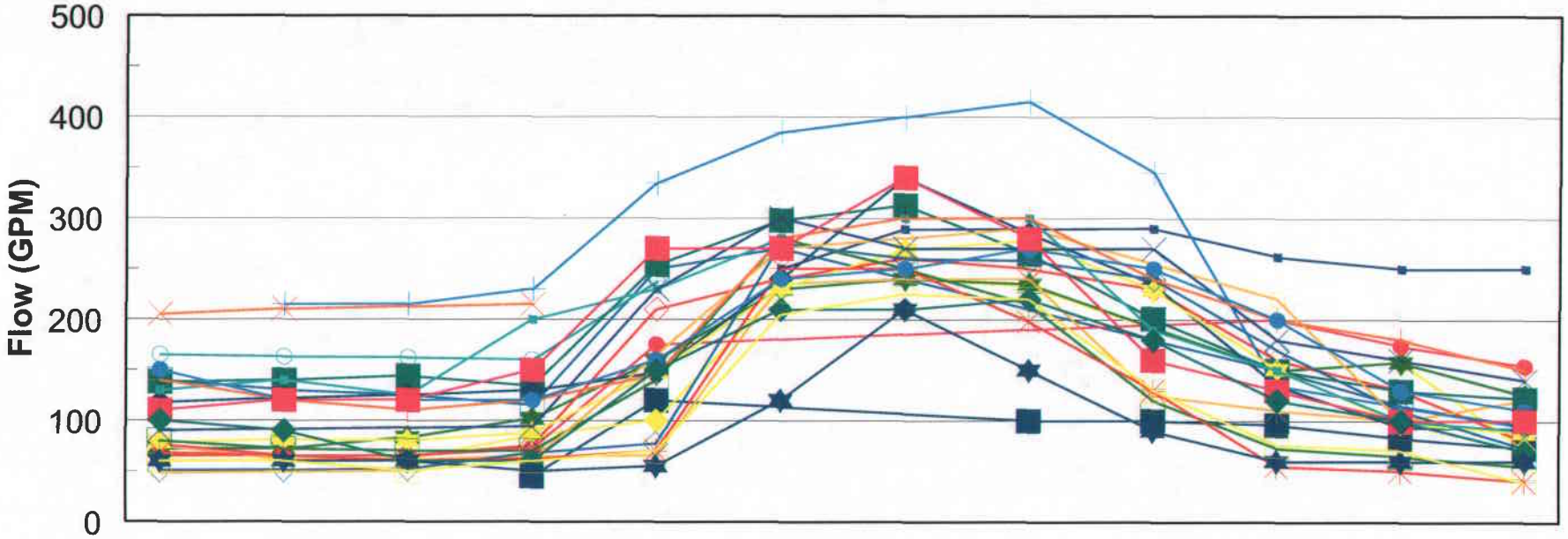


FIGURE 4 (b)

NORTH EMERY WATER USERS ASSOCIATION

RILDA CANYON SPRINGS

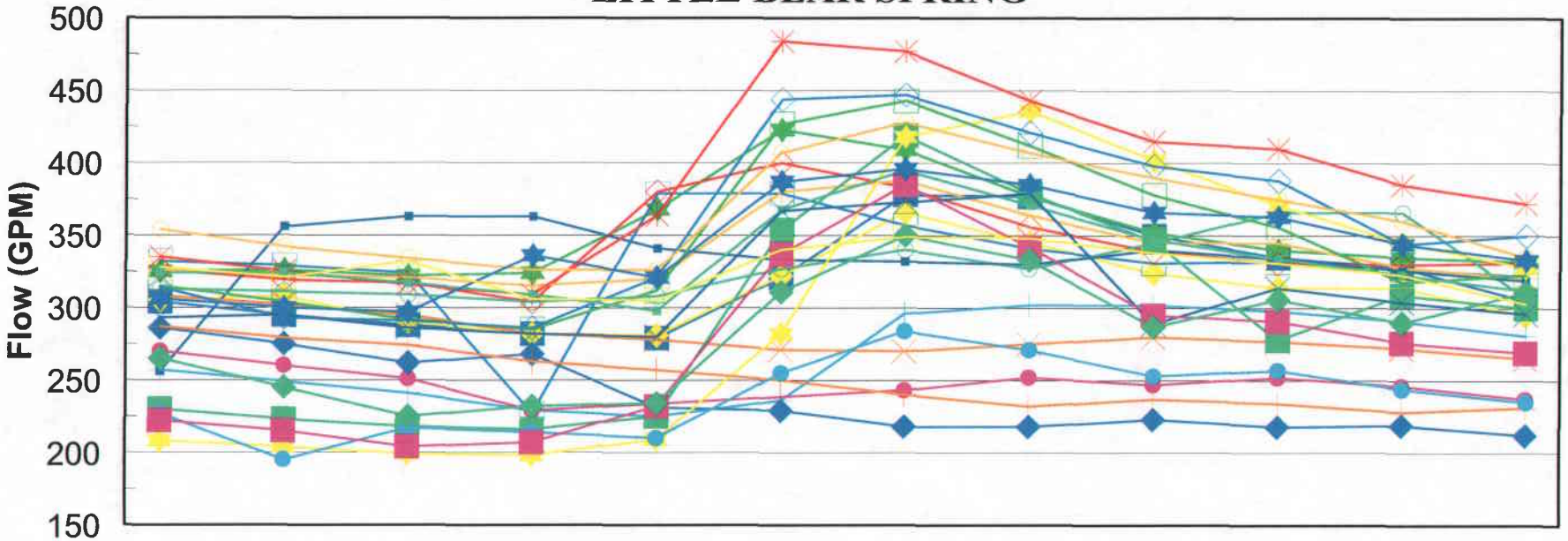


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004				45.0	120.0			100.0	100.0	96.0	83.0	73.0
2005	68.0	65.0	62.0	85.0	100.0	230.0	240.0	233.0		150.0	158.0	72.0
2006	72.0	72.0	83.0	102.0	160.0	230.0	240.0	235.0		150.0	158.0	125.0
2007	140.0	130.0	125.0	115.0	250.0	270.0				150.0	115.0	95.0
2008	65.0	65.0	65.0	75.0	210.0	240.0	260.0	250.0	230.0	160.0	130.0	80.0
2009	75.0	61.0	61.0	65.0	65.0	235.0	240.0	240.0	125.0	110.0	100.0	120.0
1982	165.0	163.0	162.0	160.0	237.0							
1983						250.0	289.0		290.0	262.0	250.0	250.0
1984	205.0	210.0		215.0								
1987		215.0	215.0	230.0	335.0	385.0	400.0	415.0	345.0	135.0	114.0	94.0
1988	76.0	65.0	65.0	72.0	175.0					200.0	174.0	154.0
1989	138.0	140.0	144.0	134.0	254.0	298.0	313.0	265.0	201.0	150.0	130.0	122.0
1990	118.0	122.0	125.0	130.0	147.0	240.0	340.0	285.0	235.0	135.0	94.0	92.0
1991	78.0	81.0	80.0	88.0	148.0	231.0	269.0	278.0	229.0	151.0	98.0	88.0
1992	80.0	72.0	70.0	70.0	140.0	280.0	250.0	215.0	120.0	73.0	65.0	55.0
1993	51.0	51.0	52.0	68.0	77.0	275.0	260.0	258.0	240.0	170.0	110.0	73.0
1994	68.0	65.0	60.0	62.0	70.0	250.0	250.0	198.0	130.0	55.0	50.0	40.0
1995	48.0		50.0	60.0		270.0	280.0	290.0		220.0	100.0	100.0
1996	130.0	140.0	125.0	200.0	230.0	280.0	300.0	300.0	190.0	150.0	100.0	90.0
1997	90.0			94.0	230.0	300.0	270.0	270.0	270.0	180.0	160.0	140.0
1998	140.0	120.0	110.0	120.0	145.0	280.0	300.0	300.0	240.0	200.0	180.0	150.0
1999	150.0	120.0	120.0	120.0	160.0	240.0	250.0	270.0	250.0	200.0	130.0	110.0
2000	110.0	120.0	120.0	150.0	270.0	270.0	340.0	280.0	160.0	130.0	100.0	100.0
2001	100.0	90.0	60.0	60.0	150.0	210.0	210.0	220.0	180.0	120.0	100.0	70.0
2002	60.0	60.0	60.0	50.0	55.0	120.0	210.0	150.0	90.0	60.0	60.0	60.0
2003	60.0	60.0	50.0	60.0	70.0	205.0	225.0	220.0	130.4	76.0	70.8	38.8

FIGURE 4 (c)

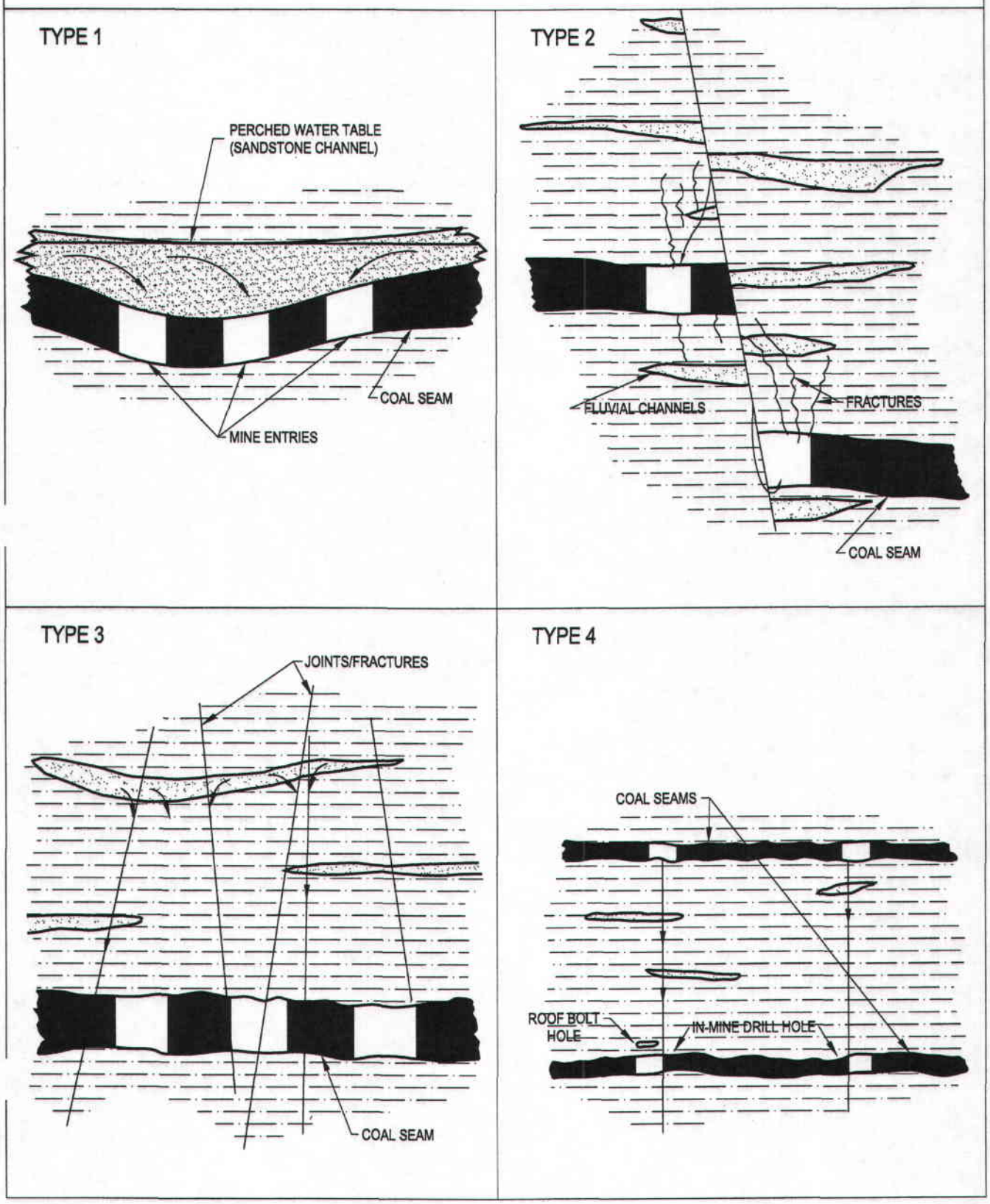
CASTLE VALLEY SPECIAL SERVICE DISTRICT

LITTLE BEAR SPRING



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	304	295	288	282	279	321	378	377	350	335	328	305
2009	305	308	290	282	281	322	366	345	324	314	314	295
1984	325	326	322	324	368	423	409	377	352	340	335	332
1985	332	329	324	227	379	379	357	341	331	332	327	322
1986	326	319	317	304	380	400	383	356	339	331	330	331
1987	326	322	321	315	320	380	388	364	345	345	328	321
1988	313	311	309	304	308	327	340	327	345	366	366	307
1989	256	356	363	363	341	333	332	330	340	334	326	319
1990	308	302	295	282	278	271	270	275	280	277	272	265
1991	257	249	241	229	225	236	296	302	302	298	291	281
1992	270	260	251	229			243	252	247	252	246	237
1993	230	223	218	216	225	354	419	379	346	278	309	300
1994	286	275	262	268	231	229	218	218	223	218	219	212
1995	208	204	199	198	209	282	418	436	402	371	345	328
1996	315	304	292	285	312	427	443	412	378	356	318	323
1997	314	293	291	286	321	444	447	421	398	388	344	350
1998	335	325	316	309	364	484	477	443	415	410	385	372
1999	354	342	334	326	326	407	428	407	390	375	360	335
2000	324	324	317	309	298	368	395	371	347	334	323	312
2001	293	295	286	282	280	367	373	379	289	314	304	296
2002	287	279	274	263	257	250	240	232	237	234	228	231
2003	227	195	217	214	210	255	284	271	253	257	244	235
2004	222	215	204	207	232	337	385	342	295	291	276	269
2005	265	245	225	232	234	311	350	333	287	306	290	311
2006	306	300	297	336	321	387	396	385	366	363	344	333
2007	328	321	332	306	305	340	349	348	338	331	323	303

FIGURE 5
LONG TERM WATER SOURCES



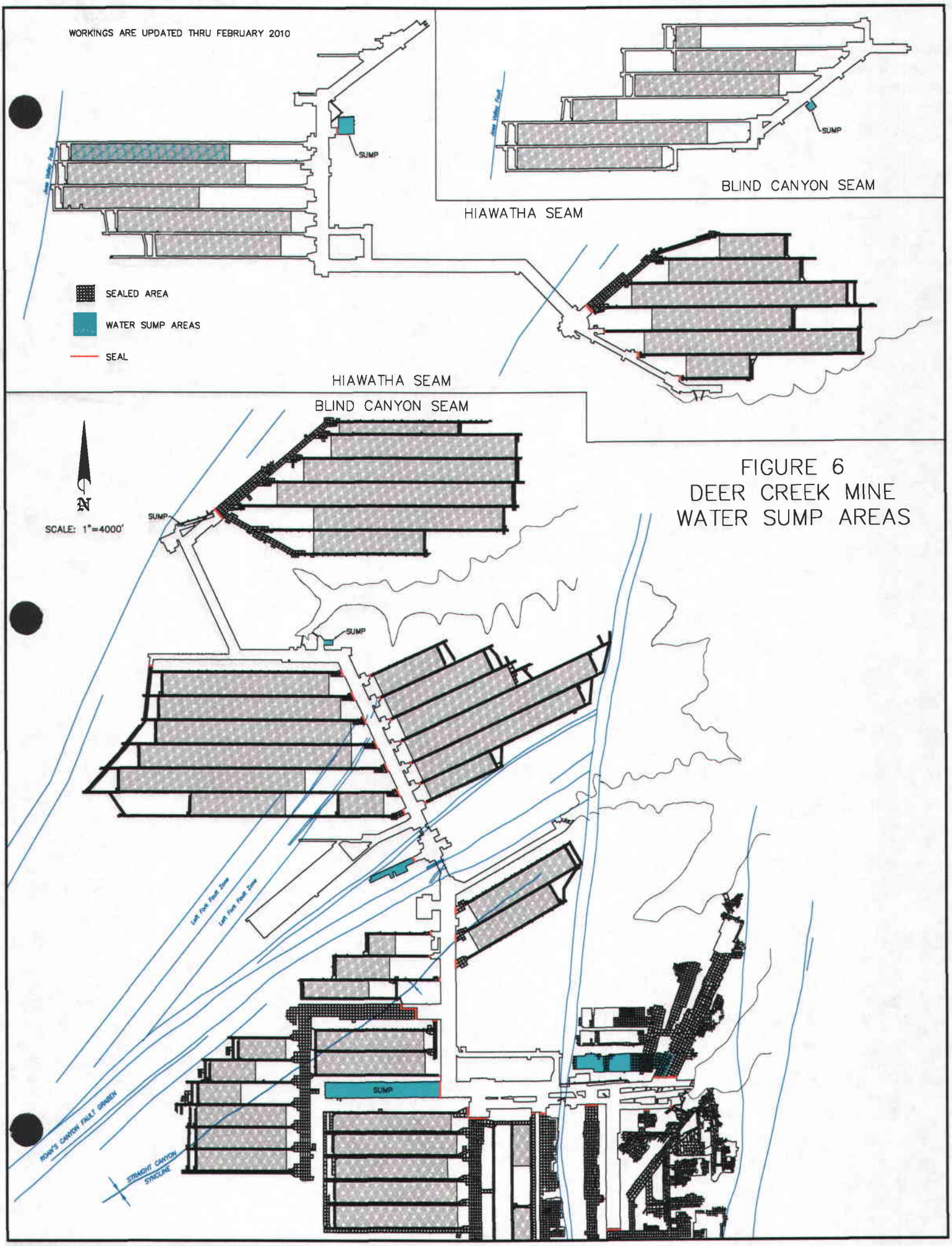


FIGURE 6
DEER CREEK MINE
WATER SUMP AREAS

FIGURE 7

DEER CREEK MINE

2009 MINE WATER DISCHARGE

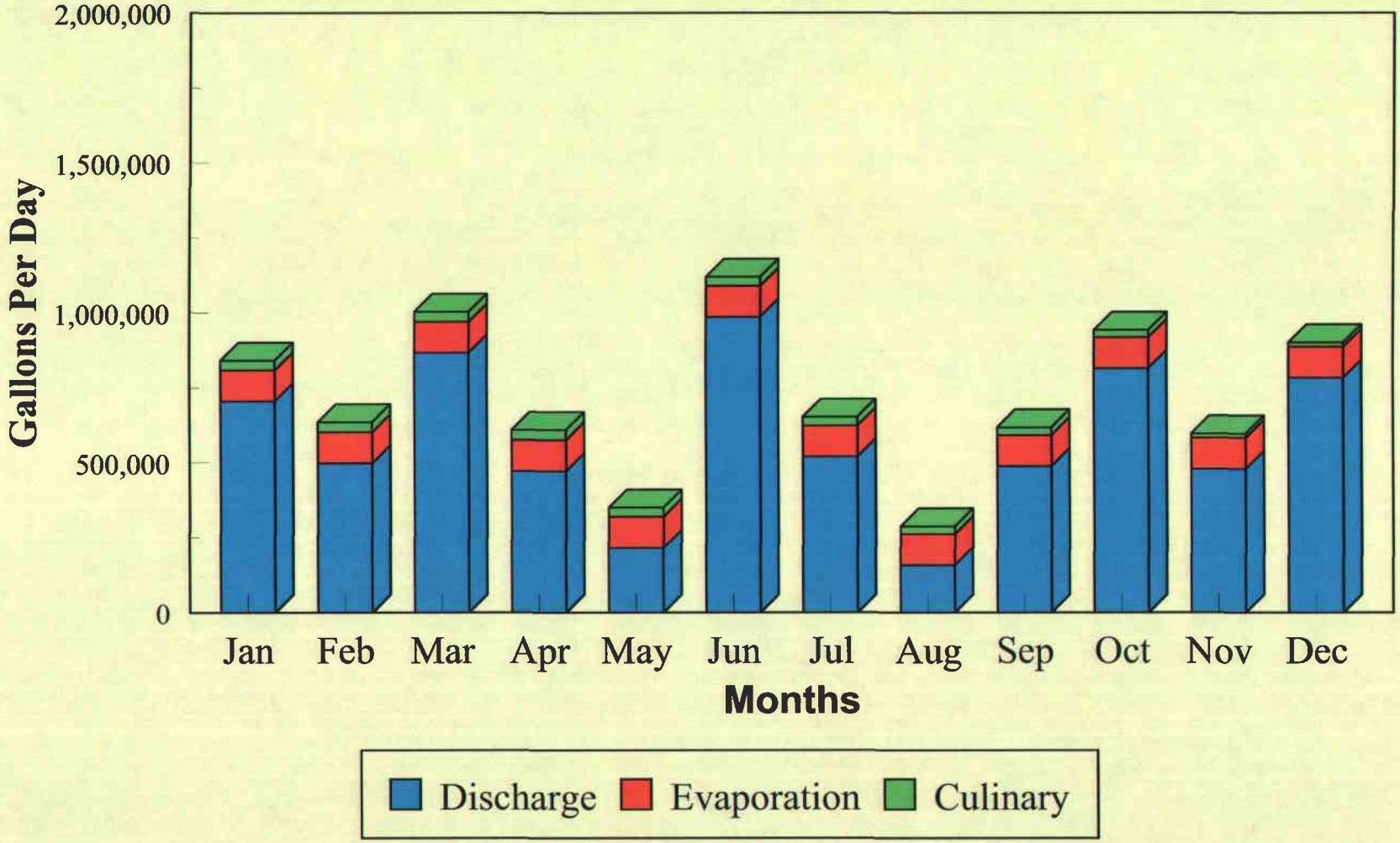
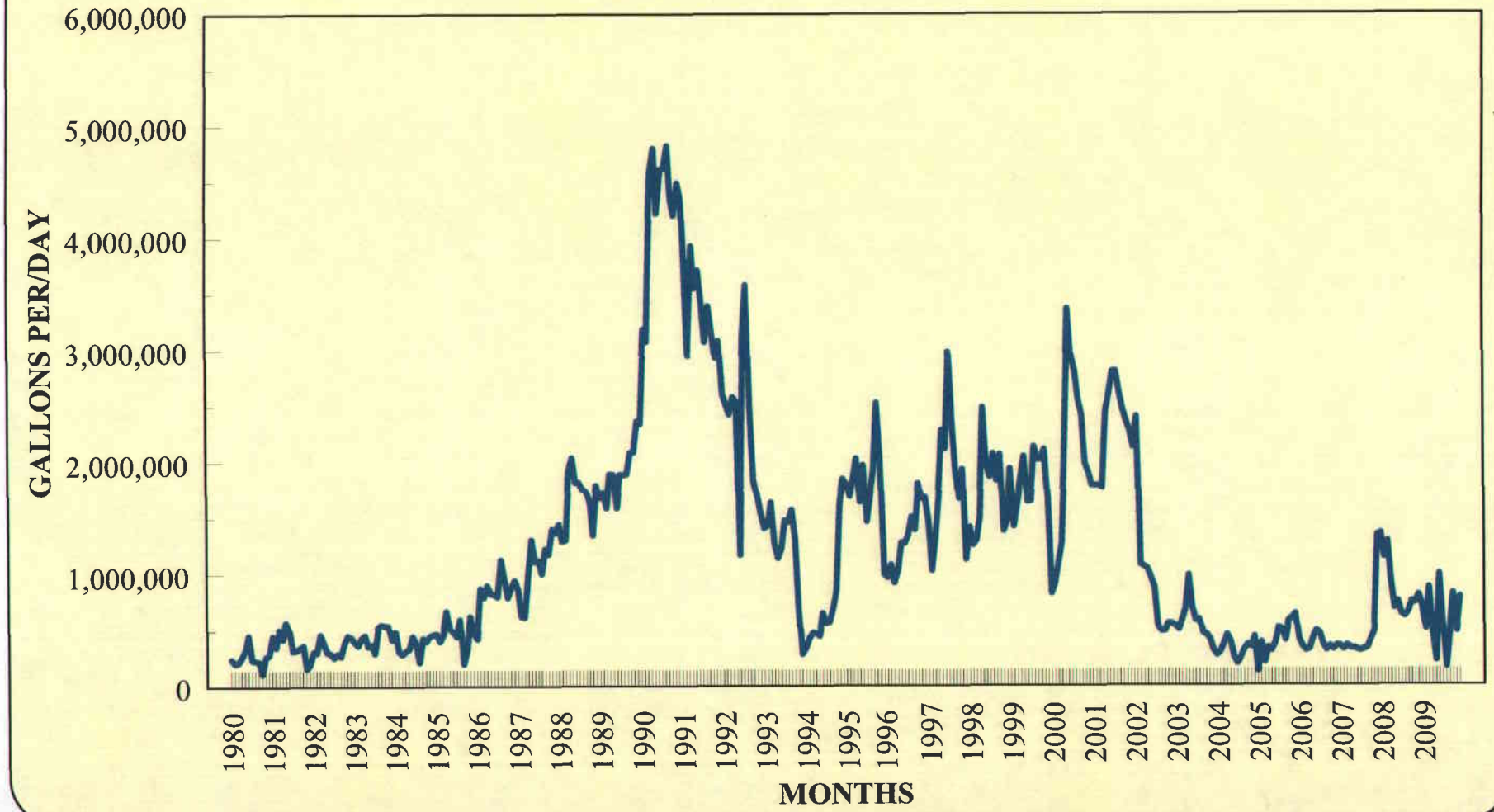


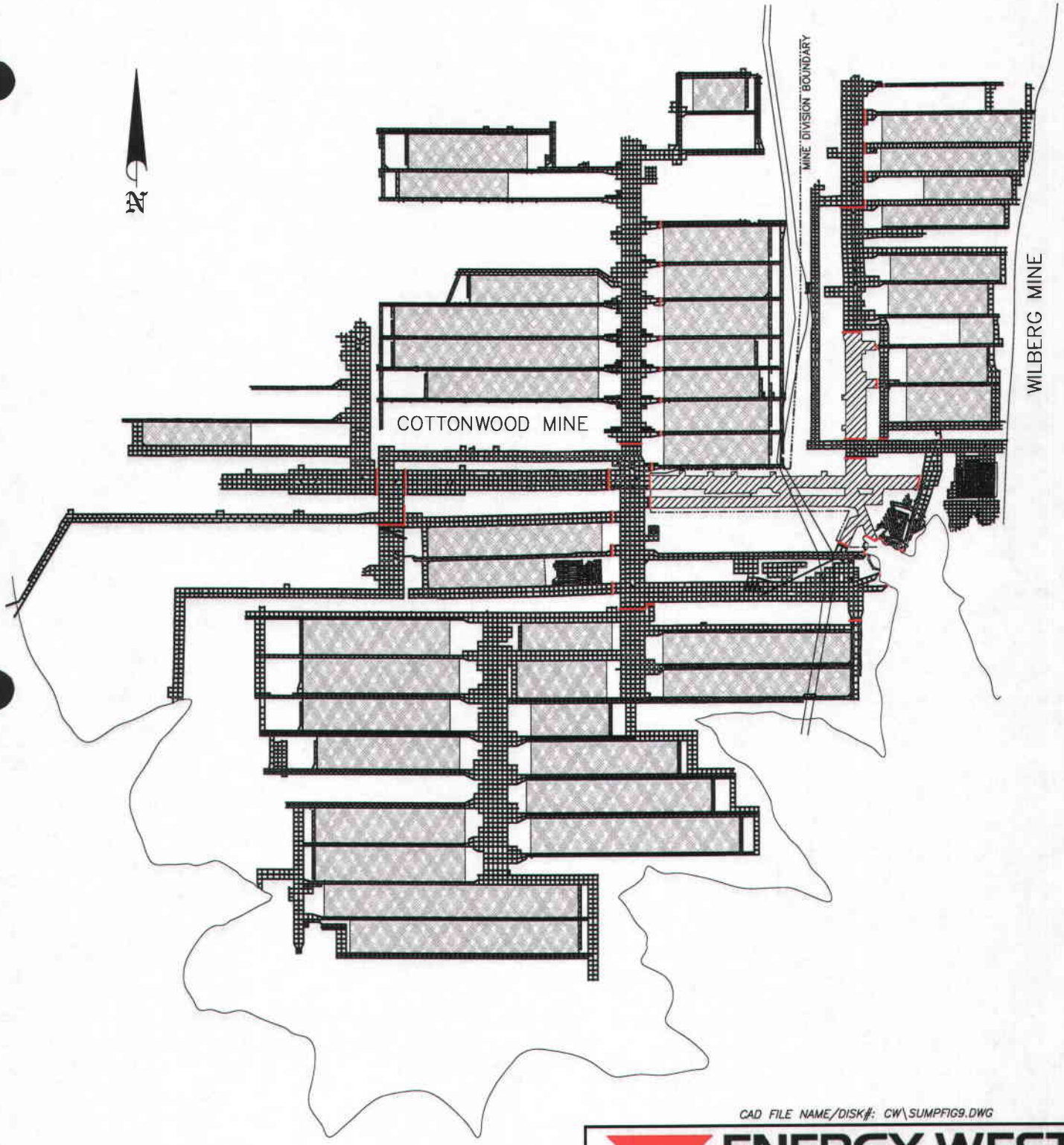
FIGURE 8

DEER CREEK MINE DISCHARGE

@ Deer Creek (UPDES UT-0023604)

January 1980 through December 2009





SEALED AREA

SEAL

SEALED AREA DUE TO THE FIRE

MINE SEALED MAY 2001
WORKINGS ARE UPDATED TO MARCH 1, 1997

CAD FILE NAME/DISK#: CW\SUMPFIG9.DWG

ENERGY WEST MINING COMPANY
A SUBSIDIARY OF PACIFICORP

COTTONWOOD/WILBERG MINE WATER SUMP AREAS

DRAWN BY: K. LARSEN	FIGURE 9	
SCALE: 1" =3000'	DRAWING #:	
DATE: MAY 13, 2009	SHEET 1 OF 1	REV. ___

FIGURE 10

WILBERG/COTTONWOOD MINE DISCHARGE

@ Grimes Wash/TMA (UPDES UT-0022986)

April 1979 through December 2009

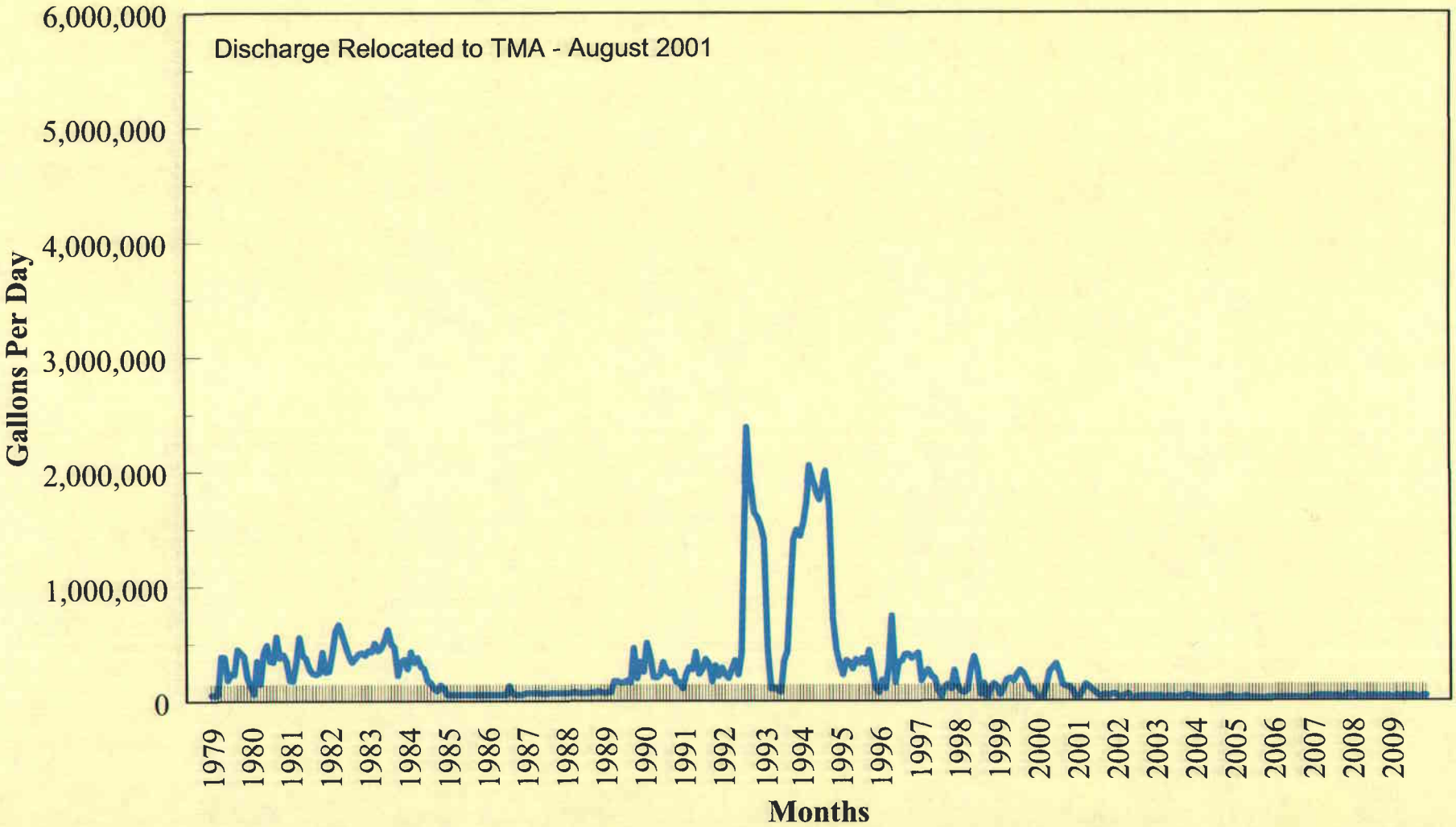
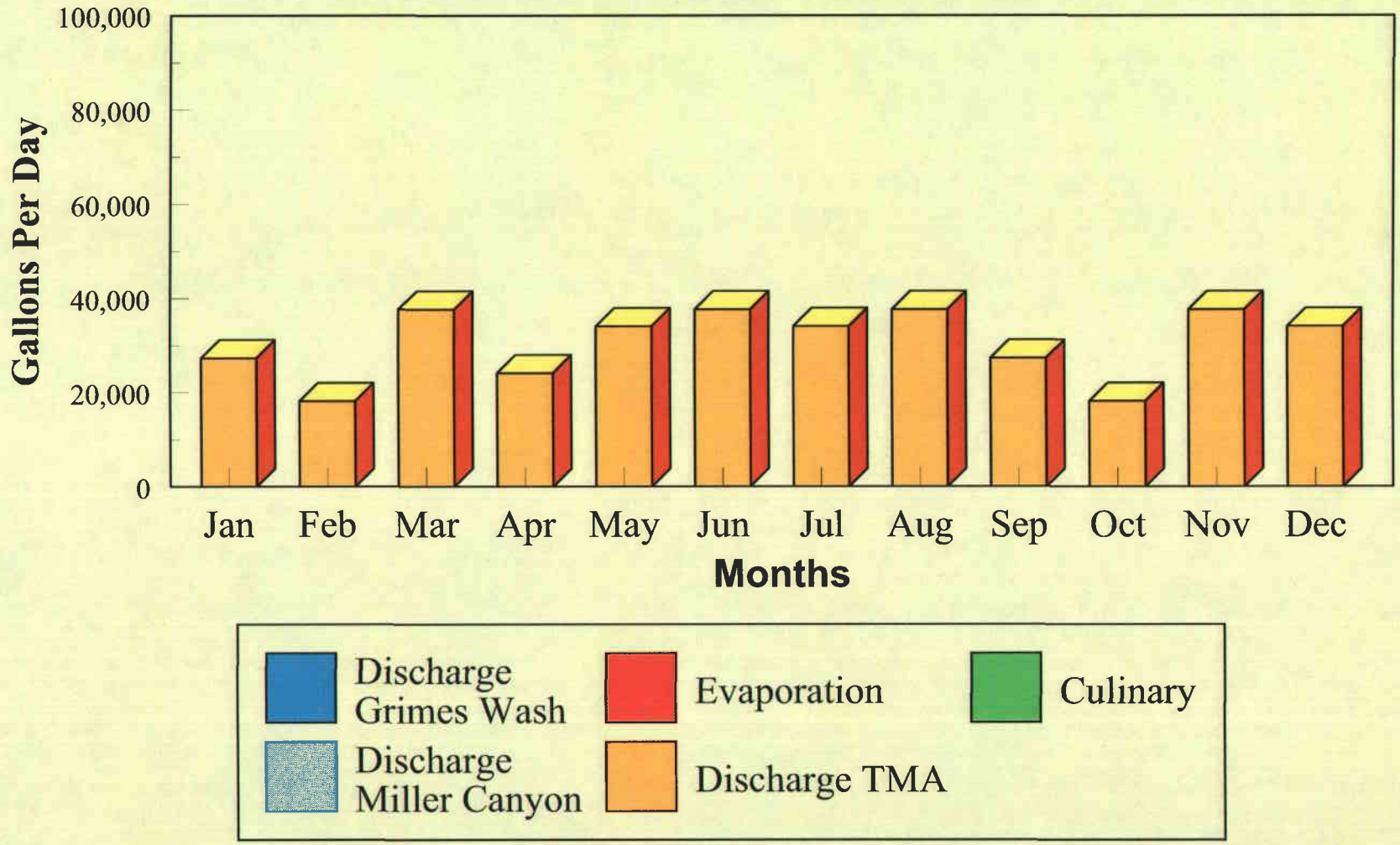
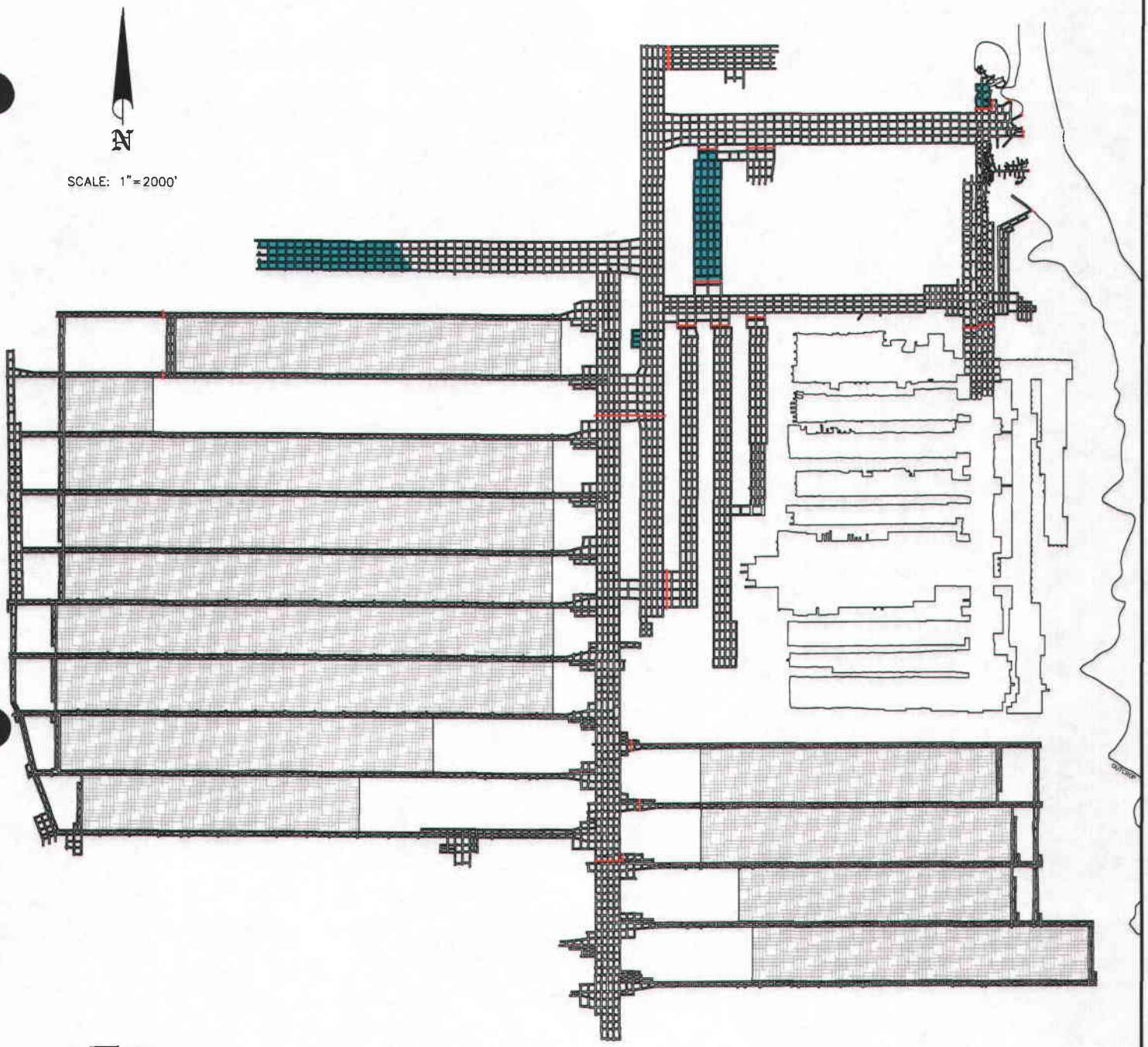


FIGURE 11

WILBERG/COTTONWOOD
2009 MINE WATER DISCHARGE





SEALED AREA

WATER SUMP AREAS

SEAL

MINE SEALED APRIL 2001
WORKINGS ARE UPDATED TO APRIL 2001

CAD FILE NAME/DISK#: SUMP12.DWG

ENERGY WEST MINING COMPANY
A SUBSIDIARY OF PACIFICORP

TRAIL MOUNTAIN MINE
WATER SUMP AREAS

DRAWN BY:	K. LARSEN	FIGURE 12	
SCALE:	1" =2000'	DRAWING #:	
DATE:	MAY 13, 2009	SHEET 1 OF 1	REV. ___

FIGURE 13

Trail Mountain Mine

@ Cottonwood Canyon Creek (UPDES UT-0023728)

January 1997 through December 2009

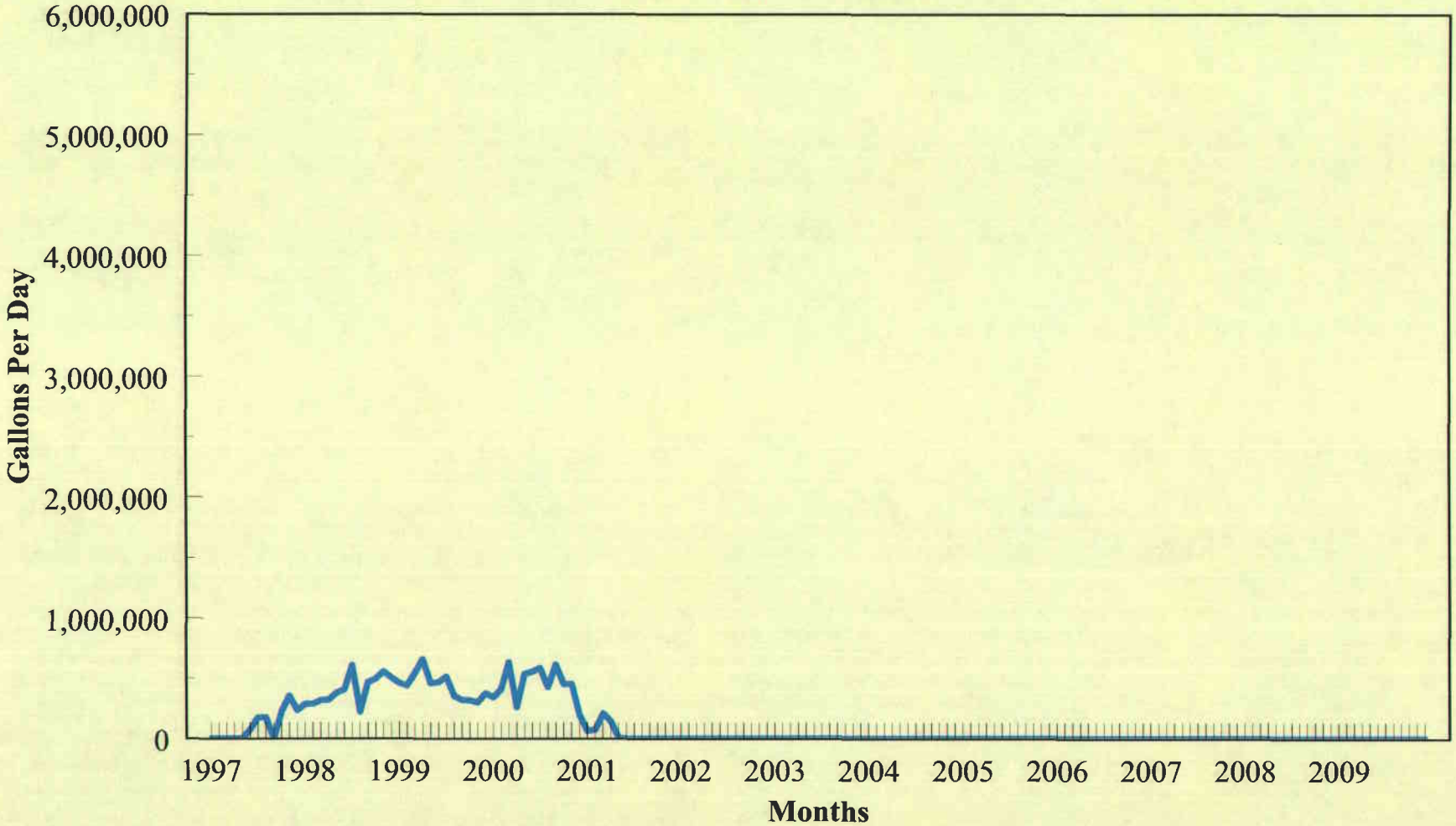


TABLE 1: PRECIPITATION IN EMERY COUNTY, UTAH (2009 Water Year)

	Castle Dale* (Elev. 5800')		Huntington Plant (Elev. 6500')		East Mountain (Elev. 8985')	
	Precip. (inches)	*% of Normal*	*Precip. (inches)*	*% of Normal*	*Precip. (inches)*	*% of Normal*
2008						
October	0.36	42	0.30	25	0.47	35
November	0.22	43	0.49	77	0.54	53
December	0.91	166	0.18	30	1.51	173
2009						
January	0.07	11	0.42	49	0.42	39
February	0.37	64	0.56	79	1.48	120
March	0	0	0.00	0	0.18	14
April	0.59	112	0.79	120	0.93	94
May	0.7	114	0.96	101	2.1	241
June	0.69	136	1.95	303	1.26	232
July	0.07	9	0.62	62	0.49	58
August	0.21	19	1.09	90	0.75	58
September	0.6	66	0.58	55	0.45	34
TOTALS	**4.79**	**59**	**7.94**	**80**	**10.58**	**84**
Mean Monthly	0.40	---	0.66		0.88	---

NR - No Record

* Tranferred Site from Hunter Plant to Castle Dale

Note: The East Mountain rain gage was inoperable from 3/3/09 to 3/9/09

TABLE 2: COMPARISON OF 2008 AND 2009 PRECIPITATION (Inches)

	2009		*2008*		*2009 As*
Station	***Amount***	***% of Normal***	***Amount***	***% of Normal***	***% of 2008***
Castle Dale	4.79	63	5.17	64	93
Huntington Plant	7.94	80	7.35	99	108
East Mountain	10.58	84	10.14	80	104

TABLE 3: CASTLE DALE PRECIPITATION

Elevation - 5,800 Feet

YEAR	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEPT*	*OCT*	*NOV*	*DEC*	*ANNUAL*
1899	-	-	0.38	0.00	0.00	0.00	1.41	1.24	0.25	0.25	0.45	0.27	4.25
1900	-	0.00	-	1.38	0.05	0.25	0.00	0.23	2.18	0.00	0.40	0.00	4.49
1901	0.24	0.93	-	-	0.11	0.10	0.00	1.83	0.00	0.40	0.00	0.00	3.61
1902	0.20	0.11	0.62	-	0.45	0.00	0.15	0.23	0.29	0.00	1.72	0.10	3.87
1903	0.08	0.28	0.57	0.10	0.13	1.01	0.74	0.15	0.49	0.78	0.00	-	4.33
1904	1.00	-	0.45	-	1.00	0.69	0.09	0.35	0.30	1.35	-	-	5.23
1905	0.50	2.00	1.03	-	0.40	-	0.45	0.98	2.23	0.80	2.55	0.25	11.19
1906	1.59	0.00	0.97	2.71	0.60	0.00	0.77	0.89	0.60	0.40	1.40	1.88	11.81
1907	-	0.40	0.00	0.40	1.03	1.16	0.07	2.91	0.62	1.63	0.47	0.70	9.39
1908	0.70	1.50	-	0.86	1.25	0.15	1.30	0.00	1.25	0.70	0.55	0.80	9.06
1909	1.44	1.66	0.00	0.80	0.05	0.41	0.00	3.00	1.60	0.00	2.28	2.08	13.32
1910	0.92	0.70	0.50	-	-	2.25	0.65	0.66	1.06	0.85	0.95	1.15	9.69
1911	1.73	0.75	0.00	-	-	1.87	1.72	0.70	1.75	0.95	0.10	0.80	10.37
1912	0.40	0.60	1.18	0.00	0.15	0.20	2.00	1.50	1.00	3.15	0.30	0.50	10.98
1913	0.40	1.24	-	0.25	0.05	0.35	1.08	0.75	1.75	0.43	1.43	2.55	10.28
1914	3.00	0.10	0.30	0.75	0.35	2.55	-	0.40	0.30	1.05	-	0.65	9.45
1915	1.80	2.75	-	1.20	0.90	0.55	0.20	0.19	0.54	0.05	0.47	1.45	10.10
1916	4.20	0.55	1.70	0.05	-	0.00	0.75	3.05	0.15	2.46	0.00	0.65	13.56
1917	0.30	0.00	0.00	1.97	1.33	0.12	0.32	0.68	1.63	-	0.10	-	6.45
1918	0.06	0.00	0.33	0.49	0.29	0.48	1.84	1.18	0.85	1.54	0.75	0.82	8.63
1919	0.00	0.76	0.36	0.33	0.46	-	0.37	1.59	0.86	0.05	0.55	0.10	5.43
1920	0.57	0.70	0.52	0.44	0.57	0.32	0.19	0.98	0.13	2.00	0.24	0.50	7.16
1921	0.73	0.24	0.15	0.31	1.13	0.78	1.67	5.02	0.30	0.30	0.00	0.58	11.21
1922	0.47	1.03	0.95	0.82	1.42	0.06	0.28	1.48	0.12	0.35	1.25	0.37	8.60
1923	0.40	0.77	0.00	1.00	0.37	-	1.95	2.00	0.23	0.66	0.62	0.54	8.54
1924	0.22	0.07	1.09	0.12	0.59	0.08	1.45	0.27	0.59	0.52	0.06	1.00	6.06
1925	0.00	0.60	0.16	0.27	0.00	1.55	0.85	0.87	2.13	1.94	0.08	0.10	8.55
1926	0.00	0.52	1.53	1.10	0.00	0.24	0.73	1.29	2.02	0.15	0.28	1.16	9.02
1927	0.18	1.22	1.15	0.08	-	1.91	1.31	2.35	2.38	0.94	0.12	0.00	11.64
1928	0.30	0.70	0.94	0.00	2.04	0.18	0.00	1.20	0.56	1.70	0.70	0.30	8.62
1929	0.48	0.51	0.83	0.47	0.33	0.22	1.25	1.55	1.87	0.67	0.00	0.26	8.44
1930	1.26	0.25	0.18	0.88	0.65	0.61	1.73	2.77	1.60	0.25	0.16	0.00	10.34
1931	0.00	0.66	0.24	0.72	0.04	0.35	0.36	1.18	0.04	0.66	0.55	0.86	5.66
1932	0.42	1.00	0.06	0.26	0.08	0.66	1.82	2.58	0.25	0.20	0.00	0.96	8.29
1933	1.60	0.15	0.40	0.00	0.88	0.00	2.27	0.37	1.26	0.32	0.85	0.58	8.68
1934	0.38	0.30	0.00	0.18	0.54	0.01	0.53	0.41	0.15	0.00	0.23	0.56	3.29
1935	0.33	0.66	1.07	1.41	0.73	0.00	0.88	0.52	0.00	0.00	0.11	0.48	6.19
1936	0.42	0.68	0.92	0.02	0.68	0.62	3.21	0.64	0.55	0.85	0.05	1.65	10.29
1937	1.12	0.61	0.90	0.04	0.97	0.50	2.04	1.61	0.91	0.46	0.08	0.70	9.94
1938	0.65	0.44	1.02	0.16	0.72	0.83	0.52	0.88	1.84	1.14	0.00	0.15	8.35
1939	1.44	0.84	0.24	0.50	0.58	0.00	0.00	1.07	2.24	0.47	0.40	0.12	7.90

TABLE 3: CASTLE DALE PRECIPITATION

Elevation - 5,800 Feet

YEAR	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEPT*	*OCT*	*NOV*	*DEC*	*ANNUAL*
1940	0.75	0.70	0.07	0.10	0.00	1.08	0.37	0.00	2.11	1.00	-	-	6.18
1941	-	-	0.07	1.86	2.73	1.10	0.44	1.95	0.73	3.65	0.30	0.42	13.25
1942	0.08	0.08	0.21	0.83	0.03	0.00	0.09	0.15	0.77	0.00	0.15	0.00	2.39
1943	0.08	0.00	-	0.59	-	-	-	-	-	-	-	-	0.67
1944	-	-	-	-	-	-	-	-	-	-	-	-	-
1945	-	-	-	-	-	-	-	-	-	-	0.10	0.35	0.45
1946	0.50	-	0.00	0.00	0.55	0.00	0.62	-	-	-	-	-	1.67
1947	-	-	-	-	-	-	-	-	-	-	-	-	-
1948	-	-	-	-	-	-	-	-	-	-	-	1.27	1.27
1949	1.13	0.31	-	-	-	0.60	1.12	0.00	0.50	1.02	0.05	1.05	5.78
1950	0.36	0.00	0.18	0.00	0.24	0.00	1.64	0.47	0.52	0.00	0.34	0.20	3.95
1951	0.13	0.10	-	0.45	0.95	0.09	0.34	2.24	0.08	1.50	1.17	0.96	8.01
1952	0.85	0.20	0.93	0.40	0.13	1.44	0.09	0.61	0.65	0.00	0.60	1.10	7.00
1953	0.15	0.00	0.50	0.32	0.40	0.20	0.75	1.62	0.00	1.48	0.65	0.12	6.19
1954	0.74	0.00	0.95	-	-	0.14	0.37	0.39	1.36	0.45	0.54	0.65	5.59
1955	0.87	-	0.00	0.00	0.01	0.10	-	-	-	-	-	-	0.98
1956	1.11	0.08	0.00	0.62	0.81	0.00	0.23	0.03	0.43	0.41	0.00	0.15	3.87
1957	0.90	0.34	0.10	1.48	2.23	0.74	1.34	1.77	0.00	2.07	2.45	0.35	13.77
1958	0.13	0.54	0.65	0.39	0.86	0.00	0.21	0.60	1.26	0.22	0.65	0.00	5.51
1959	0.02	1.07	0.00	0.42	0.18	0.12	0.43	0.76	1.60	0.36	0.31	0.69	5.96
1960	0.68	1.20	0.09	0.53	0.33	0.39	0.05	0.21	1.49	2.45	0.44	0.00	7.86
1961	0.00	0.00	1.17	0.77	0.33	0.08	0.89	3.27	3.68	0.56	0.41	0.37	11.53
1962	0.26	1.53	0.14	0.00	0.27	0.40	0.87	0.18	0.65	0.89	0.05	0.00	5.24
1963	0.13	0.00	0.26	0.28	0.06	0.28	0.02	1.65	1.12	0.23	0.18	0.00	4.21
1964	0.00	0.00	0.31	0.59	1.88	0.58	0.52	0.18	0.24	0.00	0.75	0.76	5.81
1965	0.08	1.16	0.59	1.32	1.32	2.01	2.47	1.43	1.14	0.23	1.28	1.25	14.28
1966	0.00	0.50	0.00	0.00	0.47	0.17	1.41	0.95	0.24	0.49	0.15	1.74	6.12
1967	0.53	-	0.03	-	1.79	1.46	0.49	0.28	0.85	-	0.09	1.60	7.12
1968	0.00	0.38	0.40	0.53	1.08	0.58	0.82	1.47	0.30	0.51	0.00	0.63	6.70
1969	1.72	0.96	0.13	0.14	1.32	1.30	0.16	2.06	0.52	0.63	-	-	8.94
1970	-	0.00	0.47	0.57	0.00	1.31	0.58	0.96	0.33	0.41	0.32	0.22	5.17
1971	0.31	0.62	0.00	0.21	0.76	0.16	0.19	0.54	0.05	1.63	0.21	0.94	5.62
1972	0.00	0.00	0.00	0.47	0.00	0.92	0.17	0.67	0.85	2.65	1.17	0.27	7.17
1973	0.42	0.71	0.97	1.18	0.23	0.54	0.91	0.42	0.07	0.17	0.19	0.14	5.95
1974	0.94	0.08	0.09	0.00	0.00	0.05	1.41	0.11	0.25	1.89	0.63	0.18	5.63
1975	0.29	0.23	0.85	0.06	0.21	1.01	1.34	0.11	0.31	0.13	0.36	0.02	4.92
1976	0.08	0.42	0.01	1.21	0.86	0.04	0.43	0.13	0.66	0.10	0.00	0.00	3.94
1977	0.37	0.00	0.00	0.06	1.41	0.09	2.16	0.84	0.36	0.31	0.16	0.44	6.20
1978	1.39	1.69	1.36	0.60	0.53	0.00	0.15	0.11	0.10	0.13	2.68	0.47	9.21
1979	1.52	0.66	1.64	0.05	0.74	0.04	0.00	1.50	0.00	0.01	0.11	0.26	6.53
1980	1.96	1.58	1.12	0.67	1.72	0.04	0.41	1.58	2.63	1.23	0.25	0.00	13.19

TABLE 3: CASTLE DALE PRECIPITATION

Elevation - 5,800 Feet

YEAR	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEPT*	*OCT*	*NOV*	*DEC*	*ANNUAL*
1981	0.01	0.08	1.93	0.15	0.53	0.21	0.74	0.57	1.56	1.44	0.31	0.20	7.73
1982	1.13	0.09	0.91	0.00	0.12	0.15	0.97	2.16	1.17	0.16	0.79	1.06	8.71
1983	1.07	0.46	0.96	0.25	0.23	0.30	1.25	0.40	0.74	0.49	1.24	1.07	8.46
1984	0.22	0.22	0.33	0.36	0.08	0.78	0.95	1.38	0.34	1.69	0.21	1.18	7.74
1985	0.34	0.16	0.96	1.02	0.72	0.19	1.78	0.11	0.88	0.98	1.54	0.55	9.23
1986	0.07	0.63	0.55	0.44	0.08	0.26	0.72	1.47	0.78	1.08	0.10	0.07	6.25
1987	0.48	0.45	0.74	0.53	1.03	0.80	2.50	1.65	0.09	1.54	1.02	0.66	11.49
1988	1.29	0.00	0.63	1.96	0.82	0.30	0.32	0.71	0.66	0.70	0.02	0.49	7.90
1989	0.45	0.22	0.42	0.02	0.33	0.42	0.70	2.11	0.56	0.17	0.03	0.03	5.46
1990	0.23	0.72	0.61	0.38	0.09	0.44	0.68	0.81	1.54	0.72	0.00	0.27	6.49
1991	0.18	0.12	0.85	0.13	0.92	0.90	0.89	1.01	2.13	0.20	0.60	0.13	8.06
1992	0.43	1.48	1.11	0.31	1.66	0.26	0.04	0.79	0.92	0.62	0.37	0.81	8.80
1993	2.32	1.77	1.44	0.45	1.85	0.19	0.03	0.54	0.20	1.46	0.68	0.18	11.11
1994	0.04	0.40	0.07	0.68	0.35	0.03	0.13	0.91	1.30	1.70	0.21	-	5.82
1995	0.96	0.24	0.80	1.42	1.69	0.61	0.87	1.42	0.47	0.00	0.16	0.19	8.83
1996	0.71	0.40	1.47	0.02	0.86	0.44	0.51	0.01	2.06	0.73	1.30	0.54	9.05
1997	1.17	0.18	0.00	0.91	0.59	1.61	1.13	2.77	2.50	0.43	0.38	0.05	11.72
1998	0.35	2.04	0.04	0.29	0.13	0.55	1.54	0.86	1.16	1.71	0.76	0.00	9.43
1999	0.17	0.28	0.00	1.64	0.19	0.54	1.15	2.50	1.14	0.00	0.00	0.12	7.73
2000	0.41	1.19	0.50	0.03	0.76	0.40	0.28	1.00	0.39	2.89	0.09	0.10	8.04
2001	1.14	1.03	0.47	0.23	0.53	0.23	0.81	0.82	0.76	0.16	0.75	0.17	7.10
2002	0.00	0.05	0.02	0.16	0.00	0.26	0.18	0.18	2.55	0.78	0.74	0.28	5.20
2003	0.02	0.37	1.22	0.08	0.56	0.12	0.00	0.87	0.30	0.29	0.56	0.91	5.30
2004	0.30	1.84	0.00	2.02	0.10	0.82	0.41	0.39	1.03	2.14	1.67	0.51	11.23
2005	2.01	1.11	0.17	0.19	0.40	2.11	0.15	0.58	1.00	1.37	0.26	0.06	9.41
2006	0.61	0.16	1.51	0.13	0.03	0.19	0.32	0.83	0.42	3.80	0.01	0.43	8.44
2007	0.40	0.01	0.24	0.52	0.40	0.05	0.43	3.04	1.22	0.43	0.03	1.33	8.10
2008	0.49	0.93	0.00	0.11	0.50	0.35	0.03	0.29	0.68	0.36	0.22	0.91	4.87
2009	0.07	0.37	0	0.59	0.7	0.69	0.07	0.21	0.6	0.32	0.00	1.53	5.15
Average	**0.64**	**0.58**	**0.53**	**0.53**	**0.62**	**0.51**	**0.78**	**1.08**	**0.91**	**0.85**	**0.51**	**0.55**	**7.56**

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	---	---	---	---	---	0.08	0.29	0.16	0.11	0.57	0.63	0.43	2.27
71-72	2.26	0.59	1.62	0.04	0.00	0.32	0.28	0.16	0.77	0.40	0.66	1.07	8.17
72-73	4.27	1.28	0.34	0.49	0.80	2.42	0.50	0.17	0.97	1.09	1.94	0.12	14.39
73-74	0.08	0.02	0.37	0.20	0.03	0.01	0.00	0.00	0.00	0.09	0.00	0.07	0.87
74-75	0.68	1.19	1.13	1.01	0.30	0.80	0.03	0.75	1.44	2.62	0.31	0.24	9.50
75-76	0.23	0.95	0.03	0.20	0.23	0.00	2.34	0.86	0.02	0.73	0.19	0.85	6.63
76-77	0.56	0.00	0.00	0.35	0.00	0.00	0.00	1.76	0.00	2.08	0.96	0.70	6.41
77-78	0.66	0.12	0.82	1.45	1.00	1.36	0.94	0.72	0.12	0.05	0.72	0.77	8.73
78-79	0.02	2.65	0.25	1.21	0.52	2.50	0.00	0.84	0.05	0.09	3.32	0.20	11.65
79-80	0.17	0.14	0.15	2.88	3.63	0.68	1.13	1.88	0.65	0.18	0.38	2.22	14.09
80-81	1.20	0.06	0.00	0.00	0.00	0.62	0.08	1.75	0.48	0.00	0.58	1.53	6.30
81-82	1.12	0.25	1.30	1.63	0.20	0.73	0.00	0.17	0.00	0.08	0.71	1.91	8.10
82-83	0.20	0.60	0.67	0.16	0.65	1.87	0.08	0.40	0.00	1.61	0.39	1.15	7.78
83-84	0.76	0.76	2.13	0.10	0.15	1.18	0.72	0.17	1.04	0.74	1.39	0.46	9.60
84-85	2.07	0.34	1.74	0.49	0.27	0.53	0.44	1.08	0.42	3.21	0.04	0.81	11.44
85-86	0.77	1.28	0.64	0.01	0.98	0.28	0.43	0.10	0.17	0.42	0.55	1.08	6.71
86-87	0.38	0.15	0.05	0.81	0.66	0.13	1.22	1.48	1.01	2.14	0.65	0.00	8.68
87-88	1.36	1.35	0.51	1.77	0.00	0.10	1.35	0.94	0.83	0.04	0.13	0.92	9.30
88-89	0.31	0.13	0.83	0.68	0.28	0.21	0.20	0.22	1.28	0.78	1.72	0.74	7.38
89-90	0.21	0.28	0.42	0.51	1.18	0.94	1.30	1.35	0.65	1.30	1.27	2.35	11.76
90-91	0.45	0.03	0.43	0.44	0.37	0.68	0.13	3.13	0.60	1.14	1.87	2.38	11.61
91-92	0.21	0.99	0.37	1.20	1.98	1.55	0.47	1.92	1.97	2.99	1.53	0.60	15.78
92-93	1.93	1.02	1.67	2.32	1.71	1.87	0.46	0.65	0.31	0.08	1.68	0.46	14.16
93-94	2.11	0.88	0.23	0.12	0.88	1.17	1.69	0.53	0.05	Tr.	2.14	1.69	11.49
94-95	1.33	0.26	0.33	1.10	0.26	1.05	2.65	2.67	1.17	0.32	2.81	1.48	15.42
95-96	NA	NA	0.90	1.10	0.86	1.52	0.46	1.41	0.72	1.15	0.19	2.18	-----
96-97	0.69	1.31	0.63	1.61	0.05	0.00	0.90	1.11	1.20	2.31	3.28	2.49	15.58
97-98	1.92	0.53	0.00	1.27	1.89	0.15	1.13	1.28	0.90	1.27	1.17	1.60	13.11
98-99	2.59	2.29	0.00	0.48	0.37	0.00	2.11	0.29	0.74	1.91	3.41	1.47	15.66
99-00	0.00	0.05	0.10	0.33	1.06	0.88	0.13	0.89	1.83	0.86	2.19	0.80	9.12
00-01	3.04	0.07	0.26	1.69	1.09	0.85	0.46	NR	NR	NR	NR	NR	
01-02	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
02-03	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
03-04	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
04-05	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
05-06	0.82	0.74	0.80	1.40	0.39	0.00	0.00	0.67	0.22	0.62	2.11	0.72	8.49
06-07	4.47	0.09	0.32	0.35	0.25	0.58	0.40	0.64	1.07	0.71	0.32	0.35	9.55
07-08	0.94	0.01	0.97	0.67	1.42	0.04	0.02	1.10	0.42	0.40	0.58	0.78	7.35
08-09	0.30	0.49	0.18	0.42	0.56	0.00	0.79	0.96	1.95	0.62	1.09	0.58	7.94
Average	**1.18**	**0.64**	**0.61**	**0.85**	**0.71**	**0.74**	**0.66**	**0.95**	**0.64**	**1.00**	**1.21**	**1.05**	**9.91**

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	0.36	1.05	0.66	0.47	0.40	2.15	0.78	19.88
71-72	3.49	1.69	4.07	3.35	0.58	0.70	1.02	0.28	1.49	0.70	0.80	2.91	21.08
72-73	4.18	3.43	3.27	0.97	2.09	2.74	3.67	1.42	0.85	0.82	1.23	1.15	25.82
73-74	0.79	1.90	3.52	2.70	1.12	1.52	2.49	0.20	0.13	2.09	0.06	0.09	16.61
74-75	2.27	0.62	1.73	2.10	2.37	3.42	1.23	3.21	1.08	1.93	0.49	0.25	20.70
75-76	1.31	2.57	0.82	1.44	2.23	1.35	1.47	2.00	1.23	1.07	0.54	1.19	17.22
76-77	1.00	0.25	0.14	0.76	1.14	2.00	0.05	3.00	0.90	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	0.30	0.10	0.24	0.77	21.40
78-79	0.40	3.18	2.66	2.90	2.18	2.53	0.72	1.67	0.19	0.96	2.29	0.32	20.00
79-80	1.55	2.23	0.37	4.95	6.01	3.34	1.27	3.09	0.12	0.37	0.38	1.80	25.48
10-Year	1.89	2.03	2.62	2.40	2.21	2.11	1.54	1.67	0.67	1.07	0.95	1.05	20.22
80-81	1.45	0.98	0.32	1.30	1.04	3.20	1.45	3.06	0.39	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	0.59	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	1.27	1.56	2.77	3.23	1.73	3.41	2.55	2.26	1.47	34.64
84-85	2.92	2.63	3.24	1.54	1.09	3.54	1.95	1.19	0.89	3.04	0.03	4.35	26.41
85-86	4.40	6.62	1.99	1.81	8.54	2.48	3.79	1.62	0.26	1.01	1.68	2.73	36.93
86-87	1.86	1.98	0.55	2.14	2.07	2.47	1.03	2.93	0.79	2.12	1.22	0.49	19.65
87-88	1.39	1.68	3.50	3.06	0.72	3.32	2.14	1.60	0.86	1.04	2.23	1.16	22.70
88-89	1.20	2.68	1.91	1.52	1.99	3.55	0.35	0.06	1.54	1.43	1.37	1.19	18.79
89-90	1.21	1.88	0.70	2.00	4.06	2.30	2.00	0.81	1.87	1.08	0.62	1.87	20.40
90-91	1.32	0.90	1.64	1.49	1.64	4.24	3.06	2.60	0.57	1.04	1.39	2.70	22.56
91-92	1.43	2.10	0.87	0.72	2.21	1.95	0.54	1.55	1.01	0.59	1.64	1.02	15.63
92-93	1.51	1.33	3.60	5.01	4.76	2.25	2.49	2.40	1.57	0.48	1.32	0.60	27.32
93-94	2.10	2.19	0.90	1.00	4.00	1.10	2.81	0.99	0.10	0.25	0.75	2.32	18.51
94-95	2.40	4.26	1.60	3.25	1.90	3.84	3.94	5.07	2.04	1.00	2.53	1.95	33.78
95-96	1.54	1.38	3.54	5.84	3.25	3.23	1.75	1.73	0.90	1.09	0.45	2.20	26.90
96-97	1.43	2.35	3.90	4.00	1.31	0.77	1.97	2.03	1.03	0.64	1.98	4.45	25.86
97-98	2.30	1.88	2.00	3.65	3.60	2.86	1.80	1.82	2.30	2.01	1.86	1.68	27.76
98-99	3.65	2.98	1.15	4.05	1.70	1.44	4.95	2.03	1.28	2.90	3.54	1.20	30.87
99-00	0.15	0.38	1.61	4.19	4.45	1.98	0.66	2.12	2.32	0.00	2.60	1.65	22.11
00-01	3.47	1.21	2.19	1.54	2.80	0.79	2.41	1.49	0.37	1.56	3.40	1.01	22.24
01-02	1.35	3.40	1.12	1.08	0.82	2.31	1.68	0.40	0.35	0.58	0.20	3.60	16.89
02-03	2.64	2.08	2.69	0.25	2.07	2.89	2.72	1.47	0.80	0.33	2.24	0.59	20.77
03-04	0.66	2.49	3.71	2.12	2.69	0.66	2.19	0.12	1.30	0.72	0.39	0.45	17.50
04-05	4.35	2.59	2.05	3.94	2.53	2.01	1.41	1.90	1.26	0.65	1.23	1.40	25.32
05-06	1.53	2.26	3.92	2.92	1.70	5.59	4.72	0.50	0.95	0.90	1.03	1.88	27.90
06-07	3.49	2.52	1.06	0.43	2.48	1.80	1.40	1.44	0.73	1.70	2.18	1.62	20.85
07-08	2.45	1.60	4.07	NA	NA	NA	NA	NA	1.15	1.47	0.30	0.87	11.91
08-09	No Precipitation Data was Collected from this Site in 2009.												
Average	**2.03**	**2.29**	**2.36**	**2.49**	**2.58**	**2.64**	**2.08**	**1.79**	**1.01**	**1.22**	**1.42**	**1.68**	**23.25**

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

TABLE 6: EAST MOUNTAIN PRECIPITATION

Elevation - 8,985 Feet

Water Year	*OCT*	*NOV*	*DEC*	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEPT*	*TOTAL*
80-81	1.28	0.39	0.05	0.29	0.52	2.77	0.64	0.87	0.11	0.57	0.85	2.55	10.90
81-82	1.93	0.53	0.97	3.22	0.14	1.67	0.00	0.45	0.09	1.86	1.10	2.61	14.57
82-83	0.38	2.90	1.39	1.30	1.81	1.98	0.92	0.71	0.61	1.27	4.83	1.62	19.71
83-84	0.76	2.43	2.42	0.27	0.65	1.22	0.50	0.22	1.18	1.90	2.33	0.64	14.53
84-85	3.27	0.97	1.67	0.49	0.59	1.77	1.35	1.73	0.28	2.47	0.12	2.31	17.02
85-86	1.15	2.38	0.87	0.30	2.10	1.43	1.05	0.38	0.53	0.87	2.24	1.63	14.92
86-87	1.57	0.39	0.16	1.37	1.37	1.65	1.16	1.77	0.58	2.49	1.16	0.06	13.73
87-88	2.77	1.91	1.29	1.42	0.00	0.99	2.08	1.03	0.81	0.45	0.96	0.91	14.61
88-89	0.61	0.43	1.56	1.00	0.68	1.03	0.26	0.47	0.43	1.19	2.44	0.49	10.59
89-90	0.28	0.39	0.16	0.74	2.08	1.75	1.03	0.26	0.67	0.88	1.03	1.62	10.90
10-Year	1.40	1.27	1.05	1.04	0.99	1.63	0.90	0.79	0.53	1.40	1.71	1.44	14.15
90-91	0.48	0.26	0.66	0.34	0.39	2.34	0.59	1.83	0.21	1.01	1.48	3.11	12.69
91-92	0.49	1.07	0.07	0.61	1.73	2.39	0.56	2.19	0.95	0.85	0.48	0.35	11.74
92-93	1.57	0.57	1.53	4.10	2.34	2.01	0.33	0.72	0.19	0.04	0.82	0.14	14.37
93-94	2.23	1.12	0.14	0.32	1.35	0.34	2.65	0.36	0.39	0.10	0.83	1.49	11.33
94-95	1.86	1.42	0.65	1.37	0.66	0.79	3.75	2.29	1.19	0.34	1.52	0.62	16.46
95-96	0.18	0.46	0.64	1.39	1.18	2.23	0.21	1.14	0.30	0.58	0.35	3.46	12.12
96-97	1.50	1.63	1.66	2.49	1.56	0.00	0.40	0.91	0.15	0.15	1.30	2.43	11.75
97-98	0.24	0.84	0.23	0.97	3.34	0.71	0.81	0.37	0.04	0.78	0.57	2.16	11.06
98-99	3.01	1.08	0.00	0.75	0.34	0.07	2.82	0.36	1.21	2.08	2.24	0.78	14.73
99-00	0.04	0.05	0.28	0.48	3.27	1.56	0.15	0.72	0.59	0.03	2.03	0.96	10.16
20-Year	1.28	1.06	0.82	1.16	1.30	1.43	1.06	0.94	0.53	1.00	1.43	1.50	13.39
00-01	3.48	0.62	0.39	1.96	1.21	1.03	1.12	1.39	0.19	0.58	1.09	0.12	13.17
01-02	0.11	0.40	0.18	0.03	0.19	0.10	0.16	0.00	0.06	0.26	0.69	4.15	6.34
02-03	0.73	0.82	0.75	0.01	0.96	1.20	0.37	0.57	0.37	0.06	1.59	0.94	8.36
03-04	0.27	0.86	1.95	0.21	2.73	0.00	1.94	0.12	1.27	0.49	0.67	0.38	10.89
04-05	2.56	2.06	1.16	3.47	1.41	0.63	1.19	1.04	1.36	0.44	0.83	1.07	17.22
05-06	1.44	0.64	0.98	0.87	0.41	3.67	0.44	0.03	0.55	0.58	0.50	0.48	10.59
06-07	3.66	0.21	0.48	0.25	0.18	0.96	0.98	0.19	0.05	0.70	0.89	0.99	9.54
07-08	0.87	1.74	1.44	0.95	1.36	0.27	0.47	1.06	0.17	0.16	1.53	0.12	10.14
08-09	0.47	0.54	1.51	0.42	1.48	0.18	0.93	2.10	1.26	0.49	0.75	0.45	10.58
Average	**1.35**	**1.01**	**0.87**	**1.08**	**1.24**	**1.28**	**0.99**	**0.87**	**0.54**	**0.84**	**1.30**	**1.34**	**12.65**

TABLE 7: TEMPERATURES IN EMERY COUNTY, UTAH (2009 Water Year)

	Castle Dale**		Huntington Plant		East Mountain	
2008	*Average Temperature**	*Departure From Normal*	*Average Temperature**	*Departure From Normal*	*Average Temperature**	*Departure From Normal*
October	49.7	1.3	49.9	0.5	49.0	7.7
November	39.3	1.0	40.2	4.2	37.7	8.2
December	22.1	0.0	24.3	-3.1	22.5	0.2
2009						
January	24.9	3.5	20.5	-3.1	33.4	9.6
February	33.6	6.2	29.6	-0.6	28.6	3.4
March	42	2.3	38.6	0.9	24.4	-6.5
April	47.8	1.5	43.9	-1.2	34.3	-3.4
May	60.5	3.2	58.3	3.4	54.0	6.8
June	63.9	-0.4	60.7	-5.1	54.7	-2.7
July	74.2	0.2	74.4	2.7	63.7	-1.3
August	69.3	-0.7	69.4	0.0	60.8	-2.2
September	64.3	1.8	64.1	3.7	59.6	6.1
AVERAGE	49.3	1.7	47.8	0.2	43.6	2.2

* Temperatures reported in degrees Fahrenheit.
** Tranferred Site from Hunter Plant to Castle Dale

TABLE 8: COMPARISON OF 2008 AND 2009 TEMPERATURES*

Station	2008 Average Temperature	2008 Departure From Normal	2009 Average Temperature	2009 Departure From Normal	2009 Departure From 2008
Castle Dale	46.2	-0.5	49.3	1.7	3.1
Huntington Plant	50.5	2.9	46.1	-1.6	-4.4
East Mountain	44.6	-3.2	43.6	2.2	-1.0
Average Departure From Normal		-0.3		0.7	

* Temperatures reported in degrees Fahrenheit.

TABLE 9: HUNTINGTON CREEK WATER FLOWS (2009 Water Year)

	*Huntington Creek Below Electric Lake**	*Huntington Creek At Plant**
Total Yearly Flow (Acre Feet)	14,361	54360
% of Normal	66	78
Mean Discharge in Cubic Feet Per Second (CFS)	19.8	74.8
Maximum Discharge (CFS)	128	498
Date of Maximum Discharge	28 May, 09	28 May, 09
Minimum Discharge (CFS)	5	5
Date of Minimum Discharge	1 Nov, 08 & 5 Mar, 09	1 December, 09

*Influenced by upstream storage in Electric Lake.
** Does not include Left Fork Reservoir regulation

TABLE 10: DISCONTINUED

TABLE 11: HUNTINGTON CREEK WATER QUALITY *

HCC01 - ABOVE POWER PLANT

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20090324	0	208	64.6	0	16	563	8.8	289	0.13	0	30.96	0.005	0	8.39	1.82	13.17	59	10	341
20090618	0	154	52.76	7	5	358	8.2	191	0.27	0	14.47	0	0	8.63	0.82	4.46	19	13	233
20090909	0	154	47.06	5	7	367	8.2	189	0.17	0	17.28	0	0	8.55	1.14	6.05	22	13	219
20091202	0	218	59.97	0	12	527	9	269	0.12	0	29.07	0	0	8.58	1.93	11.82	59	5	318
2009**																			
MIN	0	154	47	0	5	358	8.20	189	0.12		14.47	0.00		8.39	0.82	4	19	5	219
MAX	0	218	65	7	16	563	9.00	289	0.27		30.96	0.01		8.63	1.93	13	59	13	341
MEAN	0	184	56	3	10	454	8.55	235	0.17		22.95	0.00		8.54	1.43	9	40	10	278
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2008**																			
MIN		144	52.7	0.0	4.0	361	7.80	185	0.12		12.94	0.01		8.34	0.78	3.89	15.0	0.0	229
MAX		216	65.8	15.0	20.0	630	15.10	306	1.05		34.36	0.07		8.60	2.08	15.49	83.0	11.0	399
MEAN		181	58.5	7.7	11.0	498	10.73	243	0.39		23.53	0.03		8.51	1.52	9.11	45.8	5.7	296
2007**																			
MIN		152	49	8	5	401	10.89	188	0.13		16	0.01		8.23	0.70	4	18	13	193
MAX		207	61	8	12	599	13.12	260	0.30		27	0.03		8.51	1.68	11	54	19	301
MEAN		181	56	8	9	486	11.80	226	0.23		21	0.02		8.40	1.39	7	36	15	250
2006**																			
MIN		157	47		5	387	11.61	177	0.12		14	0.00		7.99	0.75	4	19	8	209
MAX		233	73		20	701	14.32	324	8.77		35	0.02		8.43	1.93	18	85	969	467
MEAN		198	61		11	531	13.17	252	2.34		24	0.01		8.19	1.32	10	47	251	306
2005**																			
MIN		161	49		3	362	9.42	178	0.08		14	0.01		8.28	0.69	3	15	14	204
MAX		221	65		21	641	12.43	291	0.49		31	0.05		8.45	2.36	18	66	38	366
MEAN		193	58		10	484	10.87	232	0.27		21	0.02		8.34	1.46	10	38	28	280
2004**																			
MIN		154	44	6	5	332	5.27	173	0.12		15	0.01		8.41	0.84	5	17	13	153
MAX		245	59	6	15	485	14.66	245	0.28		24	0.09		8.63	1.74	13	45	37	287
MEAN		196	53	6	9	425	10.27	215	0.22		20	0.05		8.48	1.25	8	33	23	237
2003**																			
MIN		193	46	5	6	222	4.73	206	0.11		19	0.01		8.25	1.16	7	27	6	200
MAX		237	58	5	14	525	7.01	250	0.70		26	0.03		8.56	1.96	13	51	17	321
MEAN		216	53	5	9	395	6.20	221	0.29		22	0.02		8.42	1.54	10	37	11	250
2002**																			
MIN		195	45	8	5	358	10.65	178	0.20		16			8.40	1	7	20	17	153
MAX		232	52	8	11	461	13.62	216	2.10		21			8.58	1	10	38	143	276
MEAN		217	49	8	8	413	11.86	199	0.83		19			8.46	1	9	30	63	230
2001**																			
MIN	126	170	43	5	5	348	8.20	153	0.10		11			8.43	1	5	14	7	196
MAX	400	265	58	5	15	574	8.20	248	0.50		25			8.61	2	15	45	37	290
MEAN	218	220	50	5	10	459	8.20	201	0.30		19			8.52	2	9	30	21	243
2000**																			
MIN		176	41	6	3	304	5.40	148	0.20		11			8.28	1	2	10	10	168
MAX		254	57	6	18	490	12.00	233	0.20		22			8.53	1	13	36	27	285
MEAN		216	50	6	9	398	9.58	193	0.20		17			8.39	1	7	22	19	229
HISTORICAL 1990-2008																			
MIN	0.1	126	32.7	0.1	1.0	210	3.8	118	0.01	0.01	9.00	0.00	0.1	7.10	0.01	1.00	2.0	0.00	134
MAX	25.0	400	102.6	38.0	45.0	701	15.1	392	13.30	0.25	44.70	0.30	7.0	8.90	5.00	55.00	130.0	969.00	467
MEAN	4.9	217.1	56.6	4.7	12.1	409.4	8.6	220.8	0.50	0.09	19.35	0.05	2.5	8.38	1.34	8.04	31.7	31.54	238
No. of Analysis		111	111	72	110	121	116	111	100	61	111	75	57	121	93	110	111	113	121

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 12: HUNTINGTON CREEK WATER QUALITY *

HCC02 - @ POWER PLANT (BELOW DEER CREEK CONFLUENCE)

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20090324	0	217	64.36	0	33	686	8.7	306	0.16	0	35.31	0.004	0	8.41	3.03	27.66	78	10	422
20090618	0	157	52.69	0	7	370	8	194	0.26	0	15.23	0	0	8.61	0.92	5.7	22	17	229
20090909	0	155	46.59	9	9	411	8	199	0.19	0.14	20.06	0	0	8.5	1.61	9.74	36	16	235
20091202	0	227	58.72	0	19	595	9.2	284	0.12	0	33.39	0	0	8.58	2.61	20.63	75	12	389
2009**																			
MIN	0	155	47	0	7	370	8.00	194	0.12		15	0.00		8.41	0.92	6	22	10	229
MAX	0	227	64	9	33	686	9.20	306	0.26		35	0.00		8.61	3.03	28	78	17	422
MEAN	0	189	56	2	17	515.5	8.48	245.75	0.18		26	0.00		8.53	2.04	16	53	14	319
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2008**																			
MIN		158	53	0	4	363	7.90	186	0.08		13	0.01		8.38	0.78	4	15	0	216
MAX		213	64	8	34	686	15.00	307	1.03		36	0.08		8.66	2.49	24	88	69	425
MEAN		186	59	3	16	508.5	10.73	247.75	0.36		24	0.02		8.54	1.65	13	49	21	309
2007**																			
MIN		158	48	10	5	412	10.15	185	0.14		16	0.01		8.27	1	4	19	8	192
MAX		215	61	10	22	681	14.04	270	0.24		29	0.03		8.56	2	19	66	15	330
MEAN		187	55	10	12	514.75	11.83	228.5	0.19		22	0.02		8.41	2	10	40	11	261
2006**																			
MIN		157	47		6	400	11.50	179	0.10		15	0.00		8.07	1	5	20	8	215
MAX		235	73		76	899	14.31	332	11.93		36	0.01		8.48	2	51	86	1420	498
MEAN		200	61		27	596.5	13.31	258.25	3.10		25	0.01		8.31	1	20	48	363	318
2005**																			
MIN		164	48	5	4	372	9.49	182	0.08		15	0.01		8.34	1	5	17	8	223
MAX		220	63	5	32	674	14.78	284	0.38		31	0.05		8.48	2	29	73	37	389
MEAN		194	56	5	14	498	11.79	229.75	0.23		22	0.02		8.40	2	14	41	26	289
2004**																			
MIN		153	45	6	6	336	5.61	177	0.15		16			8.29	1	5	18	12	166
MAX		226	58	6	51	609	14.61	248	0.57		25			8.59	2	32	47	41	368
MEAN		192	53	6	20	463.5	10.25	217.25	0.34		20			8.42	1	15	35	26	265
2003**																			
MIN		221	47	5	7	422	4.70	212	0.11		19			8.16	1	8	28	7	213
MAX		251	56	7	19	634	6.96	250	0.78		26			8.57	2	16	53	50	318
MEAN		234	53	6	13	511.25	6.22	226.5	0.31		23			8.44	2	12	39	21	258
2002**																			
MIN		198	44	5	6	369	10.08	180	0.20		17			8.42	1	8	22	16	172
MAX		248	53	6	16	569	13.84	227	1.60		23			8.58	2	14	43	128	300
MEAN		226	49	6	11	457.25	11.88	204.75	0.75		20			8.48	1	11	33	79	251
2001**																			
MIN		172	44	8	6	364	8.20	159	0.10		12	0.05		8.30	2	6	16	9	200
MAX		284	59	8	32	642	8.20	259	0.60		27	0.05		8.65	2	23	52	33	338
MEAN		226	50	8	19	507	8.20	207.75	0.37		20	0.05		8.50	2	14	35	21	268
2000**																			
MIN		175	41	5	5	316	5.90	148	0.10		11			8.27	1	3	14	15	169
MAX		279	60	5	34	587	11.90	261	0.20		27			8.52	2	22	65	27	339
MEAN		226	50	5	17	456	10.03	206.5	0.17		20			8.36	2	12	36	21	257
HISTORICAL 1990-2008																			
MIN	0	151	32	0	1	210	3.8	129	0.01	0	8	0	0	7.14	0.01	1	4	0	161
MAX	33	310	91.7	37	76	899	15	448	11.93	0.21	39.9	1	5.1	8.98	5	51.2	150	1420	498
MEAN	5.4	220.2	58.0	4.5	15.3	447.4	8.6	232.7	0.5	0.1	20.8	0.1	2.3	8.4	1.7	10.7	39.5	37.2	262.2
No. of Analysis	62	110	110	77	109	120	115	110	102	61	110	73	58	120	91	110	110	114	120

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater than laboratory minimum detection limit.

TABLE 13: HUNTINGTON CREEK WATER QUALITY *

HCC04 - @ RESEARCH FARM

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20090324	0	218	67	0	45	757	9	325	0	0	38	0.00	0	8.40	2.92	34	88	10	438
20090618	0	149	53	13	7	376	8	197	0	0	16	0.00	0	8.60	0.92	6	23	15	234
20090909	0	156	47	7	10	415	8	203	0	0	21	0.00	0	8.49	1.61	11	39	21	243
20091202	0	226	62	9	33	695	9	305	0	0	37	0.00	0	8.56	2.89	32	95	5	450
2009**																			
MIN		149	47	0	7	376	8.10	197	0.00	0.00	16	0.00	0.00	8.40	0.92	6	23	5	234
MAX		226	67	13	45	737	9.20	325	0.26	0.00	38	0.00	0.00	8.60	2.92	34	95	21	450
MEAN		187	57	7	24	555.75	8.58	257.5	0.14	0.00	28	0.00	0.00	8.51	2.09	21	61	13	341
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2008**																			
MIN		141	53		4	366	7.80	186	0.09		13	0.01		8.40	0.81	4	16	0	220
MAX		215	65		39	720	14.70	316	1.17		38	0.08		8.60	2.53	28	95	12	439
MEAN		183	59		19	547.25	10.57	254.25	0.40		26	0.03		8.52	1.72	15	54	7	321
2007**																			
MIN		161	49		7	428	10.18	189	0.15		16	0.01		8.31	1	6	23	8	208
MAX		212	62		25	700	13.79	279	0.26		31	0.03		8.59	3	22	73	38	370
MEAN		187	56.5		15.0	536.25	11.99	235.75	0.20		22.99	0.02		8.44	1.60	12.36	45.8	19.0	283.3
2006**																			
MIN		159	48		8	420	11.58	184	0.12		16	0.01		8.02	1	7	25	6	215
MAX		235	78		104	1036	14.59	366	16.43		42	0.01		8.50	3	70	109	1370	589
MEAN		199	63		38	663	13.52	274	4.46		28	0.01		8.33	2	27	61	358	351
2005**																			
MIN		163	48		4	378	9.07	186	0.10		15	0.00		8.06	1	5	19	38	225
MAX		215	68		48	784	12.69	312	0.42		35	0.05		8.47	2	34	97	57	459
MEAN		191	59		21	545	10.34	244	0.26		24	0.02		8.32	1	16	53	45	323
2004**																			
MIN		153	45	6	7	360	5.46	179	0.11		16	0.02		8.41	1	7	22	15	205
MAX		248	60	7	54	640	14.64	262	0.46		27	0.03		8.61	2	33	65	40	384
MEAN		198	55	7	23	493	10.25	226	0.25		22	0.02		8.49	1	16	44	24	287
2003**																			
MIN		211	49	5	11	444	4.65	218	0.11	0.01	20	0.01		8.34	1	10	34	7	282
MAX		251	61	6	38	658	7.07	282	0.84	0.01	32	0.03		8.57	2	26	79	56	377
MEAN		233	56	6	24	530	6.28	244	0.34	0.01	26	0.02		8.49	2	18	56	25	307
2002**																			
MIN		196	44	6	8	397	10.24	184	0.20		18			8.41	1	10	25	17	197
MAX		240	57	8	27	722	13.60	254	1.60		27			8.59	2	21	70	103	343
MEAN		224	51	7	18	524	11.89	220	0.63		23			8.50	1	15	47	55	289
2001**																			
MIN		181	46	5	8	382	8.30	168	0.10		13			8.36	2	8	20	8	197
MAX		294	67	5	51	727	8.30	303	0.30		33			8.59	2	35	87	29	432
MEAN		232	54	5	27	556	8.30	227	0.20		23			8.46	2	20	50	18	298
2000**																			
MIN		175	42	8	7	328	6.50	4	0.20		12			8.35	2	3	17	10	187
MAX		268	61	8	32	640	11.80	268	0.20		29			8.45	2	23	74	31	371
MEAN		225	52	8	20	484	9.80	173	0.20		21			8.38	2	13	45	21	276
HISTORICAL 1991-2008																			
MIN	0.0	96	35.3	0.0	2.0	220	4.2	145	0.01	0.00	9.90	0.000	0.0	7.35	0.01	2.00	9.0	0.00	170
MAX	29.0	326	108.1	44.0	104.0	1036	14.7	397	16.43	0.37	42.00	0.30	5.0	8.94	10.70	91.00	185.0	1370.00	589
MEAN	4.9	226	61.2	4.8	20.1	486.5	8.5	248.4	0.57	0.09	23.09	0.05	2.2	8.39	1.67	14.80	56.1	34.62	295.4
No. of Analysis	69	117	117	81	117	134	130	116	105	67	117	77	58	135	99	117	117	128	135

* Quality parameters are reported as mg/l unless otherwise noted.

**Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 14: DEER CREEK SURFACE WATER QUALITY *

DCR01 - ABOVE THE MINE

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
2009**	NO SAMPLES DURING 2009																	
2008**																		
MIN	0	205	39.54	18	4	529	207	0	0	26.31	0	na	8.71	0.96	32.66	34		268
MAX	0	205	39.54	18	4	529	207	0	0	26.31	0	na	8.71	0.96	32.66	34		268
MEAN	0	205	39.54	18	4	529	207	0	0	26.31	0	na	8.71	0.96	32.66	34		268
2007**	NO SAMPLES DURING 2007																	
MIN																		
MAX																		
MEAN																		
2006**																		
MIN		238	43		6	538	223	0.06		28			8.39	1	30	35	15	279
MAX		283	49		8	720	259	0.06		33			8.59	1	47	68	15	406
MEAN		261	46		7	629	241	0.06		31			8.49	1	39	52	15	343
2005**																		
MIN		258	49	5	5	567	268	0.23		31	0		8.18	1	30	37	27	328
MAX		278	56	5	7	702	268	0.23		35	0		8.46	1	61	63	27	403
MEAN		268	53	5	6	635	268	0.23		33	0		8.32	1	45	50	27	366
2004**																		
MIN		244	43		4	505	213			26				1	33	34	11	314
MAX		244	43		4	505	213			26				1	33	34	11	314
MEAN		244	43		4	505	213			26				1	33	34	11	314
2003**	NO FLOW DURING 2003																	
2002**	NO FLOW DURING 2002																	
2001**																		
MIN		317	41	8	5	620	222	0.20		26			8.30		31	41	35	307
MAX		321	46	8	7	662	226	0.20		30			8.72		45	63	35	366
MEAN		319	44	8	6	641	224	0.20		28			8.51		38	52	35	337
2000**																		
MIN		307	39		4	547	218			28			8.45		42	46	6	329
MAX		325	41		6	615	233			33			8.48		48	74	6	378
MEAN		316	40		5	581	226			31			8.47		45	60	6	354
HISTORICAL 1978-2008																		
MIN	0.1	205	2.2	0.1	3.5	360	193.00	0.00	0.00	19.3	0.00	0.10	6.97	0.0	13.40	10	0.5	231
MAX	137.0	397	107.2	19.0	176.0	1580	599.00	40.10	0.35	83.9	0.24	5.00	8.81	4.3	111.60	255	3592	897
MEAN	11.2	304	53.3	5.9	16.7	594.5	275.73	0.80	0.08	34.0	0.04	1.17	8.04	1.2	33.81	60.3	91.8	346.093
No. of Analysis	27	45	45	33	46	85	45	75	21	45	67	25	86	35	45	47	78	86

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 15: DEER CREEK SURFACE WATER QUALITY *

DCR06 - BELOW THE MINE

2009* SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20090324		368	69.6	0	107	1142	413.00	0	0.0	58.08	0	0.00	8.32	9	91	158	13	707
20090618		245	56.3	0	62	917	364.00	0.13	0.0	54.34	0	0.00	8.61	5	60	145	12	529
20090909		255	63.6	0	38	1009	412.00	0.29	0.0	61.59	0	0.00	8.38	9	63	211	22	647
20091202		273	50.8	12	43	860	326.00	0.11	0.0	48.41	0	0.00	8.64	6	57	115	0	510
2009**																		
MIN		245	50.8	0.0	38	860	326	0	0	48	0	0	8	5	57	115	0	510
MAX		368	69.6	12.0	107	1142	413	0	0	62	0	0	9	9	91	211	22	707
MEAN		285	60.1	3.0	63	982	379	0	0	56	0	0	8	7	68	157	12	598
Analysis		4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2008**																		
MIN		229	50	0	45	827	325	0	0	49	0	0	8	5	50	93	0	466
MAX		267	63	26	149	1279	387	0	0	56	0	0	9	7	109	151	7	744
MEAN		247	56	12	90	1027	350	0	0	51	0	0	9	6	74	123	4	588
2007**																		
MIN		243	54		30	871	332	0		46	0			5	39	74	71	431
MAX		276	66		79	988	371	1		50	0			7	64	126	71	540
MEAN		265	62		51	951	353	1		48	0			6	47	96	71	486
2006**																		
MIN		235	49		65	937	281	0		39	0			2	62	71	5	510
MAX		289	75		409	2255	406	0		57	0			6	275	113	25	1172
MEAN		267	60		179	1344	350	0		48	0			4	127	96	12	703
2005**																		
MIN		246	43		45	720	278	0		37	0			2	46	59	32	429
MAX		267	65		209	1472	375	0		51	0			6	136	109	56	791
MEAN		257	53		89	969	315	0		45	0			4	70	85	44	543
2004**																		
MIN		247	48	6	62	799	307	0			0			4	49	85	102	445
MAX		343	63	7	431	1876	351	4			0			6	254	101	216	1042
MEAN		278	54	7	196	1196	326	1			0			5	122	92	159	662
2003**																		
MIN	10	256	52.8	6	94	435	340	0.03		48			8.46	5.01	69	102	12	511
MAX	10	371	57.8	17	136	969	358	0.12		52			8.63	5.63	91	110	12	602
MEAN	10	316	55.8	10	109	780	348	0.07		51			8.57	5.35	77	106	12	563
2002**																		
MIN		266	41.0		49	735	279	0.20		43			8.50	5.00	48	87	6	400
MAX		338	53.0		93	932	322	0.20		46			8.66	5.00	68	112	6	559
MEAN		303	49.0		73	860	306	0.20		45			8.56	5.00	59	98	6	501
2001**																		
MIN		298	47.0		39	777	261	0.10		35			8.40	2.00	36	77	6	452
MAX		327	68.0		177	1364	396	0.10		55			8.65	5.00	137	136	9	779
MEAN		309	55.0		101	1015	320	0.10		44			8.50	4.00	80	108	8	565
2000**																		
MIN		286	51.0		59	858	309	0.10		44			8.19	5.00	50	99	5	494
MAX		332	65.0		77	945	389	0.70		55			8.41	6.00	57	161	63	551
MEAN		313	56.3	6	68	889	341	0.40		49			8.31	5.33	53	128	25	520
HISTORICAL 1978-2008																		
MIN	0.1	162	2.4	0.0	5.0	420	243.00	0.00	0.00	27.140	0.0	0.00	6.92	1.00	28.1	59.00	0	273
MAX	90.0	456	191.9	38.0	1112.0	4590	990.00	170.00	1.22	124.00	0.3	9.00	8.94	10.30	758.0	610	20540	2460
MEAN	6.3	304.8	73.2	5.4	103.5	1031.7	403.7	1.6	0.1	52.6	0.0	1.5	8.3	4.8	83.3	162.9	198.4	628.9
No. of Analysis	62	108	108	80	109	154	108	129	55	108	102	62	155	108	108	110	136	155

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 16: MEETINGHOUSE CANYON WATER QUALITY *

MHC01 - LEFT FORK

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
2009**	NO FLOW DURING 2009 - ELK SPRING AND SPRING 89-61 WAS DEVELOPED BY NEWUSSD IN 2009																	
2008**																		
MIN		183	36.18		3.0	437	208	0.09		24.34			8.62	0.81	6.8	17	12	249
MAX		198	48.26		3.0	451	221	0.72		28.53			8.66	1.13	9.8	22	25	291
MEAN		191	42.22		3.0	444	215	0.41		26.44			8.64	0.97	8.3	20	19	270
2007**																		
MIN		191	37		4.0	485	221	0.33		31.60			8.39	0.90	10.0	28	31	223
MAX		191	37		4.0	485	221	0.33		31.60			8.39	0.90	10.0	28	31	223
MEAN		191	36.5		4.0	485	221	0.33		31.60			8.39	0.90	10.0	28.0	31.0	223
2006**																		
MIN		199	42		5.0	437	219	0.07		27.40			8.37	0.93	8.2	26	22	222
MAX		207	43		5.0	498	229	0.14		29.41			8.59	1.05	10.5	30	22	262
MEAN		203	43		5.0	468	224	0.11		28.41			8.48	0.99	9.4	28	22	242
2005**																		
MIN		204	41		4.0	446	237	0.40		30.80	0.006		8.41	0.94	8.9	33		261
MAX		215	51		5.0	532	255	0.56		32.80	0.012		8.56	1.21	11.6	42		301
MEAN		210	46		4.5	489	246	0.48		31.80	0.009		8.49	1.08	10.2	38		281
2004**																		
MIN		210	49		3.0	420	221	0.10		23.90	0.007		8.40	0.71	6.5	18		264
MAX		210	49		3.0	420	221	0.10		23.90	0.007		8.40	0.71	6.5	18		264
MEAN		210	49		3.0	420	221	0.10		23.90	0.007		8.40	0.71	6.5	18		264
2003**	NO FLOW DURING 2003																	
2002**	NO FLOW DURING 2002																	
2001**																		
MIN		236	34	5	3.2	438	200	0.30		27.00			8.56		9.0	28	7	257
MAX		240	40	8	3.6	517	211	0.30		28.00			8.71		11.0	31	29	265
MEAN		238	37	7	3.4	478	206	0.30		27.50			8.64		10.0	30	18	261
2000**																		
MIN		241	34	5	3.0	395	199	0.40		26.00			8.29	1.00	7.0	20	50	212
MAX		262	37	5	3.0	398	204	1.20		29.00			8.47	1.00	11.0	24	66	239
MEAN		252	36	5	3.0	397	202	0.80		27.50			8.38	1.00	9.0	22	58	226
HISTORICAL 1986-2008																		
MIN	0.0	183	2.2	0.0	1.0	300	175.00	0.02	0.00	17.200	0.0	0.00	7.03	0.01	3.8	8.00	0.1	183
MAX	49.0	307	80.4	34.0	47.5	557	350.00	1.20	0.30	36.50	0.1	10.90	8.81	1.62	14.0	100.00	175	304
MEAN	6.6	235	44.7	6.0	6.8	425	229.33	0.28	0.08	27.30	0.0	1.58	8.26	0.94	8.6	31.12	31	245.83
No. of Analysis	22	42	42	34	42	42	42	39	23	42	24	22	42	33	42	42	39	42

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater than laboratory minimum detection limit.

TABLE 17: MILL FORK CANYON WATER QUALITY *

MFU3 - ABOVE MILL FORK FAULT

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20090622	0	209	62.60	9	2	453	251.00	0	0.00	23.11	0	0.00	8.49	0.98	6	23	0	261
2009**																		
MIN	0	209	62.60	9	2	453	251.00	0	0.00	23.11	0	0.00	8.49	0.98	6	23	0	261
MAX	0	209	62.60	9	2	453	251.00	0	0.00	23.11	0	0.00	8.49	0.98	6	23	0	261
MEAN	0	209	62.60	9	2	453	251.00	0	0.00	23.11	0	0.00	8.49	0.98	6	23	0	261
No. of Analysis	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2008**																		
MIN	0.0	162	60.72	37	2	428	233	0.37	0	19.69	0.01	0	8.50	0.78	4.11	15	53	234
MAX	0.0	162	60.72	37	2	428	233	0.37	0	19.69	0.01	0	8.50	0.78	4.11	15	53	234
MEAN	0.0	162	60.72	37	2	428	233	0.37	0	19.69	0.01	0	8.50	0.78	4.11	15	53	234
2007**	No Flow During 2007																	
2006**																		
MIN		221	61.80		3	468	246	0.08		22.30			8.33	1	4.72	20	9	275
MAX		221	61.80		3	468	246	0.08		22.30			8.33	1	4.72	20	9	275
MEAN		221	61.80		3	468	246	0.08		22.30			8.33	1	4.72	20	9	275
2005**																		
MIN		187	64.20	20	2	431	240	0.22		19.40	0		8.46	1	4.35	17	50	247
MAX		187	64.20	20	2	431	240	0.22		19.40	0		8.46	1	4.35	17	50	247
MEAN		187	64.20	20	2	431	240	0.22		19.40	0		8.46	1	4.35	17	50	247
2004**																		
MIN		222	54.20		2	436	224	0.11		21.60			8.35	1	4.67	22		227
MAX		222	54.20		2	436	224	0.11		21.60			8.35	1	4.67	22		227
MEAN		222	54.20		2	436	224	0.11		21.60			8.35	1	4.67	22		227
2003**																		
MIN		251	61.40	7	3	455	241	0.10		21.40			8.38	1	4.79	23		272
MAX		251	61.40	7	3	455	241	0.10		21.40			8.38	1	4.79	23		272
MEAN		251	61.40	7	3	455	241	0.10		21.40			8.38	1	4.79	23		272
2002**	NO FLOW DURING 2002																	
2001**	NO FLOW DURING 2001																	
2000**	NO FLOW DURING 2000																	
HISTORICAL 1986-2008																		
MIN	0.0	162	54.2	7.0	2.0	428	224.00	0.08	0.000	19.4	0.00	0.00	8.33	1	4	15	9	227
MAX	0.0	251	64.2	37.0	3.0	468	246.00	0.37	0.000	22.3	0.00	0.00	8.50	1	5	23	53	275
MEAN	0.0	209	60.5	21.3	2.4	443.6	236.80	0.18	0.000	20.9	0.00	0.00	8.40	0.8	4.53	19.4	37.333	251
No. of Analysis	1	5	5	3	5	5	5	5	1	5	2	1	5	5	5	5	3	5

*** Quality parameters are reported as mg/l unless otherwise noted.**

**** Data: Database input restricted to values greater then laboratory minimum detection limit.**

TABLE 18: MILL FORK CANYON WATER QUALITY *

MFA1 - ABOVE MINE

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20090622	0	206	61.23	10	2	443	246.00	0	0.00	23	0	0.00	8.61	0.96	6	23	8	264
2009**																		
MIN	0.0	206	61.23	10	2	443	246.00	0	0.00	23	0	0.00	8.61	0.96	6	23	8	264
MAX	0.0	206	61.23	10	2	443	246.00	0	0.00	23	0	0.00	8.61	0.96	6	23	8	264
MEAN	0.0	206	61.23	10	2	443	246.00	0	0.00	23	0	0.00	8.61	0.96	6	23	8	264
No. of Analysis	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2008**																		
MIN		162	60.59	36	2	433	233	0.40		19.78			8.52	0.78	4.20	15	26	227
MAX		162	60.59	36	2	433	233	0.40		19.78			8.52	0.78	4.20	15	26	227
MEAN		162	60.59	36	2	433	233	0.40		19.78			8.52	0.78	4.20	15	26	227
2007**																		
MIN	No Flow During 2007																	
MAX																		
MEAN																		
2006**																		
MIN		220	63		3	463	251	0.08		23			8.47	1	4.84	20	12	265
MAX		220	63		3	463	251	0.08		23			8.47	1	4.84	20	12	265
MEAN		220	63		3	463	251	0.08		23			8.47	1	4.84	20	12	265
2005**																		
MIN		190	62	17	2	429	239	0.54		21	0		8.51	1	4.51	17	43	245
MAX		190	62	17	2	429	239	0.54		21	0		8.51	1	4.51	17	43	245
MEAN		190	62	17	2	429	239	0.54		21	0		8.51	1	4.51	17	43	245
2004**																		
MIN		215	54		2	436	223			22			8.54	1	4.77	23	5	219
MAX		215	54		2	436	223			22			8.54	1	4.77	23	5	219
MEAN		215	54		2	436	223			22			8.54	1	4.77	23	5	219
2003**																		
MIN		275	61	6	3	451	243	0.07		22			8.45	1	4.60	23	4	262
MAX		275	61	6	3	451	243	0.07		22			8.45	1	4.60	23	4	262
MEAN		275	61	6	3	451	243	0.07		22			8.45	1	4.60	23	4	262
2002**	NO FLOW DURING 2002																	
2001**	NO FLOW DURING 2001																	
2000**	NO FLOW DURING 2000																	
HISTORICAL 1986-2008																		
MIN	0.0	153	32.0	5.0	2.0	180	208	0.06	0.0	13.0	0.00	0.00	8	1	1	12	1	176
MAX	0.0	400	82.0	36.0	24.0	813	462	3.03	0.5	73.0	0.00	0.00	9	3	24	223	342	710
MEAN	0.0	273	57.7	13.7	9.4	514.3	298.1	0.59	0.2	37.5	0.00	0.00	8.2	1.66	9.7	61.6	44.5	334.9
No. of Analysis	1	24	25	5	24	25	25	19	3	25	1	1	26	22	25	25	23	25

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 19: MILL FORK CANYON WATER QUALITY *

MFB2 - BELOW MINE

2008** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20090622	0	267	67	0	6	628	347.00	0	0	43	0	0.00	9	2	12	70	18	357
20090909	0	269	59	0	10	759	408.00	0	0	63	0	0.00	9	3	15	117	0	473
2009**																		
MIN		267	59	0	6	628	347	0	0	43	0	0	9	2	12	70	0	357
MAX		269	67	0	10	759	408	0	0	63	0	0	9	3	15	117	18	473
MEAN		268	63	0	8	694	378	0	0	53	0	0	9	2	13	94	9	415
No. of Analysis	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	0
2008**																		
MIN		283	67	0	10	810	441			66	0		8	3	16	132	0	504
MAX		293	75	18	11	918	474			70	0		9	3	17	148	0	546
MEAN		288	71	9	11	864	458			68	0		8	3	17	140	0	525
2007**																		
MIN		315	70		11	956	438			64	0.003		8.13	2.32	17.40	124	7	561
MAX		351	82		14	1040	519			77	0.003		8.33	3.60	20.40	177	7	579
MEAN		336	77		12	984	487			71	0.003		8.23	2.94	19.23	154	7	571
2006**																		
MIN		251	66		5	564	296	0		32	0.002		8.41	1.29	7.06	39	17	324
MAX		332	77		12	924	447	0		62	0.002		8.43	2.58	16.98	132	17	497
MEAN		292	71		9	744	372	0		47	0.002		8.42	1.94	12.02	86	17	411
2005**																		
MIN		200	56	16	3	461	258	1		23	0.018		8.46	0.97	5.12	22	54	280
MAX		274	66	22	9	730	350	1		51	0.018		8.48	2.33	12.90	77	54	415
MEAN		237	61	19	6	596	304	1		37	0.018		8.47	1.65	9.01	50	54	348
2004**																		
MIN		279	58	10	10	654	327	0		44	0.027		8.49	1.88	10.60	67		338
MAX		297	59	10	12	684	357	0		51	0.027		8.52	2.52	13.90	93		415
MEAN		288	59	10	11	669	342	0		47	0.027		8.51	2.20	12.25	80		377
2003**																		
MIN		354	71	9	14	715	375			48			8.41	2.20	12.20	86		415
MAX		354	71	9	14	715	375			48			8.41	2.20	12.20	86		415
MEAN		354	71	9	14	715	375			48			8.41	2.20	12.20	86		415
2002**	NO FLOW DURING 2002																	
2001**																		
MIN		318	52	7	11	746	330			45			8.46	2	12	76	5	382
MAX		338	58	8	14	763	340			51			8.59	3	14	106	5	433
MEAN		328	55	8	13	755	335			48			8.53	3	13	91	5	408
2000**	NO FLOW DURING 2000																	
HISTORICAL 1986-2008																		
MIN	0.0	183	1.0	0.0	2.0	240	227.0	0.00	0	14.0	0.0	0.00	7.27	0.70	5	16	0	204
MAX	0.0	412	81.6	37.0	17.0	1040	519.0	0.97	10	81.1	0.0	0.00	8.90	5.20	20	177	64	579
MEAN	0.0	309	58.7	13.4	9.1	591.9	334.3	0.30	2.08	46.4	0.0	0.00	8.24	2.05	11.0	70.91	17.4	376.3
No. of Analysis	3	40	40	15	41	42	41	21	8	41	6	2	42	40	41	41	26	40

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 20: RILDA CANYON SURFACE WATER QUALITY *

RCF1 - RILDA CANYON FLUME - RIGHT FORK

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20090909	0	202	53	9	3	446	237.00	0	0.0	25.120	0	0.00	8.50	1.15	9	25	0	264
2009**																		
MIN		202	53	9	3	446	237	0	0	25	0	0	9	1	9	25	0	264
MAX		202	53	9	3	446	237	0	0	25	0	0	9	1	9	25	0	264
MEAN		202	53	9	3	446	237	0	0	25	0	0	9	1	9	25	0	264
No. of Analysis	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2008**																		
MIN		198	52	0	2	446	228	0		0	0		0	1	1	9		0
MAX		202	53	9	3	453	228	237		24	25		9	9	9	24		252
MEAN		200	53	5	3	450	228	119		12	13		4	5	5	16		126
2007**																		
MIN		186	51		2	484	217	0.05		21.6	0.000		8.05	0.74	7.36	19		242
MAX		199	53		3	513	240	0.05		26.0	0.000		8.32	1.24	8.93	27		263
MEAN		193	52.4		2.5	498.5	228.5	0.05		23.8	#DIV/0!		8.19	0.99	8.15	23.0		252.5
2006**																		
MIN		207	56		3	434	228	0.25		19.7	0		8.46	0.86	5.00	15	16	240
MAX		213	59		3	488	231	0.25		22.1	0		8.49	1.01	8.06	23	16	259
MEAN		210	58		3	461	230	0.25		20.9	0		8.48	0.94	6.53	19	16	250
2005**																		
MIN		199	56		2	420	236	0.31		19.1	0		8.30	0.80	4.86	13	73	268
MAX		208	65		3	485	240	0.31		23.5	0		8.61	1.14	8.74	22	73	280
MEAN		204	60		3	453	238	0.31		21.3	0		8.46	0.97	6.80	18	73	274
2004**																		
MIN		195	46		2	394	193	0.06		18.7	0		8.44	0.77	5.36	16	6	145
MAX		204	51		3	433	220	0.06		22.9	0		8.60	1.02	8.02	25	6	233
MEAN		200	48		3	414	207	0.06		20.8	0		8.52	0.90	6.69	21	6	189
2003**																		
MIN	5	224	49	5	2	416	218	0.04		20.4			8.56	0.74	5.92	16	5	215
MAX	5	245	56	8	2	421	223	0.56		23.3			8.58	1.21	8.40	24	5	248
MEAN	5	235	52	7	2	419	221	0.30		21.9			8.57	0.98	7.16	20	5	232
2002**																		
MIN		269	50		2	430	215			22.0			8.62		9.00	22		229
MAX		269	50		2	430	215			22.0			8.62		9.00	22		229
MEAN		269	50		2	430	215			22.0			8.62		9.00	22		229
2001**																		
MIN		244	46	6	2	468	205	0.10		19.0			8.55		5.00	15	17	242
MAX		261	58	6	2	508	223	0.10		22.0			8.62		9.00	26	17	273
MEAN		253	52	6	2	488	214	0.10		20.5			8.59		7.00	21	17	258
2000**																		
MIN		252	53		2	420	223			22.0			8		6.00	20	13	266
MAX		252	53		2	420	223			22.0			8		6.00	20	13	266
MEAN		252	53		2	420	223			22.0			8		6.00	20	13	266
HISTORICAL 1989-2008																		
MIN	0.0	177	46.0	0.0	1.0	300	193.0	0.00	0.00	18.0	0.0	0.00	7.78	0.01	3.8	1.0	0	145
MAX	10.0	329	108.6	27.0	15.0	513	384.0	2.50	1.20	30.0	0.1	5.00	8.88	10.00	24.0	80.0	240	292
MEAN	3.5	237	58.5	9.1	4.4	428.9	237.2	0.46	0.15	22.2	0.0	2.52	8.45	1.48	7.9	21.7	47.3	249.53
No. of Analysis	11	34	34	26	34	34	34	23	12	34	12	10	34	27	34	33	21	34

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 21: RILDA CANYON SURFACE WATER QUALITY *

RCF3 - RILDA CANYON FLUME - ABOVE NEWUA SPRINGS

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20090324	10	363	107.5	0	10	1005	8.5	545	0.84	0	67.12	0.039	0	7.84	3.34	29.85	183	90	678
20090618	0	217	62	0	2	462	8.2	251	0.27	0	23.36	0.004	0	8.35	0.86	7.08	26	16	288
20090909	12	374	101.38	0	9	969	8	513	0.79	0	63.06	0.032	0	8.01	3.16	27.13	158	12	621
20091202	15	365	94.98	0	9	924	8.7	483	0.43	0	59.6	0.035	0	8.05	2.99	24.95	154	6	614
2009**																			
MIN	0	217	62.0		2.0	462	8.00	251	0.27		23.36	0.00		7.84	0.86	7.08	26.0	6.0	288
MAX	15	374	107.5		10.0	1005	8.70	545	0.84		67.12	0.04		8.35	3.34	29.85	183.0	90.0	678
MEAN	9	330	91.5		7.5	840	8.35	448	0.58		53.29	0.03		8.06	2.59	22.25	130.3	31.0	550
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2008**																			
MIN	0	179	61		2	470	9	242	1		22	0		8	1	5	18	8	247
MAX	20	378	115		10	1072	16	577	1		70	0		9	4	29	213	12	742
MEAN	10	322	97		8	911	12	471	1		55	0		8	3	23	147	10	571
2007**																			
MIN		285	77.6		6.0	834	10.09	378	0.20		44.70	0.02		7.54	1.86	15.60	90.0	5.0	438
MAX		400	132.0		12.0	1304	12.48	614	1.17		69.10	0.09		8.04	3.51	30.06	255.0	6.0	746
MEAN		370	111.2		10.2	1128.2	11.26	536.2	0.50		62.75	0.05		7.79	3.14	26.11	196.0	5.5	652.6
2006**																			
MIN		220	62		3.0	487	10.3	252	0.16		23.8	0		7.78	0.98	6.4	25	6	278
MAX		376	112		12.0	1073	12.5	563	0.30		69.0	0		8.18	3.32	26.8	185	18	626
MEAN		328	94		8.8	906	11.7	454	0.25		53.3	0		7.97	2.57	20.9	135	10	517
2005**																			
MIN		206	61	13.0	2.0	437	9.1	239	0.15		21.2	0		7.94	0.94	5.8	19	109	273
MAX		353	95	13.0	11.0	974	14.2	467	2.16		56.0	0		8.53	3.16	27.4	155	109	586
MEAN		310	83	13.0	7.8	805	11.6	392	0.68		44.8	0		8.13	2.32	19.9	111	109	486
2004**																			
MIN	8	217	53		3.0	450	6.0	225	0.17		22.6	0		7.92	0.94	7.1	29	19	217
MAX	15	448	102		12.0	948	13.3	505	0.27		60.7	0		8.31	2.82	27.3	176	19	613
MEAN	12	341	85		8.0	791	10.1	408	0.21		47.5	0		8.08	2.29	20.8	128	19	478
2003**																			
MIN	7	280	62		3.0	505	5.1	263	0.12		21.8			7.73	1.02	8.9	36	11	319
MAX	16	458	100		12.0	948	6.5	497	0.27		58.2			8.26	2.90	27.4	176	11	605
MEAN	12	406	89		8.5	823	6.0	430	0.20		40.9			8.05	2.40	22.3	133	11	512
2002**																			
MIN		423	90		8.0	885	9.2	447	0.10		54.0		2	8.02	2.00	25	151	8	563
MAX		433	94		9.0	936	12.8	474	0.30		58.0		4	8.12	3.00	27	172	8	624
MEAN		429	92		8.8	912	10.7	460	0.18		56.0		3	8.07	2.75	26	163	8	584
2001**																			
MIN		287	55		3.4	564		244	0.10		26.0			7.97	1.00	10	43	5	302
MAX		431	92		8.5	908		456	1.30		55.0			8.19	3.00	23	159	16	569
MEAN		380	78		6.7	792		377	0.53		44.0			8.10	2.33	18	116	11	474
2000**																			
MIN	38.0	281	56		3.0	500	9.9	251	0.10		27.0			7.88	2.00	8	44	5	199
MAX	38.0	418	87		8.0	882	10.8	431	0.10		52.0			8.17	3.00	24	140	14	570
MEAN	38.0	367	76		6.0	740	10.4	370	0.10		43.7			8.07	2.50	18	106	8	436
HISTORICAL 1989-2008																			
MIN	0.0	179	52.7	0.0	2.0	380	4.4	225	0.02	0.00	21.2	0.000	0.0	7.50	0.01	5.4	7.0	1.0	199
MAX	38.0	500	132.0	30.0	50.0	1304	15.5	748	3.00	0.41	70.2	0.20	5.0	8.83	5.00	30.1	255.0	250.0	746
MEAN	9.2	363	85.3	5.8	9.4	747.6	8.6	406.3	0.47	0.11	45.2	0.04	2.4	8.08	2.24	16.9	105.4	34.4	458.6
No. of Analysis	35	71	71	30	71	72	65	71	69	24	71	43	27	72	68	71	71	47	71

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 22: RILDA CANYON SURFACE WATER QUALITY *

RCW4 - RILDA CANYON FLUME - NEAR HIGHWAY 31

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20090324	11	349	162	0	17	1683	9.20	1015	0.00	0.00	148.6	0.00	0.00	8.15	5.51	35	643	0	1393
20090618	0	243	77	0	5	679	8.50	367	0.36	0.00	42.4	0.00	0.00	8.46	1.69	12	118	21	450
20090909	0	326	129	0	16	1474	8.40	858	0.00	0.00	130.3	0.00	0.00	8.29	4.83	31	486	0	1152
20091202	0	361	134	0	16	1486	9.10	871	0.00	0.00	130.4	0.00	0.00	8.36	4.89	31	529	0	1197
2009**																			
MIN		243	77.1		5.0	679	8.40	367	0.00		42.44	0.00		8.15	1.69	11.59	118.0	0.0	450
MAX		361	161.5		17.0	1683	9.20	1015	0.36		148.57	0.00		8.46	5.51	35.14	643.0	21.0	1393
MEAN		320	125.3		13.5	1331	8.80	778	0.09		112.93	0.00		8.32	4.23	27.27	444.0	5.3	1048
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2008**																			
MIN		222	72		3	601	9	313	0		32	0		8	1	8	72	0	336
MAX		356	175		20	1890	14	1137	1		170	0		9	6	38	764	92	1532
MEAN		307	139		13	1447	11	852	0		122	0		8	5	28	503	23	1095
2007**																			
MIN		296	115.0		12.0	1392	10.12	678	0.07		94.80	0.00		7.98	2.99	24.10	349.0	5.0	868
MAX		373	172.0		25.0	2050	13.47	1060	0.07		155.00	0.00		8.37	5.25	37.10	698.0	5.0	1429
MEAN		339	153.4		18.8	1810.2	11.35	947.2	0.07		136.95	0.00		8.15	4.51	33.70	606.4	5.0	1292.6
2006**																			
MIN		242	70.2		5.0	592	10.41	313	0.35		33.40	0.00		8.20	1.45	9.65	61.0	26.0	351
MAX		337	114.0		16.0	1272	13.50	659	0.35		90.80	0.00		8.41	3.78	28.40	309.0	26.0	825
MEAN		305	96.1		12.0	1038	11.96	529	0.35		70.00	0.00		8.31	2.95	21.57	222.3	26.0	663.33
2005**																			
MIN		222	65.5		3.0	421	9.38	270	2.96		25.90	0.06		8.28	1.02	7.44	35.0	188.0	302
MAX		339	99.7		15.0	1129	15.87	550	2.96		73.00	0.06		8.55	3.13	27.50	239.0	188.0	729
MEAN		298	83.2		11.0	846	12.25	442	2.96		56.80	0.06		8.38	2.40	20.48	164.7	188.0	564.67
2004**																			
MIN	10	252	60.9		5.0	585	4.46	297	0.65		35.10	0.02	3.0	8.27	1.53	11.80	75.0	35.0	348
MAX	10	421	90.0		16.0	979	10.57	529	0.65		73.90	0.02	3.0	8.45	3.19	27.20	210.0	35.0	666
MEAN	10	325	74.3		10.3	796	8.19	415	0.65		55.77	0.02	3.0	8.33	2.45	20.47	147.3	35.0	511
2003**																			
MIN	22	326	73.9	10	8.0	662	5.38	361	0.07		42.80	0.01		8.23	1.84	15.60	102.0	5.0	451
MAX	22	448	94.3	10	17.0	1058	6.66	538	0.54		73.50	0.01		8.54	3.34	27.50	255.0	24.0	701
MEAN	22	394	84.4	10	13.8	906	6.22	476	0.24		64.28	0.01		8.38	2.85	24.23	194.5	14.5	584.25
2002**																			
MIN		389	81.0		17.0	970	9.17	495			67.00			8.23	3.00	26.00	179.0		616
MAX		421	87.0		19.0	1058	12.92	505			71.00			8.40	3.00	30.00	230.0		717
MEAN		398	84.8		18.5	995	10.70	501			69.75			8.30	3.00	28.25	207.8		652.5
2001**																			
MIN		311	62.0		8.4	724	8.20	307	0.20		37.00			8.23	2.00	15.00	97.0	17.0	386
MAX		426	85.0		19.0	1046	8.20	476	0.20		64.00			8.47	3.00	27.00	190.0	17.0	603
MEAN		385	76.3		14.8	907	8.20	419	0.20		55.50			8.34	2.75	23.00	156.8	17.0	536.5
2000**																			
MIN		325	63.0		6.0	630	6.20	318	0.10		39.00			8.19	2.00	14.00	83.0	5.0	376
MAX		420	76.0		16.0	907	14.00	415	0.10		59.00			8.32	3.00	26.00	157.0	7.0	572
MEAN		382	69.3		12.0	802	10.50	387	0.10		52.00			8.24	2.50	22.25	130.0	6.0	492
HISTORICAL 1989-2008																			
MIN	0.0	209	59.0	0.0	2.0	400	3.9	254	0.00	0.00	24.00	0.000	0.0	7.27	0.01	7.00	15.0	0.0	260
MAX	40.0	461	175.1	51.0	700.0	2050	15.9	1137	3.80	0.28	170.07	0.20	5.0	8.86	10.00	52.00	764.0	505.0	1532
MEAN	7.4	362	87.5	7.1	24.6	878.4	8.6	477.6	0.60	0.07	62.84	0.05	2.2	8.29	2.88	21.59	182.5	55.0	579.8
No. of Analysis	29	70	70	34	70	71	65	70	38	23	70	26	28	71	68	70	70	42	70

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 23: COTTONWOOD CANYON CREEK WATER QUALITY *

SW-1

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20090325	14.0	358	95.5	0.0	22.0	992	527.00	0.12	0.00	69.98	0.0	0.00	7.76	1.74	35.2	169.0	6	663
20090617	12	400	99.52	0	20	1109	580	0.15	0	80.41	0	0	8.02	1.7	36.51	216	29	706
2009**																		
MIN	12	358	95	0	20	992	527	0	0	70	0	0	8	2	35	169	6	663
MAX	14	400	100	0	22	1109	580	0	0	80	0	0	8	2	37	216	29	706
MEAN	13	379	97	0	21	1051	554	0	0	75	0	0	8	2	36	193	18	685
No. of Analysis	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2008**																		
MIN		400	100		20	1109	0	580		0	80		0	8	2	37	216	29
MAX		400	100		20	1109	0	580		0	80		0	8	2	37	216	29
MEAN		400	100		20	1109	#DIV/0!	580		0	80		0	8	2	37	216	29
2007**																		
MIN		355	85		16	924	457	0		60	0		8	2	27	131	35	560
MAX		389	88		20	1026	513	0		71	0		8	2	34	149	35	630
MEAN		372	86		18	975	485	0		66	0		8	2	30	140	35	595
2006**																		
MIN		245	60		6	583	284	0		32	0		8	1	10	35	7	318
MAX		335	81		13	858	425	0		54	0		8	1	22	96	28	452
MEAN		302	72		10	755	369	0		46	0		8	1	17	71	14	405
2005**																		
MIN		237	60		5	535	281	0		31	0		8	1	11	37	9	336
MAX		372	83		14	968	456	0		60	0		8	2	25	125	17	565
MEAN		305	72		10	752	369	0		46	0		8	1	18	81	13	451
2004**																		
MIN		331	86		14	858	443			56			8	2	23	165	5	575
MAX		331	86		14	858	443			56			8	2	23	165	5	575
MEAN		331	86		14	858	443			56			8	2	23	165	5	575
2003**																		
MIN		442	95		20	1015	541	0		74	0		8	2	34	206	7	657
MAX		442	95		20	1015	541	0		74	0		8	2	34	206	7	657
MEAN		442	95		20	1015	541	0		74	0		8	2	34	206	7	657
2002**	NO FLOW DURING 2002																	
2001**																		
MIN		289	43		8	521	239	0		32			8.10	3.0	12.0	38	25	304
MAX		299	49		9	531	262	0		34			8.24	3.0	13.0	43	29	319
MEAN		294	46		9	526	251	0		33			8.17	3.0	12.5	41	27	312
2000**																		
MIN		289	43		8	521	239	0		32			8.10	3.0	12.0	38	25	304
MAX		299	49		9	531	262	0		34			8.24	3.0	13.0	43	29	319
MEAN		294	46		9	526	251	0		33			8.17	3.0	12.5	41	27	312
HISTORICAL 1977-2008																		
MIN	0.0	231	6.0	0.0	0.7	380.0	210.00	0.00	0.0	2	0.0	0.50	7.1	1.0	6.0	20.0	1	226
MAX	27.0	442	152.3	20.0	27.0	1026.0	541.0	15.90	0.4	78	1.3	358.00	8.7	21.0	60.0	238.7	1298	690
MEAN	5.7	337	67.1	5.6	12.5	690.7	343.1	0.82	0.1	40	0.1	11.10	8.0	2.8	20.2	75.8	65	386.8
No. of Analysis	46	91	90	21	91	52	58	81	19	91	64	41	86	87	90	91	81	91

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 24: COTTONWOOD CANYON CREEK WATER QUALITY *

SW-2

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20090325	9	340	101.4	0	22	1099	577.00	0	0.0	78.71	0	0.00	8.24	5.94	44	239	8	782
20090617	0	307	78.8	0	21	1001	490.00	0	0.0	71.21	0		8.35	5.03	38	221	12	630
20090908	0	293	82.0	0	15	1003	502.00	0	0.0	72.13	0	0.00	8.35	6.62	36	220	0	663
20091203	0	330	90.2	5	15	1023	508.00	0	0.0	68.59	0	0.00	8.31	6.85	37	242	7	685
2009**																		
MIN	0	293	79	0	15	1001	490	0	0	69	0	0	8	5	36	220	0	630
MAX	9	340	101	5	22	1099	577	0	0	79	0	0	8	7	44	242	12	782
MEAN	2	318	88	1	18	1032	519	0	0	73	0	0	8	6	39	231	7	690
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	4
2008**																		
MIN	0	288	70	0	15	915	462	0		70	0		8	4	33	178	0	526
MAX	0	360	96	0	26	1162	549	0		75	0		8	7	43	244	10	718
MEAN	0	315	85	0	19	1034	507	0		71	0		8	6	37	218	3	652
2007**																		
MIN	8	287	78	5	14	995	464	0		65	0		8	3.59	34	170	16	597
MAX	8	326	92	26	22	1156	515	0		71	0		8	7.23	41	257	16	716
MEAN	8	305	87	16	17	1068	500	0		68	0		8	6.0575	37	231	16	680
2006**																		
MIN		244	57		8	597	289	0		35	0		8	1.39	12	45	5	331
MAX		327	86		23	1057	503	0		70	0		8	4.16	34	183	35	628
MEAN		298	75		17	905	432	0		59	0		8	3.19	28	138	20	520
2005**																		
MIN		233	58	9	7	558	282	0		34	0		8	1.46	12	46	5	333
MAX		331	92	9	42	1283	546	0		77	0		9	5.53	46	250	38	768
MEAN		303	75	9	22	971	446	0		63	0		8	4.03	32	174	18	593
2004**																		
MIN		287	73	8	16	908	448	1		60	0		8	3.51	33	214	10	602
MAX		345	87	8	45	1097	510	1		71	0		8	6.94	49	289	49	692
MEAN		310	81	8	28	1001	472	1		66	0		8	5.6825	41	243	30	659
2003**																		
MIN		356	78.0	6	16	993	479			69			8.26	5.01	38.9	238	6	630
MAX		391	91.2	7	25	1079	535			77			8.49	7.47	46.0	274	6	738
MEAN		372	85.1	7	22	1035	510			72			8.41	6.33	42.2	258	6	696
2002**																		
MIN		361	76.0	5	19	1021	474			68			8.25	6.00	43.0	249	15	702
MAX		398	87.0	8	28	1096	505			70			8.42	8.00	46.0	273	15	758
MEAN		375	80.0	7	24	1064	484			69			8.36	6.75	44.5	259	15	730
2001**																		
MIN		288	19.0	5	13	563	113	0.10		16			8.36	1.00	25.0	57	6	335
MAX		627	46.0	20	92	1251	271	0.50		38			8.62	5.00	268.0	103	29	786
MEAN		489	31.5	12	39	1037	192	0.30		28			8.50	3.50	171.8	87	14	642
2000**																		
MIN		288	19.0	5	13	563	113	0.10		16			8.36	1.00	25.0	57	6	335
MAX		627	46.0	20	92	1251	271	0.50		38			8.62	5.00	268.0	103	29	786
MEAN		489	31.5	12	39	1037	192	0.30		28			8.50	3.50	171.8	87	14	642
HISTORICAL 1977-2008																		
MIN	0.00	233	11.1	0.0	1.5	410	113.00	0.00	0.00	2.400	0.0	0.00	7.00	1	8.0	19.5	0	267
MAX	25.00	642	136.9	85.0	179.0	1709	631.00	16.20	1.25	109.00	1.4	39.00	8.93	25.6	268.0	289.0	1004	1170
MEAN	4.96	352	67.09	11.25	22.76	929.25	382.32	1.03	0.15	47.50	0.09	3.11	8.16	4.7	47.0	128.0	69	506
No. of Analysis	46	111	111	40	111	72	78	91	26	111	67	54	106	110	110	111	91	111

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 25: COTTONWOOD CANYON CREEK WATER QUALITY *
SW-3

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
	NO FLOW DURING 2009																	
2009**																		
MIN																		
MAX																		
MEAN																		
No. of Analysis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008**																		
MIN	1	1	1		1	1	1	0.08		1	0.016		1.00	1.00	1	1	0	1
MAX	10	466	124		303	2300	784	1.00		115	1.000		8.21	4.46	220	395	1	1498
MEAN	7	311	83		202	1534	523	0.39		77	0.344		5.81	3.31	147	264	0	999
2007**																		
MIN	6	352	110		330	2380	748	0		115	0		8	5	220	382	9	1515
MAX	6	375	117		336	2390	778	0		118	0		8	6	228	401	9	1544
MEAN	6	364	113		333	2385	763	0		117	0		8	5	224	392	9	1530
2006**																		
MIN		246	58		33	738	312	0		41	0		8	2	27	69	37	409
MAX		346	105		215	1914	668	0		99	0		8	4	140	279	37	1120
MEAN		296	81		124	1326	490	0		70	0		8	3	83	174	37	765
2005**																		
MIN		228	57	10	10	566	301	0		39	0		9	1	15	51	14	332
MAX		433	153	10	447	3070	913	0		129	0		9	5	221	444	23	1835
MEAN		331	105	10	229	1818	607	0		84	0		9	3	118	248	19	1084
2004**	NO FLOW DURING 2004																	
2003**	NO FLOW DURING 2003																	
2002**	NO FLOW DURING 2002																	
2001**																		
MIN		485	15	18	31	1230	99	0.30		15.0			8.52	4.00	233	112	12	774
MAX		602	32	48	607	2800	216	0.30		33.0			9.00	5.00	531	147	18	1563
MEAN		552	23	30	181	1652	159	0.30		24.8			8.75	4.50	325	130	15	988
2000**																		
MIN		485	15	18	31	1230	99	0.30		15.0			8.52	4.00	233	112	12	774
MAX		602	32	48	607	2800	216	0.30		33.0			9.00	5.00	531	147	18	1563
MEAN		552	23	30	181	1652	159	0.30		24.8			8.75	4.50	325	130	15	988
HISTORICAL 1977-2008																		
MIN	0.1	228	14.3	0.0	1.7	506	99.00	0.04	0.00	2.400	0.0	0.00	7.20	1	3	22.0	0	40
MAX	27.0	633	159.0	70.0	607.0	3070	913.00	19.00	0.43	129.00	2.5	114.00	9.00	30	531	444.0	5024	1835
MEAN	5.4	371	71.8	12.5	56.9	1298	424.84	1.06	0.13	51.17	0.1	4.69	8.15	4.28	84.0	170.3	132	637
No. of Analysis	47	95	94	37	94	56	62	84	24	95	60	61	90	93	94	95	80	95

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 26: GRIMES WASH WATER QUALITY *

GWR01 - RIGHT FORK

2009 **SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
2009**	NO SAMPLES COLLECTED DURING 2009 -NO FLOW																	
2008**	NO SAMPLES COLLECTED DURING 2008 -NO FLOW																	
2007**	NO SAMPLES COLLECTED DURING 2007 -NO FLOW																	
2006**	NO SAMPLES COLLECTED DURING 2006 -NO FLOW																	
2005**	NO SAMPLES COLLECTED DURING 2005 -NO FLOW																	
2004**	NO SAMPLES COLLECTED DURING 2004 -NO FLOW																	
2003**	NO SAMPLES COLLECTED DURING 2003 -NO FLOW																	
2002**	NO SAMPLES COLLECTED DURING 2002 -NO FLOW																	
2001**	NO SAMPLES COLLECTED DURING 2001 -NO FLOW																	
2000**	NO SAMPLES COLLECTED DURING 2000 -NO FLOW																	
HISTORICAL 1979-2008																		
MIN	0.1	104	30.0	1.0	3.0	190	112	0.01	0.05	6.30	0.01	0.5	7.20	1.60	1.85	20.0	0.5	115
MAX	39.0	320	57.0	1.0	26.4	750	320	20.60	3.31	46.20	0.30	9.0	8.70	7.64	20.44	161.7	7116.0	700
MEAN	5.5	238	42.6	1.0	10.8	557	238	1.38	0.47	31.96	0.06	1.8	8.09	3.21	13.20	63.7	370.2	338
No. of Analysis	11	10	10	9	12	43	10	47	9	9	42	12	47	10	10	14	47	47

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 27: GRIMES WASH WATER QUALITY *

GWR02 - LEFT FORK

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
2009**	NO SAMPLES COLLECTED DURING 2009 -NO FLOW																	
No. of Analysis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008**	NO SAMPLES COLLECTED DURING 2008 -NO FLOW																	
2007**																		
MIN		297	56.2		11	810	359			53			8.3	1.1	40	129		527
MAX		297	56.2		11	810	359			53			8.3	1.1	40	129		527
MEAN		297	56.2		11	810	359			53			8.3	1.1	40	129		527
2006**																		
MIN		263	51	16	9	732	305	1		43	0		8.4	1.2	34	82	9	391
MAX		303	71	16	9	838	369	1		47	0		8.5	1.4	39	112	25	497
MEAN		283	61	16	9	785	337	1		45	0		8.4	1.3	37	97	17	444
2005**																		
MIN		286	55	9	9	803	330	0		47	0		8.5	1.4	38	101	5	450
MAX		304	69	25	9	818	380	0		50	0		8.6	1.8	40	117	53	491
MEAN		295	62	17	9	811	355	0		49	0		8.5	1.6	39	109	29	471
2004**	No flow during 2004																	
2003**	No flow during 2003																	
2002**	No flow during 2002																	
2001**																		
MIN		329	44.0	7.0	8.0	806	303	0.10		44.00			8.40	1.00	35.00	109.2	10.0	451
MAX		370	72.0	7.0	9.8	917	361	0.10		47.00			8.66	1.00	42.00	122.0	10.0	460
MEAN		350	58.0	7.0	8.9	861.5	332	0.10		45.50			8.53	1.00	38.50	115.6	10.0	455.5
2000**																		
MIN		296	40.0		10.0	691	302			49.00			8.48	2.00	42.00	136.0	17.0	423
MAX		296	40.0		10.0	691	302			49.00			8.48	2.00	42.00	136.0	17.0	423
MEAN		296	40.0		10.0	691	302			49.00			8.48	2.00	42.00	136.0	17.0	423
HISTORICAL 1979-2007																		
MIN	1.0	188	2.3	1.0	6.0	410	196	0.02	0.02	23.80	0.01	0.1	7.30	1.00	11.10	30.4	0.5	212
MAX	34.0	482	88.9	26.0	156.0	917	460	2.52	0.22	68.50	0.15	3.5	8.85	3.00	42.00	212.0	1428.0	570
MEAN	4.2	312	51.5	6.4	14.6	652	308	0.22	0.08	42.54	0.03	1.0	8.08	1.50	31.30	91.4	51.8	380
No. of Analysis	16	28	28	21	28	63	28	59	7	28	51	15	65	28	28	29	62	65

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 28: GRIMES WASH WATER QUALITY *

GWR03 - RIGHT FORK

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20090617	7	293	144	0	475	2810	931.00	0.00	0.0	138.780	0	0.00	8.24	8	262	578	0	1863
2009**																		
MIN	7	293	144	0	475	2810	931	0	0	139	0	0	8	8	262	578	0	1863
MAX	7	293	144	0	475	2810	931	0	0	139	0	0	8	8	262	578	0	1863
MEAN	7	293	144	0	475	2810	931	0	0	139	0	0	8	8	262	578	0	1863
No. of Analysis	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2008**																		
MIN		335	158		397	2740	1004	0.17		148.2	0.007		8.18	8.06	236	561	22	1873
MAX		335	158		397	2740	1004	0.17		148.2	0.007		8.18	8.06	236	561	22	1873
MEAN		335	158		397	2740	1004	0.17		148.2	0.007		8.18	8.06	236	561	22	1873
2007**																		
MIN		275	80		204	1689	564	0.08		88	0.00		8.11	4.08	143	300	6	1082
MAX		340	157		517	3210	1049	0.09		161	0.01		8.50	8.66	294	622	6	2071
MEAN		311	131		397	2653	863	0.09		130	0.01		8.28	6.78	231	486	6	1685
2006**																		
MIN		277	64	15	29	900	363	0.07		48	0.00		8.40	1.66	45	122	10	512
MAX		282	66	15	73	1081	388	0.50		56	0.00		8.47	2.14	70	142	16	619
MEAN		280	65	15	51	991	376	0.29		52	0.00		8.44	1.90	57	132	13	565.5
2005**																		
MIN		257	70	7	35	856	373	0.07		48	0.00		8.34	2.09	48	134	11	581
MAX		308	145	16	360	2760	799	0.74		106	0.02		8.50	5.77	215	427	56	1620
MEAN		282	97	12	165	1622	537	0.50		71	0.01		8.44	3.57	116	244	34	974.3
2004**																		
MIN		311	122		183	1657	674	0.09	1.18	90	0.00		7.68	5.74	118	434	7	1159
MAX		394	192		539	3020	1048	2.62	1.18	144	0.04		8.21	7.73	252	653	134	2006
MEAN		349	167		433	2629	945	0.94	1.18	129	0.02		8.04	7.19	213	582	49	1758
2003**																		
MIN	10	356	133	7	182	1781	756	0.03	0.02	101	0.01	2	8.01	6.41	113	460		1242
MAX	12	447	163	7	294	2290	909	0.62	0.02	124	0.02	2	8.43	7.08	165	549		1579
MEAN	11	395	145	7	221	2006	842	0.19	0.02	116	0.01	2	8.26	6.75	136	517		1421
2002**																		
MIN		318	146		296	2250	859			118			7.84	7.00	171	538		1584
MAX		438	166		708	3650	1065			158			8.49	9.00	397	783		2449
MEAN		390	155		433	2737	930			132			8.07	7.67	248	631		1894
2001**																		
MIN		346	80		60	1169	418	0.80		53			7.87	2.00	59	172	6	601
MAX		423	143		651	3640	843	0.80		118			8.43	6.00	429	551	37	1985
MEAN		372	108		239	2151	623	0.80		86			8.24	4.50	194	361	22	1272
2000**																		
MIN		298	105		223	1895	563	0.50		73			8.15	5.00	150	392	10	1347
MAX		323	132		3226	9960	696	1.00		101			8.22	6.00	1870	464	70	5862
MEAN		311	116		1030	4136	650	0.75		88			8.20	5.25	630	432	43	2568
HISTORICAL 1979-2008																		
MIN	0.1	117	5.1	0.0	10.0	220	146.00	0.01	0.00	10.700	0.0	0.00	7.10	0.01	9.0	46.0	0.5	152
MAX	127.0	486	274.0	16.0	4531.0	12000	1165.00	22.60	2.26	160.80	0.9	27.00	8.81	12.80	3181.0	783.0	9702	7160
MEAN	12.0	342	126.1	2.6	297.0	1718.6	660.34	0.78	0.19	83.29	0.1	2.85	8.07	5.83	204.8	357.6	160.1	1089.51
No. of Analysis	59	94	94	53	96	134	94	121	55	94	100	55	138	93	94	97	116	136

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

Table 29

EAST MOUNTAIN SPRINGS DISCHARGE

2009

Spring	Date Sampled	Flow (GPM)	Temp. C	Date Sampled	Flow (GPM)	Temp. C	Seasonal Net Change %
Sheba	07/16/2009	2.6	7.2	10/01/2009	0.3	8.3	-89.23
Elk Spring*	07/10/2009	Developed		10/12/2009	Developed		
Burnt Tree	07/16/2009	2.8	8.4	10/12/2009	2.6	7.9	-7.14
Jerk Water							
Pine Springs							
Pine Sp. Trough							
Ted's Tub	07/16/2009	11.8	8.0	10/01/2009	2.7	8.3	-77.12
79-1							
79-2	07/16/2009	1.5	6.6	10/12/2009	0.7	5.9	-53.33
79-3							
79-4							
79-5							
79-6							
79-7							
79-8							
79-9							
79-10	07/16/2009	5.9	8.2	10/01/2009	2.5	5.1	-57.63
79-11							
79-12	07/16/2009	Dry		10/01/2009	Dry		
79-13							
79-14							
79-15	07/15/2009	0.7	10.3	10/01/2009	Dry		
79-16							
79-17							
79-18							
79-19							
79-20							
79-21							
79-22							
79-23	07/16/2009	Dry		10/12/2009	Dry		
79-24	07/16/2009	Dry		10/12/2009	Dry		
79-25							
79-26	07/20/2009	Dry		10/13/2009	Dry		
79-27							
79-28	07/20/2009	0.8	7.4	10/13/2009	0.9	7.3	12.50
79-29	07/20/2009	0.6	7.2	10/13/2009	0.6	5.3	
79-30							
79-31							
79-32	07/20/2009	0.2	12.4	10/13/2009	Seep		0.00
79-33							
79-34	07/15/2009	3.7	9.1	10/01/2009	1.4	6.5	-62.16
79-35	07/15/2009	1.7	7.8	10/01/2009	0.9	7.7	-47.06
79-36							
79-37							
79-38	07/16/2009	1.2	16.0	10/12/2009	Seep		
79-39							
79-40	07/16/2009	Dry		10/13/2009	Dry		
80-41	07/16/2009	Damp		10/13/2009	Dry		
80-42							
80-43	07/16/2009	Dry		10/12/2009	Dry		
80-44	07/16/2009	Damp		10/13/2009	Damp		
80-45							
80-46	07/16/2009	Dry		10/12/2009	Dry		
80-47	07/16/2009	1.4	7.6	10/12/2009	2.0	6.7	42.86
80-48	07/15/2009	0.5	12.5	10/12/2009	Damp		
80-49							
80-50	07/13/2009	0.8	8.6	10/16/2009	Seep		
82-51	07/16/2009	Dry		10/12/2009	Dry		
82-52	07/16/2009	Seep		10/12/2009	Dry		
84-53							
84-54							
84-55							
84-56	07/20/2009	Seep		10/13/2009	Damp		
85-57							
86-58							
86-59							
89-60	07/16/2009	Seep		10/12/2009	Dry		
89-61*	07/15/2009	Developed		10/12/2009	Developed		

Table 29

EAST MOUNTAIN SPRINGS DISCHARGE

2009

Spring	Date Sampled	Flow (GPM)	Temp. C	Date Sampled	Flow (GPM)	Temp. C	Seasonal Net Change %
89-62							
89-63							
89-64							
89-65	07/15/2009	0.8	8.1	10/12/2009	0.4	6.9	
89-66	07/15/2009	Dry		10/12/2009	Dry		
89-67	07/15/2009	3.5	6.0	10/12/2009	2.4	4.6	-31.43
89-68	07/15/2009	0.3	14.1	10/12/2009	0.2	9.1	
89-69							
89-70							
89-71							
91-72	07/14/2009	3.3	20.5	10/15/2009	3.0	15.7	-9.09
91-73	07/14/2009	Dry		10/15/2009	Dry		

TOTAL FLOW FOR JULY **40.8** **TOTAL FLOW FOR OCTOBER** **17.6**
(W\OUT 80-50, 91-72 & 73) **Net % Change - Average** -31.57
Net % Change - By Volume -56.91

TOTAL FOR JULY 2007 = 466.4 GPM (included flow for Elk Spring and 89-61)

*Note: Elk Spring and 89-61 was developed for culinary use by NEWUSSD in early 2009. Flow rates not included.

EAST MOUNTAIN SPRINGS DISCHARGE

MILL FORK

2009

Spring	Date Sampled	Flow (GPM)	Temp. C	Date Sampled	Flow (GPM)	Temp. C	Seasonal Net Change %
EM-216	07/22/2009	Seep		10/14/2009	Seep		
EMPOND	07/22/2009	4.0	6.5	10/12/2009	1.1	7.4	-72.50
GRANTS SPRING	07/22/2009	1.3	5.5	10/14/2009	0.7	6.7	-46.15
LITTLE BEAR	08/11/2009	366.0	9.7	10/16/2009	324.0	10.5	-11.48
JV-9	07/22/2009	3.0	6.8	10/15/2009	0.8	7.1	-73.33
JV-34	07/22/2009	17.3	13.9	10/15/2009	4.3	5.9	-75.14
MF-7	07/21/2009	33.3	4.6	10/13/2009	22.4	4.9	-32.73
MF-10	07/22/2009	33.4	3.6	10/08/2009	10.7	2.6	-67.96
MF-19B	07/21/2009	1.2	10.3	10/08/2009	0.7	4.8	
MF-213	07/21/2009	46.2	10.6	10/13/2009	21.8	7.2	-52.81
MF-219	07/27/2009	5.3	6.0	10/12/2009	3.1	4.7	-41.51
MFR-10	7/22/0*9	33.4	3.6	10/12/2009	4.0	5.2	-88.02
MFR-30	07/27/2009	1.2	8.7	10/12/2009	Seep		
RR-5	07/22/2009	4.0	4.3	10/08/2009	0.5	3.7	-87.50
RR-15	07/22/2009	21.1	3.4	10/08/2009	9.2	4.3	-56.40
RR-23A	07/22/2009	31.6	4.3	10/08/2009	14.3	5.7	-54.75
SPI-26	07/27/2009	2.8	5.5	10/12/2009	4.5	5.2	60.71
SPI-29	07/27/2009	0.7	5.3	10/12/2009	0.1	7.3	
UJV-101	07/22/2009	1.3	6.8	10/15/2009	1.3	7.5	0.00
UJV-206	07/22/2009	2.5	6.4	10/15/2009	1.5	5.8	-40.00
UJV-213	07/22/2009	1.3	7.3	10/15/2009	0.5	7.9	-61.54

TOTAL FLOW FOR JULY **610.9** **425.5**
Net % Change - Average -46.22
Net % Change - By Volume -30.35

Table 30: East Mountain Yearly Spring Discharge Variations (GPM)

SOUTHERN AREA

July Flow Data

Spring	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Burnt Tree	30.5	26.6	26.1	17.5	10.2	12.0	6.4	4.1	2.0	4.0	8.6	7.5	7.5	5.5	8.5	6.8	5.0	3.3	5.6	3.4	2.2	2.0	6.0	7.0	3.6	3.6	2.8
Elk Spring*	642.3	427.9	390.5	309.7	217.0	217.4	78.5	130.8	176.0	116.8	369.9	46.2	599.3	309.0	235.0	413.0	309.0	107.0	131.0	46.0	73.0	110.0	280.0	309.0	91.0	91.0	Developed
Sheba	22.9	19.7	14.4	8.6	11.4	10.4	1.1	8.1	10.1	6.3	11.0	0.9	10.6	14.9	4.8	7.2	6.1	2.6	2.9	0.4	3.0	3.1	6.5	5.0	1.3	1.3	2.6
Ted's Tub	89.0	48.0	39.1	31.6	69.0	60.0	5.0	13.0	21.0	13.6	51.0	6.0	76.2	36.7	42.9	83.2	30.0	20.0	24.0	3.0	10.7	15.0	32.0	38.0	11.9	32.0	11.8
79-2	9.1	9.7	5.5	2.9	4.0	2.1	2.7	3.9	2.4	2.3	7.5	1.7	2.6	2.0	2.1	2.1	2.2	1.9	1.9	0.1	1.2	2.0	2.0	2.6	1.2	2.1	1.5
79-10	37.1	20.0	33.3	26.1	26.1	25.0	7.0	10.2	12.5	10.5	30.0	4.0	30.0	17.6	14.0	24.0	20.0	5.2	10.3	1.3	5.5	5.7	16.0	21.0	3.2	11.4	5.9
79-15	42.9	26.1	18.2	18.2	14.6	12.7	2.9	3.0	5.0	4.1	20.7	2.0	33.3	11.0	13.6	18.3	15.0	6.3	10.5	0.1	4.8	7.6	12.0	15.0	3.9	15.8	0.7
79-23	20.0	3.6	6.8	0.6	damp	damp	dry	dry	damp	dry	damp	dry	no flow	dry	dry	0.2	dry	dry	dry	dry	dry	dry	Dry	Damp	Dry	Dry	Dry
79-24	9.3	6.1	5.0	4.3	damp	0.8	dry	dry	dry	dry	damp	dry	0.1	dry	dry	1.0	dry	dry	dry	dry	dry	dry	Dry	Dry	Dry	Dry	Dry
79-26	20.7	20.0	10.9	8.7	1.5	3.3	0.3	dry	damp	damp	10.0	dry	10.0	0.8	5.0	7.9	2.7	1.4	4.3	0.1	dry	dry	5.6	6.0	0.01	1.00	Dry
79-29	10.0	6.2	6.0	4.7	2.5	2.6	1.1	1.3	1.7	0.8	2.9	0.7	3.1	1.2	1.0	3.0	1.7	1.3	1.5	0.1	0.6	seep	1.0	0.6	0.2	1.0	0.6
79-32	3.3	3.1	2.7	1.3	1.0	0.6	0.5	damp	no flow	no flow	1.3	damp	1.0	0.6	1.0	2.2	1.0	0.4	0.6	0.1	0.1	seep	0.3	0.2	Seep	Seep	0.2
79-34	56.7	42.9	18.5	16.7	10.5	13.3	dry	dry	0.3	damp	13.0	dry	30.0	7.5	5.5	13.2	8.6	0.4	8.4	dry	1.8	2.0	13.5	17.4	0.5	13.9	3.7
79-35	15.0	10.5	10.5	7.8	6.3	2.7	dry	1.9	4.3	4.4	8.9	0.5	3.0	4.5	8.6	4.6	5.0	2.7	4.5	0.8	1.3	2.3	3.5	3.9	1.0	2.0	1.7
79-38	10.9	9.2	4.7	3.6	8.3	10.0	1.1	7.8	6.5	2.3	6.4	0.5	10.0	7.5	4.0	7.5	5.0	4.0	3.3	0.1	2.3	2.4	4.0	5.0	0.5	4.9	1.2
79-40	15.0	8.3	5.6	4.7	2.0	5.4	dry	dry	dry	dry	4.0	dry	2.0	0.5	1.4	2.0	1.7	dry	1.3	dry	dry	dry	1.0	1.2	Dry	Dry	Dry
80-41	10.9	15.0	5.8	4.1	2.5	3.9	dry	dry	dry	dry	4.0	dry	2.4	0.5	4.5	5.4	3.7	1.3	4.8	dry	dry	1.4	5.4	6.0	Seep	Seep	Damp
80-43	24.0	20.0	6.6	3.1	0.4	1.8	dry	dry	dry	dry	2.7	dry	1.5	damp	damp	0.5	0.1	dry	dry	dry	dry	dry	Seep	Seep	Dry	Damp	Dry
80-44	24.0	13.1	5.5	2.2	dry	0.5	dry	dry	dry	dry	1.4	dry	3.0	damp	0.2	0.5	0.1	0.5	0.5	dry	dry	damp	Damp	Damp	Damp	Damp	Damp
80-46	60.0	28.3	18.2	12.0	4.0	6.7	dry	dry	dry	dry	7.5	dry	5.0	damp	4.0	4.6	2.5	damp	2.1	dry	dry	seep	2.9	4.0	Dry	Dry	Dry
80-47	20.0	15.0	12.5	12.2	7.4	9.9	4.6	2.0	1.3	3.3	13.3	2.2	12.6	5.0	9.2	10.5	8.6	5.0	9.4	2.0	1.5	4.4	7.8	6.0	2.4	3.0	1.4
82-51	10.0	5.9	3.8	2.6	damp	damp	dry	dry	0.1	damp	3.2	damp	3.0	0.5	2.0	2.1	0.7	0.1	1.3	dry	0.1	seep	1.0	1.0	Dry	1.3	Dry
82-52	80.0	48.0	32.1	23.3	20.1	21.5	2.6	1.3	1.0	1.0	16.7	2.0	15.0	7.0	12.0	12.0	12.0	3.4	8.0	1.8	1.0	1.0	16.0	17.8	2.9	1.6	Seep
84-56	9.6	6.3	4.7	3.7	2.5	2.9	1.6	1.0	0.5	0.6	1.0	0.3	1.0	0.3	0.7	1.7	0.9	0.2	0.8	0.1	dry	seep	Seep	0.5	0.01	Damp	Seep
Totals	1273.2	839.5	687.0	530.2	421.3	425.5	115.4	188.4	244.7	170.0	595.0	74.5	862.2	432.6	379.9	633.5	441.6	167.0	237.0	59.4	109.1	158.9	416.5	467.2	123.6	185.9	34.1

xx No measurement - utilized yearly comparison.

*Note: Elk Spring and 89-61 was developed for culinary use by NEWUSSD in early 2009.

MILL FORK AREA

Spring	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
EM-216												0.3	0					0	0.5	0	Seep	Dry	Dry	1.8	0.0	Damp	Damp
EMPOND											3	6	0.5					0.8	2.3	1.3	3.3	3.5	6.7	4.3	2.3	4.0	4.0
GRANTS SPRING																				0.4	1.32	1.6	2.3	2.3	1.0	1.8	1.3
LITTLE BEAR*	430	409	357	383	388	340	332	270	296	243	419	218	418	443	447	477	428	395	373	240	284	385.0	350.0	396.0	349.0	378.0	366.0
JV-9																		1.5	1.8	0.8	1.6	1.4	1.7	2.2	1.2	1.6	3.0
JV-34																		3.6	47.2	0	4.3	9.5	37.0	80.0	8.6	42.8	17.3
MF-7											20	10						9.2	30	13.3	21.1	23.7	42.0	30.0	19.4	34.7	33.3
MF-10											0.5	0.25	10					6.8	27.3	14.3	60	35.3	40.0	54.0	19.2	46.2	33.4
MF-19B												0.25	0.5					0.4	0	1.3	1.3	1.9	2.3	1.4	0.5	1.9	1.2
MF-213																		17.6	26.1	20.1	27	33.0	68.0	55.0	29.3	58.30	46.2
MF-219																		2.1	5.6	2.4	2.7	3.1	5.0	2.3	4.0	2.0	5.3
MFR-10																			151	4.9	11.81	11.6	12.9	19.4	10.4	29.1	33.4
MFR-30																			26.6	0	0.75	1.0	1.2	2.3	0.1	2.3	1.2
RR-5												2	0					0	1.6	1.1	8.66	8.7	15.0	13.8	3.0	15.4	4.0
RR-15												20	10					8	13.9	12	24	26.0	10.6	37.0	17.1	32.4	21.1
RR-23A													5					10	15	11	26.6	42.0	34.0	32.0	30.0	8.7	31.6
SPI-26																		4.4	4.3	5.8	18.6	14.0	26.7	23.5	9.0	28.6	2.8
SPI-29																			0.5	0.4	1.6	1.7	1.0	0.8	0.3	1.0	0.7
UJV-101											0	0	0.3					0.8	3.9	0	1.1	1.5	1.6	0.8	0.7	1.3	1.3
UJV-206											0	0.5	0					2.1	2.6	1.5	1.1	2.4	6.0	7.9	3.2	3.40	2.5
Totals											442.5	257.3	444.3					462.3	733.2	330.6	500.8	606.9	664.0	766.8	508.4	693.5	609.6

*Note: Little Bear flow values for 2006 -2008 has been corrected.

Table 31a

Mode of Occurrence – East Mountain Springs – Southern Area

Occurrences

Stratigraphic Location	Permeable fluvial channels that intersect the land surface	Flow along permeable strata underlain by impermeable mudstone which intersects he land surface	Contact of permeable beds and the Roans Canyon Fault zone	Mode of Occurrence not identified
Base of Flagstaff		79-6, 79-7, 79-35, 86-58, 89-69	Sheba Springs, 79-1	
North Horn Formation	Ted's 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, 80-53, 84-56, 86-59, 89-62, 89-63, 89-64, 89-65, 89-66, 89-67, 89-68, 89-71		Elk Springs, 79-10, 79-18, 79-19, 79-20, 84-54, 89-61, 89-70	
Base of North Horn Formation		79-23, 79-25, 79-32, 79-36, 79-37, 79-38, 84-55	79-30, 79-31	
Other Stratigraphic Horizons	Blackhawk Formation 80-50, 84-57, 91-73 Price River Formation Bear Canyon Fault Zone 82-51		Price River 80-49, Blackhawk 91-72	Flagstaff Limestone 79-4, 79-5, Pine Springs Trough Price River Formation 79-24, 79-33, 79-40, 80-41, 80-44, 80-45, 82-52, Jerk Water, 89-60 (Alpine)

Table 31b

Mode of Occurrence – East Mountain Springs – Mill Fork Area

Occurrences

Stratigraphic Location	Flow along permeable strata (fluvial channels) underlain by impermeable mudstone which intersects he land surface
Alluvium **Joes Valley Alluvium** **JV-1 through JV-35**	
Flagstaff Limestone	EM-221A
North Horn Formation	EM-216, EM-217, EM-218, EM-221B, EM-222,EM-223, EM-227, EM-228, EMPOND, GRANTS SPRING, JV-36, JV-37, JV-38, JV-39, JV-40, JV-41, JV-42, JV-43, JV-44, JV-45, JV-46, JV-47, JV-48, JV-49, JV-50, JV-51, JV-52, MF-10, MF-11, MF-12, MF-13, MF-14, MF-14A, MF-15, MF-16, MF-18, MF-18A, MF 18B, MF-18C, MF-19A, MF-19B, MF-19E, MF-19H, MF-19I, MF-21, MF-217, MF-218, MF-219, MF-220, MF-221, MFR-1, MFR-2, MFR-3, MFR-7, MFR-8, MFR-9, MFR-10, MFR-11, MFR-16, MFR-17, MFR-18, MFR-19, MFR-20, MFR-21, MFR-22, MFR-23, MFR-24, RR-2, RR-2A, RR-2B, RR-3, RR-4, RR-4A, RR-5, RR-6, RR-6A, RR-7A, RR-10, RR-11, RR-12, RR-14, RR-14A, RR-14B, RR-15, RR-16, RR-17, RR-18, RR-20, RR-21, RR-22, RR-23, RR-23A, RR-24, RR 24A, RR-25, RR-26, RR-27, RR-28, RR-30, RR-34, SP1-26, SP1-29, SP1-31, SP2-42, UJV-100, UJV-100A, UJV-104, UJV-105, UJV-202, UJV-203
Upper Price River Formation	EM-214, EM-215, MF-1, MF-4, MF-4A, MF-5, MF-20, MFR-4, MFR-5, MFR-12, MFR-13, MFR-14, MFR-15, MFR-26, MFR-27, MFR-28, MFR-29, MFR-30, MFR-31, MFR-32, RR-7, UJV-100C, UJV-105B, UJV-106, UJV-106A, UJV-109, UJV-109B, UJV-109 South, UJV 151, UJV-204, UJV-205, UJV-206, UJV-207, UJV-209, UJV-209A
Castle Gate Sandstone	MFR-6, UJV-101, UJV-208, UJV-210, UJV-211, UJV-212, UJV-213
Blackhawk Formation	MF-2, MF-3, MF-7, MF-8A, MF-213, MFR-2
Star Point Sandstone	Little Bear Spring

TABLE 32: TEMPERATURE COMPARISON

	EAST MOUNTAIN DEPARTURE FROM NORMAL	ELECTRIC LAKE DEPARTURE FROM NORMAL	CASTLE DALE DEPARTURE FROM NORMAL	HUNTINGTON PLANT DEPARTURE FROM NORMAL
1993				
JAN	-3.8	2.7	0.9	-0.8
FEB	-3.5	-2.9	0.5	-4.3
MAR	4.2	-3.6	7.2	-0.5
APR	-2.2	0.1	4.4	-2.0
MAY	4.1	2.8	8.9	1.6
JUN	-3.9	-2.2	5.8	-4.1
1994				
JAN	0.8	2.3	-1.2	6.3
FEB	-3.5	3.2	1.6	-3.5
MAR	6.1	6.6	10.1	5.0
APR	0.0	6.0	4.7	0.2
MAY	4.6	7.2	8.9	2.7
JUN	9.1	4.8	13.4	5.4
1995				
JAN	1.4	1.6	3.9	1.5
FEB	10.3	5.2	11.8	7.4
MAR	3.1	2.4	7.6	0.1
APR	3.4	-0.1	3.4	-2.0
MAY	2.2	-3.9	3.4	-5.5
JUN	1.1	-2.2	2.5	-6.6
1996				
JAN	5.1	2.1	3.5	2.4
FEB	7.7	-0.9	8.4	1.6
MAR	7.5	0.6	7.8	1.5
APR	3.0	2.6	5.4	1.1
MAY	8.5	3.6	8.0	2.2
JUN	8.5	5.2	9.6	1.2
1997				
JAN	-0.9	1.6	0.1	0.3
FEB	0.8	-5.7	-2.3	-4.2
MAR	8.8	6.2	8.1	2.2
APR	1.4	-0.7	3.2	-3.1
MAY	0.0	4.2	10.5	3.5
JUN	4.6	4.9	8.9	-0.6
1998				
JAN	4.2	2.0	6.9	5.4
FEB	-1.5	-3.1	4.6	-2.8
MAR	6.4	2.1	5.7	1.0
APR	0.6	-2.0	0.8	-2.9
MAY	5.0	0.3	5.3	-0.5
JUN	-2.3	-1.1	3.0	-6.1
1999				
JAN	7.8	5.4	8.9	8.0
FEB	4.7	-0.5	7.6	2.1
MAR	7.4	4.1	8.6	6.7
APR	-0.9	-3.7	-1.8	-1.9
MAY	-0.4	-1.0	4.9	-0.1
JUN	1.8	0.2	6.3	-3.1
2000				
JAN	2.5	3.6	10.0	4.0
FEB	4.4	-0.9	9.8	5.0
MAR	1.8	1.0	6.8	2.0
APR	8.6	7.2	7.0	6.0
MAY	9.2	7.4	11.0	5.9
JUN	5.8	3.3	8.8	2.8
2001				
JAN	-9.2	-2.6	1.3	1.0
FEB	-11.5	-2.0	1.0	-4.0
MAR	-7.8	4.4	9.0	1.9
APR	-8.5	3.0	2.2	-1.1
MAY	-3.9	6.5	9.5	
JUN	-6.0	3.7	9.0	
2002				
JAN	-4.7	-4.0	1.9	
FEB	-6.4	-8.1	2.0	
MAR	-1.0	-1.8	2.2	
APR	3.5	5.6	7.4	
MAY		3.0	7.8	
JUN	6.0	4.4	10.5	
2003				
JAN	12.6	1.9	10.1	
FEB	-1.8	-4.3	4.0	
MAR	3.4	1.7	6.2	
APR	3.1	0.3	3.9	

TABLE 32: TEMPERATURE COMPARISON

	EAST MOUNTAIN DEPARTURE FROM NORMAL	ELECTRIC LAKE DEPARTURE FROM NORMAL	CASTLE DALE DEPARTURE FROM NORMAL	HUNTINGTON PLANT DEPARTURE FROM NORMAL
MAY	10.0	3.0	10.2	
JUN	2.7	1.9	8.0	
2004				
JAN	1.0	-3.8	-5.3	
FEB	-2.5	-6.4	0.4	
MAR	9.1	9.0	10.5	
APR	0.5	6.6	6.7	
MAY	5.7	3.0	8.1	
JUN	1.7	2.0	7.5	
2005				
JAN	14.1	8.9	6.1	
FEB	6.3	-6.1	4.4	
MAR	7.2	-0.3	10.8	
APR	7.1	-2.0	2.6	
MAY	8.8	-0.1	8.7	
JUN	3.7	-3.5	0.2	
2006				
JAN	5.6	-7.2	2.3	3.9
FEB	2.3	-14.1	2.2	0.0
MAR	2.3	-3.4	0.3	-4.1
APR	7.3	3.0	6.5	2.6
MAY	11.2	6.0	12.1	3.7
JUN	4.3	5.2	9.8	2.2
2007				
JAN	8.0	9.4	1.1	1.3
FEB	6.9	-0.1	7.1	5.9
MAR	14.4	6.6	4.8	11.2
APR	5.6	5.3	2.4	2.8
MAY	7.1	3.3	1.7	2.0
JUN	9.9	4.2	2.6	4.4
2008				
JAN	5.1	NA	-2.9	-3.1
FEB	-6.6	NA	-2.6	-2.0
MAR	5.8	NA	-0.9	-2.5
APR	-3.4	NA	-1.7	-3.0
MAY	-5.1	NA	-1.4	-3.6
JUN	-4.2	-1.1	0.3	-0.5
2009				
JAN	9.6	NA	3.5	-3.1
FEB	3.4	NA	6.2	-0.6
MAR	-6.5	NA	2.3	0.9
APR	-3.4	NA	1.5	-1.2
MAY	6.8	NA	3.2	3.4
JUN	-2.7	NA	-0.4	-5.1

YEAR	EAST MOUNTAIN	ELECTRIC LAKE	HUNTER PLANT	HUNTINGTON PLANT	TOTAL
1982		-2.8	0.0	1.2	-0.5
1983		-2.7	2.5	1.0	0.3
1984		-2.2	0.5	0.1	-0.5
1985	3.1	0.3	3.0	0.9	1.8
1986	2.9	3.4	6.3	3.2	4.0
1987	1.7	-0.5	3.2	1.1	1.4
1988	-0.2	-0.1	3.5	0.5	0.9
1989	0.0	-0.1	4.1	0.3	1.1
1990	2.3	1.8	7.3	1.2	3.2
1991	-1.9	-1.4	3.8	-2.5	-0.5
1992	1.9	6.5	6.6	1.8	4.2
1993	-0.9	-0.5	4.6	-1.7	0.4
1994	2.9	5.0	6.3	2.7	4.2
1995	3.6	0.5	5.4	-0.9	2.2
1996	6.7	2.2	7.1	1.7	4.4
1997	2.5	1.8	4.8	-0.3	2.2
1998	2.1	-0.3	4.4	-1.0	1.3
1999	3.4	0.8	5.8	2.0	3.0
2000	5.4	3.6	8.9	4.3	5.6
2001	-7.8	2.2	5.3		-0.1
2002	-0.5	-0.2	5.3		1.5
2003	5.0	0.8	7.1		4.3
2004	2.6	1.7	4.7		3.0
2005	7.9	-0.5	5.5		4.3
2006	5.5	-1.8	5.5	1.4	2.7
2007	8.6	4.8	3.3	4.6	5.3
2008	-1.4		-1.5	-2.5	-1.8

EAST MOUNTAIN

SPRING DISCHARGE RECESSION STUDY

YEAR 2009

SPRING		JUL	AUG	SEP	OCT
79-10	Flow (GPM)	5.9	4.3	2.7	2.5
	Temp. (C)	8.2	10.3	6.8	5.1
SHEBA SPRINGS	Flow (GPM)	2.6	0.7	0.4	0.3
	Temp. (C)	7.2	9.6	9.6	8.3
ELK SPRING*	Flow (GPM)	Developed and no longer applicable to recession stud			
	Temp. (C)				
79-35	Flow (GPM)	1.7	1.0	0.9	0.9
	Temp. (C)	7.8	7.4	6.9	7.7
79-26	Flow (GPM)	Dry	Dry	Dry	Dry
	Temp. (C)				
79-29	Flow (GPM)	0.6	0.6	0.7	0.6
	Temp. (C)		6.5	5.0	5.3
84-56	Flow (GPM)	Seep	Dry	Dry	Damp
	Temp. (C)				
80-44	Flow (GPM)	Damp	Damp	Damp	Damp
	Temp. (C)				
80-46	Flow (GPM)	Dry	Dry	Dry	Dry
	Temp. (C)				
BURNT TREE	Flow (GPM)	2.8	2.6	2.3	2.6
	Temp. (C)	8.4	8.1	8.1	7.9
79-23	Flow (GPM)	Dry	Dry	Dry	Dry
	Temp. (C)				
82-52	Flow (GPM)	Seep	Dry	Dry	Dry
	Temp. (C)				

Table 34a: East Mountain Springs Water Quality (Historical vs. 2009) *

Southern Area

PARAMETER	Burnt Tree Historical	Burnt Tree 2009	Elk Spring Historical	Elk Spring 2009	Sheba Springs Historical	Sheba Springs 2009	79-10 Historical	79-10 2009	79-23 Historical	79-23 2009	79-26 Historical	79-26 2009
Elevation	9260		9350		9740		9350		9035		9310	
Geologic Formation	TKn		TKn		Tf		Kpr		TKn		TKn	
Bicarbonate	327	264	285	241	288	252	312	260	413	no	323	no
Calcium	59.2	54.4	62.4	61.3	83.7	85.2	72.1	68.4	79.6	flow	54.4	flow
Carbonate	1.60	0.00	1.66	0.00	1.33	0.00	2.06	0.00	1.00	during	5.20	during
Chloride	5.6	3.0	4.6	2.0	4.8	1.50	5.1	2.5	11.3	2009	6.5	2009
Cond.(umhos/cm)	510	526	447	464	448	479	485	537	691		522	
Hardness	260	255	247	253	248	260	273	269			265	
Iron	0.16	0.00	0.12	0.00	0.17	0.17	0.22	0.75	0.09		0.50	
Magnesium	27.80	28.85	22.80	24.24	10.65	11.47	22.30	23.69	38.29		30.98	
Mangenese	0.05	0.00	0.05	0.00	0.05	0.00	0.05	0.00	0.01		0.04	
pH(units)	7.54	765.00	7.83	7.97	7.52	7.61	7.64	8.27	7.73		8.09	
Potassium	1.29	0.65	1.85	0.72	2.15	0.08	1.91	0.57	1.54		1.58	
Sodium	15.70	20.97	7.47	6.89	4.04	4.16	4.81	5.24	14.87		15.50	
Sulfate	18.8	11.5	16.8	7.5	15.6	4.5	11.6	7.0	27.2		20.2	
TDS	287	285	252	266	260	284	275	279	364		293	

PARAMETER	79-29 Historical	79-29 2009	79-35 Historical	79-35 2009	80-44 Historical	80-44 2009	80-46 Historical	80-46 2009	82-52 Historical	82-52 2009	84-56 Historical	84-56 2009
Elevation	9410		9585		8980		9350		8995		9335	
Geologic Formation	TKn		Tf		Kpr		TKn		Kpr		TKn	
Bicarbonate	323	254	296	253	443	no	348	no	4.12.02	no	345	no
Calcium	44.9	40.0	80.6	75.7	98.0	flow	61.4	flow	74.4	flow	61.4	flow
Carbonate	1.65	0.00	1.50	0.00	1.00	during	1.80	during	1.71	during	1.70	during
Chloride	18.22	19	4.18	1.50	10.86	2009	4.57	2009	10.11	2009	9.75	2009
Cond.(umhos/cm)	557	586	455	468	863		549		681		552	
Hardness	254	259	265	264	374		281		331		291	
Iron	0.50	0.12	0.43	0.00	0.11		0.10		0.20		0.69	
Magnesium	35.20	38.47	16.12	18.13	41.14		29.00		35.90		32.90	
Mangenese	1.10	0.00	0.05	0.00	0.02		0.03		0.04		0.05	
pH(units)	7.71	7.99	7.80	8.09	7.83		7.40		7.66		7.47	
Potassium	2.20	1.35	1.06	0.23	3.90		0.80		1.50		1.45	
Sodium	32.54	35.86	4.44	3.25	35.01		9.84		28.94		16.79	
Sulfate	38.2	34.5	16.8	4.0	136.0		16.3		44.1		27.8	
TDS	326	340	267	274	530		310		400		323	

* Quality parameters reported as mg/l unless otherwise noted

Table 34b: East Mountain Springs Water Quality (Historical vs. 2009) *

Mill Fork Area

PARAMETER	EM POND Historical	EM POND 2009	EMS JV34 Historical	EMS JV34 2009	EMS JV9 Historical	EMS JV9 2009	EMS MF 7 Historical	EMS MF 7 2009	EMS MF10 Historical	EMS MF10 2009	EMS MF19B Historical	EMS MF19B 2009
Elevation	10,280		8,692		8,618		8,580		10,250		10,111	
Geologic Formation	TKn		Alluvium		Alluvium		Kbh		TKn		TKn	
Bicarbonate	252.6	217.5	321.9	303.5	341.7	314.0	281.9	256	217.9	183.5	232.8	225.0
Calcium	59.7	57.6	83.5	83.3	87.6	90.2	72.8	74.22	55.7	56.2	65.1	69.0
Carbonate									1.7		3.0	7.5
Chloride	1.5	1.0	3.2	4.0	4.9	5.0	2.7	2.5	1.7	1.0	1.8	2.0
Cond.(umhos/cm)	470.1	456.0	602.7	579.5	698.9	671.0	587.9	543.5	423.9	382.0	446.6	503.0
Hardness	242.0	237.0	310.0	318.5	355.1	376.5	302.2	311	218.4	214.5	241.0	256.0
Iron - Total	0.5	0.0	0.6	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.7	0.1
Magnesium	22.6	22.7	24.7	26.9	34.5	36.7	29.3	30.5	19.3	18.0	19.1	20.3
Manganese - Total	0.004	0.000	0.012	0.007	0.008	0.002	0.0	0.000	0.002	0.000	0.053	0.0
pH (units)	7.96	8.1	8.1	8.2	7.3	7.4	7.8	7.85	8.1	8.2	8.3	8.4
Potassium	0.63	0.6	1.4	1.3	1.3	1.4	1.2	1.24	0.9	0.7	0.8	1.3
Sodium	2.26	2.1	7.5	8.2	7.1	7.4	6.0	6.36	2.2	1.9	1.8	1.9
Sulfate	5.11	4.0	17.1	14.0	51.1	54.0	45.8	46	7.5	6.0	7.2	4.5
TDS	253.4	253	327	337	385	399	325	343	230	237	239	281.0

PARAMETER	EMS MF213 Historical	EMS MF213 2009	EMS MF219 Historical	EMS MF219 2009	EMS MFR-10 Historical	EMS MFR-10 2009	EMS MFR-30 Historical	EMS MFR-30 2009	EMS RR-15 Historical	EMS RR-15 2009	EMS RR-23A Historical	EMS RR-23A 2009
Elevation	8,030		10,220		9,900		9,680		10,350		10,023	
Geologic Formation	Kbh		TKn		TKn		Kpr		TKn		TKn	
Bicarbonate	282.9	253.5	243.8	217.0	271.9	246.5	308.8	301.0	240.6	210.0	263.8	233.5
Calcium	65.3	65.5	66.1	67.0	73.9	71.6	84.0	85.8	59.1	57.0	69.9	69.9
Carbonate	3.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chloride	2.7	2.5	2.0	2.0	2.6	2.0	2.3	2.0	1.3	1.0	1.9	1.5
Cond.(umhos/cm)	559.7	478.0	503.4	478.5	531.5	508.0	630.9	620.0	443.8	420.0	504.0	476.5
Hardness	282.9	285.0	260.9	267.5	279.9	279.5	310.1	321.0	230.3	229.5	259.1	262.0
Iron - Total	0.1	0.0	0.3	0.1	0.4	0.0	0.5	0.2	0.2	0.0	0.3	0.5
Magnesium	29.1	29.6	23.3	24.3	23.6	24.5	24.3	26.1	20.1	21.1	20.5	21.2
Manganese - Total	0.001	0.0	0.010	0.001	0.0	0.0	0.010	0.0	0.004	0.0	0.004	0.0
pH (units)	7.9	8.2	7.8	8.1	8.0	8.4	7.9	8.2	7.9	7.8	7.6	7.6
Potassium	1.0	1.1	1.2	1.2	0.8	0.8	0.8	0.9	0.7	0.8	0.7	0.7
Sodium	5.6	5.5	2.4	2.4	3.9	3.9	12.7	14.9	2.8	3.2	2.8	2.8
Sulfate	25.5	25.0	27.2	31.5	22.9	23.5	31.9	35.0	6.4	7.0	12.0	11.5
TDS	294	302	271	288	293	303	350	370	243	227.5	276	278

PARAMETER	EMS RR-5 Historical	EMS RR-5 2009	EMS SP1-26 Historical	EMS SP1-26 2009	EMS SP1-29 Historical	EMS SP1-29 2009	EMS UJV101 Historical	EMS UJV101 2009	EMS UJV206 Historical	EMS UJV206 2009	GRANTS Historical	GRANTS 2009	LITTLE Historical	LITTLE 2009
Elevation	10,160		10,340		10,360		8,960		9,200		10,280		7,540	
Geologic Formation	TKn		TKn		TKn		Kcg		Kpr		TKn		Ksp	
Bicarbonate	216.2	197.5	215.9	190.0	283.1	244.5	242.3	231.5	261.3	234.0	241.2	221.0	288.1	278.0
Calcium	64.5	57.8	60.3	59.2	69.8	65.8	69.5	72.2	67.5	68.8	55.3	52.6	66.4	65.8
Carbonate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chloride	1.7	1.0	2.6	2.5	2.3	2.0	4.5	4.5	4.7	5.0	4.0	3.0	4.0	4.0
Cond.(umhos/cm)	442.8	410.5	434.8	400.5	511.2	482.5	538.6	513.5	525.6	509.5	480.1	449.0	595.7	573.5
Hardness	229.5	216.5	213.8	213.5	267.7	260.5	268.1	279.5	265.4	274.5	247.5	239.5	316.5	317.0
Iron - Total	0.3	0.8	0.5	0.5	0.0	0.0	0.390	0.320	0.054	0.0	0.0	0.0	0.040	0.0
Magnesium	16.6	17.6	15.4	15.9	22.7	23.4	23.0	24.2	23.5	25.0	26.6	26.2	36.6	37.0
Manganese - Total	0.003	0.028	0.001	0.003	0.0	0.0	0.001	0.0	0.0	0.0	0.0	0.0	0.001	0.0
pH (units)	7.8	7.8	7.8	8.1	7.6	7.8	8.0	7.6	8.0	8.0	7.7	7.9	7.4	7.5
Potassium	0.5	0.7	0.7	0.9	1.2	1.5	1.2	1.3	1.5	1.7	1.6	1.4	1.7	1.5
Sodium	1.8	1.8	2.2	2.5	3.1	3.0	5.6	5.8	6.4	6.4	3.5	3.8	7.2	7.0
Sulfate	8.7	9.0	7.1	6.5	7.3	6.5	38.6	39.5	31.1	32.0	12.2	10.5	35.9	38.0
TDS	243.4	238.0	232.9	234.5	264.9	267	299.2	316.0	291.3	299.0	254.0	260.0	325.9	330.0

* Quality parameters reported as mg/l unless otherwise noted

TABLE 35: NEWUA - RILDA CANYON SPRING FLOW (GPM)
MONTHLY MEASUREMENTS

DATE	METER 2	METER 3	METER 4	TOTAL
09/06/1990	20	75	120	215
09/18/1990	15.8	78.9	91	186
11/07/1990	13.3	37.5*	20	71
11/14/1990	14.5	67.4	9.3	91
11-19-90**	13.6	57.7	6.3	78
04/08/1991	10.9	56.5	4.7	72
06/11/1991	10.9	107	136	253.9
07/17/1991	12.5	95	160	267.5
08/19/1991	9.3	95	160	264.3
09/10/1991	9.2	105	140	254.2
10/21/1991	7.5	85	55	147.5
11/20/1991	8	80	16.2	104.2
04/07/1992	8	46	7.7	61.7
05/18/1992	7.5	110	140	257.5
06/12/1992	7	100	180	287
07/20/1992	7	80	150	237
08/14/1992	7.1	90	110	207.1
09/03/1992	6	35	75	116
10/30/1992	5.5	45	2.6	53.1
05/13/1993	6	25	13	44
06/11/1993	8.6	90	150	248.6
07/29/1993	6	110	170	286
08/27/1993	4	96	170	270
09/28/1993	2	60	110	172
10/22/1993	3	30	55	88
05/24/1994	4.6	65	75	144.6
06/16/1994	5	100	160	265
07/18/1994	5.5	100	130	235.5
08/24/1994	2	70	80	152
09/13/1994	2.7	30	20	52.7
10/23/1994	2	30	1.5	33.5
12/14/1995	2	38	***	40
06/28/1995	8	over capacity	***	
07/21/1995	2	over capacity	***	
08/24/1995	4	over capacity		
09/15/1995	2.3	150	***	157.3
10/31/1995			NEWUA conducting maintenance	
11/30/1995	3.3	75	***	78.3
04/02/1996	8	100	***	108
05/17/1996	5	175	***	180
06/11/1996	5.5	175.0'	***	180
07/23/1996	5.5	200.0'	***	205
08/21/1996	4.5	150.0'	***	154.5
09/16/1996	4.5	150.0'	***	154.5
10/23/1996	3.8	80	***	83.8
11/14/1996	4	80	***	84
12/12/1996	4	100	***	104

1996 problems: Valve seating affected flow measurements

	METER 2	METER 3	TOTAL	NEWUA METER
04/28/1997	5.2	150	+ 150 ****	94.0 *****
05/29/1997	6	150	+ 150 ****	230
06/25/1997	6	150	+ 150 ****	300
07/17/1997	6	150	+ 150 ****	270
08/26/1997	5.5	150	+ 150 ****	270
09/15/1997	5.5	150	+ 150 ****	270
10/13/1997	5	150	+ 150 ****	180
11/18/1997	3.9	100	+100.0 ****	160
12/04/1997	4	100	+100.0 ****	150

	METER 2	METER 3	TOTAL	NEWUA METER
04/14/1998	6.7	100		120
05/27/1998	7.5	158		145
06/08/1998	10.3	+100.0 ****		280
07/06/1998	7.5	+100.0 ****		300
08/10/1998	7.1	+100.0 ****		300
09/14/1998	6.0	+100.0 ****		240
10/05/1998	6.0	+100.0 ****		200
11/09/1998	6.7	172		180
12/09/1998	5.0	95		150

	METER 2	METER 3	TOTAL	NEWUA METER
01/12/1999	5.0	120	125+	150
02/02/1999	6.3	90	96+	120
03/03/1999	6.6	80	87+	110
04/13/1999	5.0	65	70+	120
05/11/1999	5.5	100	106+	130
06/15/1999	6.6	150	157+	240
07/26/1999	6.9	170	177+	250
08/12/1999	6.7	200	207+	270
09/16/1999	6.0	200	206+	225
10/05/1999	4.0	200	204	200
11/17/1999	3.2	100	103	130
12/09/1999	2.5	80	83	110
01/12/2000	2.2	60	62.2+	110
02/03/2000	3.4	53	56.4+	120
03/09/2000	++	++	++	120
04/05/2000	++	++	++	150
05/05/2000	3	86	89+	270
06/22/2000	3	160	163+	270
07/06/2000	2.1	170	172.1+	340
08/09/2000	1.6	200	201.6*	280
09/13/2000	1.2	120	121.2*	160
10/10/2000	1.7	50	51.7*	130
11/28/2000	1.4	65	66.4*	100
12/05/2000	1.07	61	62.1*	100
01/05/2001	1.02	62.5	63.52*	100
02/05/2001	*Inaccessible*			90
03/13/2001	*Inaccessible*			60
04/23/2001	1.5	52	53.5	60
05/21/2001	1.9	140	141.9	150
06/29/2001	1.6	214	215.6	210
07/03/2001	1.2	200	201.2	210
08/14/2001	1.1	180	181.1	220
09/17/2001	1	162	163	180
10/17/2001	1.5	150	151.5	120
11/27/2001	1.6	100	101.6	100
12/12/2001	*Lid Frozen*	40	40*	70
01/17/2002	1.5	45	47	60
02/11/2002	1.4	50	51	60
03/26/2002	0.5	33	34	60
04/11/2002	0.6	46	47	50
05/08/2002	0.5	40	41	55

TABLE 35: NEWUA - RILDA CANYON SPRING FLOW (GPM)
MONTHLY MEASUREMENTS

DATE	*METER 2*	*METER 3*	*METER 4*	*TOTAL*	
06/25/2002	1.0	166	167	120	
07/22/2002	0.7	170	171	210	
08/16/2002	0.7	150	151	150	
09/18/2002	0.5	60	61	90	
10/16/2002	0.4	55	55	60	
11/12/2002	0.4	51	51	60	
12/15/2002	1.8	46	48	60	
01/17/2003	1.6	46	48	60	
02/26/2003	1.6	33	35	60	
03/12/2003	1.5	40	42	50	
04/21/2003	1.3	50	51	60	
05/22/2003	3.7	150	154	70	
06/26/2003	3	222	225	205	
07/18/2003	2.8	190	193	225	
08/26/2003	2.2	190	192	220	
09/24/2003	0.4	130	130	130.4	+++
10/13/2003	1	75	76	76	+++
11/17/2003	0.8	70	71	70.8	+++
12/09/2003	0.8	38	39	38.8	+++

* Flow not stabilized.
** Data collected during pump test.
*** Diverted through Meter 3.
**** Over capacity
***** Meter/Valve problems
+ Meter 3 - Valve would not seat
++ Canyon Accessible
+++ Main Meter Not Working - Used Total of Meter 2 & 3
++++ Line Replacement

TABLE 36
NEWUA - RILDA CANYON SPRINGS
AVERAGE WATER QUALITY*

PARAMETER **	METER 2		METER 3		METER 4
	Historical	2009	Historical	2009	Historical
					Combined with Meter 3 in 1995
Bicarbonate	433.2	No Samples	377.16	298	356
Calcium	88.4	During	77.9	75.1	70.3
Carbonate	1.9	2009	1.8	0.0	0.7
Chloride	10.5	Problem	9.2	7.0	13.1
Cond.(umhos/cm)	792	With	722.77	704.33	535
Hardness	433	Valve	386.16	373.67	348
Iron - Total	0.46		0.22	1.76	0.13
Iron - Dissolved	0.11		0.08	0.00	
Magnesium	51.47		46.53	45.24	41.90
Mangenese - Total	0.10		0.05	0.006	0.08
Mangenese -Dissolved	0.04		0.005	0.027	
pH(units)	7.28		7.410	7.38	7.40
Potassium	2.68		1.996	1.82	2.13
Sodium	16.70		15.61	15.02	12.96
Sulfate	104.5		86.25	72.3	55.4
TDS	498		435.97	425.33	365

* Quality parameters reported as mg/l unless otherwise noted

** Data: Database input restricted to values greater then laboratory minimum detection limit.

Flow through Meter 4 was combined with Meter 3 in 1995

TRAIL MOUNTAIN

SPRING DISCHARGE RECESSION STUDY

YEAR 2009

SPRING		JUL	AUG	SEP	OCT	Seasonal Net Change %
T-6	Flow (GPM)	Dry	Dry	Dry	Dry	0.0
18-2-1	Temp. (C)					
T-8	Flow (GPM)	Dry	Dry	Dry	Dry	0.0
17-21-1	Temp. (C)					
T-9	Flow (GPM)	5.8	3.9	3.3	3.6	37.93
17-22-1	Temp. (C)	11.9	10.8	9.7	7.1	
T-10	Flow (GPM)	Seep	Seep	Seep	Seep	0.0
17-26-4	Temp. (C)					
T-14	Flow (GPM)	Dry	Dry	Dry	Dry	0.0
17-25-1	Temp. (C)					
T-14A	Flow (GPM)	Dry	Dry	Dry	Dry	0.0
17-26-5	Temp. (C)					
T-15	Flow (GPM)	Dry	Dry	Dry	Dry	0.0
17-35-1	Temp. (C)					
T-16	Flow (GPM)	Dry	Dry	Dry	Dry	0.0
17-35-2	Temp. (C)					
TM-23*	Flow (GPM)	0.0	0.0	0.0	0.0	0.0
	Temp. (C)					

JULY TOTAL **5.8**

OCTOBER TOTAL **3.6**

Net Change - Average -37.93

Net Change - By Volume Same

TOTAL FOR JULY 2008 = 13.0 GPM

JULY 2008 224% higher THAN JULY 2009

TABLE 38: TRAIL MOUNTAIN YEARLY SPRING DISCHARGE VARIATIONS (GPM)

JULY FLOW DATA

Spring	*1988*	*1989*	*1990*	*1991*	*1992*	*1993* ***	*1994*	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*
T-6 (18-2-1)	11	0.5	0.5	1.2	0.03	6	1.6	4.1	3.3	7.5	9.8	3.5	3	4.8	1.0	0.0	0.0	1.8	3.6	0.3	1.2	Dry
T-8 (17-21-1)	4.7	0.2	0.25	Dry	0.14	1.7	0.2	1.7	0.6	0.9	2.1	1.4	0.4	0.4	<0.1	<0.1	0	0.26	0.52	Dry	Dry	Dry
T-9 (17-22-1)	8	0.2	0.1	Dry	2.5	40	4	20	8.6	4.8	24	10.9	2.7	6	2.6	5.2	6.8	17	6	3.9	11.8	5.8
T-10 (17-26-4)	4.7	Dry	0.15	Dry	Dry	0.4	Damp	0.4	0.2	0.4	0.5	0.7	0.3	0.2	Seep	Seep	Seep	Seep	0.25	Seep	Seep	Seep
T-14 (17-25-1)	5	Dry	Dry	Dry	Dry	1.6	Damp	2	0.9	1	2.1	2.1	0.3	0.5	Seep	Dry	Dry	0	Damp	Dry	Dry	Dry
T-14A (17-26-5)	10	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Damp	Dry	0	0.0	0.0	0.0	0.0	0.0	Dry	Dry	Dry
T-15 (17-35-1)	2.1	0.2	0.5	0.75	0.33	1.6	0.5	1.2	0.8	1	3.3	2.3	0.9	0	0.0	0.0	0.0	0.0	0.0	Dry	Dry	Dry
T-16 (17-35-2)	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Damp	Damp	Dry	0	0.0	0.0	0.0	0.0	0.0	Dry	Dry	Dry
T-23 (17-14-4)	22**	4.0*	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	57.8****	84.4****	39.7****	0	0.0	0.0	0.0	17.7****	24.4****	Dry	Dry	Dry
TOTAL	67.5	5.1	1.5	1.95	2.67	51.3	6.3	29.4	14.4	15.6	99.6	105.3	47.2	11.9	3.6	5.2	6.8	36.76	46.6	Dry	13.0	5.8

* August measurement
** September measurement
*** First year monitored by PacifiCorp
**** Cottonwood Creek Gain/Loss Surveys

Table 39: Trail Mountain Springs Water Quality (Historical vs. 2009) *

PARAMETER	18-2-1 Historical	18-2-1 2009	17-21-1 Historical	17-21-1 2009	17-22-1 Historical	17-22-1 2009	17-26-4 Historical	17-26-4 2009	17-25-1 Historical	17-25-1 2009	17-26-5 ** Historical	17-26-5 ** 2009
Elevation	8395		9320		9210		8880		8155		9080	
Geologic Formation	TKn		TKn		TKn		TKn		Kcg		TKn	
Bicarbonate	396	No	390	No	315	251	396	Seep	546	No	404	no
Calcium	61.7	Flow	52.9	Flow	46.6	44.8	54.9	During	89.6	Flow	78.6	flow
Carbonate	1.36	During	1.39	During	3.66	0.00	8.33	2009	3.50	During	<.5	during
Chloride	45.5	2009	30.8	2009	9.8	8.0	28.8		31.5	2009	20.8	2009
Cond.(umhos/cm)	972		718		543	506	716		1169		860	
Hardness	389		244		257	253	333		486		442	
Iron	0.18		0.10		0.29	0.52	1.17		6.80		0.30	
Magnesium	57.06		27.93		34.20	34.23	47.48		59.30		59.75	
Mangenese	0.05		0.05		0.05	0.00	0.11		0.50		0.02	
pH(units)	8.15		7.59		7.76	8.05	8.03		7.85		7.75	
Potassium	1.58		2.06		1.46	1.49	1.81		2.29		1.93	
Sodium	66.51		61.32		20.30	18.55	33.28		66.70		31.07	
Sulfate	140.2		17.9		18.0	11.5	32.9		217.0		142.8	
TDS	583		394		294	285	398		723		515	

PARAMETER	17-35-1 Historical	17-35-1 2009	17-35-2 Historical	17-35-2 2009	17-14-4 Historical	17-14-4 2009
Elevation	8880		9000		7880	
Geologic Formation	TKn		TKn		Alluvium	
Bicarbonate	388	No	No	No	363	No
Calcium	41.6	Flow	Historical	Flow	65.9	Flow
Carbonate	5.71	During	Flow	During		During
Chloride	42.47	2009		2009	13.91	2009
Cond.(umhos/cm)	770				642	
Hardness	251				346	
Iron	0.67				0.19	
Magnesium	36.40				43.95	
Mangenese	0.08				0.02	
pH(units)	8.00				7.77	
Potassium	1.55				1.95	
Sodium	78.00				15.83	
Sulfate	45.2				61.9	
TDS	441				385	

TRAIL MOUNTAIN SPRINGS
CROSS REFERENCE

ARCO'S	ENERGY WEST
T-6	18-2-1
T-8	17-21-1
T-9	17-22-1
T-10	17-26-4
T-14	17-25-1
T-14A	17-26-5
T-15	17-35-1
T-16	17-35-2
TM-23	17-14-4

* Quality parameters reported as mg/l unless otherwise noted
** High TSS, Elevated Total Iron

TABLE 40: DEER CREEK IN-MINE WATER QUALITY *

2009*** SAMPLE DATES	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON DISSOLVED	MAGNESIUM	MANGANESE	PH (units)	POTASSIUM	SODIUM	SULFATE	TDS
TW-10														
20090331	306	73.21	0.0	4	649	338	0.0	37.68	0.0	7.47	1.27	15.35	43	370
20090618	305	74.48	0.0	5	652	341	0.0	37.69	0.0	7.43	1.39	17	45	377
20090923	317	73.32	0.0	4	647	342	0.0	38.61	0.0	7.44	1.37	15.55	44	382
20091214	310	72.31	0.0	4	646	339	0.0	38.53	0.0	7.52	1.33	15.34	44	379
2009* **														
MIN	305	72.31	0.0	4	646	338	0.0	37.68	0.0	7.43	1.27	15.34	43	370
MAX	317	74.48	0.0	5	652	342	0.0	38.61	0.0	7.52	1.39	17.00	45	382
MEAN	310	73.33	0.0	4	649	340	0.0	38.13	0.0	7.47	1.34	15.81	44	377
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4
HISTORICAL 1988-2008														
MIN	714	211.0	5.0	30.0	950	732	1.17	77.10	1.210	8.40	5.00	55.03	350	505
MAX	279	61.3	0.0	0.4	450	279	0.00	18.70	0.000	6.60	0.01	9.81	27	313
MEAN	366	77.1	1.4	6.9	634	348	0.15	36.55	0.083	7.38	1.38	15.46	50	376
MN-ME**														
20090331	364	102.27	0.0	7	868	501	0.0	59.66	0.0	8.02	2.92	19.14	159	579
20090618	326	98.4	0.0	7	907	491	0.0	59.65	0.0	8.13	3.2	21.53	167	584
20090923	322	92.39	0.0	7	898	482	0.0	61.12	0.0	8.14	3.1	19.51	165	570
20091214	328	92.94	0.0	7	869	476	0.0	59.17	0.0	8.17	3.02	18.79	151	554
2009* **														
MIN	322	92.39	0.0	7	868	476	0	59.17	0.0	8.02	2.92	18.79	151	554
MAX	364	102.27	0.0	7	907	501	0	61.12	0.0	8.17	3.20	21.53	167	584
MEAN	335	96.50	0.0	7	886	488	0	59.90	0.0	8.12	3.06	19.74	161	572
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4.00	4	4
HISTORICAL 1991-2008														
MIN	475	120.3	23.0	25.0	1139	590	2.81	70.43	0.200	8.23	14.00	37.16	218.00	678
MAX	294	69.0	0.0	4.0	500	329	0.00	37.60	0.000	6.90	0.74	14.90	40.00	240
MEAN	403	90.5	2.8	7.8	817	425	0.22	48.25	0.040	7.74	3.06	18.70	109.96	498

*** Quality parameters are reported as mg/l unless otherwise noted.**

**** Sample site intiated during 1991.**

***** 1997 Data: Database input restricted to values greater than laboratory minimum detection limit.**

TABLE 41: DEER CREEK MINE - DISCHARGE WATER QUALITY*

	2009**				Historical - (1976-2008)			
Parameters	***Minimum***	***Maximum***	***Mean***	***No. of Analysis***	***Minimum***	***Maximum***	***Mean***	***No. of Analysis***
pH (units)	7.35	7.65	7.47	12	6.52	8.51	7.49	396
Acidity				ND	0.1	97	13.3	266
Chloride	9	149	35.14	12	0.7	285	17.87	394
Conductivity (umhos/cm)	766	1257	941.58	12	480	1900	895.37	408
Iron - Total	0.18	0.94	0.55	12	0.01	7.53	0.63	404
Oil & Grease	Visal Observation - No Samples During 2009				0.1	48.8	3.21	238
Sulfate	79	235	133.17	12	13	518	174.74	402
TDS	441	787	576.67	12	289	1111	571.06	414
TSS	0	6	0.92	12	0	2784	52.26	343

* Quality parameters reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater than laboratory minimum detection limit.

TABLE 42: WILBERG/COTTONWOOD IN-MINE WATER QUALITY *

2009** SAMPLE DATES	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON DISSOLVED	MAGNESIUM	MANGANESE	PH (units)	POTASSIUM	SODIUM	SULFATE	TDS
2S XC-11	Mine Sealed May 2001 - In-Mine Monitoring Discontinued													
2009**														
MIN														
MAX														
MEAN														
No. of Analysis														
HISTORICAL 1983-2001														
MIN	403	116.0	0.1	6.0	1000	725	0.01	5.40	0.01	6.50	0.30	5.80	250.0	664
MAX	676	330.0	5.0	160.0	2600	1022	0.30	134.40	0.20	8.07	7.40	36.90	690.0	1328
MEAN	565	171.0	1.6	20.3	1495.0	868.0	0.13	105.50	0.05	7.23	4.22	22.56	412.0	1050
TMA XC-32	Mine Sealed May 2001 - In-Mine Monitoring Discontinued													
2009**														
MIN														
MAX														
MEAN														
No. of Analysis														
HISTORICAL 1983-2001														
MIN	379	114	1	7	1171	581	0.10	72	0.10	7.03	6	33	256	816
MAX	467	133	5	17	1352	688	0.70	90	0.20	8.20	10	44	491	993
MEAN	441.0	119.0	3.5	12.3	1259.0	609.0	0.2	75.7	0.1	7.27	7.5	39.2	338.5	868.4

*** Quality parameters are reported as mg/l unless otherwise noted.**

**** 1997 Data: Database input restricted to values greater then laboratory minimum detection limit.**

TABLE 43 : WILBERG/COTTONWOOD - DISCHARGE WATER QUALITY

* GRIMES WASH

	2009				Historical - (1976-2001)			
	Min	Max	Mean	No. of Analysis	Min	Max	Mean	No. of Analysis
pH	No Discharge During 2009				6.9	8.47	7.7	273
Acidity					0.1	62	10.61	193
Bicarb. Alkalinity					190	539	364	173
Chloride					0.6	80	17.5	247
Conductivity					490	1611	1041	205
Iron					0.01	3	0.33	233
Oil & Grease					0.1	23.8	2.3	193
Sulfate					29.2	600	264	249
TDS					407	1287	672	273
TSS					0.1	222	7.8	262

MILLER CANYON

	2009				Historical - (1984-2008)			
	Min	Max	Mean	No. of Analysis	Min	Max	Mean	No. of Analysis
pH	No Discharge During 2009				6.4	8.83	7.3	81
Acidity					0.1	100	22.45	72
Bicarb. Alkalinity					267	543	408.7	79
Chloride					10	155	22.14	77
Conductivity					480	1900	1216	81
Iron - Total					0.01	1.38	0.24	79
Oil & Grease					0.1	7.2	2.1	71
Sulfate					200	680	419.3	79
TDS					413	1182	926	81
TSS					0.1	32	4.8	109

TMA001*

	2009				Historical - (2001-2008)			
	Min	Max	Mean	No. of Analysis	Min	Max	Mean	No. of Analysis
pH	7.3	7.42	7.37	12	6.20	8.08	7.4	92
Acidity				ND	6	6	6	1
Bicarb. Alkalinity	361	385	377.67	12	344	456	386	93
Chloride	14	15	14.42	12	6	41	17.63	93
Conductivity	1060	1132	1113.7	12	1077	1436	1178	93
Iron - Total	0	0	0	12	0	0.4	0.055	9
Oil & Grease	Visal Observation - No Samples During 2009							ND
Sulfate	230	254	240.83	12	215	322	266.31	93
TDS	736	766	751.5	12	696	803	758.8	93
TSS	0	0	0	12	0	14	4.36	14

* Discharge Re-located From Grimes Wash to TMA July 2001
ND - Not Detected

TABLE 44: TRAIL MOUNTAIN IN-MINE WATER QUALITY *

2008** SAMPLE DATES	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON DISSOLVED	MAGNESIUM	MANGANESE	PH (units)	POTASSIUM	SODIUM	SULFATE	TDS
UG-3	Mine Sealed April 2001 - In-Mine Monitoring Discontinued													
2009**														
MIN														
MAX														
MEAN														
No. of Analysis														
HISTORICAL 1985 - 2001														
MIN	260	26.0	0.1	2	380	151	0.03	19.6	0.03	7.41	2.1	33.0	15.0	252
MAX	344	49.3	25.0	16	696	222	0.20	29.0	0.20	8.48	5.0	61.0	130.0	424
MEAN	305	34.2	7.3	8.80	542	189	0.15	25.3	0.10	8.09	3.6	46.1	33.7	308

* *Quality parameters are reported as mg/l unless otherwise noted.*

** Data: Database input restricted to values greater then laboratory minimum detection limit.

TABLE 45 : TRAIL MOUNTAIN - DISCHARGE WATER QUALITY

@ COTTONWOOD CANYON PORTALS

	2009				Historical			
	Min	Max	Mean	No. of Analysis	Min	Max	Mean	No. of Analysis
pH	Mine Sealed April 2001 - No Discharge				7.8	8.53	8.26	67
Acidity					12	58	35	2
Bicarb. Alkalinity					341	922	753	48
Chloride					10	410	36.5	49
Conductivity					1116	1655	1464	55
Iron					0.3	2.3	0.55	71
Oil & Grease					2	2	2	2
Sulfate					50	292	152	48
TDS					671	1072	936	70
TSS					5	42	109	36

OLIPHANT PORTALS

	2009				Historical			
	Min	Max	Mean	No. of Analysis	Min	Max	Mean	No. of Analysis
pH	Seep During 2009				7.54	8.91	8.1	45
Acidity					1	19	7.73	15
Bicarb. Alkalinity					214	327	282	45
Chloride					4	21	8.3	45
Conductivity					482	925	663	42
Iron					0.01	0.7	0.16	23
Oil & Grease					0.4	5	4.4	8
Sulfate					90	330	123	45
TDS					354	584	410	45
TSS					1	90	22.6	23

TABLE 46: WELLS - WATER QUALITY *

2009** SAMPLE DATES	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON DISSOLVED	MAGNESIUM	MANGANESE	PH (units)	POTASSIUM	SODIUM	SULFATE	TDS
DEER CREEK - DCWR-1														
20090324	631	116.43	0	736	17820	1096	0	195.44	0.012	7.67	17.25	4893.5	9567	16228
20090618	635	117	0	801	18660	1064	0	187.36	0.012	7.59	15.73	4832	9892	16432
20090909	646	116.19	0	760	18520	1088	0	193.79	0.013	7.62	14.51	5062.3	9652	16267
20091202	641	109.51	0	805	17760	1022	0	181.71	0.01	7.87	16.18	4976.8	10152	16486
2009**														
MIN	631	110	0	736	17760	1022	0	182	0	8	15	4832	9567	16228
MAX	646	117	0	805	18660	1096	0	195	0	8	17	5062	10152	16486
MEAN	638	115	0	776	18190	1068	0	190	0	8	16	4941	9816	16353
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4
HISTORICAL 1989-2008:														
MIN	531	95.0	0	17	17300	318	0.00	4.54	0.00	7.34	6.12	4500	6000	11466
MAX	935	880.10	83	1140	45000	3351	1.74	351.00	0.20	8.47	43.80	9978	18000	24189
MEAN	748.97	161.51	3.86	757.04	22203.81	1193.45	0.22	191.67	0.04	7.75	17.53	6014.71	11900.13	19161.80
WILBERG/COTTONWOOD - CWRW-1														
20090325	435	456.72	0	2745	17590	4561	0	830.6	0.009	7.3	39.0	3641.1	7862	16154
20090617	441	443.15	0	2691	18320	4414	0	803.1	0	7.36	36.2	3542.8	7922	16293
20090908	435	465	0	2667	18510	4835	0	892.0	0	7.27	35.7	3858.4	7852	16376
20091203	435	426	0	2744	17630	4499	0	834.4	0.058	7.38	36.7	3566.6	8087	16342
2009**														
MIN	435	426	0	2667	17,590	4414		803	0.000	7.27	35.7	3,543	7,852	16,154
MAX	441	465	0	2745	18,510	4835		892	0.058	7.38	39.0	3,858	8,087	16,376
MEAN	437	448	0	2712	18,013	4577		840	0.017	7.33	36.9	3,652	7,931	16,291
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4
HISTORICAL 1989-2008:														
MIN	233	132	0.00	280	10,666	1629	0.00	137.7	0.003	6.90	8.0	851	750	5,231
MAX	864	1135	10	4020	120,000	8327	37.77	1717	2.480	8.33	122.0	8,812	24,000	30,440
MEAN	405	371	1.5	2292	21,800	3783	1.92	688	0.260	7.60	35.8	3,913	8,439	15,797
TRAIL MOUNTAIN TM-1B														
20090325	410	9.36	15	52	991	62	0	9.39	0.009	7.43	2.3	204.59	10	610
20090617	433	9.46	0	57	1016	63	0	9.6	0	8.45	2.23	210.13	14	611
20090908	429	9.13	17	56	1035	61	0	9.2	0.009	8.46	2.3	214.25	10	603
20091203	438	9.39	15	57	1036	63	0	9.56	0.009	8.6	2.33	223.29	15	627
2009**														
MIN	410	9.13	0	52	991	61	0	9.2	0	7.43	2.23	204.59	10	603
MAX	438	9.46	17	57	1036	63	0	9.6	0.009	8.6	2.33	223.29	15	627
MEAN	427.50	9.34	11.75	55.50	1019.50	62.25	0.00	9.44	0.01	8.24	2.29	213.07	12.25	612.75
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4
HISTORICAL 1985-2008:														
MIN	304.0	2.4	0	16	783	7.0	0.00	1.0	0.002	8.02	1	5	0	402
MAX	1015.0	14	164	717	4580	72.0	0.20	10.7	0.2	9.55	15.7	1316	664	3,290
MEAN	502.98	8.73	28.9	67.47	1098.43	55.4	0.06	8.2	0.022	8.46	2.65	239.98	27.73	646

610
611
603
627

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater than laboratory minimum detection limit.

PacifiCorp Energy
Reservoir Records
Electric Lake 2008 - 2009
Daily Active Contents (Acre Feet)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	27028	26170	25497	24829	24390	24029	23776	24370	30482	30549	29908	27967	1
2	27002	26162	25465	24806	24374	24006	23768	24526	30506	30549	29885	27901	2
3	26977	26162	25444	24782	24359	23994	23764	24687	30487	30544	29861	27840	3
4	26947	26146	25416	24774	24339	23975	23757	24857	30497	30544	29838	27775	4
5	26922	26141	25384	24770	24327	23968	23741	25032	30506	30544	29768	27710	5
6	26897	26133	25360	24770	24312	23952	23722	25267	30544	30544	29699	27645	6
7	26871	26113	25332	24703	24308	23944	23718	25566	30582	30516	29629	27580	7
8	26842	26100	25308	24691	24281	23937	23711	25907	30597	30492	29560	27520	8
9	26833	26088	25284	24672	24273	23918	23711	26220	30597	30468	29496	27455	9
10	26821	26067	25259	24656	24261	23914	23707	26523	30601	30444	29427	27391	10
11	26783	26030	25231	24640	24250	23902	23699	26838	30601	30421	29358	27326	11
12	26749	26022	25207	24632	24242	23887	23699	27194	30601	30392	29289	27262	12
13	26711	26006	25191	24605	24222	23871	23699	27524	30601	30368	29221	27202	13
14	26678	25993	25163	24589	24211	23860	23699	27758	30601	30345	29157	27138	14
15	26640	25965	25139	24574	24199	23848	23695	27984	30601	30321	29089	27075	15
16	26632	25936	25135	24558	24188	23837	23695	28217	30601	30297	29021	27011	16
17	26619	25907	25112	24538	24180	23822	23695	28465	30597	30274	28953	26947	17
18	26561	25879	25092	24519	24172	23818	23695	28742	30597	30246	28886	26888	18
19	26536	25854	25068	24499	24164	23810	23695	29048	30597	30222	28823	26825	19
20	26502	25826	25052	24483	24145	23799	23695	29331	30597	30198	28755	26762	20
21	26469	25793	25028	24468	24130	23799	23707	29606	30597	30175	28688	26699	21
22	26444	25756	25000	24452	24110	23795	23734	29810	30597	30151	28621	26636	22
23	26415	25720	24988	24452	24106	23791	23791	30011	30597	30128	28554	26577	23
24	26382	25679	24976	24452	24095	23791	23868	30255	30597	30100	28492	26498	24
25	26357	25651	24964	24452	24087	23791	23979	30468	30582	30076	28425	26423	25
26	26328	25618	24948	24452	24075	23791	24068	30587	30578	30053	28358	26340	26
27	26299	25598	24936	24452	24052	23791	24118	30663	30573	30029	28292	26261	27
28	26270	25574	24921	24448	24041	23791	24157	30673	30573	30006	28226	26187	28
29	26245	25545	24893	24437		23787	24195	30535	30563	29983	28164	26113	29
30	26220	25517	24869	24425		23783	24257	30501	30554	29955	28098	26039	30
31	26187		24845	24413		23779		30497		29931	28032		31

	Monthly Totals												Yearly Totals
Mean	26,618	25,905	25,145	24,580	24,210	23,864	23,807	27,989	30,573	30,286	29,018	27,033	**26,586**
Min	26,187	25,517	24,845	24,413	24,041	23,779	23,695	24,370	30,482	29,931	28,032	26,039	**23,695**
Max	27,028	26,170	25,497	24,829	24,390	24,029	24,257	30,673	30,601	30,549	29,908	27,967	**30,673**
Change	-875	-670	-672	-432	-372	-262	478	6,240	57	-623	-1,899	-1,993	**-1,023**

Notes: Due to instrumentation errors, elevations (from which the contents are derived) are linearly interpolated between manual readings for two periods: 7 July and 4 August; 4 August and 23 September. Reviewed 3/24/2010.

PacifiC[illegible] Energy
Reservoir Level Records
Electric Lake 2008 - 2009
End-of-Day Elevation (ft.)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	8567.22	8565.17	8563.52	8561.85	8560.73	8559.80	8559.14	8560.68	8574.92	8575.06	8573.71	8569.41	1
2	8567.16	8565.15	8563.44	8561.79	8560.69	8559.74	8559.12	8561.08	8574.97	8575.06	8573.65	8569.26	2
3	8567.10	8565.15	8563.39	8561.73	8560.65	8559.71	8559.11	8561.49	8574.93	8575.05	8573.60	8569.11	3
4	8567.04	8565.11	8563.32	8561.71	8560.60	8559.66	8559.09	8561.92	8574.95	8575.05	8573.55	8568.96	4
5	8566.97	8565.10	8563.24	8561.70	8560.57	8559.64	8559.05	8562.36	8574.97	8575.05	8573.40	8568.81	5
6	8566.91	8565.08	8563.18	8561.70	8560.53	8559.60	8559.00	8562.95	8575.05	8575.05	8573.25	8568.67	6
7	8566.85	8565.03	8563.11	8561.53	8560.52	8559.58	8558.99	8563.69	8575.13	8575.00	8573.11	8568.52	7
8	8566.79	8565.00	8563.05	8561.50	8560.45	8559.56	8558.97	8564.53	8575.16	8574.95	8572.96	8568.37	8
9	8566.76	8564.97	8562.99	8561.45	8560.43	8559.51	8558.97	8565.29	8575.16	8574.89	8572.81	8568.22	9
10	8566.73	8564.92	8562.93	8561.41	8560.40	8559.50	8558.96	8566.02	8575.17	8574.84	8572.66	8568.07	10
11	8566.65	8564.83	8562.86	8561.37	8560.37	8559.47	8558.94	8566.77	8575.17	8574.79	8572.51	8567.93	11
12	8566.56	8564.81	8562.80	8561.35	8560.35	8559.43	8558.94	8567.61	8575.17	8574.74	8572.37	8567.78	12
13	8566.48	8564.77	8562.76	8561.28	8560.30	8559.39	8558.94	8568.38	8575.17	8574.69	8572.22	8567.63	13
14	8566.39	8564.74	8562.69	8561.24	8560.27	8559.36	8558.94	8568.92	8575.17	8574.64	8572.07	8567.48	14
15	8566.31	8564.67	8562.63	8561.20	8560.24	8559.33	8558.93	8569.44	8575.17	8574.58	8571.92	8567.33	15
16	8566.28	8564.60	8562.62	8561.16	8560.21	8559.30	8558.93	8569.97	8575.17	8574.53	8571.77	8567.19	16
17	8566.25	8564.53	8562.56	8561.11	8560.19	8559.26	8558.93	8570.53	8575.16	8574.48	8571.63	8567.04	17
18	8566.11	8564.46	8562.51	8561.06	8560.17	8559.25	8558.93	8571.15	8575.16	8574.43	8571.48	8566.89	18
19	8566.05	8564.40	8562.45	8561.01	8560.15	8559.23	8558.93	8571.83	8575.16	8574.38	8571.33	8566.74	19
20	8565.97	8564.33	8562.41	8560.97	8560.10	8559.20	8558.93	8572.45	8575.16	8574.33	8571.18	8566.59	20
21	8565.89	8564.25	8562.35	8560.93	8560.06	8559.20	8558.96	8573.05	8575.16	8574.27	8571.03	8566.45	21
22	8565.83	8564.16	8562.29	8560.89	8560.01	8559.19	8559.03	8573.49	8575.16	8574.22	8570.89	8566.30	22
23	8565.76	8564.07	8562.26	8560.89	8560.00	8559.18	8559.18	8573.92	8575.16	8574.17	8570.74	8566.15	23
24	8565.68	8563.97	8562.22	8560.89	8559.97	8559.18	8559.38	8574.44	8575.16	8574.12	8570.59	8565.96	24
25	8565.62	8563.90	8562.19	8560.89	8559.95	8559.18	8559.67	8574.89	8575.13	8574.07	8570.44	8565.78	25
26	8565.55	8563.82	8562.16	8560.89	8559.92	8559.18	8559.90	8575.14	8575.12	8574.02	8570.29	8565.58	26
27	8565.48	8563.77	8562.13	8560.89	8559.86	8559.18	8560.03	8575.30	8575.11	8573.96	8570.15	8565.39	27
28	8565.41	8563.71	8562.08	8560.88	8559.83	8559.18	8560.13	8575.32	8575.11	8573.91	8570.00	8565.21	28
29	8565.35	8563.64	8562.01	8560.85		8559.17	8560.23	8575.03	8575.09	8573.86	8569.85	8565.03	29
30	8565.29	8563.57	8561.95	8560.82		8559.16	8560.39	8574.96	8575.07	8573.81	8569.70	8564.85	30
31	8565.21		8561.89	8560.79		8559.15		8574.95		8573.76	8569.55		31

ELECTRIC LAKE STATISTICS

	Monthly												Yearly
Daily Mean	8,566.25	8,564.52	8,562.64	8,561.22	8,560.27	8,559.37	8,559.22	8,569.28	8,575.11	8,574.51	8,571.76	8,567.22	8,565.95
Daily Min	8,565.21	8,563.57	8,561.89	8,560.79	8,559.83	8,559.15	8,558.93	8,560.68	8,574.92	8,573.76	8,569.55	8,564.85	8,558.93
Daily Max	8,567.22	8,565.17	8,563.52	8,561.85	8,560.73	8,559.80	8,560.39	8,575.32	8,575.17	8,575.06	8,573.71	8,569.41	8,575.32

Notes: Due to instrumentation errors, elevations are linearly interpolated between manual readings for two periods: 7 July and 4 August; 4 August and 23 September. Reviewed 3/24/2(

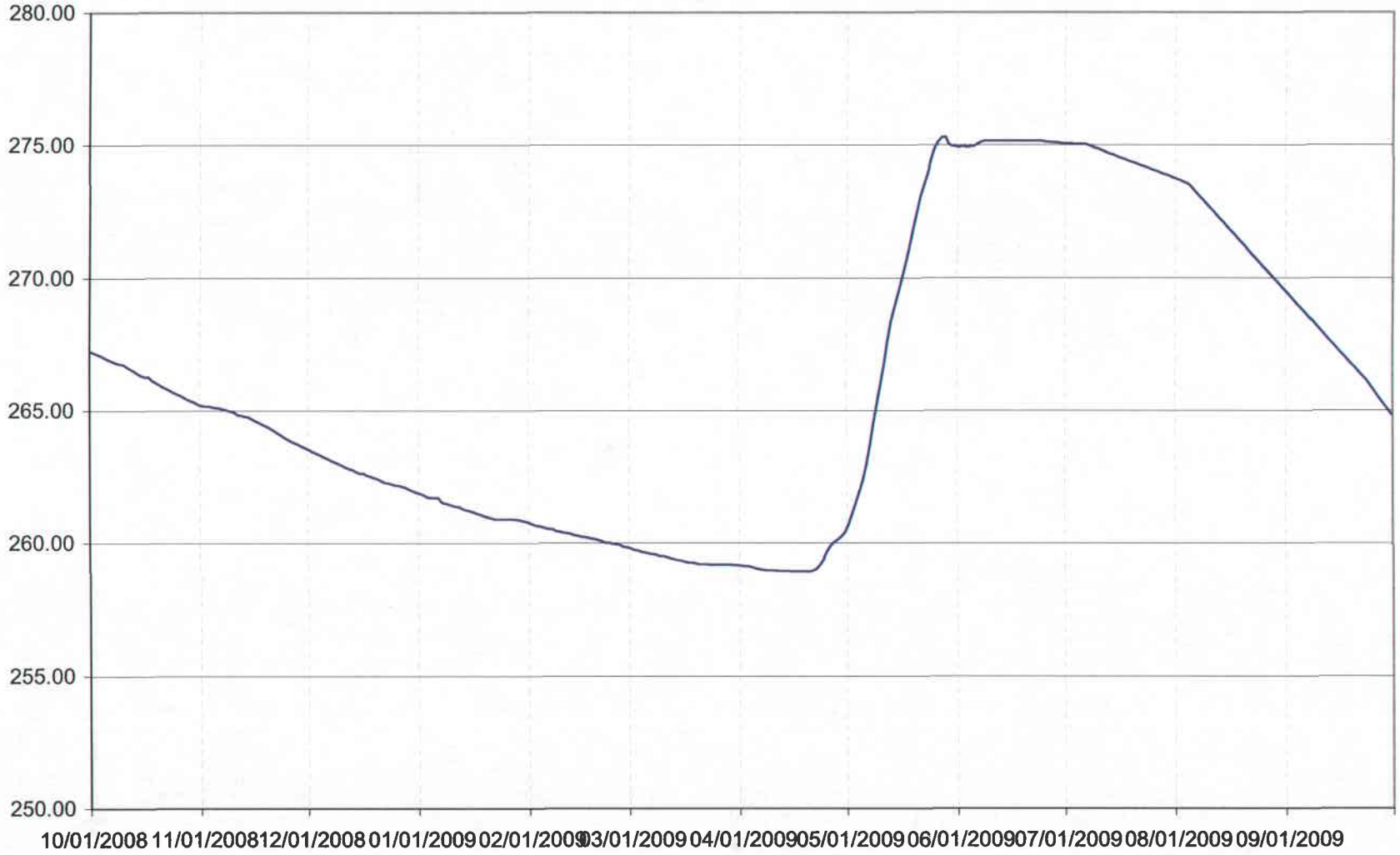
PacifiC[illegible] Energy
Reservoir Records
Electric Lake 2008 - 2009
Daily Evaporation (Acre Feet)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	0	0	0	0	0	0	0	0	4	4	5	4	1
2	0	0	0	0	0	0	0	0	4	4	5	4	2
3	0	0	0	0	0	0	0	0	4	4	4	4	3
4	0	0	0	0	0	0	0	0	4	4	4	4	4
5	0	0	0	0	0	0	0	0	4	4	4	4	5
6	0	0	0	0	0	0	0	0	4	4	4	4	6
7	0	0	0	0	0	0	0	0	4	5	4	4	7
8	0	0	0	0	0	0	0	0	4	5	4	4	8
9	0	0	0	0	0	0	0	0	4	5	4	4	9
10	0	0	0	0	0	0	0	0	4	5	4	4	10
11	0	0	0	0	0	0	0	0	4	5	4	4	11
12	0	0	0	0	0	0	0	0	4	5	4	4	12
13	0	0	0	0	0	0	0	0	4	5	4	4	13
14	0	0	0	0	0	0	0	0	4	5	4	4	14
15	0	0	0	0	0	0	0	0	4	5	4	4	15
16	0	0	0	0	0	0	0	0	4	5	4	4	16
17	0	0	0	0	0	0	0	0	4	5	4	4	17
18	0	0	0	0	0	0	0	0	4	5	4	4	18
19	0	0	0	0	0	0	0	0	4	5	4	4	19
20	0	0	0	0	0	0	0	0	4	5	4	4	20
21	0	0	0	0	0	0	0	0	4	5	4	4	21
22	0	0	0	0	0	0	0	0	4	5	4	4	22
23	0	0	0	0	0	0	0	0	4	5	4	4	23
24	0	0	0	0	0	0	0	0	4	5	4	4	24
25	0	0	0	0	0	0	0	0	4	5	4	4	25
26	0	0	0	0	0	0	0	0	4	5	4	4	26
27	0	0	0	0	0	0	0	0	4	5	4	4	27
28	0	0	0	0	0	0	0	0	4	5	4	4	28
29	0	0	0	0		0	0	0	4	5	4	4	29
30	0	0	0	0		0	0	0	4	5	4	4	30
31	0		0	0		0		4		5	4		31

	Monthly Totals												Yearly Totals
Mean	0	0	0	0	0	0	0	0	4	4	4	4	1
Min	0	0	0	0	0	0	0	0	4	4	4	4	0
Max	0	0	0	0	0	0	0	4	4	5	5	4	5
Change	0	0	0	0	0	0	0	4	0	1	-1	0	4

Notes: Daily evaporation is based on monthly evaporation pan readings distributed evenly over the days between readings. Some evaporation may occur before and after pan readings available.

Electric Lake Stage



PacifiC[illegible] Energy
Reservoir Records
Electric Lake 2008 - 2009
Surface Area (Acre)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	424	413	404	395	390	386	382	390	475	476	466	437	1
2	424	412	403	395	390	385	382	392	476	476	466	436	2
3	267	412	403	395	390	385	382	394	475	476	466	435	3
4	423	412	403	395	389	385	382	396	476	476	465	435	4
5	423	412	402	395	389	385	382	398	476	476	464	434	5
6	422	412	402	395	389	385	382	401	476	476	463	433	6
7	422	412	402	394	389	384	382	405	477	476	462	432	7
8	422	412	401	394	389	384	382	409	477	476	461	431	8
9	421	412	401	393	388	384	382	413	477	475	460	430	9
10	421	411	401	393	388	384	382	417	477	475	459	429	10
11	421	411	400	393	388	384	382	422	477	474	458	428	11
12	420	411	400	393	388	384	382	426	477	474	457	427	12
13	420	410	400	393	388	384	382	431	477	474	456	427	13
14	419	410	400	392	388	383	382	434	477	473	455	426	14
15	419	410	399	392	388	383	381	438	477	473	454	425	15
16	419	410	399	392	387	383	381	441	477	472	453	424	16
17	419	409	399	392	387	383	381	444	477	472	452	423	17
18	418	409	399	392	387	383	381	449	477	472	451	422	18
19	417	408	398	391	387	383	381	453	477	471	450	421	19
20	417	408	398	391	387	383	381	457	477	471	449	420	20
21	417	408	398	391	387	383	382	462	477	470	448	420	21
22	416	407	398	391	387	383	382	465	477	470	447	419	22
23	416	407	397	391	386	383	383	468	477	470	446	418	23
24	415	406	397	391	386	383	384	472	477	469	445	417	24
25	415	406	397	391	386	383	385	475	477	469	444	416	25
26	415	405	397	391	386	383	386	477	477	469	443	415	26
27	414	405	397	391	386	383	387	478	477	468	442	414	27
28	414	405	397	391	386	383	387	478	477	468	441	413	28
29	414	404	396	391		383	388	476	476	467	440	412	29
30	413	404	396	390		383	388	476	476	467	439	411	30
31	413		396	390		382		476		467	438		31

	Monthly Totals												Yearly Totals
Mean	414	409	399	392	388	384	383	439	477	472	453	424	419
Min	267	404	396	390	386	382	381	390	475	467	438	411	267
Max	424	413	404	395	390	386	388	478	477	476	466	437	478
Change	-11	-9	-8	-5	-4	-4	6	86	1	-9	-28	-26	-11

Notes:

PacifiC[illegible]Energy

Stream Discharge Records

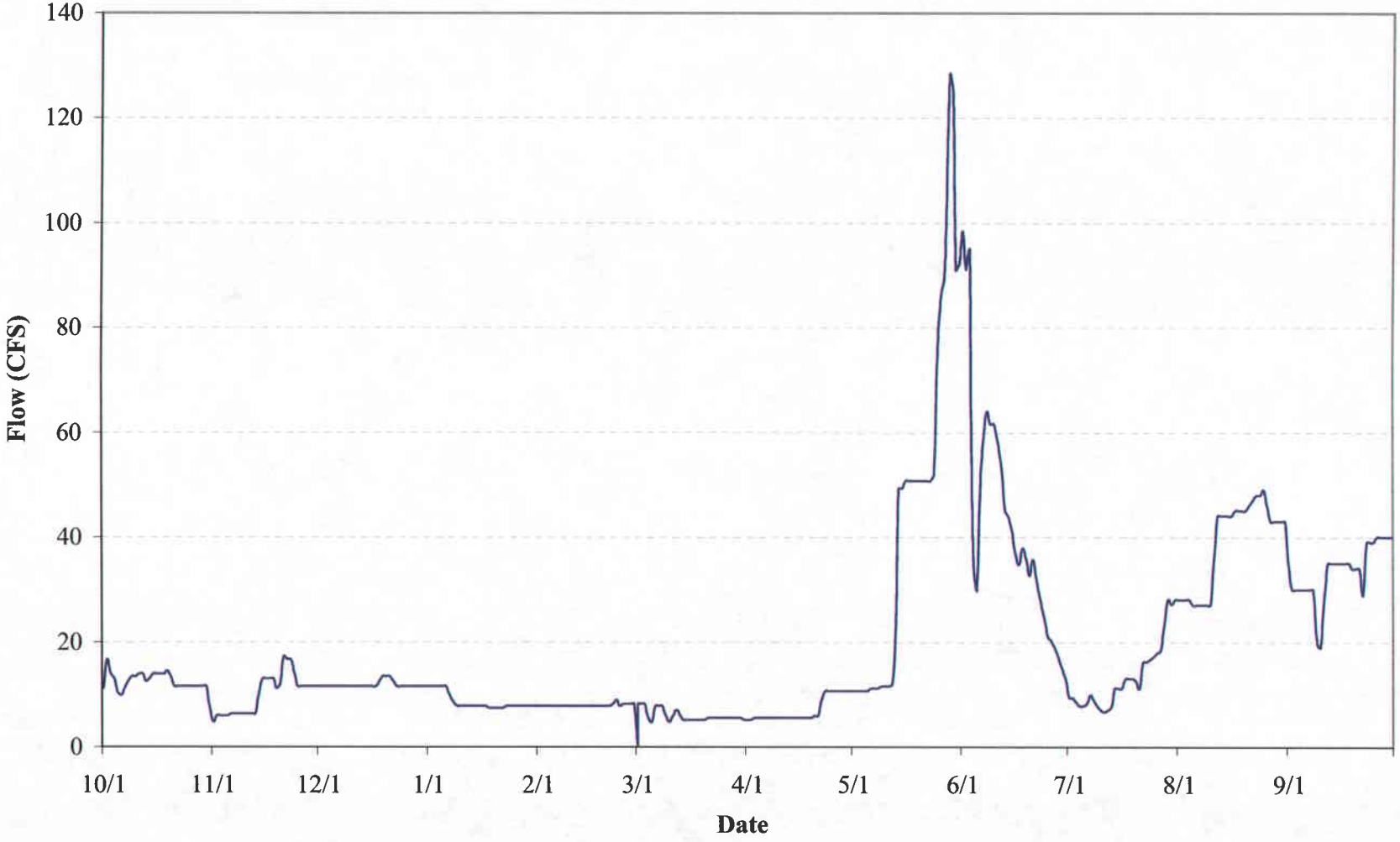
Below Electric Lake 2008 - 2009

Daily Average Discharge (CFS)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	11.1	4.8	11.5	11.5	7.8	8.2	5.1	10.7	98.4	9.4	28.0	35.0	1
2	16.6	5.9	11.5	11.5	7.8	8.2	5.1	10.7	91.0	9.4	28.0	30.0	2
3	13.9	5.9	11.5	11.5	7.8	8.2	5.5	10.7	94.7	8.6	28.0	30.0	3
4	13.0	5.9	11.5	11.5	7.8	5.5	5.5	10.7	36.8	7.8	28.0	30.0	4
5	10.2	5.9	11.5	11.5	7.8	4.8	5.5	10.7	29.8	7.8	27.0	30.0	5
6	9.8	6.3	11.5	11.5	7.8	7.8	5.5	11.1	49.3	8.2	27.0	30.0	6
7	11.1	6.3	11.5	9.8	7.8	7.8	5.5	11.1	58.3	9.8	27.0	30.0	7
8	12.5	6.3	11.5	8.6	7.8	7.8	5.5	11.1	63.9	9.0	27.0	30.0	8
9	13.4	6.3	11.5	7.8	7.8	5.9	5.5	11.5	61.5	7.8	27.0	20.0	9
10	13.4	6.3	11.5	7.8	7.8	4.8	5.5	11.5	61.5	7.0	27.0	19.0	10
11	13.9	6.3	11.5	7.8	7.8	5.9	5.5	11.5	58.3	6.6	36.0	28.0	11
12	13.9	6.3	11.5	7.8	7.8	7.0	5.5	12.0	53.6	7.0	44.0	35.0	12
13	12.5	6.3	11.5	7.8	7.8	5.9	5.5	23.2	45.2	7.8	44.0	35.0	13
14	13.0	10.2	11.5	7.8	7.8	5.1	5.5	49.3	43.9	11.1	44.0	35.0	14
15	13.9	13.0	11.5	7.8	7.8	5.1	5.5	49.3	41.4	11.1	44.0	35.0	15
16	13.9	13.0	11.5	7.8	7.8	5.1	5.5	50.7	36.8	11.1	44.0	35.0	16
17	13.9	13.0	11.5	7.8	7.8	5.1	5.5	50.7	34.7	13.0	45.0	35.0	17
18	13.9	13.0	12.5	7.4	7.8	5.1	5.5	50.7	37.9	13.0	45.0	35.0	18
19	14.5	11.1	13.4	7.4	7.8	5.1	5.5	50.7	35.7	13.0	45.0	34.0	19
20	13.4	12.0	13.4	7.4	7.8	5.1	5.9	50.7	32.6	12.5	45.0	34.0	20
21	11.5	17.2	13.4	7.4	7.8	5.5	5.9	50.7	35.7	11.1	46.0	34.0	21
22	11.5	16.6	12.5	7.4	8.2	5.5	9.0	50.7	31.7	16.1	47.0	29.0	22
23	11.5	16.6	11.5	7.8	9.0	5.5	10.7	50.7	28.0	16.1	48.0	39.0	23
24	11.5	13.9	11.5	7.8	7.8	5.5	10.7	52.1	24.7	16.6	48.0	39.0	24
25	11.5	11.5	11.5	7.8	8.2	5.5	10.7	76.2	21.0	17.2	49.0	39.0	25
26	11.5	11.5	11.5	7.8	8.2	5.5	10.7	86.0	20.3	17.8	46.0	40.0	26
27	11.5	11.5	11.5	7.8	8.2	5.5	10.7	91.0	19.0	18.4	43.0	40.0	27
28	11.5	11.5	11.5	7.8	8.2	5.5	10.7	128.0	17.2	23.2	43.0	40.0	28
29	11.5	11.5	11.5	7.8		5.5	10.7	124.0	15.0	28.0	43.0	40.0	29
30	11.5	11.5	11.5	7.8		5.5	10.7	91.0	13.0	27.1	43.0	40.0	30
31	7.8		11.5	7.8		5.1		92.2		28.0	43.0		31
						Monthly Totals							**Yearly Totals**
Total	385	297	364	264	221	184	210	1,401	1,291	410	1,209	1,005	7,241
Daily Mean	12.40	9.90	11.70	8.53	7.89	5.92	7.00	45.20	43.00	13.20	39.00	33.50	19.80
Daily Min	7.78	4.76	11.50	7.39	7.78	4.76	5.13	10.70	13.00	6.63	27.00	19.00	4.76
Daily Max	16.60	17.20	13.40	11.50	8.98	8.17	10.70	128.00	98.40	28.00	49.00	40.00	128.00
Ins. Min	2.53	1.77	11.50	3.65	7.78	1.39	5.13	10.70	8.57	0.75	26.30	0.39	0.39
Ins. Max	17.80	17.20	13.40	11.50	8.98	8.17	11.50	181.00	101.00	30.70	49.30	42.70	181.00
Acre Ft	763	589	722	524	438	364	417	2,780	2,560	814	2,400	1,990	14,361

Notes: Reviewed 3/24/2010 CKB

BELOW ELECTRIC LAKE GRAPH
2008 - 2009



PacifiC[illegible]nergy

Stream Discharge Records

Huntington Creek at Plant 2008 - 2009

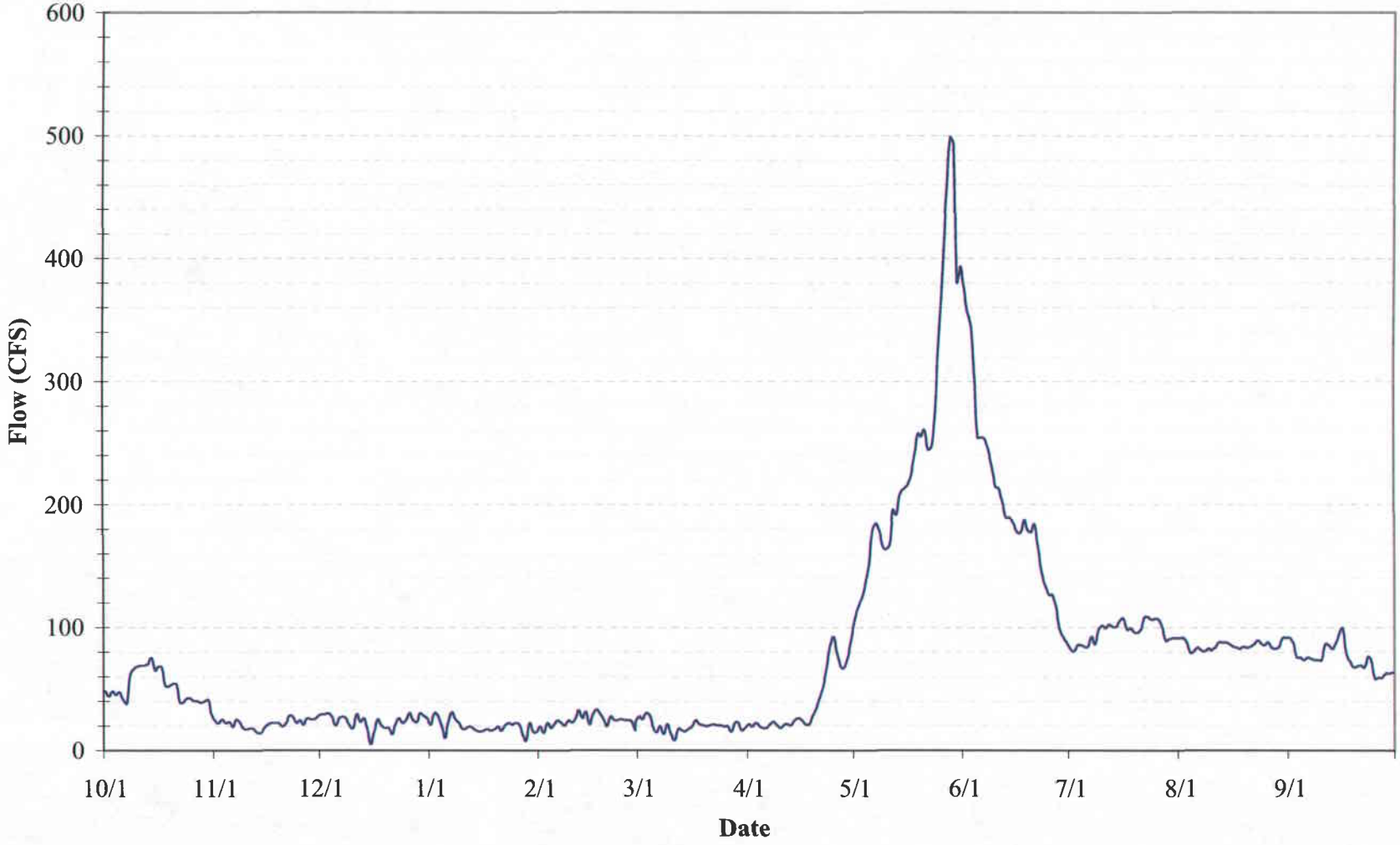
Daily Discharge (CFS)

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Day
1	48.0	24.0	29.0	21.0	19.0	27.0	21.0	107	376	82	91.0	91.0	1
2	44.0	22.0	29.0	30.0	14.0	25.0	19.0	117	356	80	91.0	87.0	2
3	48.0	25.0	30.0	28.0	22.0	30.0	22.0	124	345	85	87.0	75.0	3
4	45.0	22.0	27.0	20.0	18.0	28.0	19.0	136	312	85	79.0	75.0	4
5	47.0	23.0	20.0	10.0	21.0	18.0	18.0	149	254	84	80.0	73.0	5
6	41.0	19.0	26.0	23.0	24.0	14.0	18.0	177	254	84	83.0	75.0	6
7	38.0	25.0	27.0	31.0	22.0	19.0	21.0	184	253	92	81.0	74.0	7
8	60.0	23.0	26.0	25.0	20.0	13.0	23.0	178	244	86	80.0	73.0	8
9	66.0	18.0	20.0	22.0	24.0	21.0	20.0	165	230	98.0	82.0	73.0	9
10	68.0	17.0	18.0	17.0	22.0	13.0	18.0	163	214	101.0	81.0	73.0	10
11	69.0	18.0	29.0	18.0	26.0	8.0	21.0	169	213	99.0	83.0	86.0	11
12	69.0	17.0	23.0	19.0	32.0	17.0	21.0	195	202	102.0	87.0	85.0	12
13	70.0	14.0	26.0	18.0	26.0	16.0	20.0	191	189	100.0	87.0	82.0	13
14	75.0	14.0	18.0	16.0	31.0	15.0	24.0	208	189	100.0	87.0	87.0	14
15	65.0	18.0	5.0	15.0	21.0	17.0	26.0	212	184	105.0	86.0	95.0	15
16	68.0	21.0	15.0	16.0	29.0	19.0	24.0	215	177	107.0	84.0	99.0	16
17	67.0	22.0	25.0	17.0	33.0	24.0	21.0	222	177	98.0	83.0	78.0	17
18	52.0	22.0	20.0	16.0	29.0	21.0	21.0	239	187	99.0	82.0	72.0	18
19	52.0	22.0	18.0	17.0	24.0	20.0	28.0	257	179	96.0	84.0	67.0	19
20	54.0	19.0	18.0	19.0	19.0	19.0	33.0	255	177	95.0	83.0	68.0	20
21	54.0	22.0	13.0	16.0	27.0	20.0	42.0	260	183	98.0	84.0	69.0	21
22	39.0	28.0	21.0	20.0	24.0	21.0	51.0	244	164	108.0	86.0	67.0	22
23	39.0	27.0	26.0	22.0	24.0	20.0	67.0	247	144	108.0	89.0	76.0	23
24	42.0	22.0	22.0	21.0	25.0	20.0	85.0	275	133	106.0	86.0	72.0	24
25	42.0	24.0	24.0	22.0	24.0	19.0	92.0	337	126	107.0	85.0	58.0	25
26	40.0	21.0	30.0	21.0	24.0	19.0	77.0	394	126	106.0	87.0	59.0	26
27	40.0	26.0	24.0	12.0	23.0	15.0	67.0	449	117	100.0	83.0	59.0	27
28	39.0	25.0	23.0	8.0	16.0	22.0	67.0	498	98	89.0	82.0	62.0	28
29	40.0	25.0	30.0	22.0		22.0	75.0	492	92	90.0	84.0	62.0	29
30	41.0	27.0	28.0	15.0		16.0	90.0	381	87	91.0	91.0	63.0	30
31	29.0		26.0	15.0		18.0		393		91.0	91.0		31
						Monthly Statistics							**Yearly Stats**
Vol. (SFD)	1,591	652	716	592	663	596	1,151	7,633	5,982	2,972	2,629	2,235	27,412
Daily Mean	51.30	21.70	23.10	19.10	23.70	19.20	38.40	246.00	199.00	95.90	84.80	74.50	74.80
Daily Min	29.00	14.00	5.00	8.00	14.00	8.00	18.00	107.00	87.00	80.00	79.00	58.00	5.00
Daily Max	75.00	28.00	30.00	31.00	33.00	30.00	92.00	498.00	376.00	108.00	91.00	99.00	498.00
Ins. Min	25.90	3.59	2.69	2.98	3.59	5.01	8.00	92.00	0.00	0.00	76.00	44.00	0.00
Ins. Max	86.40	62.00	91.80	39.50	45.50	62.00	122.00	584.00	395.00	395.00	113.00	123.00	584.00
Vol. (AF)	3,160	1,290	1,420	1,170	1,320	1,180	2,280	15,140	11,870	5,890	5,210	4,430	54,360

Notes: The river froze-back severely on Dec 15 due to low temperatures. Change from 15-minute to hourly stage readings beginning April 2009. Instrumentation change from Sut to Campbell Scientific.

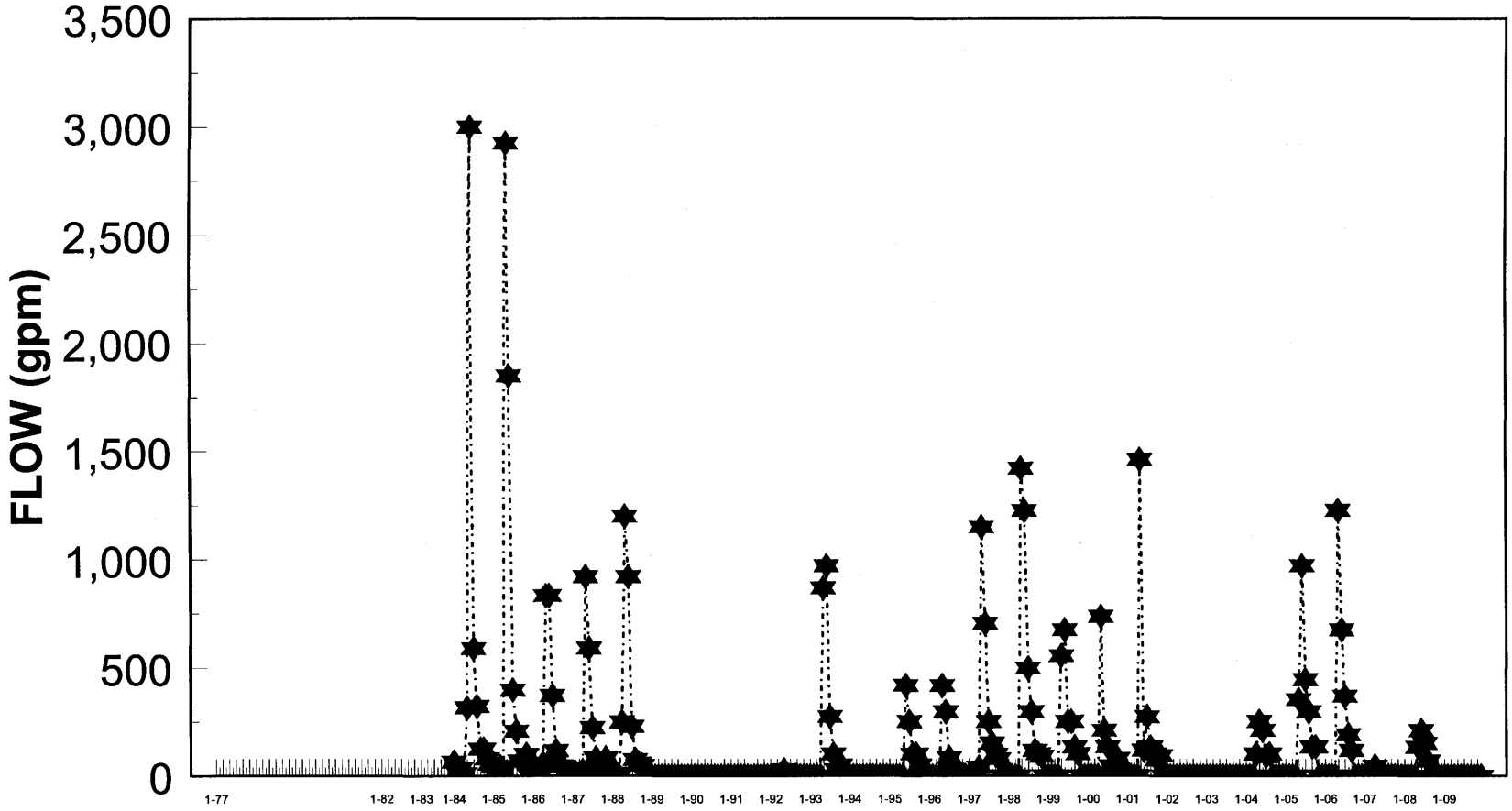
Reviewed 3/23/2010 by Connely Baldwin.

HUNTINGTON CREEK HYDROGRAPH
2008 - 2009



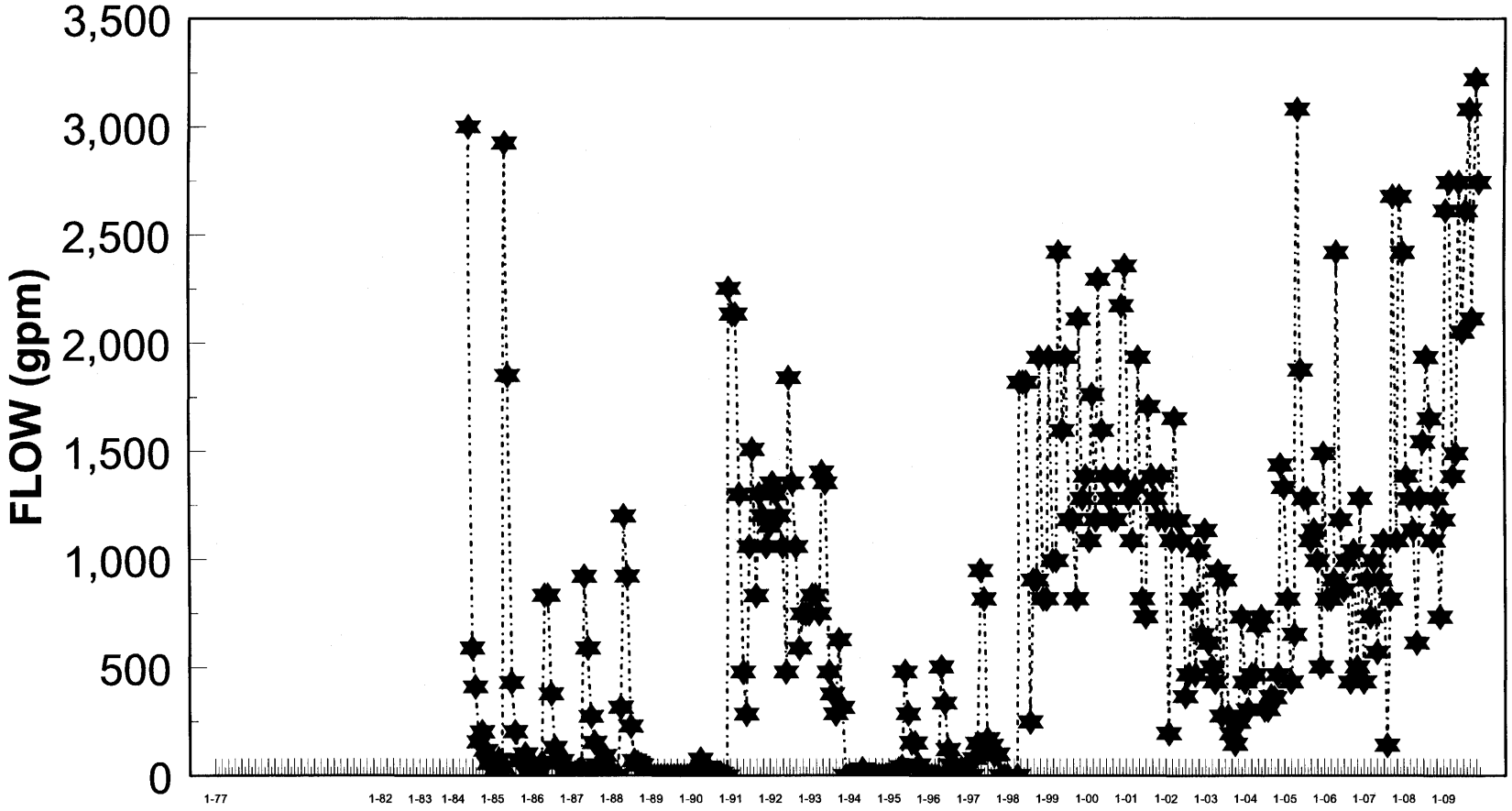
DEER CREEK

ABOVE MINE
DISCHARGE RECESSION CURVE



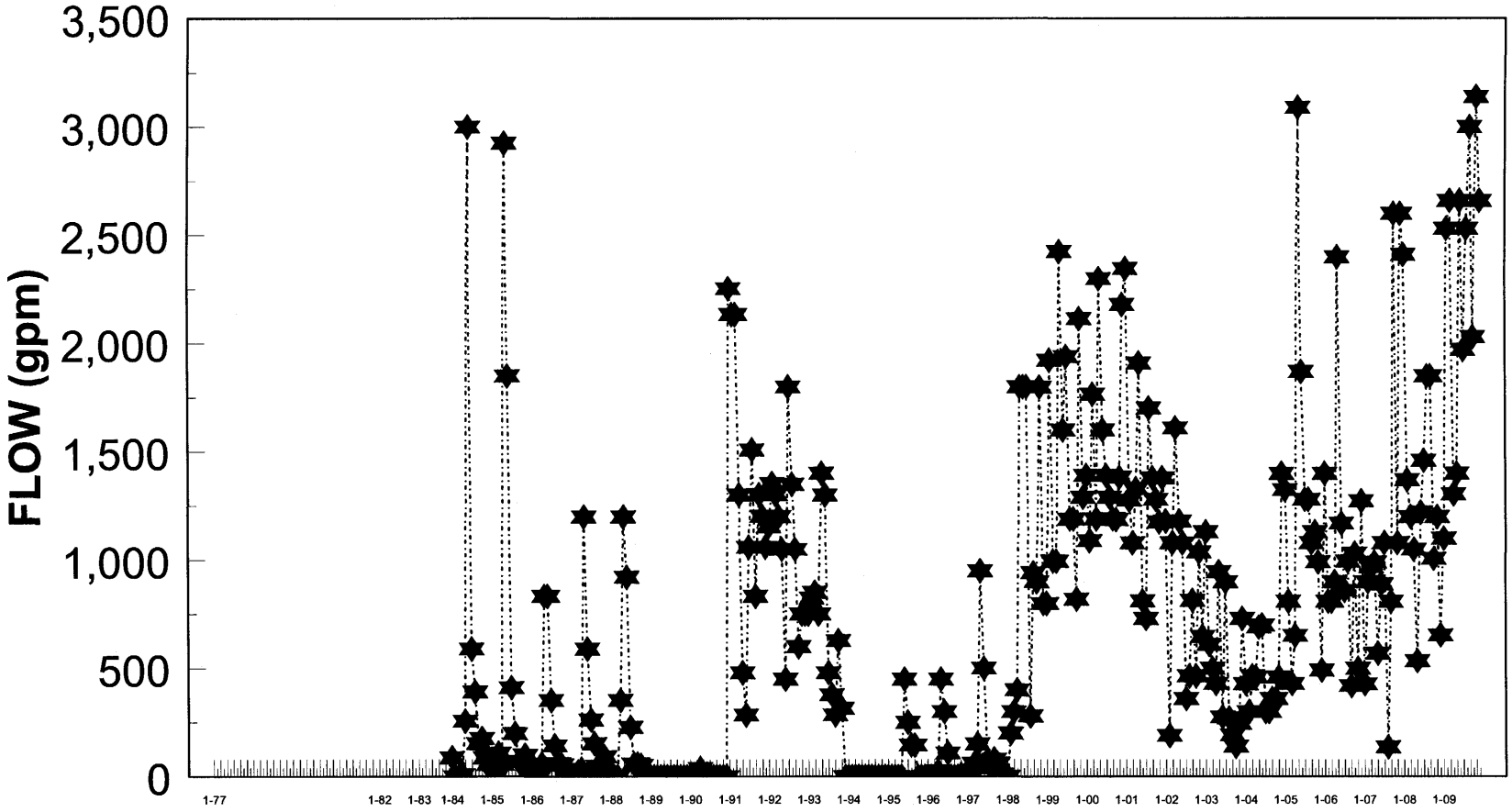
DEER CREEK

@ PERMIT BOUNDARY
DISCHARGE RECESSION CURVE



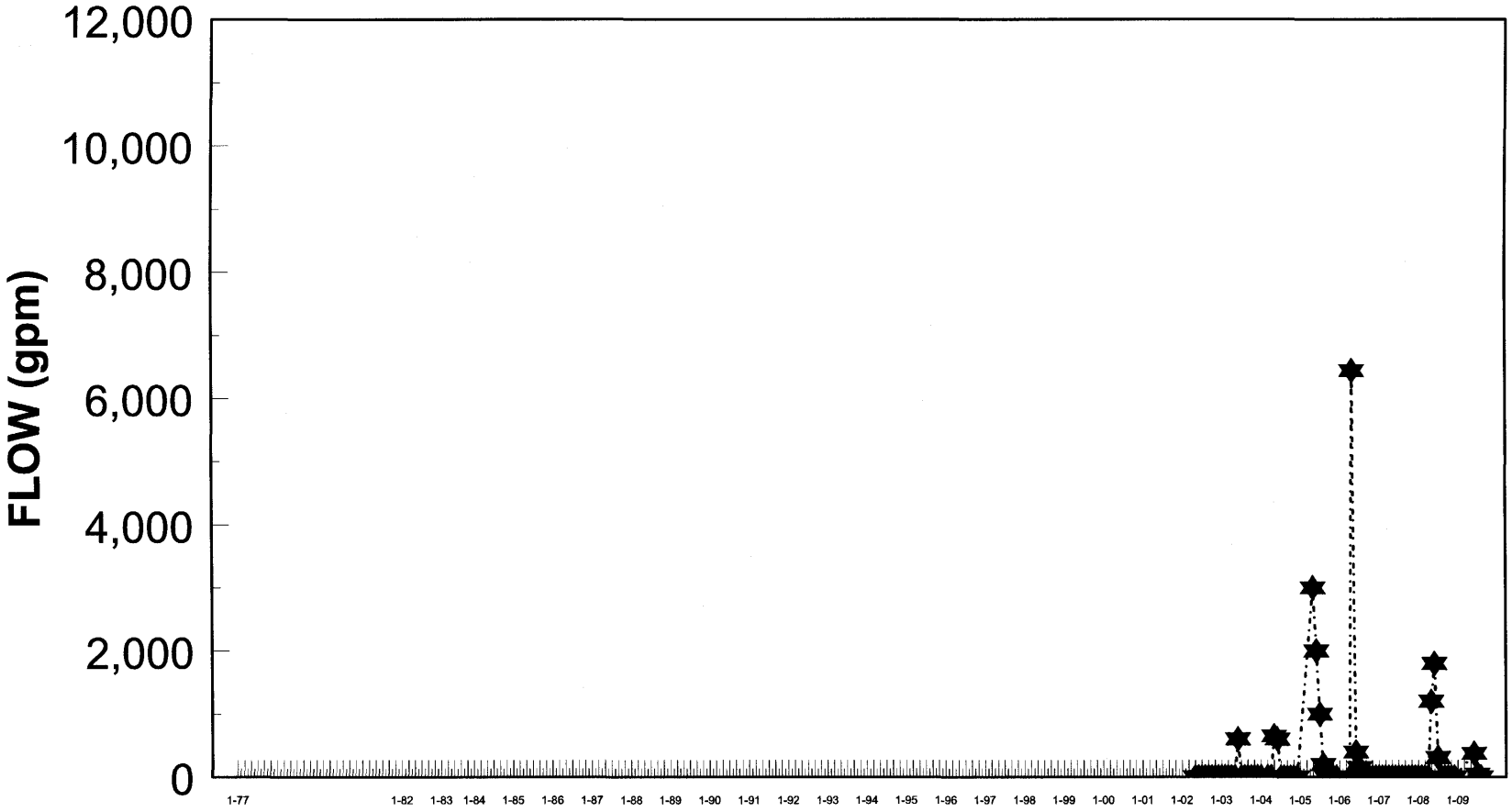
DEER CREEK

@ BELOW MINE
DISCHARGE RECESSION CURVE



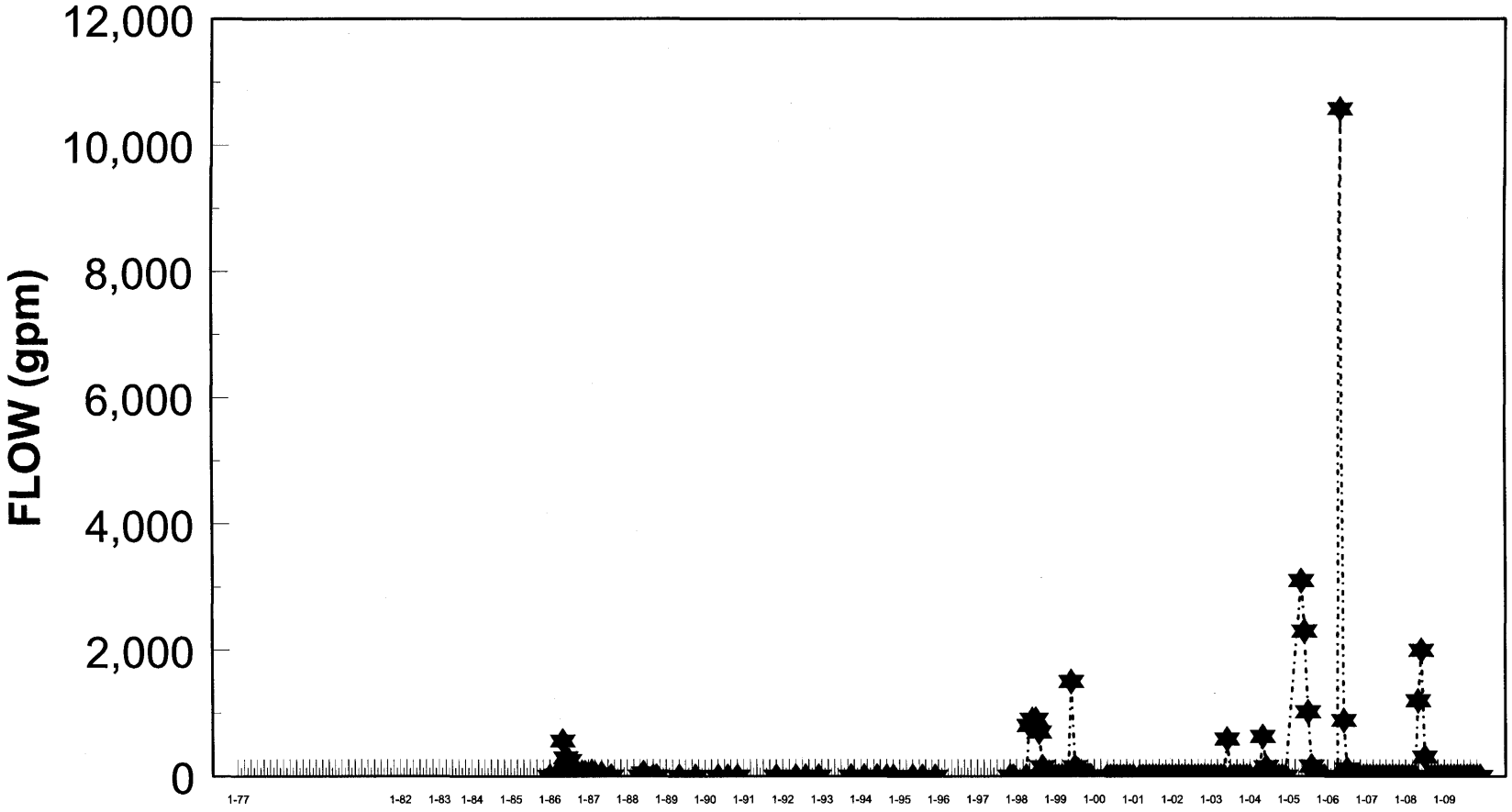
MILL FORK

MFU3: ABOVE MILL FORK GRABEN
DISCHARGE RECESSION CURVE



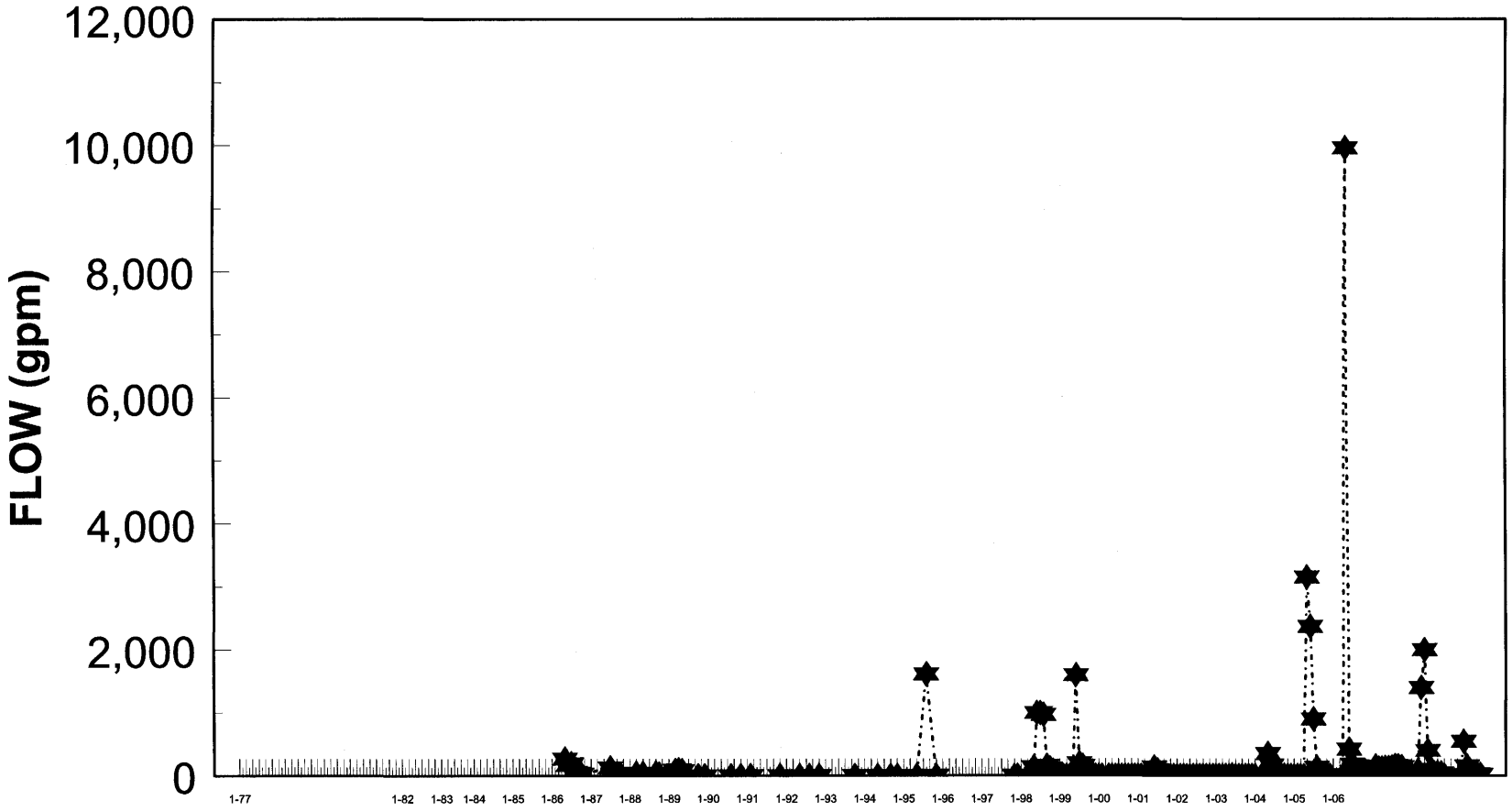
MILL FORK

MFA1: ABOVE MINE
DISCHARGE RECESSION CURVE



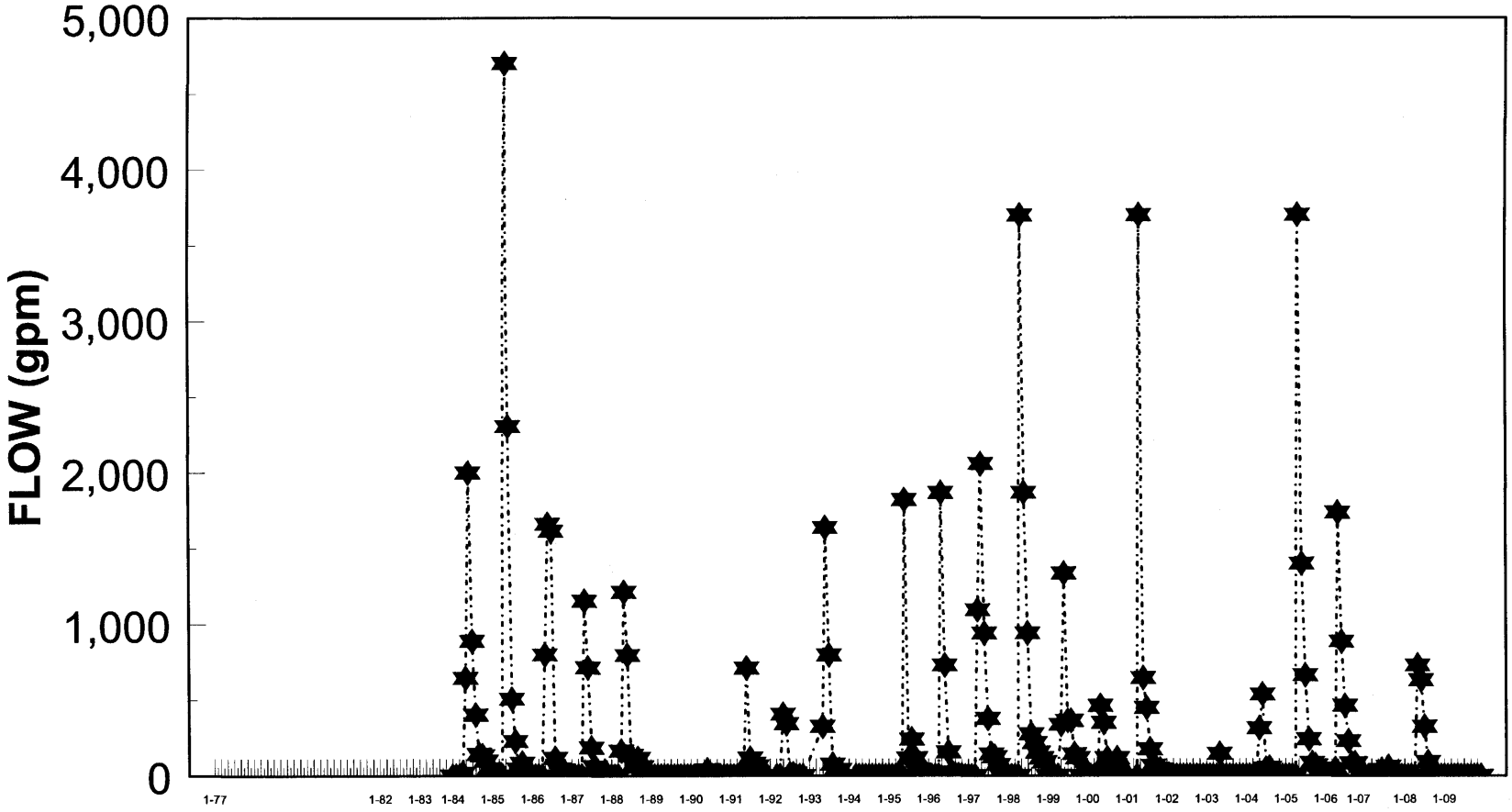
MILL FORK

MFB2: BELOW MINE
DISCHARGE RECESSION CURVE



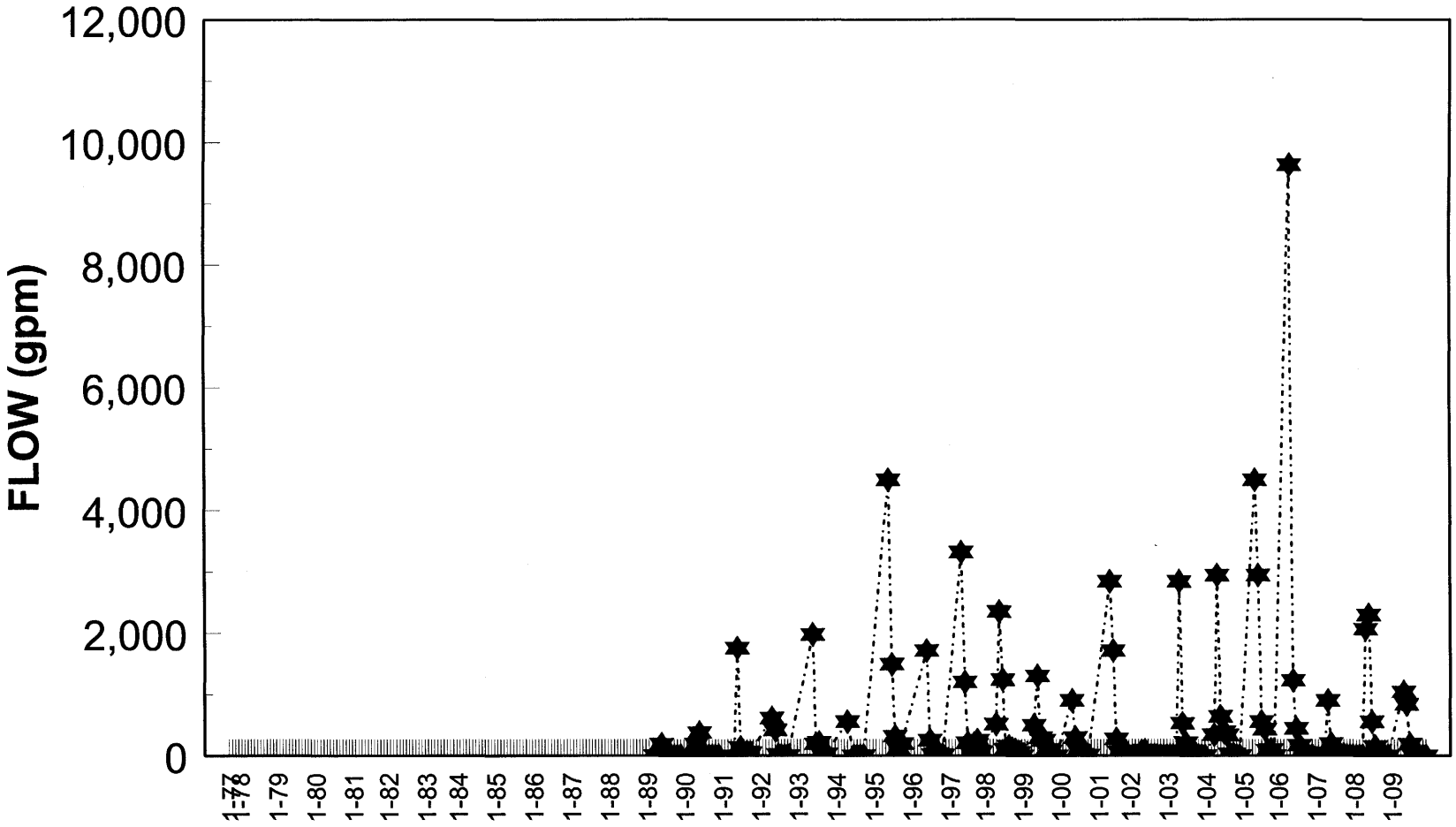
MEETINGHOUSE CANYON

LEFT FORK
DISCHARGE RECESSION CURVE



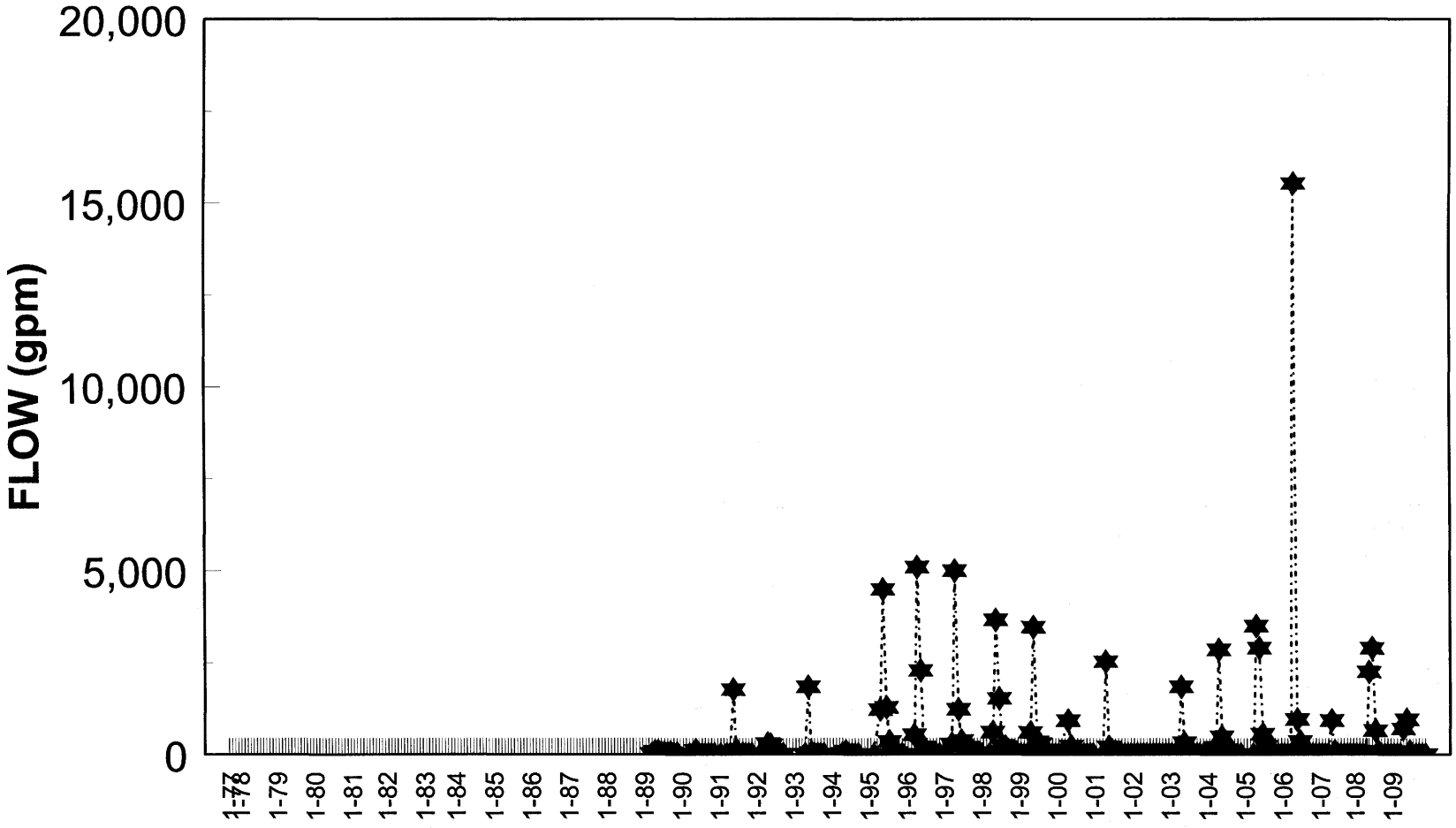
RILDA CANYON

RCF-1: RIGHT FORK
DISCHARGE RECESSION CURVE



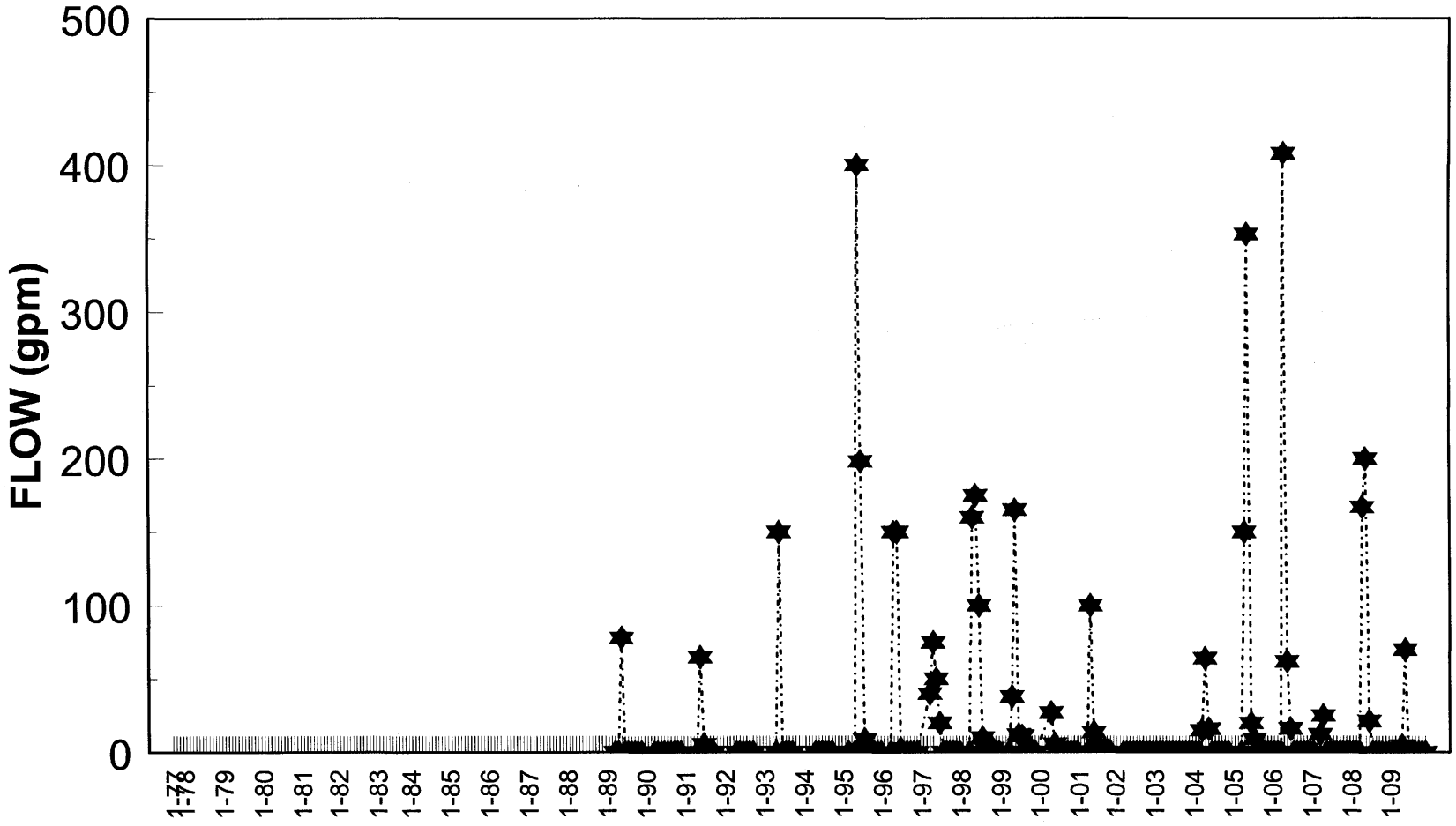
RILDA CANYON

RCF-2: ABOVE NEWUA SPRINGS
DISCHARGE RECESSION CURVE



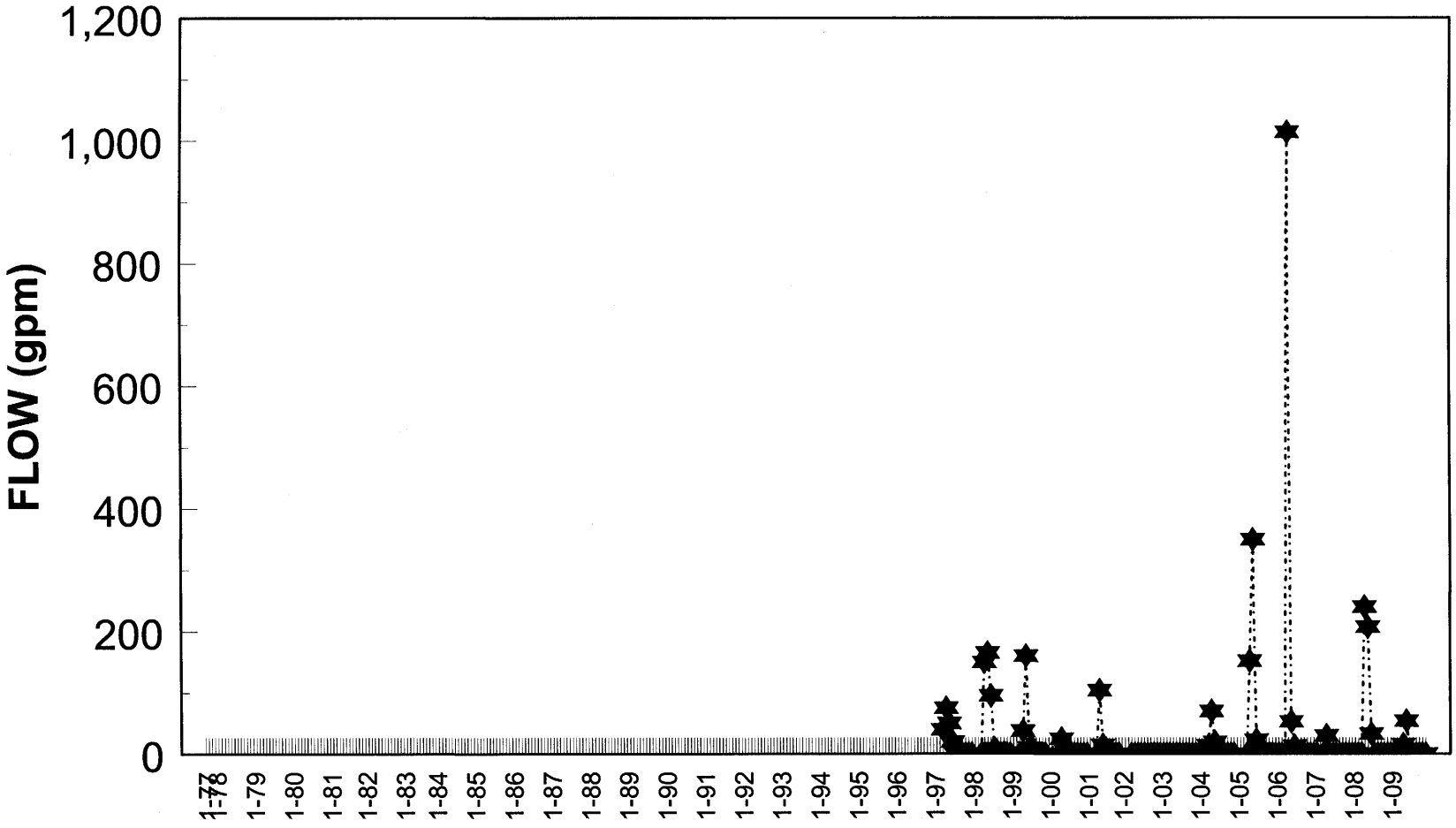
RILDA CANYON

RCLF-1: LEFT FORK - BELOW BREAKOUTS
DISCHARGE RECESSION CURVE



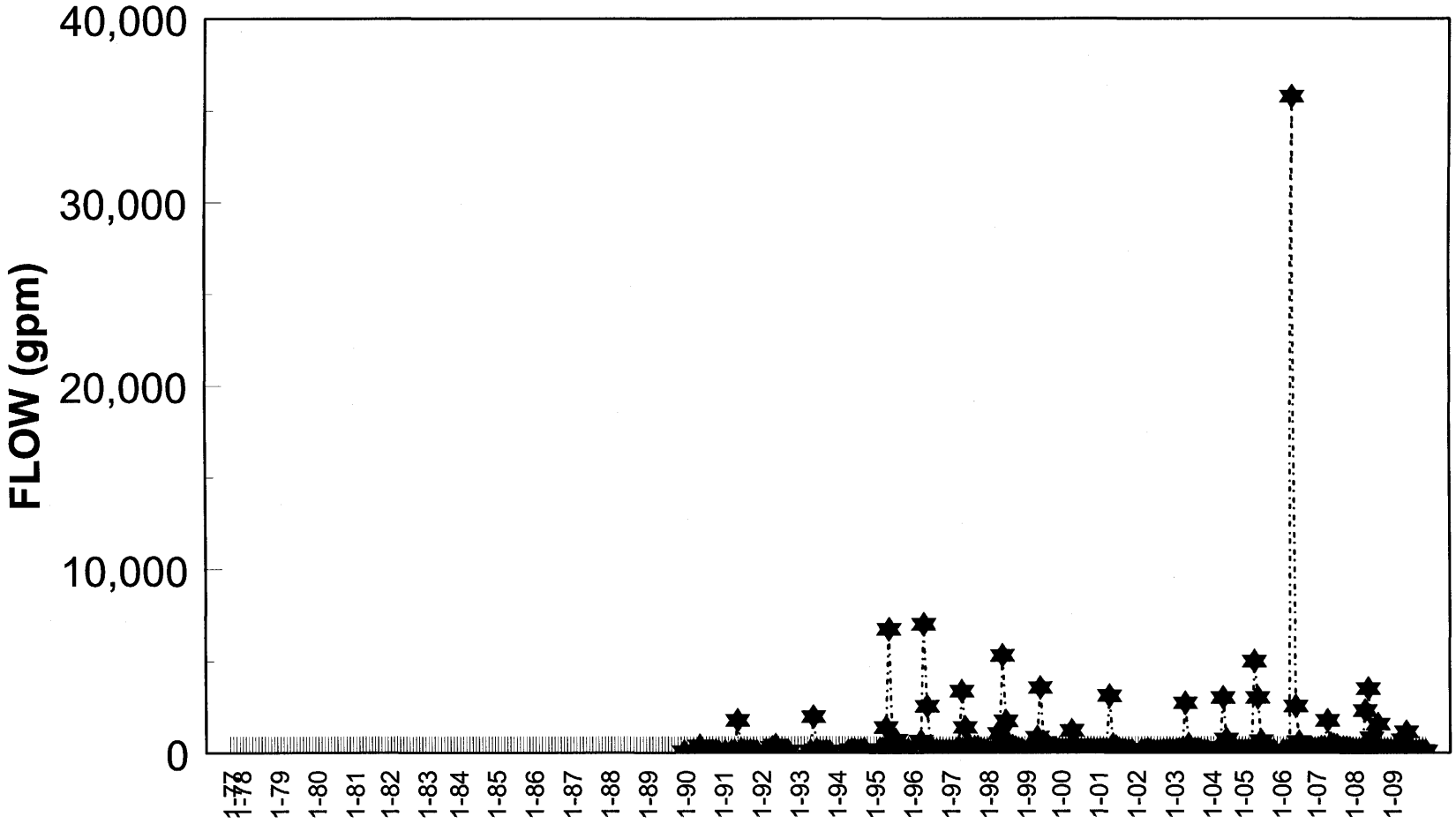
RILDA CANYON

RCLF-2: RIGHT FORK - ABOVE BREAKOUTS
DISCHARGE RECESSION CURVE



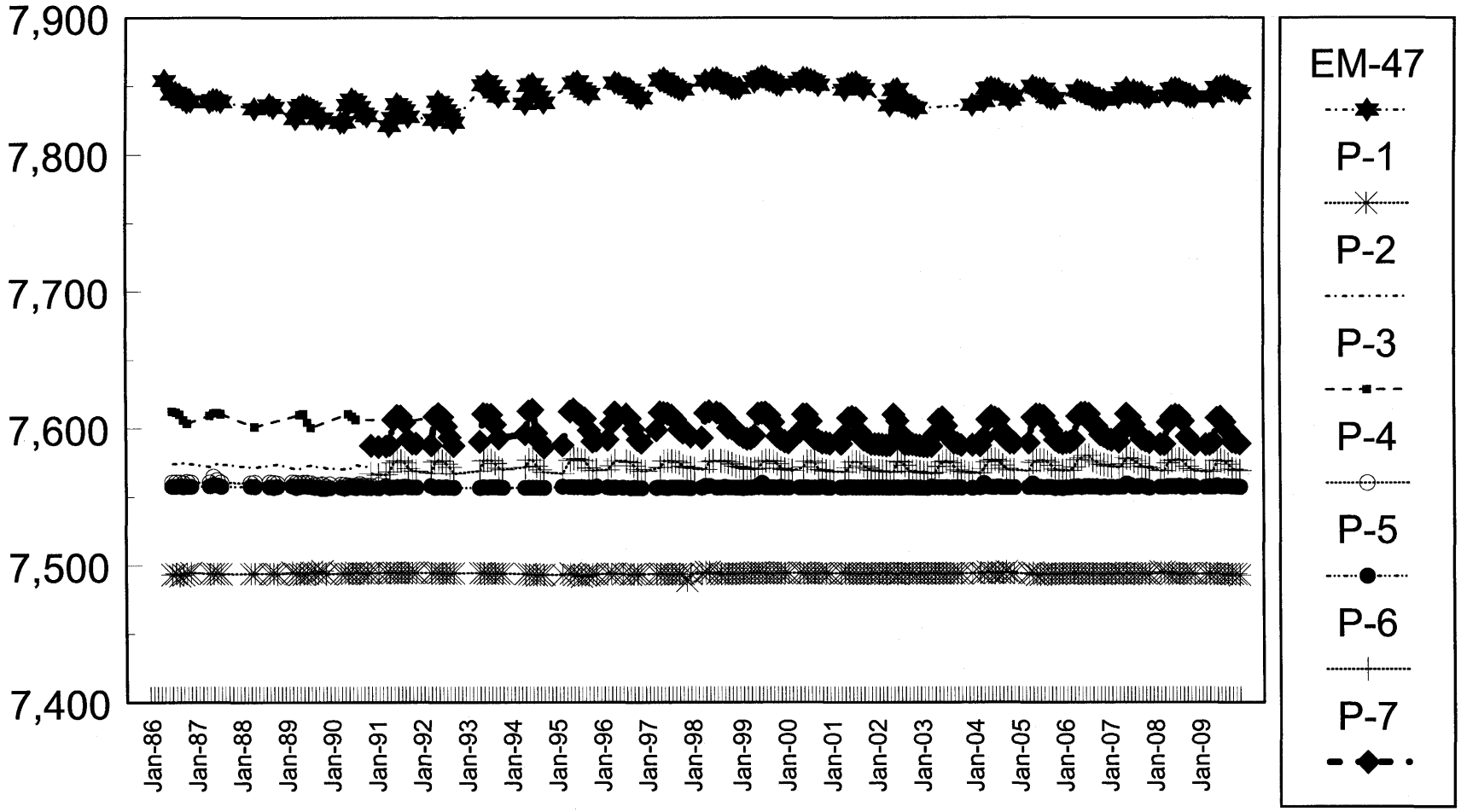
RILDA CANYON

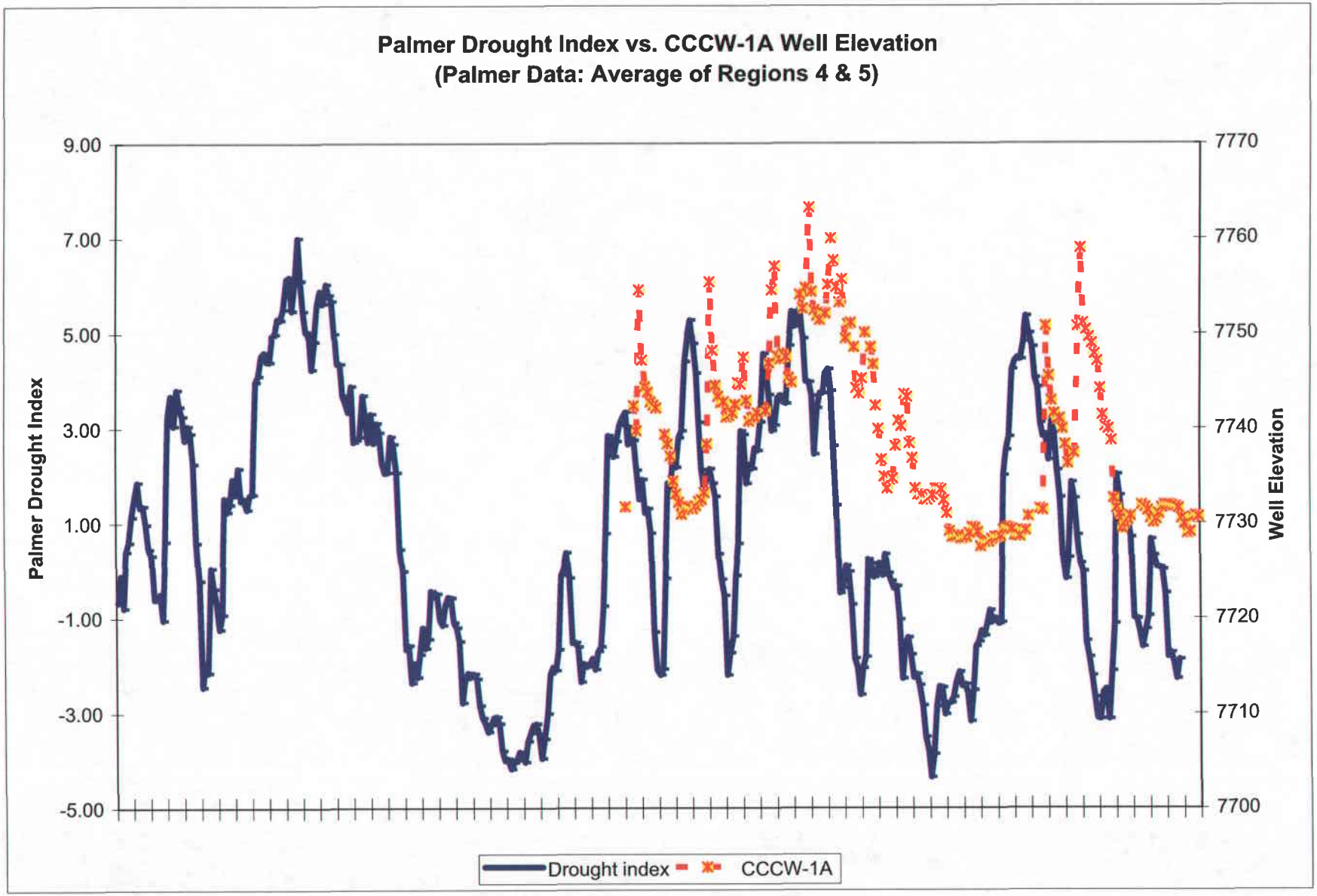
RCW-4: NEAR HUNTINGTON CANYON
DISCHARGE RECESSION CURVE

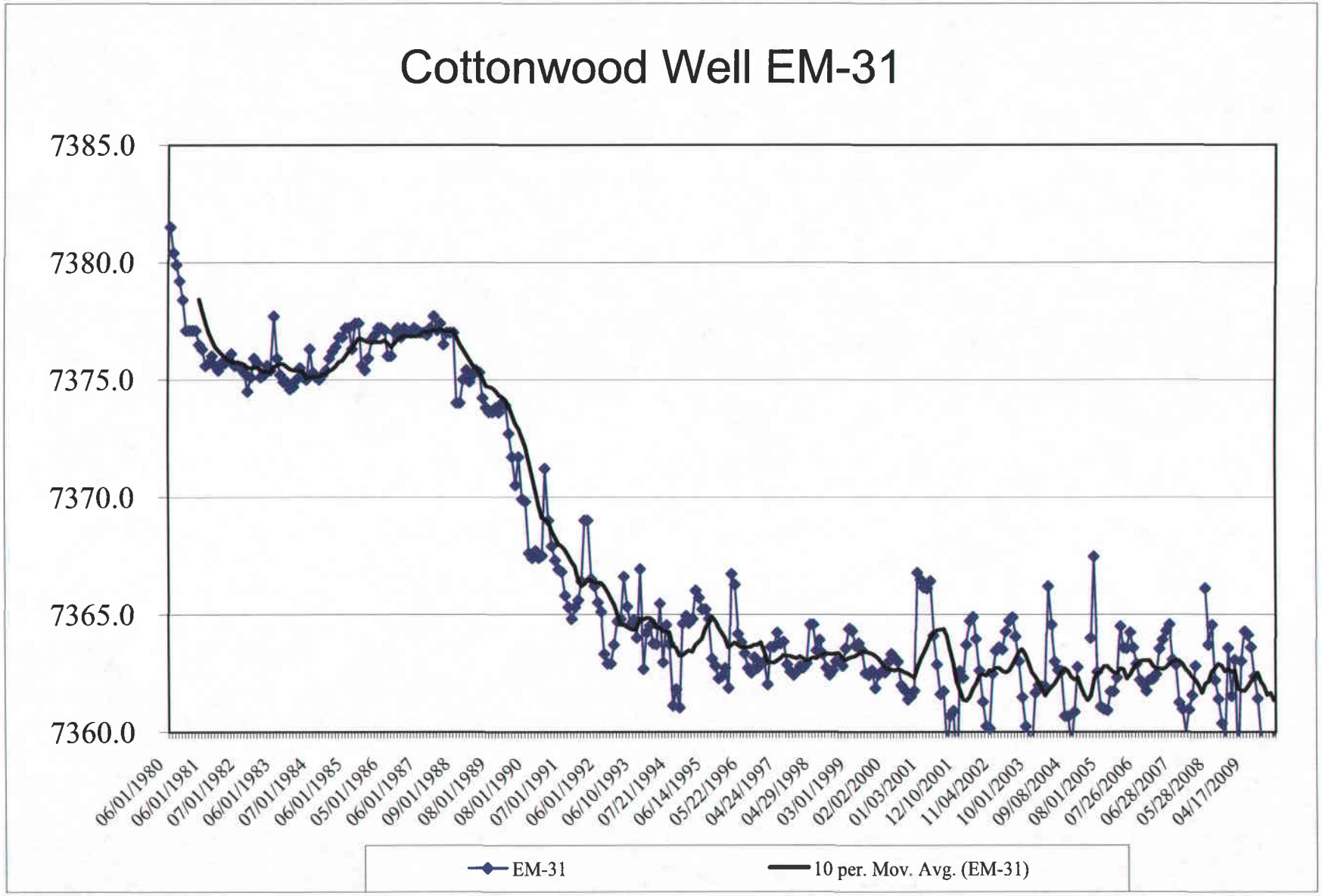


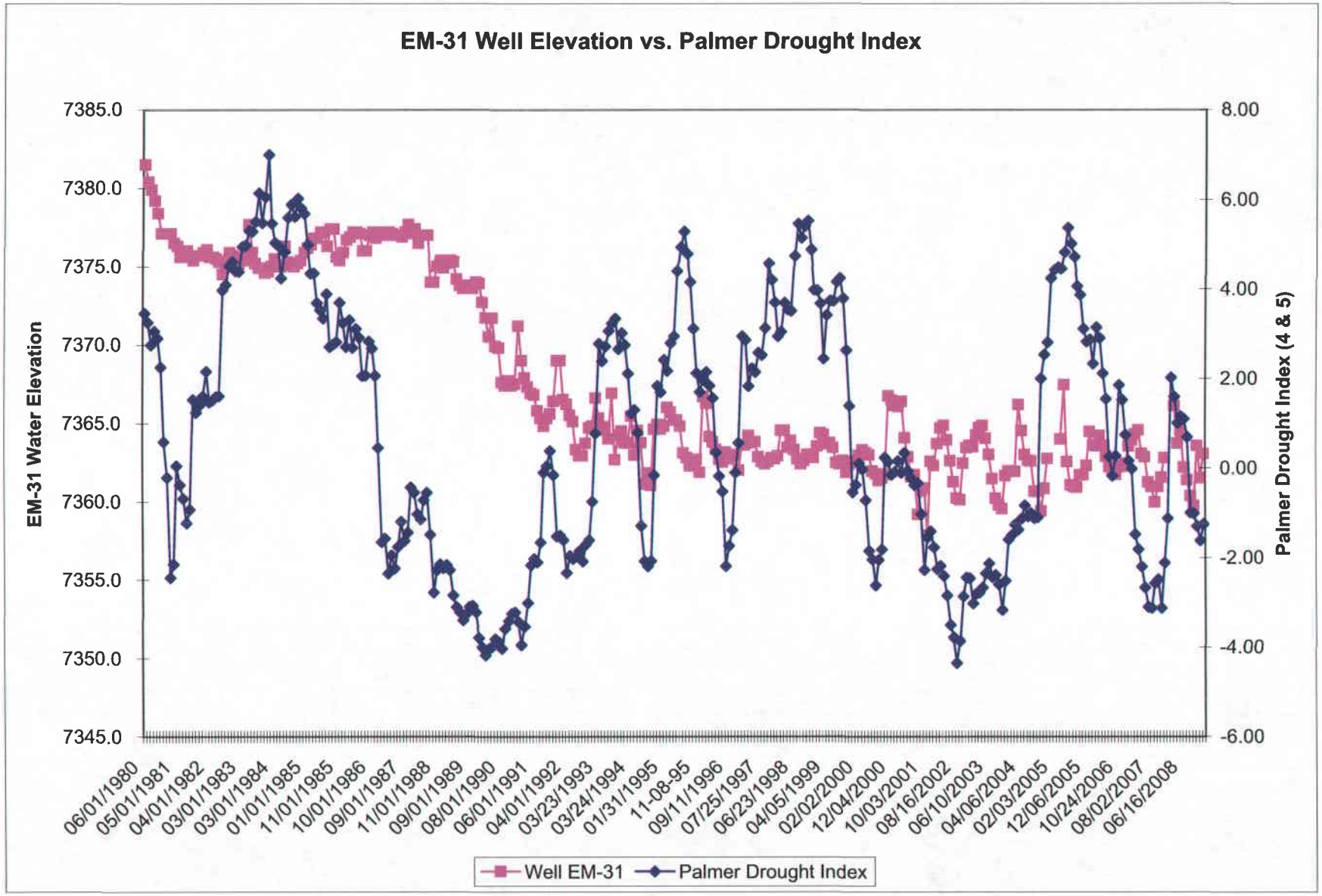
RILDA CANYON

MONITORING WELLS
PIEZOMETRIC DATA



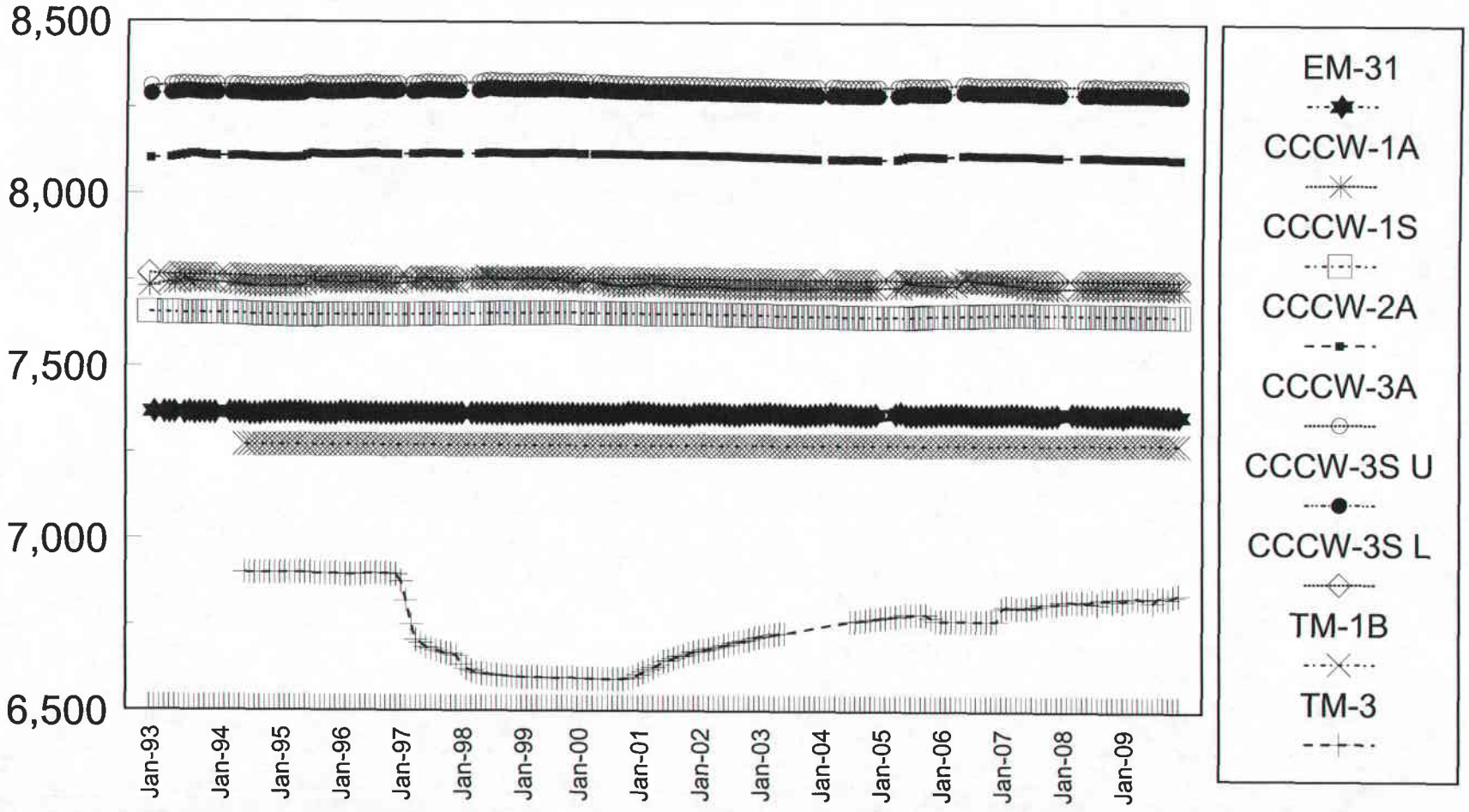

Palmer Drought Index vs. CCCW-1A Well Elevation
(Palmer Data: Average of Regions 4 & 5)
Palmer Drought Index
Well Elevation
9.00
7.00
5.00
3.00
1.00
-1.00
-3.00
-5.00
7770
7760
7750
7740
7730
7720
7710
7700
Drought index
CCCW-1A

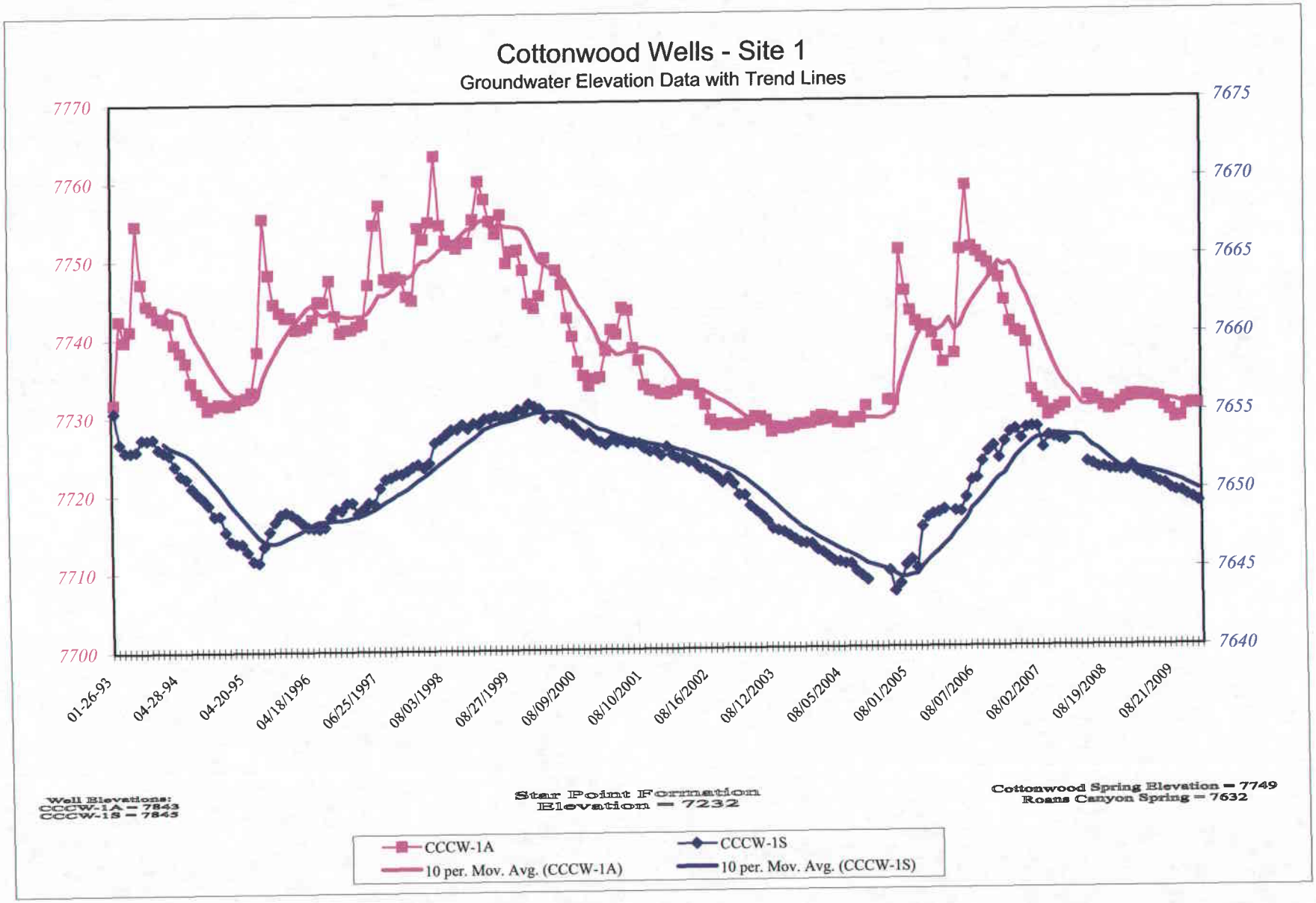

Cottonwood Well EM-31
7385.0
7380.0
7375.0
7370.0
7365.0
7360.0
06/01/1980
06/01/1981
07/01/1982
06/01/1983
07/01/1984
06/01/1985
05/01/1986
06/01/1987
09/01/1988
08/01/1989
08/01/1990
07/01/1991
06/01/1992
06/10/1993
07/21/1994
06/14/1995
05/22/1996
04/24/1997
04/29/1998
03/01/1999
02/02/2000
01/03/2001
12/10/2001
11/04/2002
10/01/2003
09/08/2004
08/01/2005
07/26/2006
06/28/2007
05/28/2008
04/17/2009
EM-31
10 per. Mov. Avg. (EM-31)

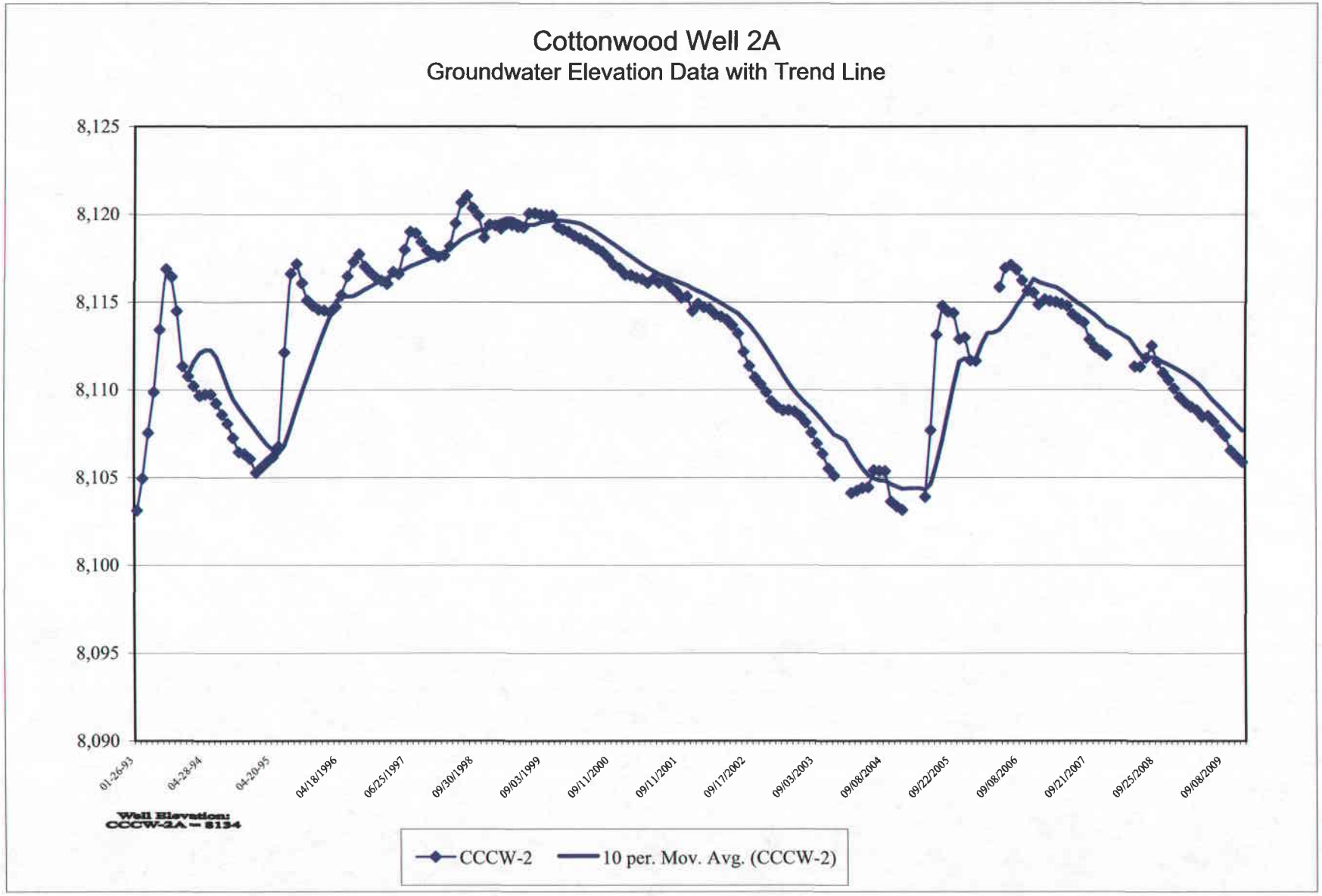

EM-31 Well Elevation vs. Palmer Drought Index
EM-31 Water Elevation
Palmer Drought Index (4 & 5)
7385.0
7380.0
7375.0
7370.0
7365.0
7360.0
7355.0
7350.0
7345.0
8.00
6.00
4.00
2.00
0.00
-2.00
-4.00
-6.00
06/01/1980
05/01/1981
04/01/1982
03/01/1983
03/01/1984
01/01/1985
11/01/1985
10/01/1986
09/01/1987
11/01/1988
09/01/1989
08/01/1990
06/01/1991
04/01/1992
03/23/1993
03/24/1994
01/31/1995
11-08-95
09/11/1996
07/25/1997
06/23/1998
04/05/1999
02/02/2000
12/04/2000
10/03/2001
08/16/2002
06/10/2003
04/06/2004
02/03/2005
12/06/2005
10/24/2006
08/02/2007
06/16/2008
Well EM-31
Palmer Drought Index

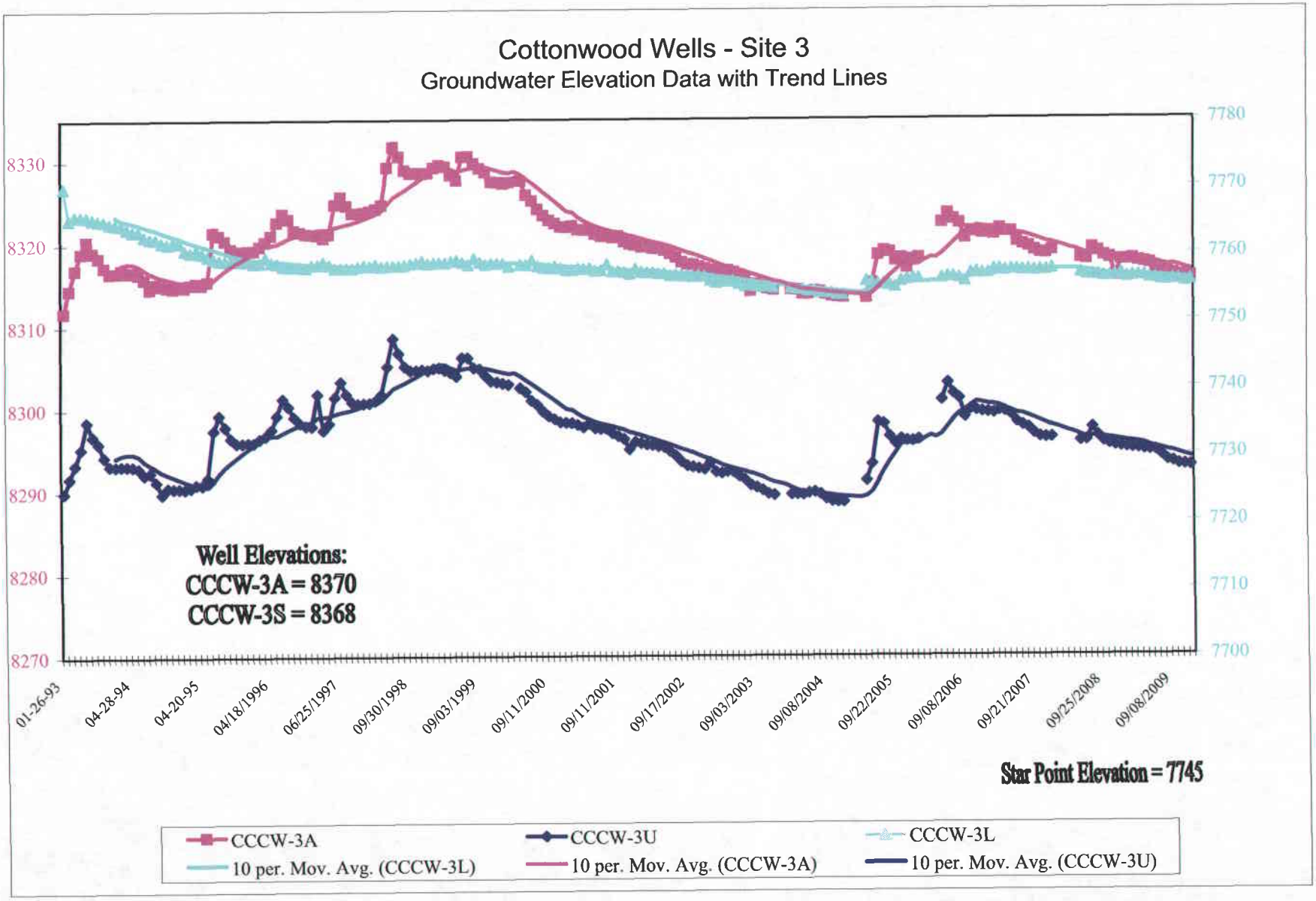
COTTONWOOD CANYON

MONITORING WELLS
PIEZOMETRIC DATA




Cottonwood Wells - Site 1
Groundwater Elevation Data with Trend Lines
7770
7760
7750
7740
7730
7720
7710
7700
7675
7670
7665
7660
7655
7650
7645
7640
01-26-93
04-28-94
04-20-95
04/18/1996
06/25/1997
08/03/1998
08/27/1999
08/09/2000
08/10/2001
08/16/2002
08/12/2003
08/05/2004
08/01/2005
08/07/2006
08/02/2007
08/19/2008
08/21/2009
Well Elevations:
CCCW-1A = 7843
CCCW-1S = 7843
Star Point Formation
Elevation = 7232
Cottonwood Spring Elevation = 7749
Roans Canyon Spring = 7632
CCCW-1A
CCCW-1S
10 per. Mov. Avg. (CCCW-1A)
10 per. Mov. Avg. (CCCW-1S)

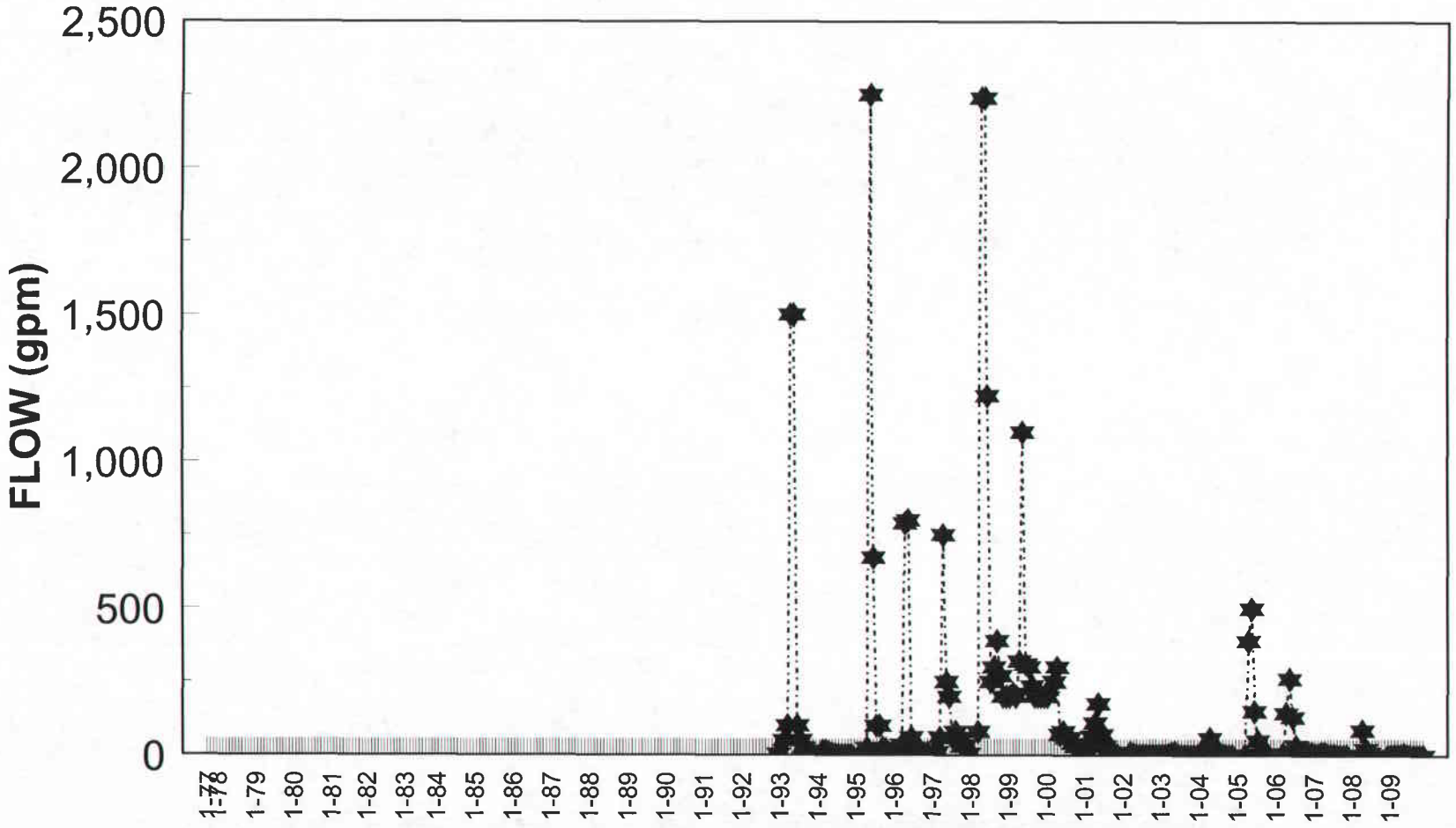

Cottonwood Well 2A
Groundwater Elevation Data with Trend Line
8,125
8,120
8,115
8,110
8,105
8,100
8,095
8,090
01-26-93
04-28-94
04-20-95
04/18/1996
06/25/1997
09/30/1998
09/03/1999
09/11/2000
09/11/2001
09/17/2002
09/03/2003
09/08/2004
09/22/2005
09/08/2006
09/21/2007
09/25/2008
09/08/2009
Well Elevation:
CCCW-2A = 8134
CCCW-2
10 per. Mov. Avg. (CCCW-2)


Cottonwood Wells - Site 3
Groundwater Elevation Data with Trend Lines
8330
8320
8310
8300
8290
8280
8270
7780
7770
7760
7750
7740
7730
7720
7710
7700
01-26-93
04-28-94
04-20-95
04/18/1996
06/25/1997
09/30/1998
09/03/1999
09/11/2000
09/11/2001
09/17/2002
09/03/2003
09/08/2004
09/22/2005
09/08/2006
09/21/2007
09/25/2008
09/08/2009
Well Elevations:
CCCW-3A = 8370
CCCW-3S = 8368
Star Point Elevation = 7745
CCCW-3A
CCCW-3U
CCCW-3L
10 per. Mov. Avg. (CCCW-3L)
10 per. Mov. Avg. (CCCW-3A)
10 per. Mov. Avg. (CCCW-3U)

COTTONWOOD CANYON CREEK

SW-1

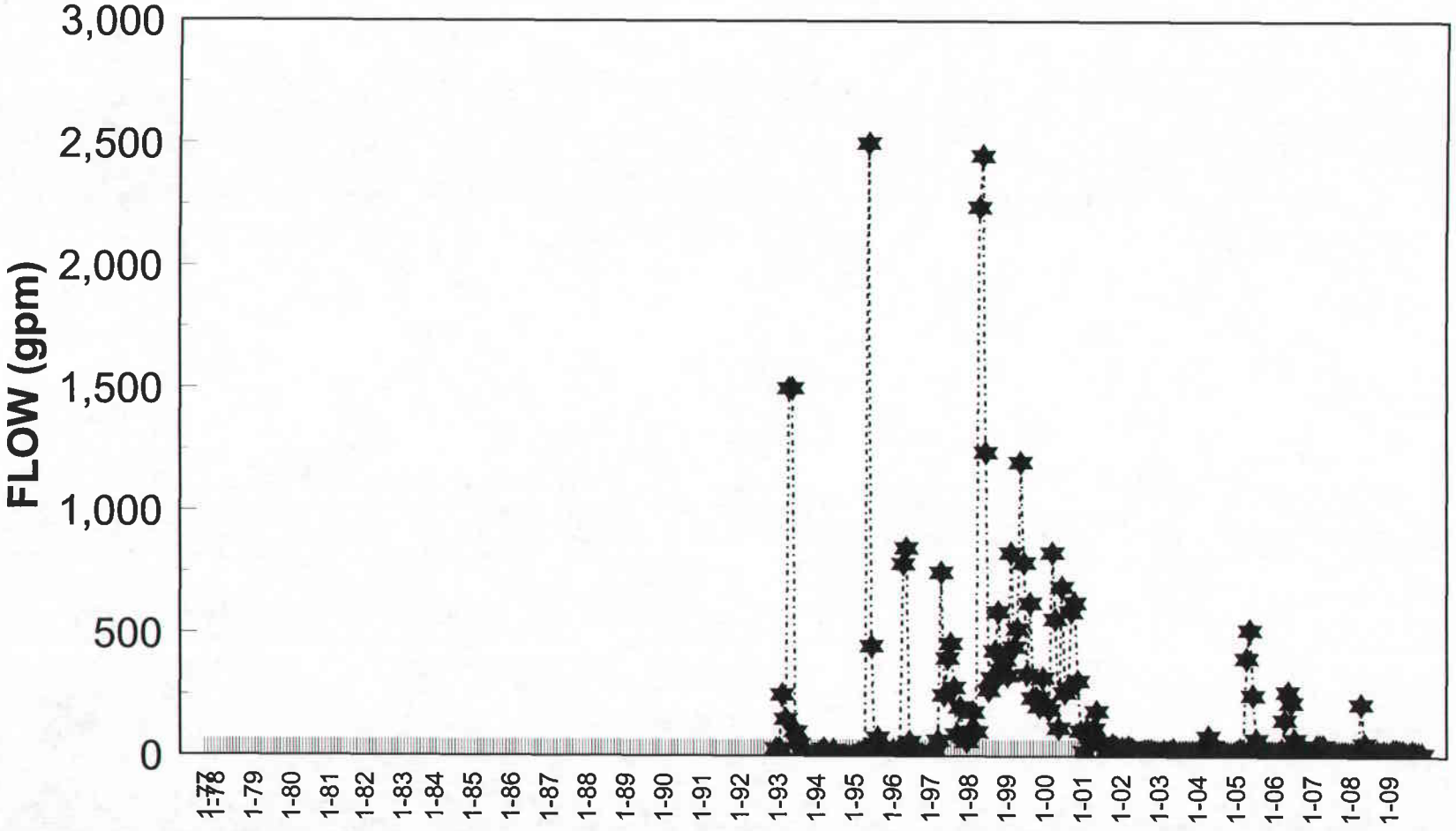
DISCHARGE RECESSION CURVE



COTTONWOOD CANYON CREEK

SW-2

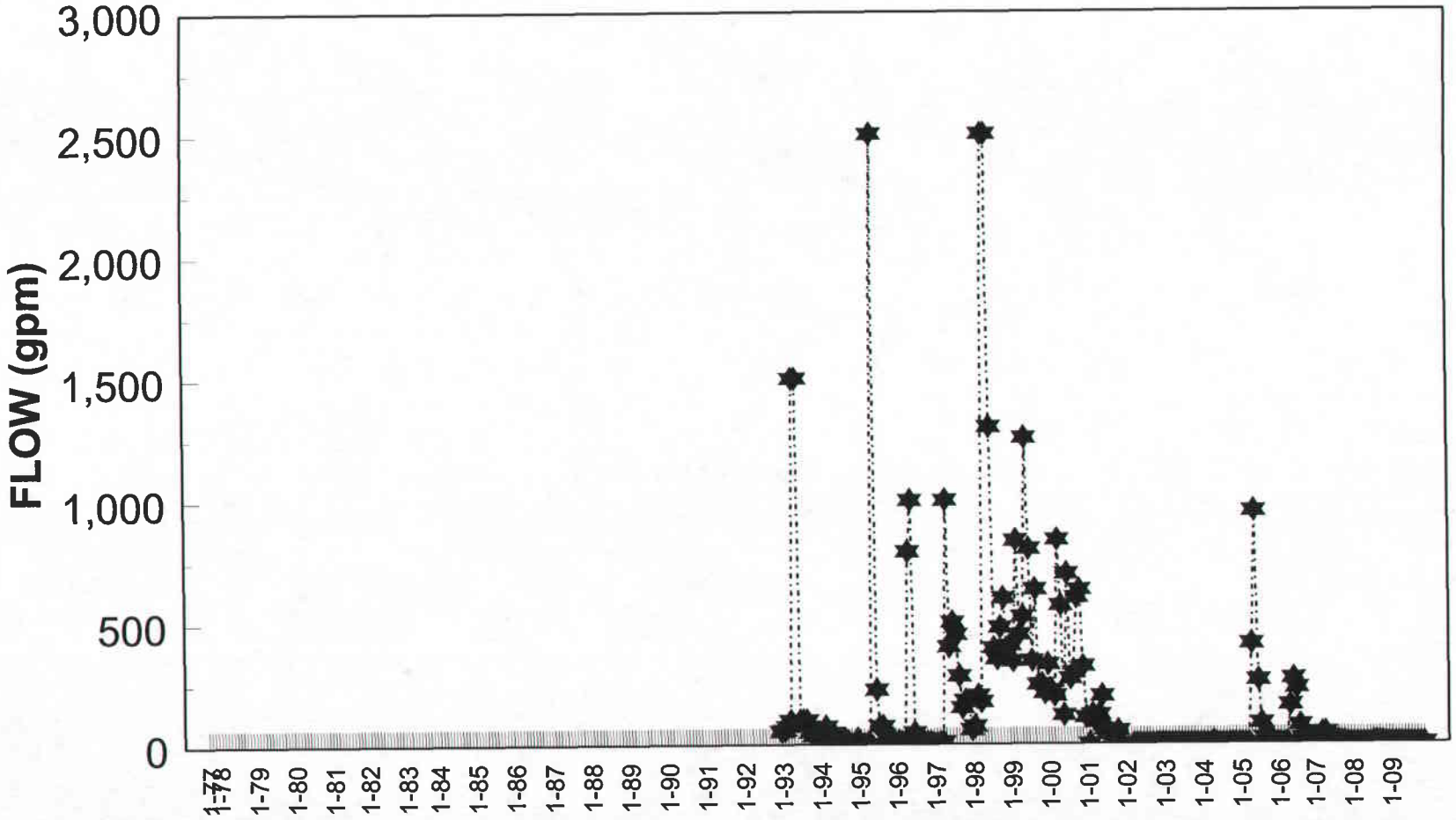
DISCHARGE RECESSION CURVE



COTTONWOOD CANYON CREEK

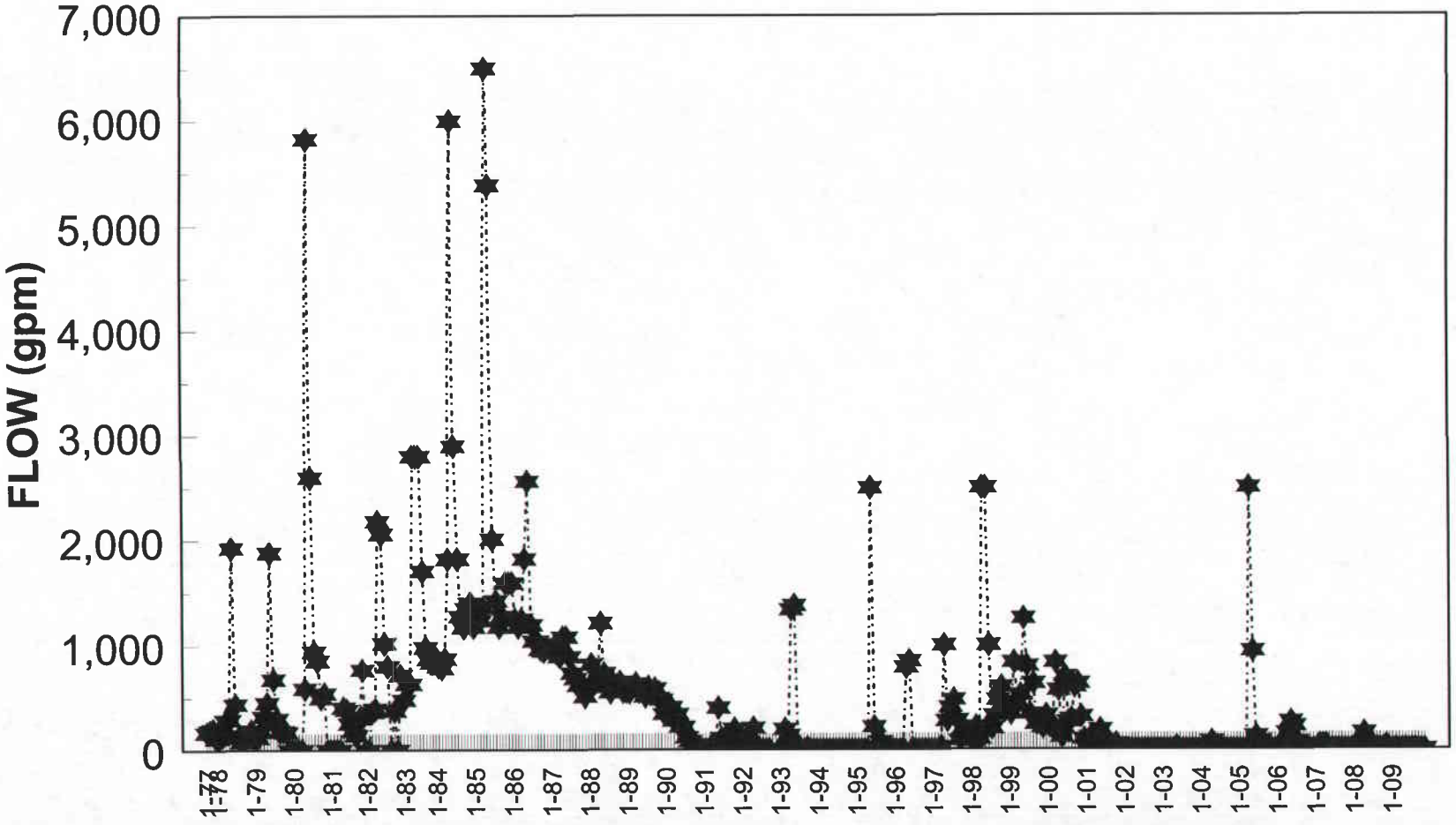
SW-3

DISCHARGE RECESSION CURVE



COTTONWOOD CANYON CREEK

@ USGS FLUME
DISCHARGE RECESSION CURVE



INDIAN CREEK WATER QUALITY *

ICA

APPENDIX F

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20091007	5	262	72.65		2	511		278	0.09		23.39			8.22	1.05	3.32	11	0	277
2008**																			
MEAN		257	74.26		2	499		280	0.12		22.97	0.002		8.3	0.89	3.27	10	0	286
2007**																			
MEAN		251	72.0		2	496		274	0.30		22.8	0.02		8.02	1.07	3.01	14	26	294
2006**																			
MEAN		297	77.5		3	554		282	0.06		21.5	0.01		7.96	0.64	2.71	8		282
2005**																			
MEAN		265	80.8		3	571	10	294	0.07		23	0		8.30	1.56	3.27	8	5	291
2004**																			
MEAN		262	77.4		2	493		281	0.08		21.4	0.03		8.06	0.79	2.92	13	7	299
2003**																			
MEAN		312	71.5		2	493		271	0.02		22.4			8.24	0.91	2.93	19		265
2002**																			
MEAN		286	67.0		2	483		258			22.0			8.25		4.00	23		304
2001**																			
MEAN		327	71.0		3	633		264	0.20		21.0			8.21		3.00	9		289
2000**																			
MEAN		313	69.0		2	487		255	0.20		20.0			8.10		3.00	10	43	274
HISTORICAL 2000-2008																			
MIN		251.0	67.0	0.0	2	483		255.00	0.02		20.000	0.0	0.00	7.96	0.64	2.7	8.0	0	265
MAX	5	327.0	80.8	0.0	3	633		294.00	0.30		22.970	0.0	0.00	8.30	1.56	4.0	23.0	43	304
MEAN		285.6	73.4	0.0	2	523		273.22	0.13		21.836	0.0	0.00	8.16	0.98	3.1	12.6	16.2	287.111111
No. of Analysis	1	9	9		9	9	1	9	8		9	5		9	6	9	9	5	9

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory **minimum detection limit.**

INDIAN CREEK WATER QUALITY *

ICB

APPENDIX F

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20091007		246	67.70		2	480		267	0.41		23.85	0		8.35	1.05	4.34	13	14	261
2008**																			
MEAN	7	236	66	0	2	465		259	0.25		23	0.006		8.27	0.9	3.99	11	0	276
2007**																			
MEAN		237	64.9		2.0	466		258	1.43		23	0.046		8.09	1.01	3.73	14.0	37	286
2006**																			
MEAN		239	72.0		3.0	527		268	0.24		22	0.005		8.25	0.61	3.62	9.0		278
2005**																			
MEAN		238	68.2	5	2.0	534	9	258	0.20		21	0.013		8.41	1.00	4.29	10.0	9	268
2004**																			
MEAN		258	73.4		2.0	490		271	0.72		21	0.025		7.94	0.75	3.29	12.0	10	284
2003**																			
MEAN		276	59.3		2.0	427		236	0.37		21			8.13	0.93	3.41	11.0	21	216
2002**																			
MEAN		282	57.0		2.0	432		233	0.40		22			8.21		4.00	8.0		235
2001**																			
MEAN		293	59.0		2.4	559		234	0.20		21			8.26		3.00	7.7	6	253
2000**																			
MEAN	12	301	65.0		2.0	468		245	0.10		20			8.19	1.00	3.00	9.0	9	266
HISTORICAL 2000-2008																			
MIN	7.0	236	57.0	0.0	2.0	427		233	0.10		20	0.005		7.94	0.61	3.00	7.7	0.0	216
MAX	12.0	301	73.4	5.0	3.0	559		271	1.43		23	0.023		8.41	1.01	4.29	14.0	37.0	286
MEAN	9.5	262	65.0	2.5	2.2	485		251	0.43		22	0.011		8.19	0.89	3.59	10.2	13.1	262.444
No. of Analysis	2	9	9	2	9	9		9	9		9	5		9	7	9	9	7	9

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

INDIAN CREEK WATER QUALITY *

ICD

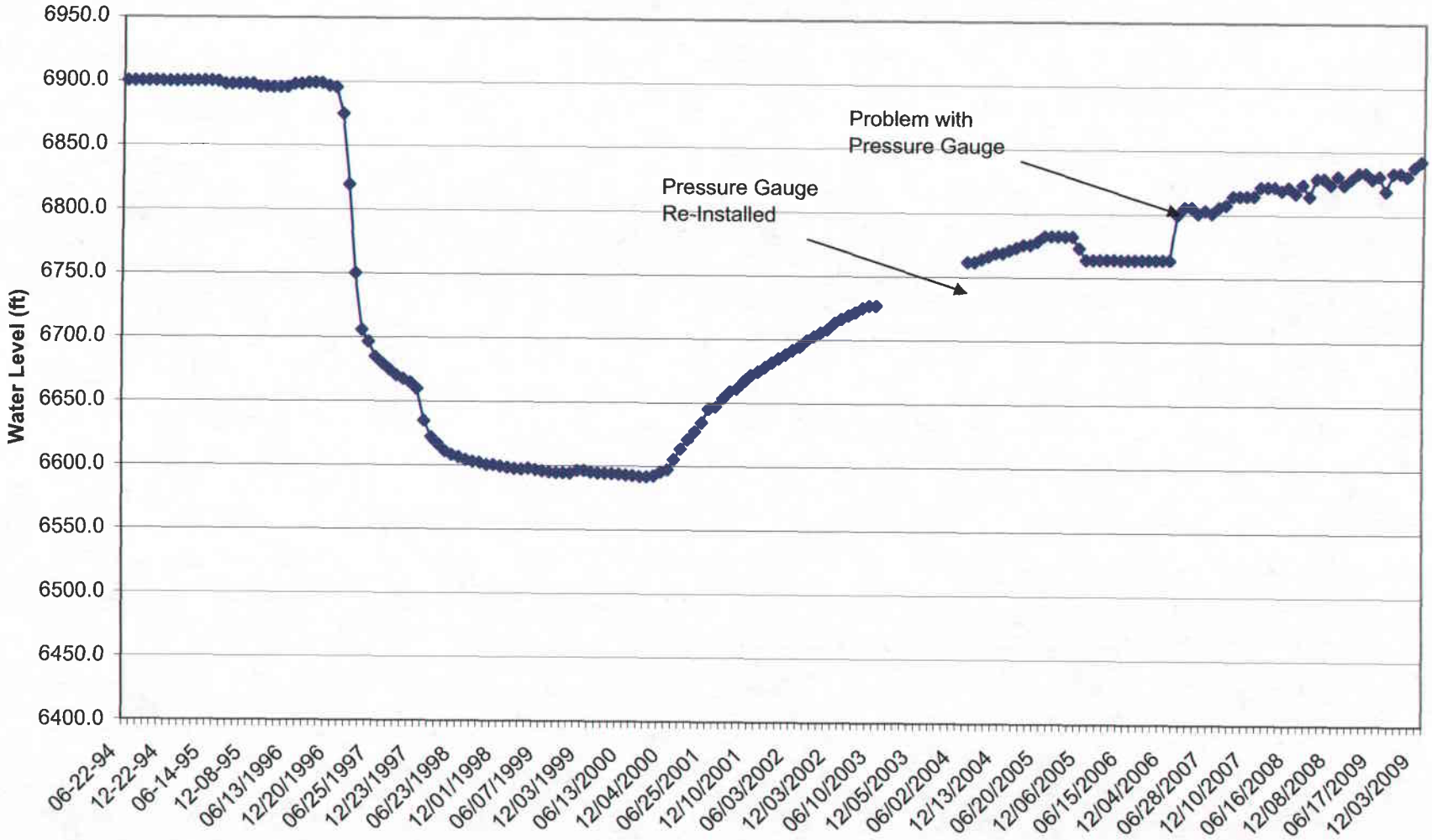
APPENDIX F

2009** SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	DISSOLVED OXYGEN	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20091007	9	269	89.02		4	662		363	0.21		34.29	0.007		8.19	1.51	10.11	87	8	407
2008** MEAN		279	85.77		4	628		350	0.06		33.04	0.005	0	9.43	1.19	10.15	66	0	395
2007** MEAN		256	96.8	6.0	4.0	717		388	0.12		35.60	0.02		8.17	1.39	10.30	130.0		484
2006** MEAN		361	108.0		7	813	9	413	0.14		35	0.06	4.00	8.04	2.45	11.20	47	7	450
2005** MEAN		361	108.0		7	813	9	413	0.14		35	0.06	4.00	8.04	2.45	11.20	47	7	450
No Flow During 2004																			
2003** MEAN		307	81.5		3	624		329	0.13		30	0.009		8.21	1.05	8.87	108		367
2002** MEAN		266	96.0		3	740		384	0.30		35			8.28		10.00	188		528
2001** MEAN		379	80.0		4	753		323	0.10		30			8.29		10.00	43	10	369
2000** MEAN		321	92.0		5	689		362			32			8.00	1.00	10.00	125		459
HISTORICAL 2000-2008																			
MIN		256.0	80.0	0.0	3	624		323.00	0.06		30.00	0.003	0.00	8.00	1.00	8.86	23.0	0	367
MAX		379.0	108.0	6.0	7	813		413.00	0.38		35.60	0.054	4.00	9.43	2.45	11.2	188.0	10	528
MEAN		311.88	91.30	3.0	4.39	712		362.75	0.18		32.75	0.026	2.00	8.31	1.37	9.92	91.25	5.67	428.88
No. of Analysis		8	8	2	8	8	0	8	7	1	8	5	2	8	6	8	8	3	8

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

Trail Mountain Mine
Straight Canyon Well: TM-3



STRAIGHT CANYON WATER QUALITY *

T-19

APPENDIX F

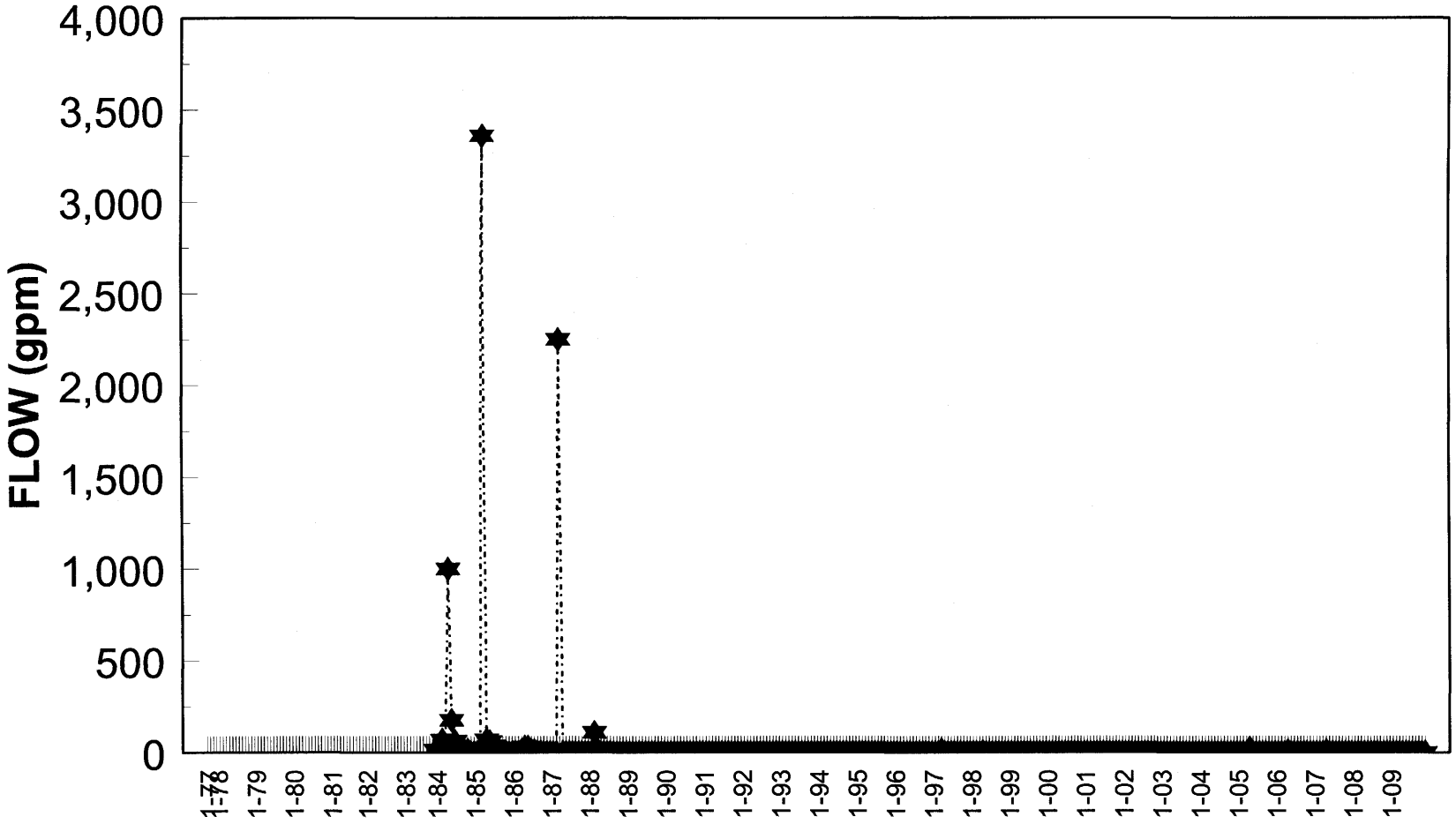
2009* SAMPLE DATES	ACIDITY	ALKALINITY BICARBONATE	CALCIUM	CARBONATE	CHLORIDE	CONDUCTIVITY (umhos/cm)	HARDNESS	IRON TOTAL	IRON DISSOLVED	MAGNESIUM	MANGANESE	OIL & GREASE	PH (units)	POTASSIUM	SODIUM	SULFATE	TSS	TDS
20090325	0	319	65.8	0	30	1151	543	0.00	0.00	92	0.00	0.00	8.32	5.04	69.27	283	0	802
20090617	0	320	59.7	0	32	1117	507	0.06	0.00	87	0.00	0.00	8.55	5.20	65.93	280	21	749
20090908	0	361	82.4	31	37	1572	857	0.00	0.00	158	0.00	0.00	8.44	9.62	69.53	490	0	1124
20091203	0	419	87.8	0	43	1578	802	0.00	0.00	142	0.00	0.00	8.34	8.17	82.56	498	0	1152
2009**																		
MIN	0	190	14.3	0	19	581	178.00	0	0.00	24.00	0.00	0.00	7.44	1	12	39	0	340
MAX	14	500	98.9	78	68	1840	993.00	5	0.38	162.00	0.20	5.00	8.87	30	125	609	420	1256
MEAN	5.76	362.59	53.4	15.06	36.63	1068.63	448.23	1	0.13	73.57	0.05	3.28	8.42	4.137	73.80	218.94	79.27	671.09
No. of Analysis	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2008**																		
MIN		286	53	0	30	959	434	0		73	0		8	4	60	182	0	577
MAX		368	78	22	36	1494	732	0		131	0		9	8	78	434	7	1016
MEAN		326	66	7	33	1210	538	0		96	0		8	5	70	303	4	794
2007**																		
MIN	9	322	56	6	29	1016	420	2		68	0		8	3	68	179	158	622
MAX	9	364	99	49	43	1840	836	2		143	0		8	9	90	518	158	1154
MEAN	9	350	73	23	37	1398	611	2		104	0		8	6	82	355	158	898
2006**																		
MIN		290	43	13	19	843	338	0		56	0		8	2	36	99	13	456
MAX		312	62	13	30	1127	461	1		75	0		9	3	66	203	51	658
MEAN		298	52	13	25	944	387	1		62	0		8	3	51	139	31	526
2005**																		
MIN		287	42	17	22	827	360	0		62	0		9	2	44	124	33	498
MAX		329	68	24	37	1493	552	1		93	0		9	5	92	341	338	879
MEAN		306	55	20	28	1097	438	1		73	0		9	3	64	211	135	657
2004**																		
MIN		334	51.9	8	33	1060	429	0.07		73			8.41	3.93	63	271	10	698
MAX		430	95.7	8	38	1716	906	2.54		162			8.46	10.10	88	609	177	1256
MEAN		381	70.4	8	36	1326	617	0.90		107			8.43	6.09	78	393	94	913
2003**																		
MIN		376	64.1	5	32	1324	605	0.03	0.04	107		2	8.42	5.46	77	362	5	885
MAX		500	86.7	19	43	1646	836	0.08	0.04	154		2	8.67	9.48	90	542	8	1205
MEAN		425	74.7	12	36	1462	706	0.06	0.04	126		2	8.54	7.14	84	440	7	1026
2002**																		
MIN		410	58.0	5	33	1252	495	0.50		85			8.38	4.00	88	303	46	816
MAX		498	79.0	14	40	1674	786	0.50		143			8.55	9.00	90	520	46	1198
MEAN		459	68.0	8	37	1423	622	0.50		110			8.46	6.00	89	397	46	983
2001**																		
MIN		345	42.0	12	42	1105	400	0.30		68			8.18	3.00	103	181	7	722
MAX		424	58.0	23	53	1319	516	2.50		92			8.53	5.00	109	340	309	868
MEAN		393	50.8	16	48	1221	454	1.10		80			8.33	3.75	105	266	113	792
2000**																		
MIN		345	42.0	12	42	1105	400	0.30		68			8.18	3.00	103	181	7	722
MAX		424	58.0	23	53	1319	516	2.50		92			8.53	5.00	109	340	309	868
MEAN		393	50.8	16	48	1221	454	1.10		80			8.33	3.75	105	266	113	792
HISTORICAL 1977-2007																		
MIN	0.1	190	14.3	1.0	19.0	581	178	0.034	0.03	24	0.002	1.0	7.44	0.70	12	39.0	1.0	340
MAX	14.0	500	98.9	78.0	67.9	1840	993	5.10	0.38	162	0.20	5.0	8.87	30.20	125	609.0	420.0	1256
MEAN	6.9	365	52.7	15.7	36.8	1060	443	0.77	0.15	72	0.05	3.8	8.43	4.06	74.00	214.2	82.1	664.2
No. of Analysis	13	71	71	49	71	67	71	54	14	71	21	12	70	69	71	71	54	71

* Quality parameters are reported as mg/l unless otherwise noted.

** Data: Database input restricted to values greater then laboratory minimum detection limit.

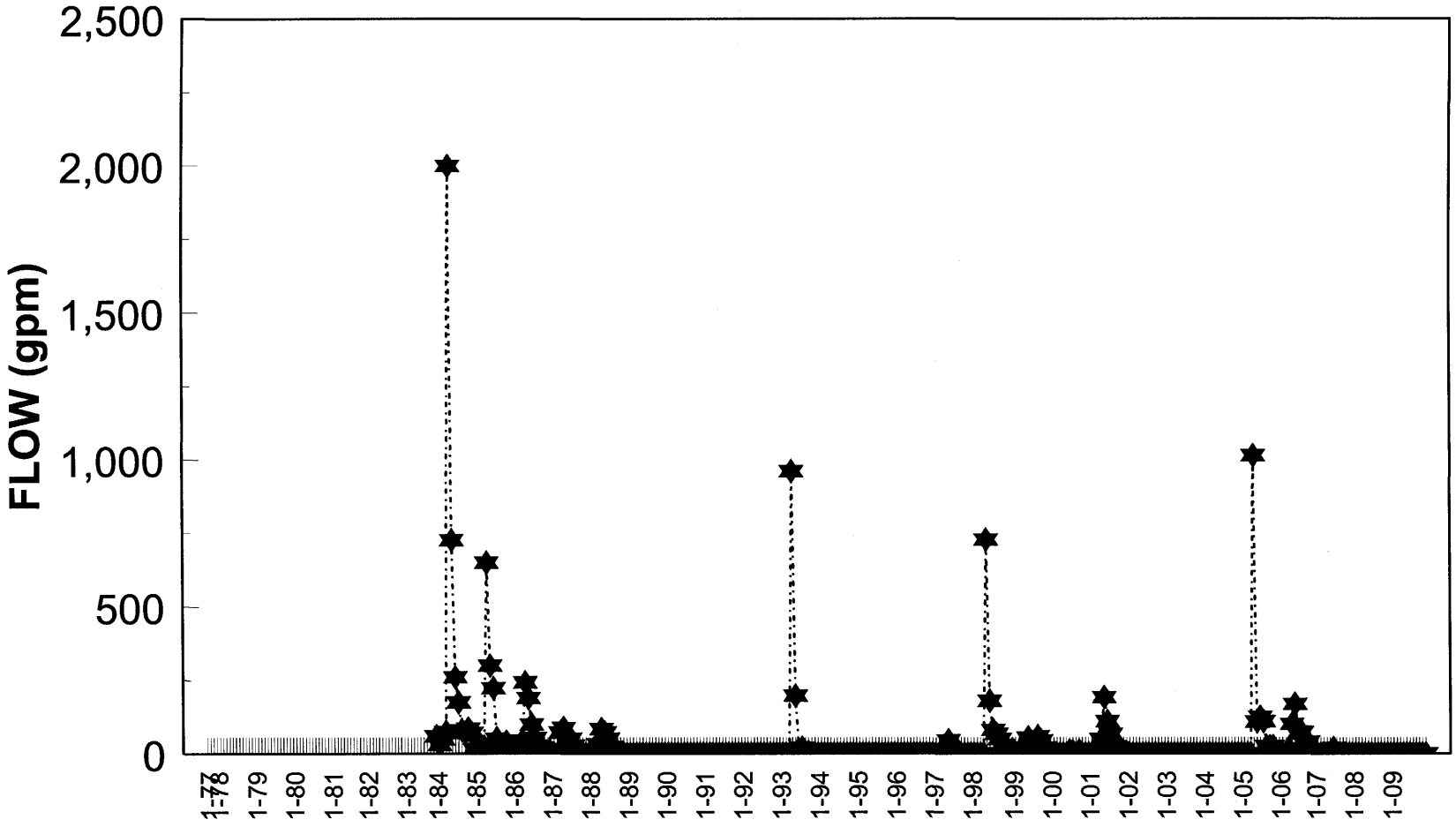
GRIMES WASH

RIGHT FORK
DISCHARGE RECESSION CURVE



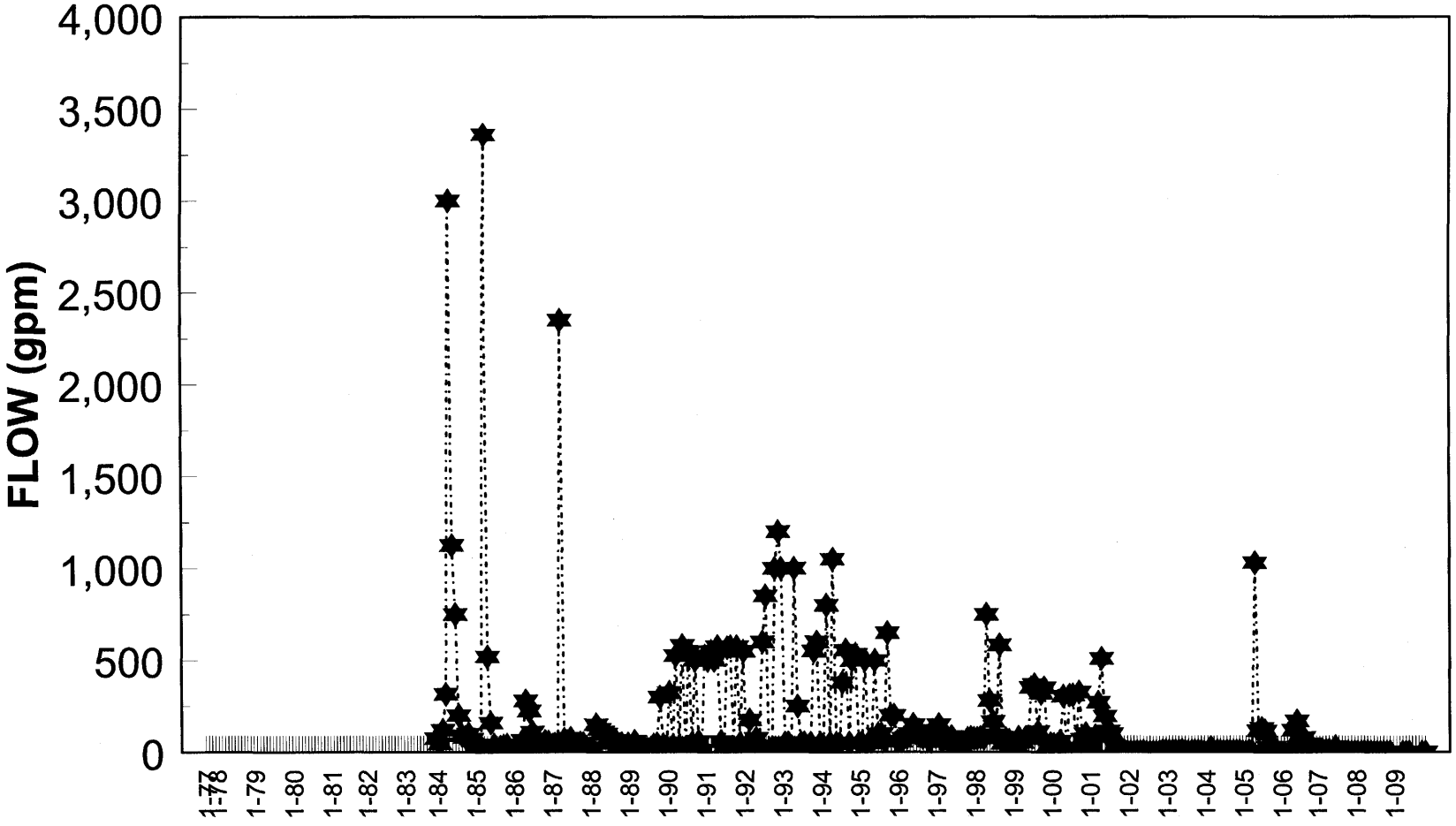
GRIMES WASH

LEFT FORK
DISCHARGE RECESSION CURVE



GRIMES WASH

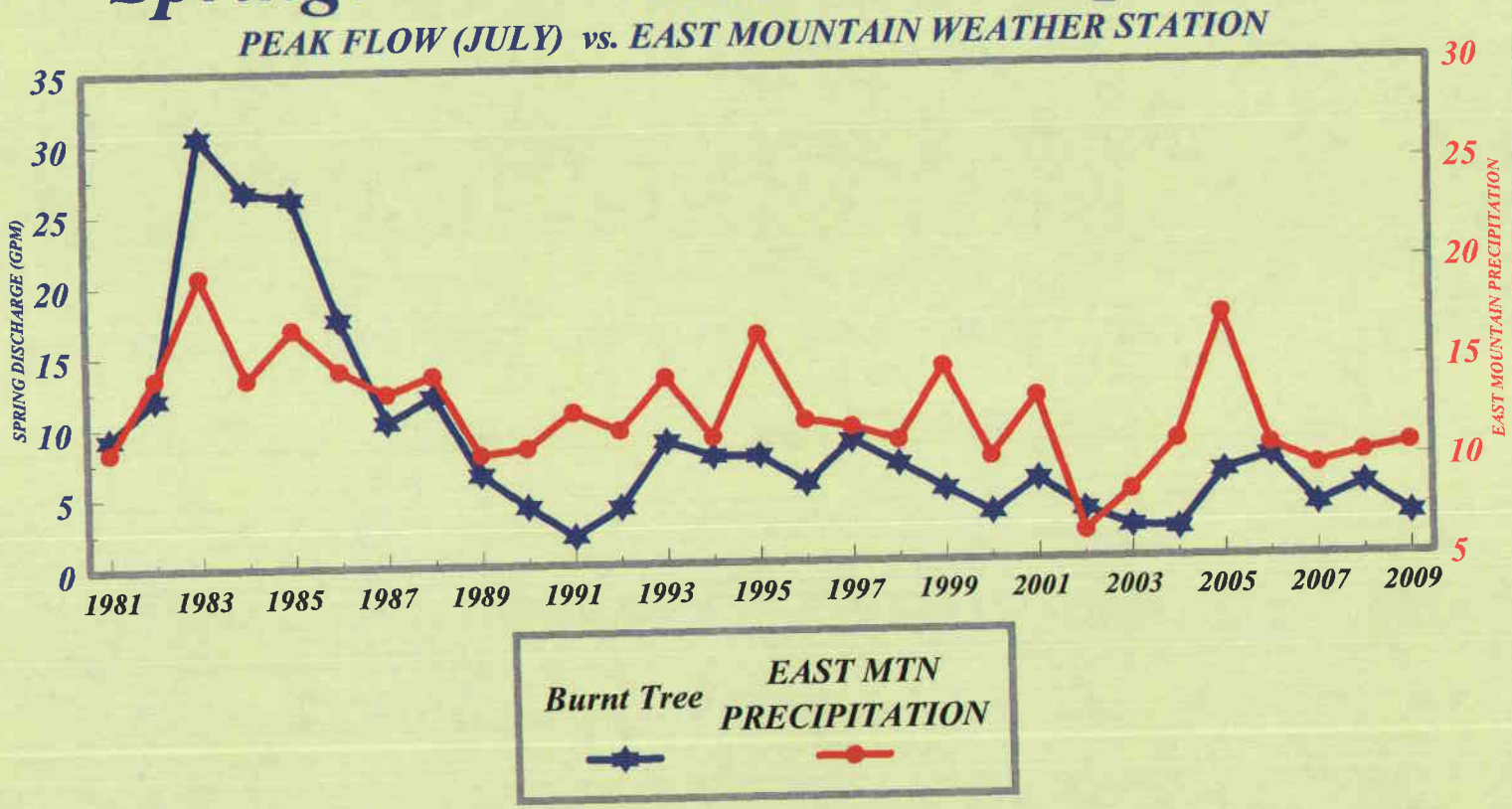
BELOW MINE
DISCHARGE RECESSION CURVE



East Mountain Springs Southern Area

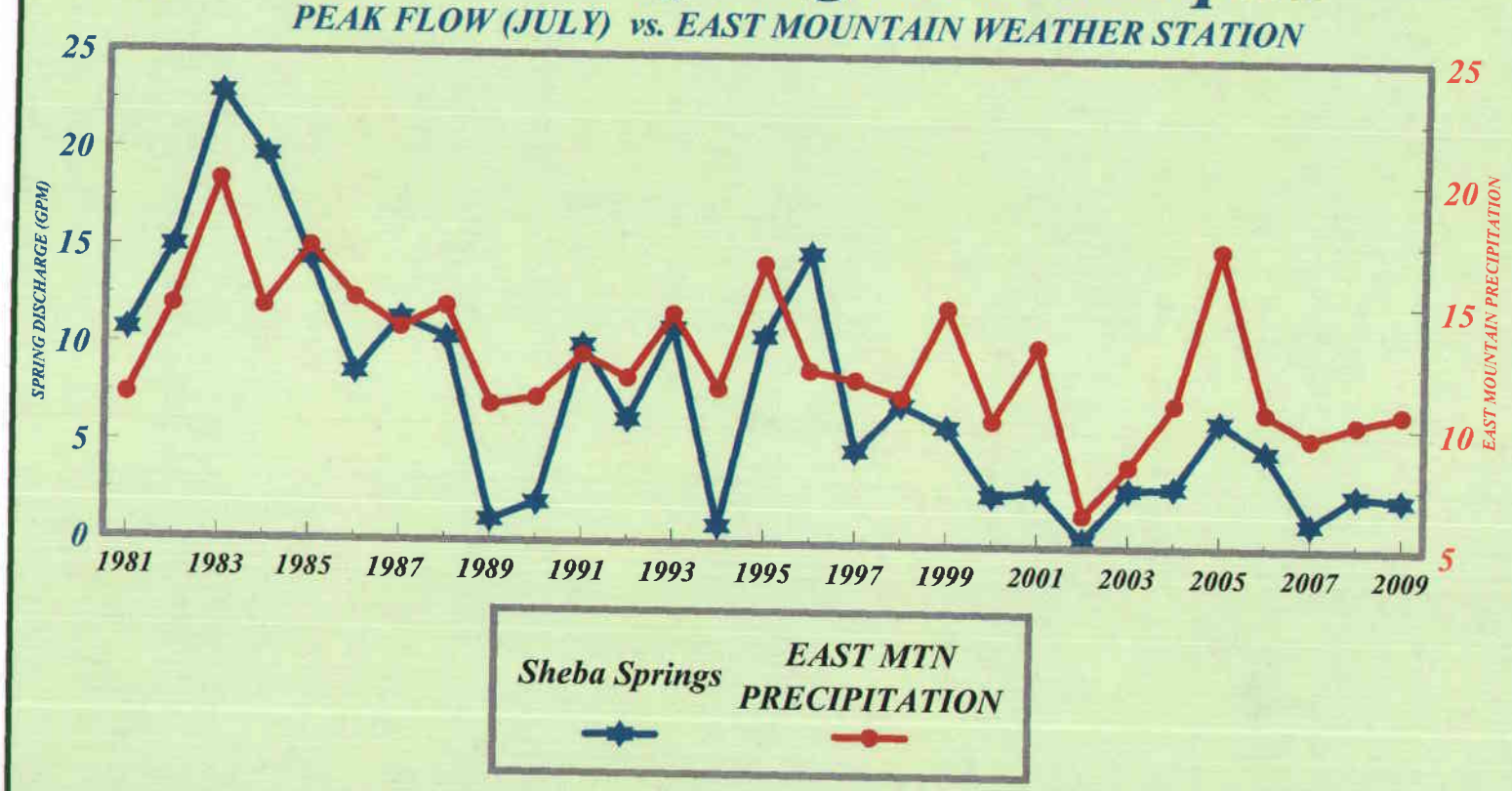
EAST MOUNTAIN SPRINGS

Spring: Burnt Tree vs. Precipitation



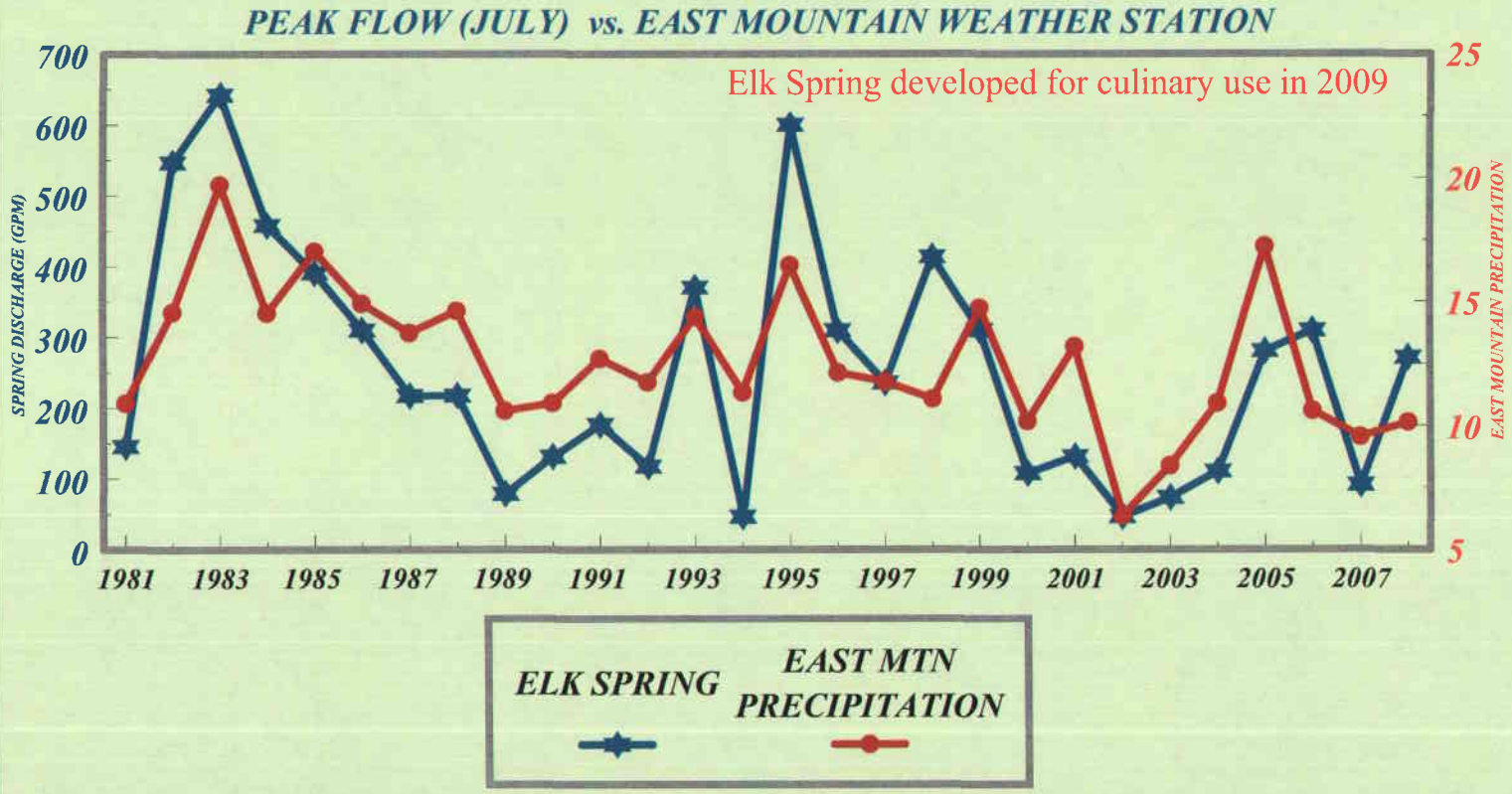
EAST MOUNTAIN SPRINGS

Spring: Sheba Springs vs. Precipitation



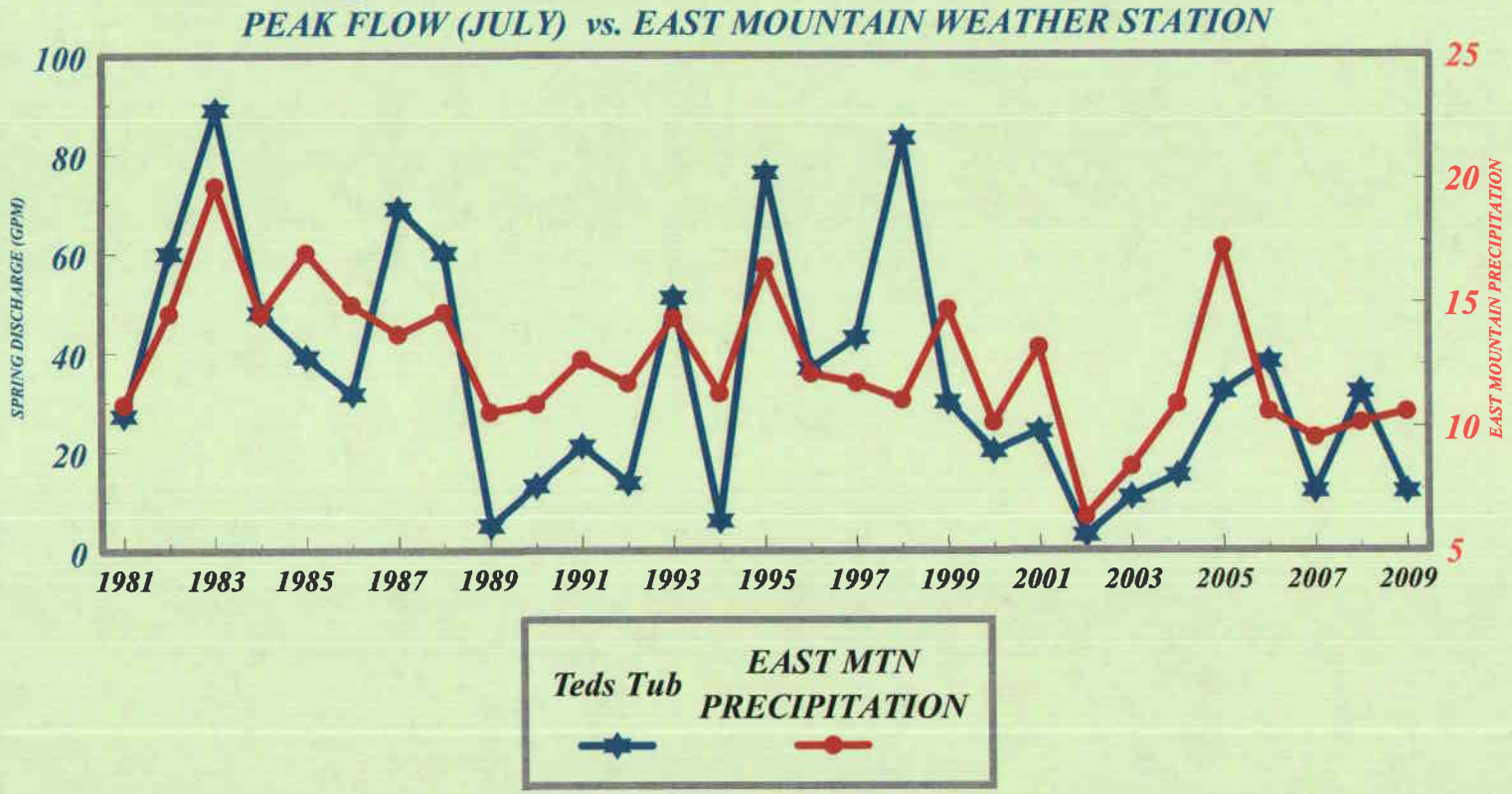
EAST MOUNTAIN SPRINGS

Spring: Elk Spring vs. Precipitation



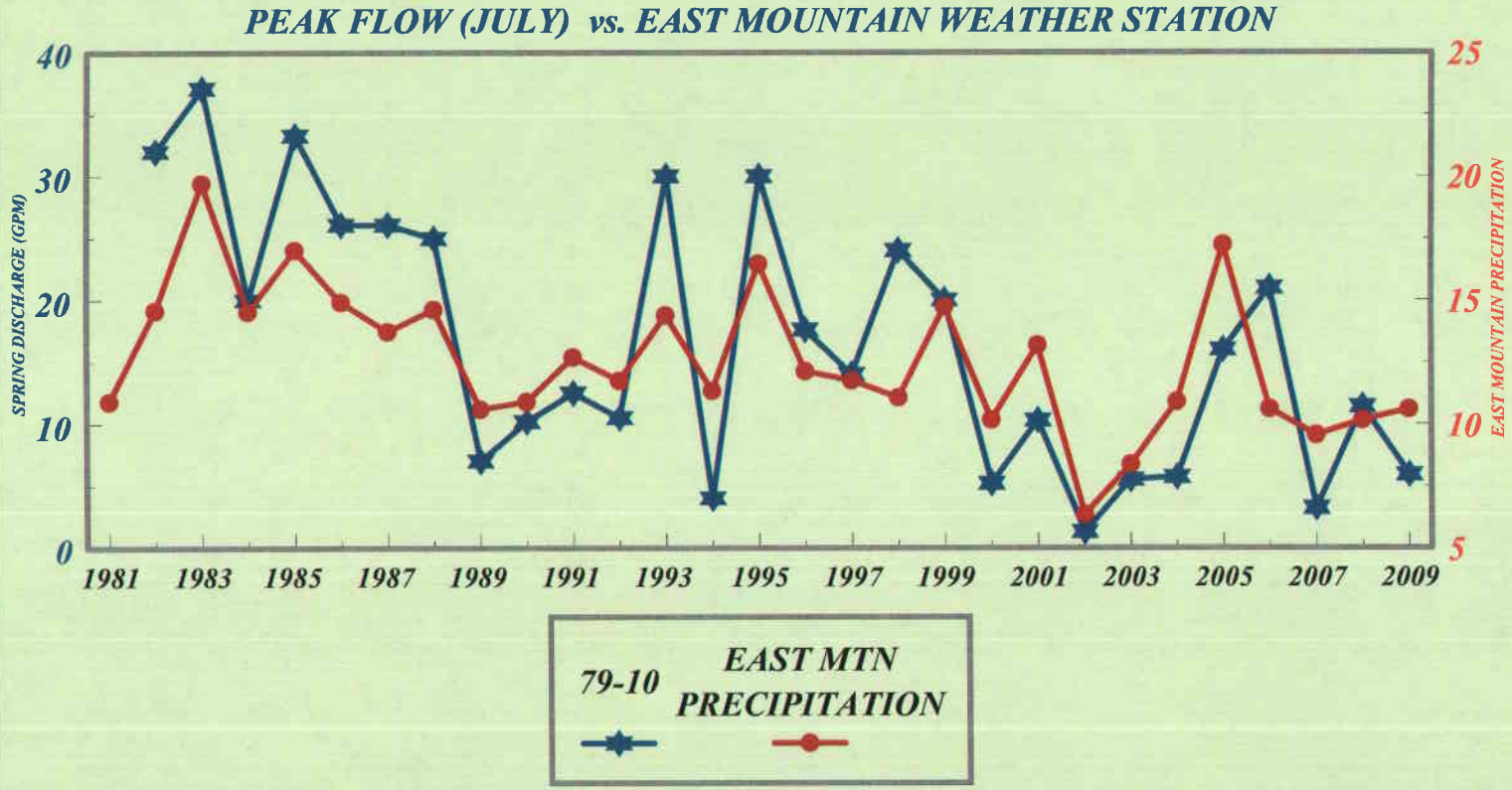
EAST MOUNTAIN SPRINGS

Spring: Teds Tub vs. Precipitation



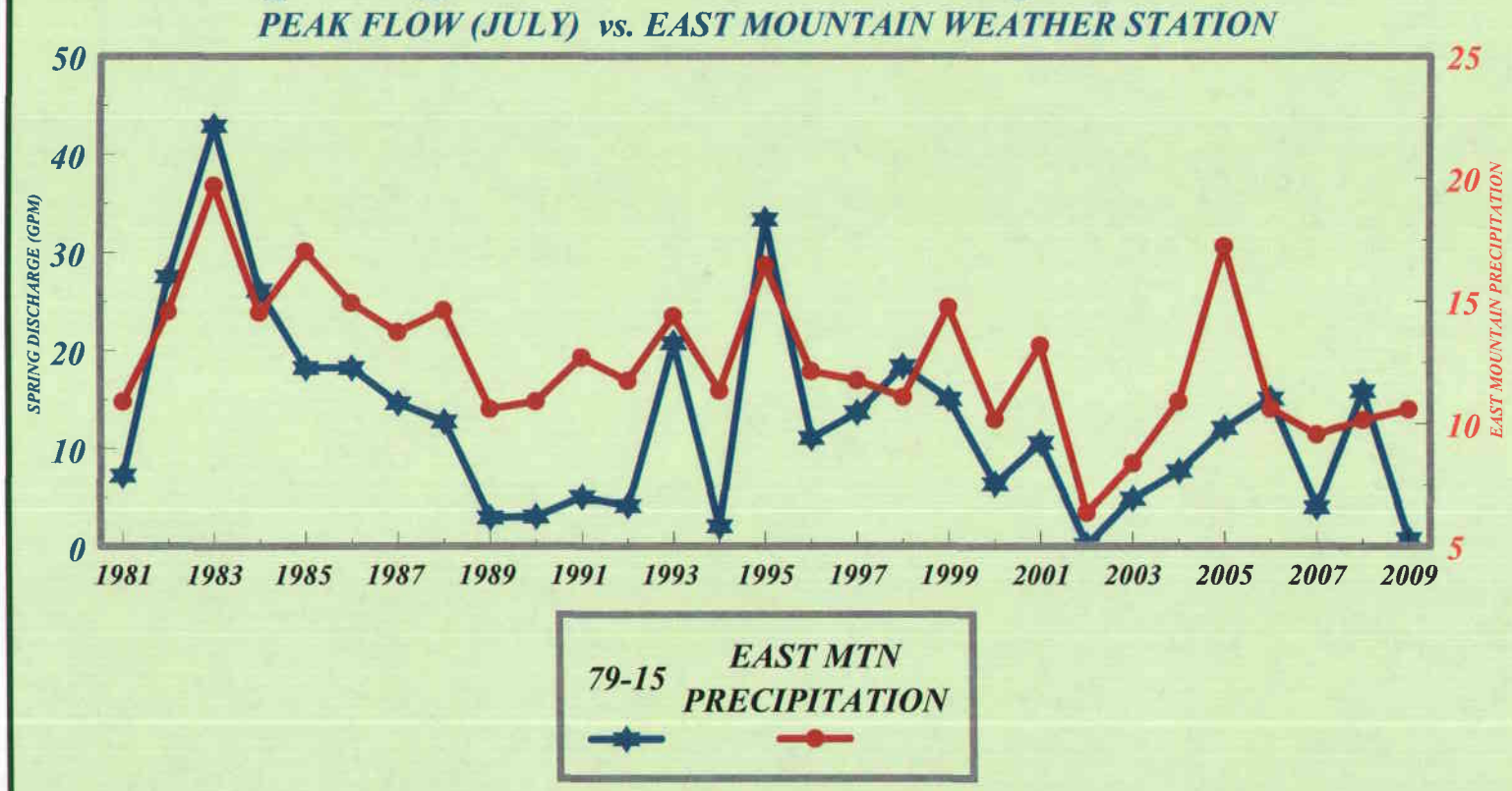
EAST MOUNTAIN SPRINGS

Spring: 79-10 vs. Precipitation



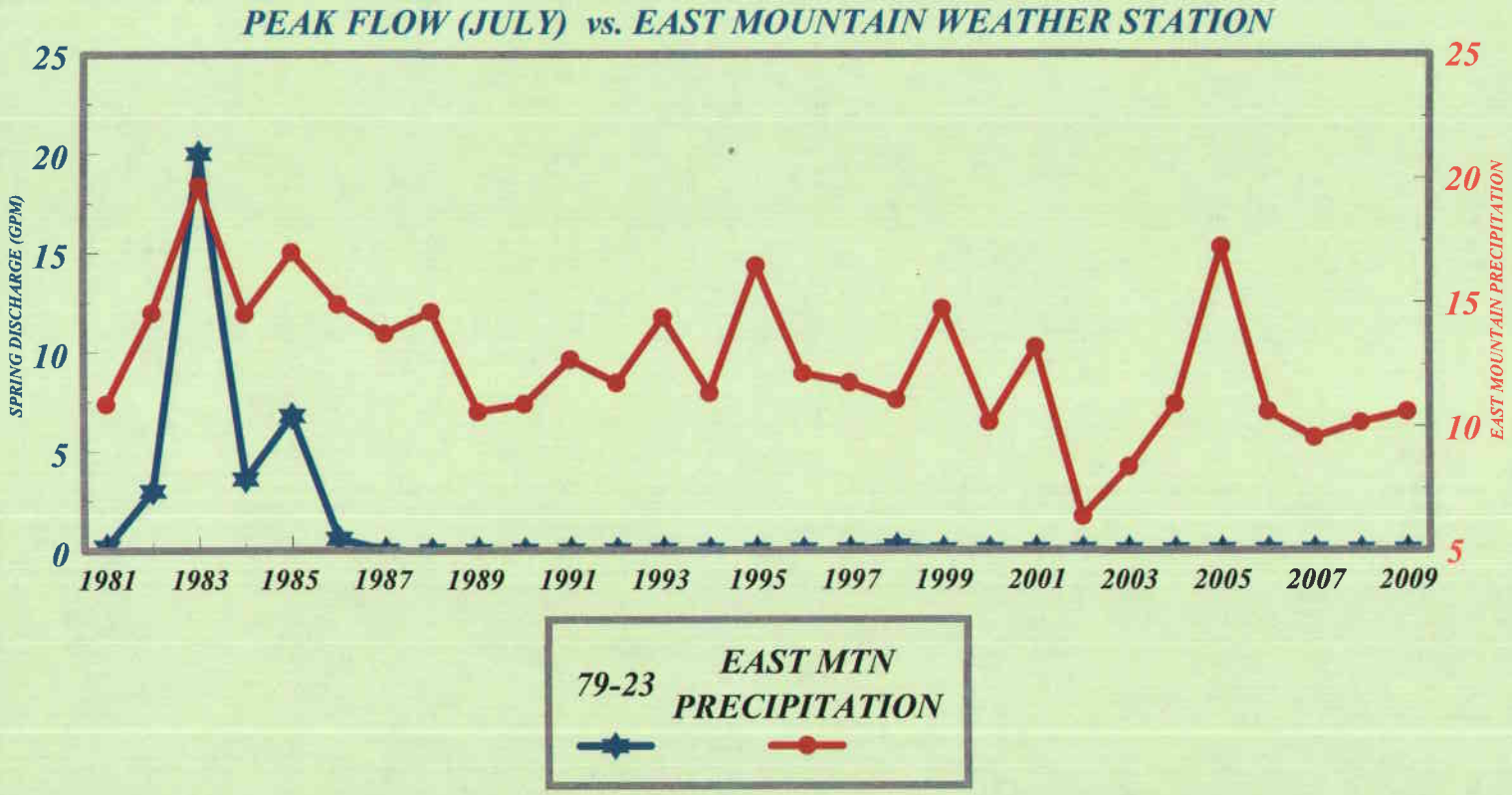
EAST MOUNTAIN SPRINGS

Spring: 79-15 vs. Precipitation



EAST MOUNTAIN SPRINGS

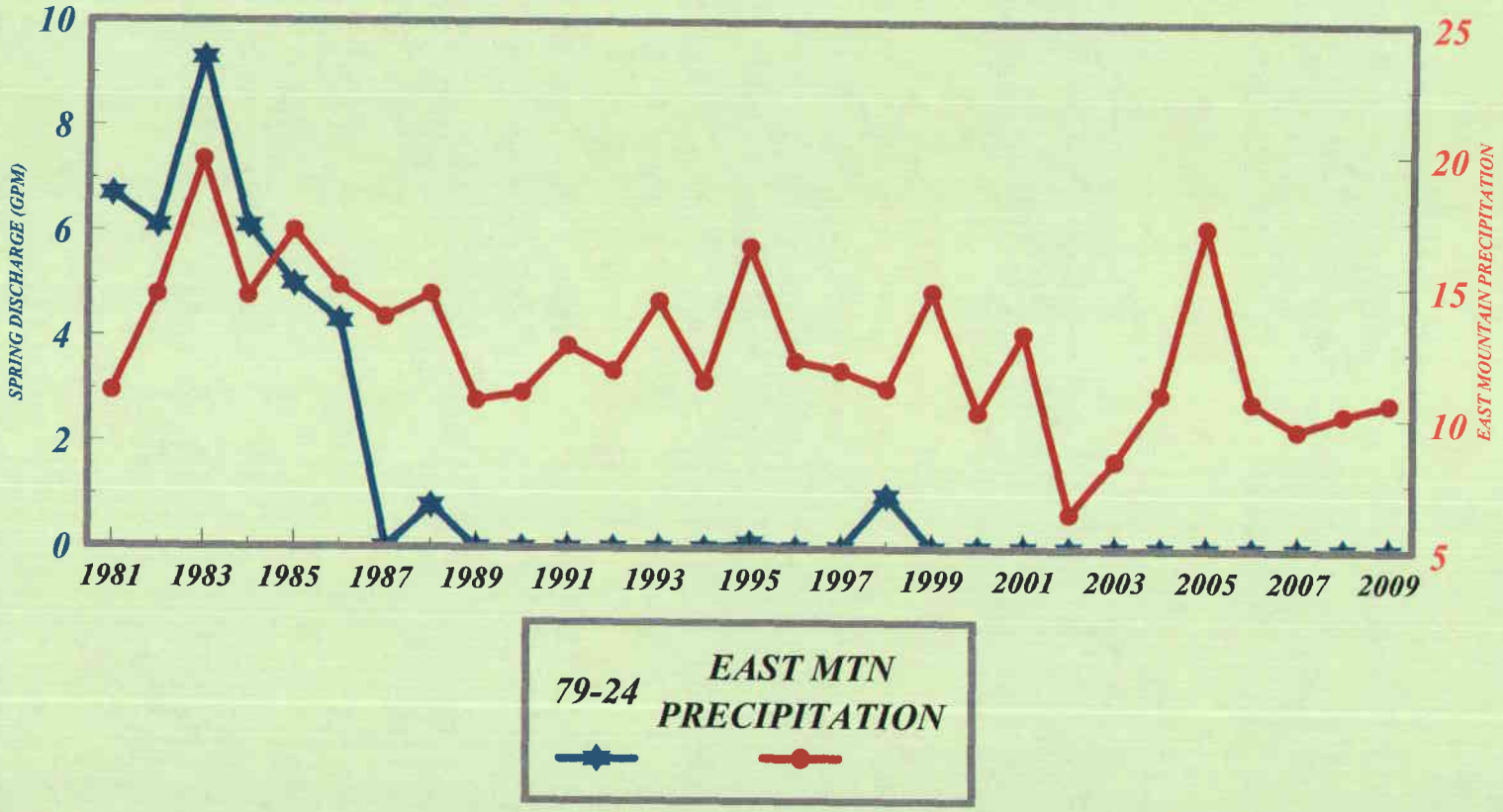
Spring: 79-23 vs. Precipitation



EAST MOUNTAIN SPRINGS

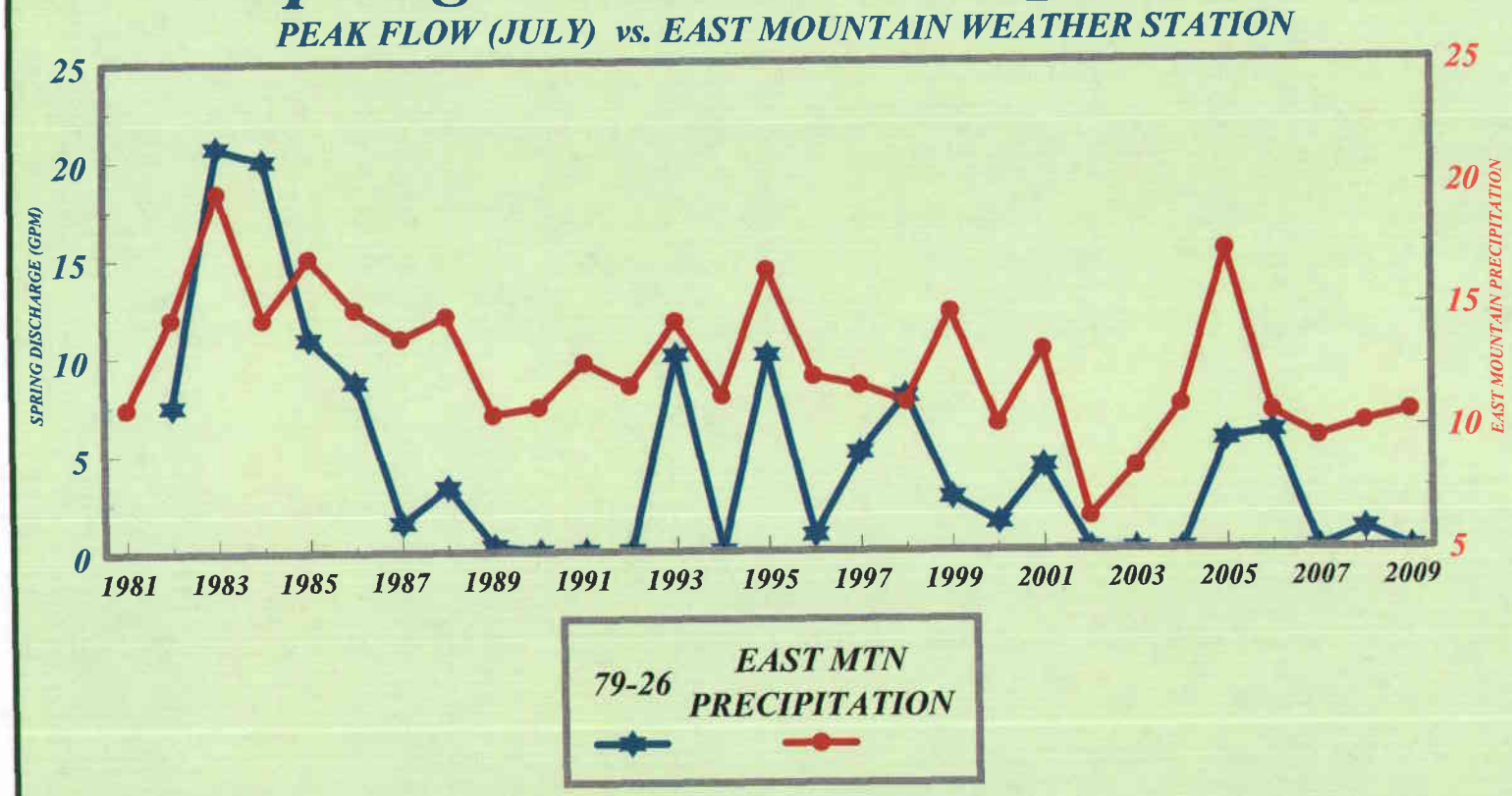
Spring: 79-24 vs. Precipitation

PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



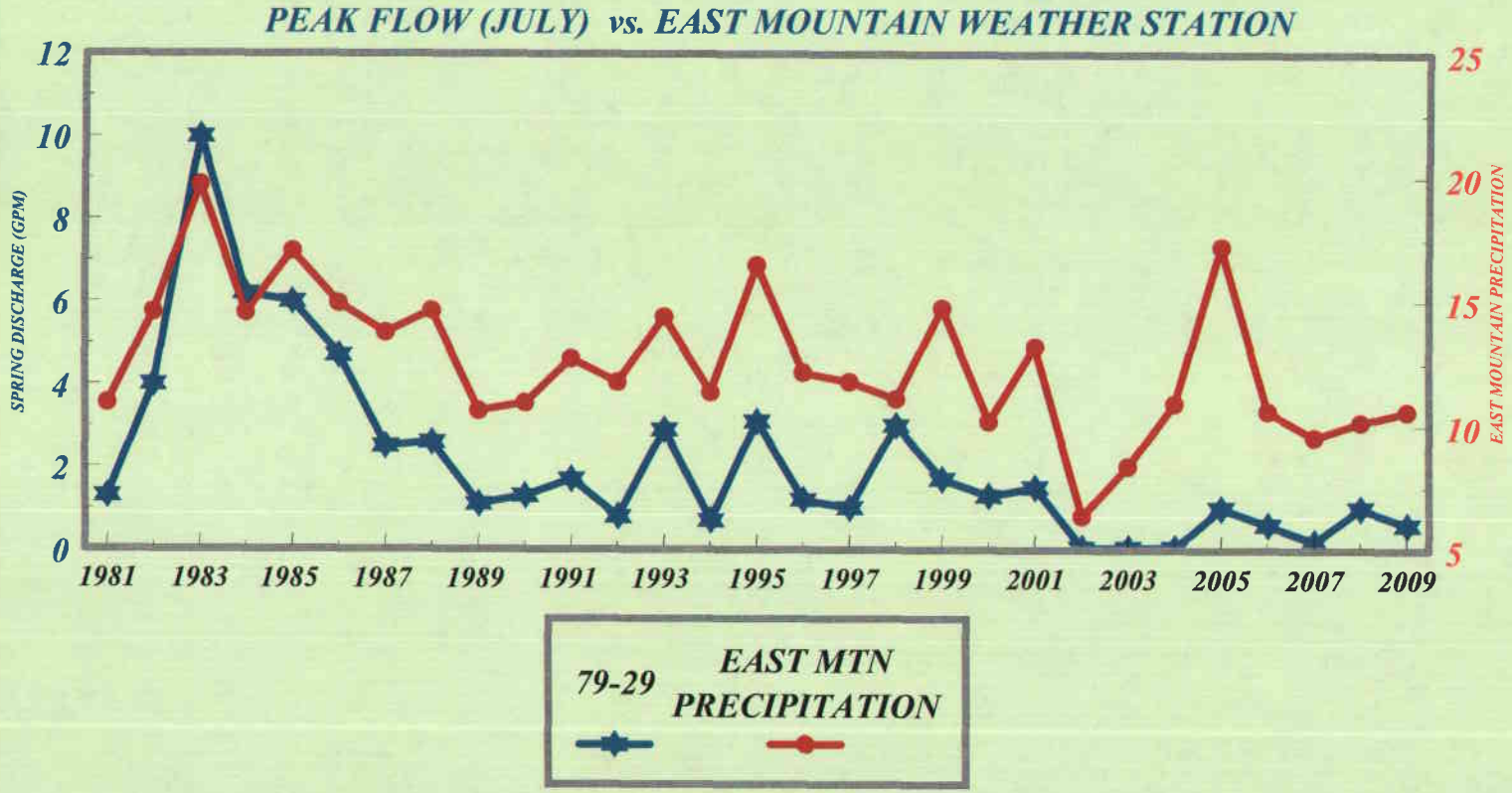
EAST MOUNTAIN SPRINGS

Spring: 79-26 vs. Precipitation



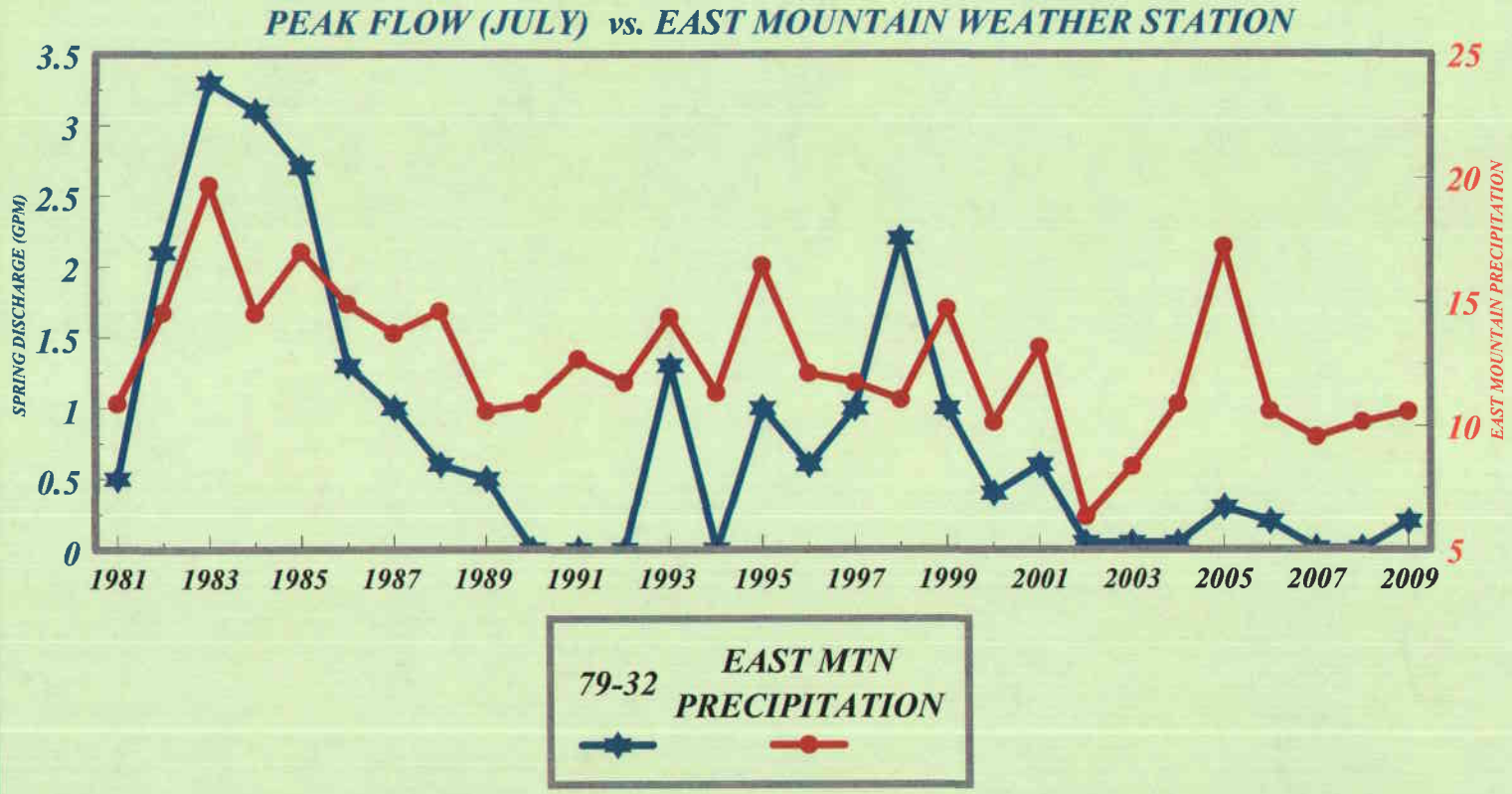
EAST MOUNTAIN SPRINGS

Spring: 79-29 vs. Precipitation



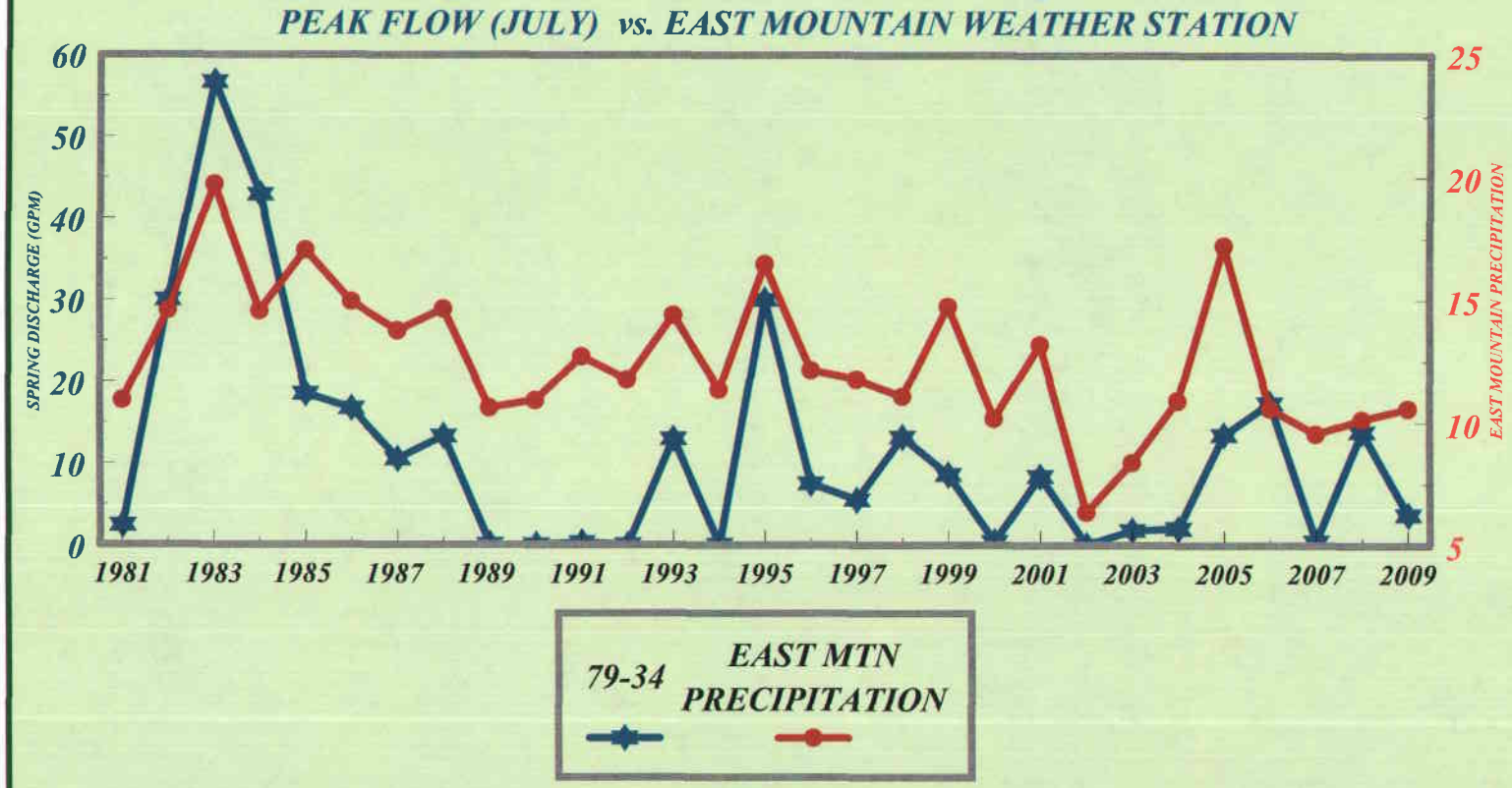
EAST MOUNTAIN SPRINGS

Spring: 79-32 vs. Precipitation



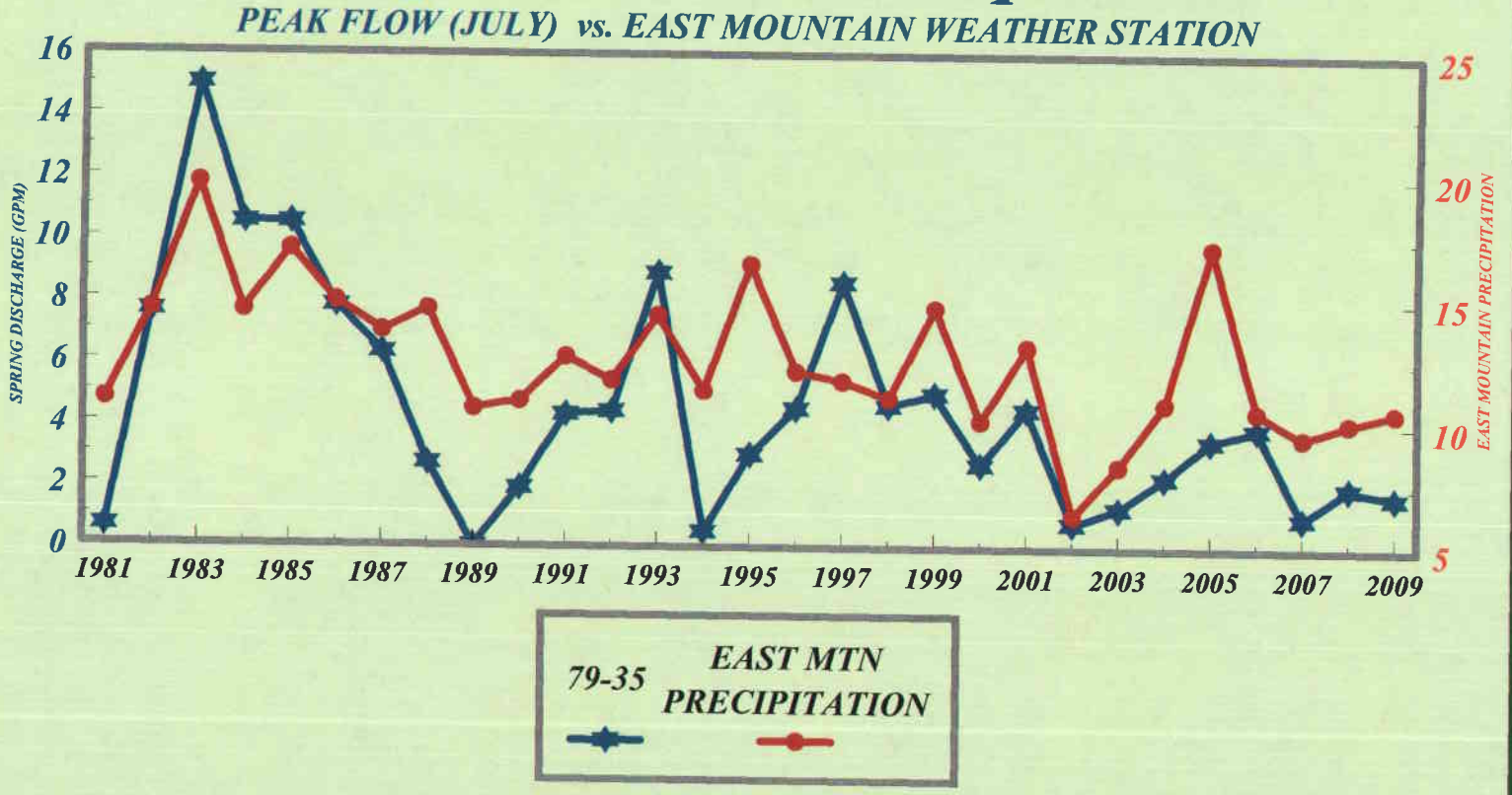
EAST MOUNTAIN SPRINGS

Spring: 79-34 vs. Precipitation



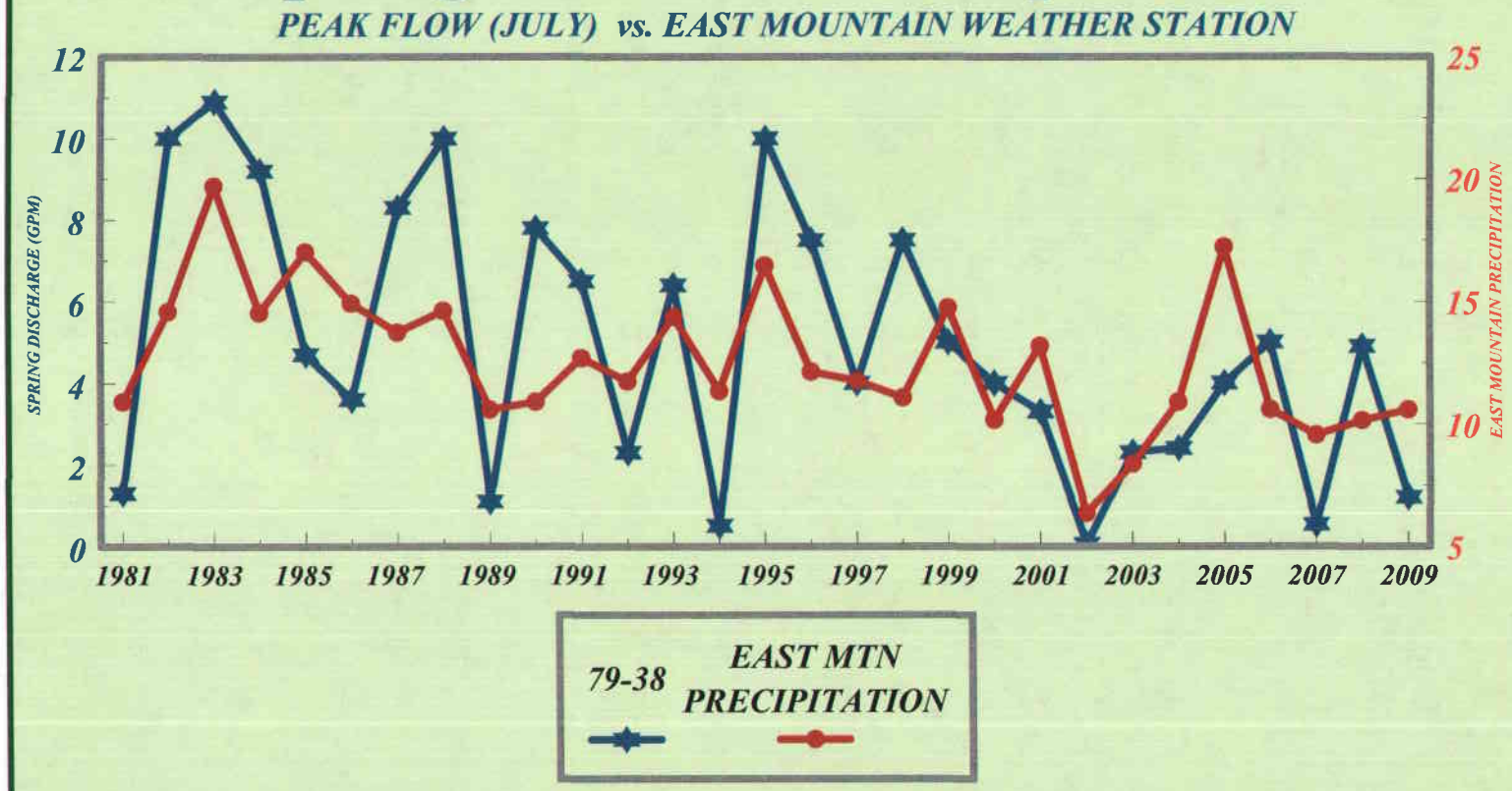
EAST MOUNTAIN SPRINGS

Spring: 79-35 vs. Precipitation



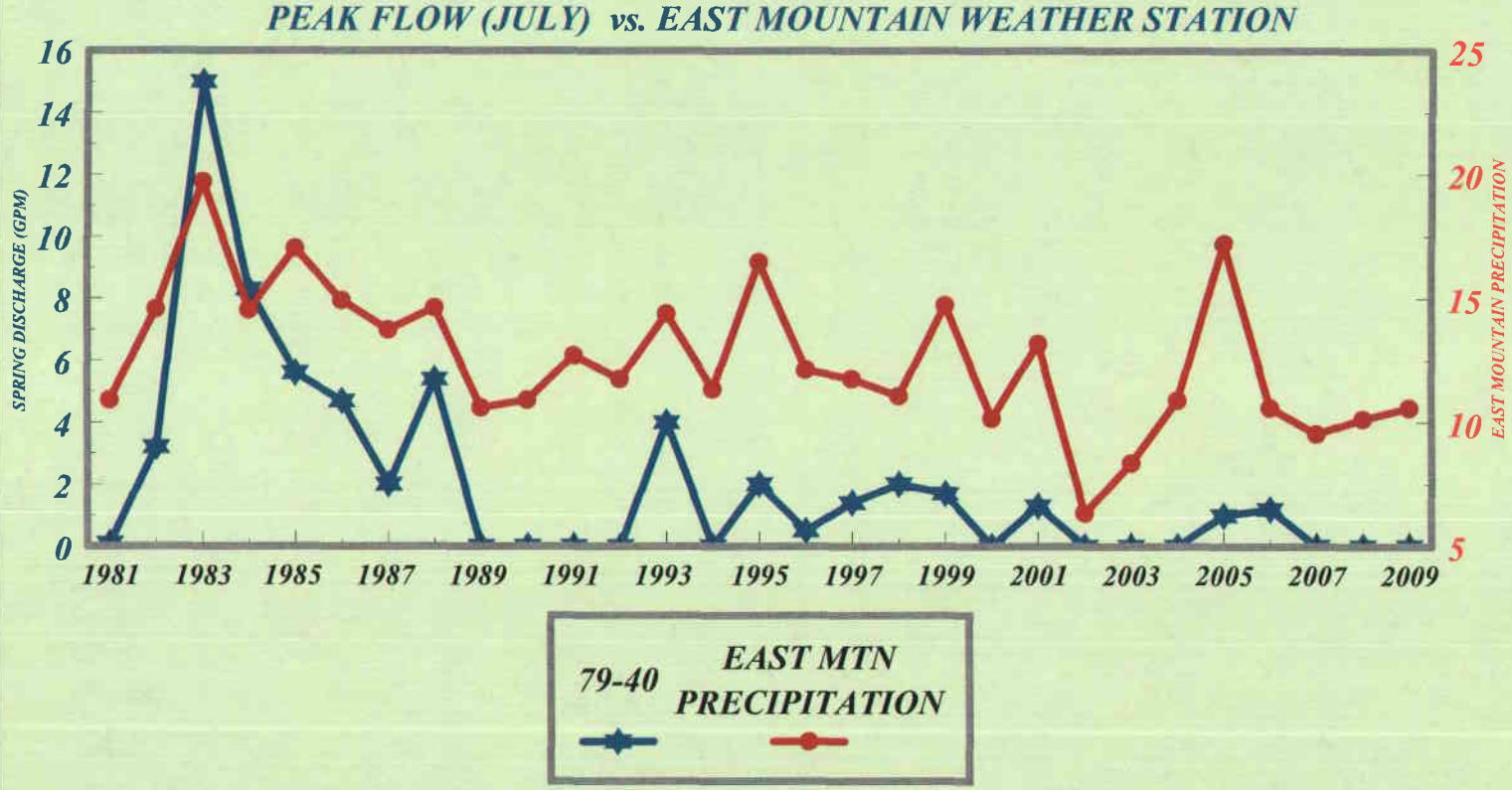
EAST MOUNTAIN SPRINGS

Spring: 79-38 vs. Precipitation



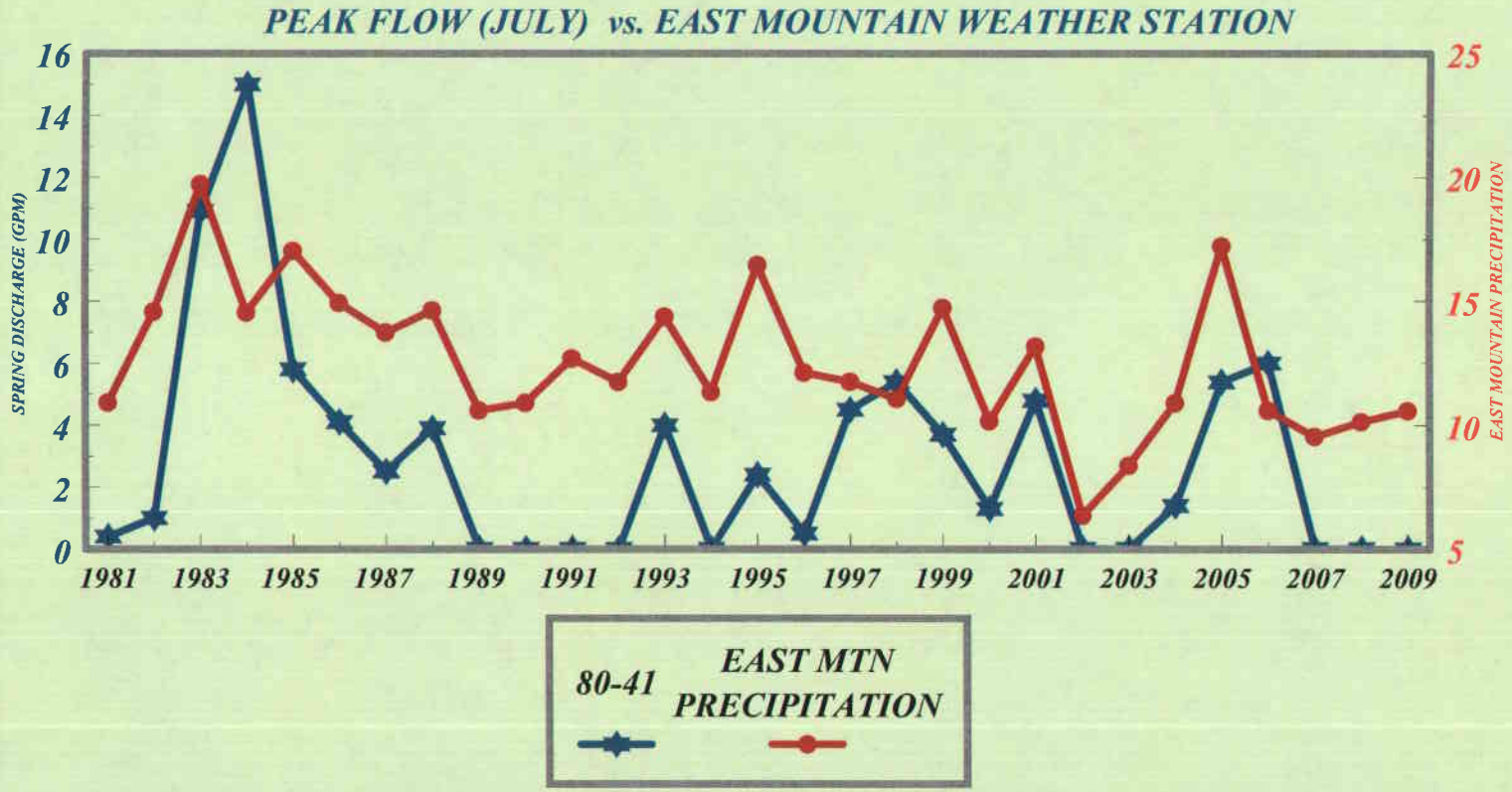
EAST MOUNTAIN SPRINGS

Spring: 79-40 vs. Precipitation



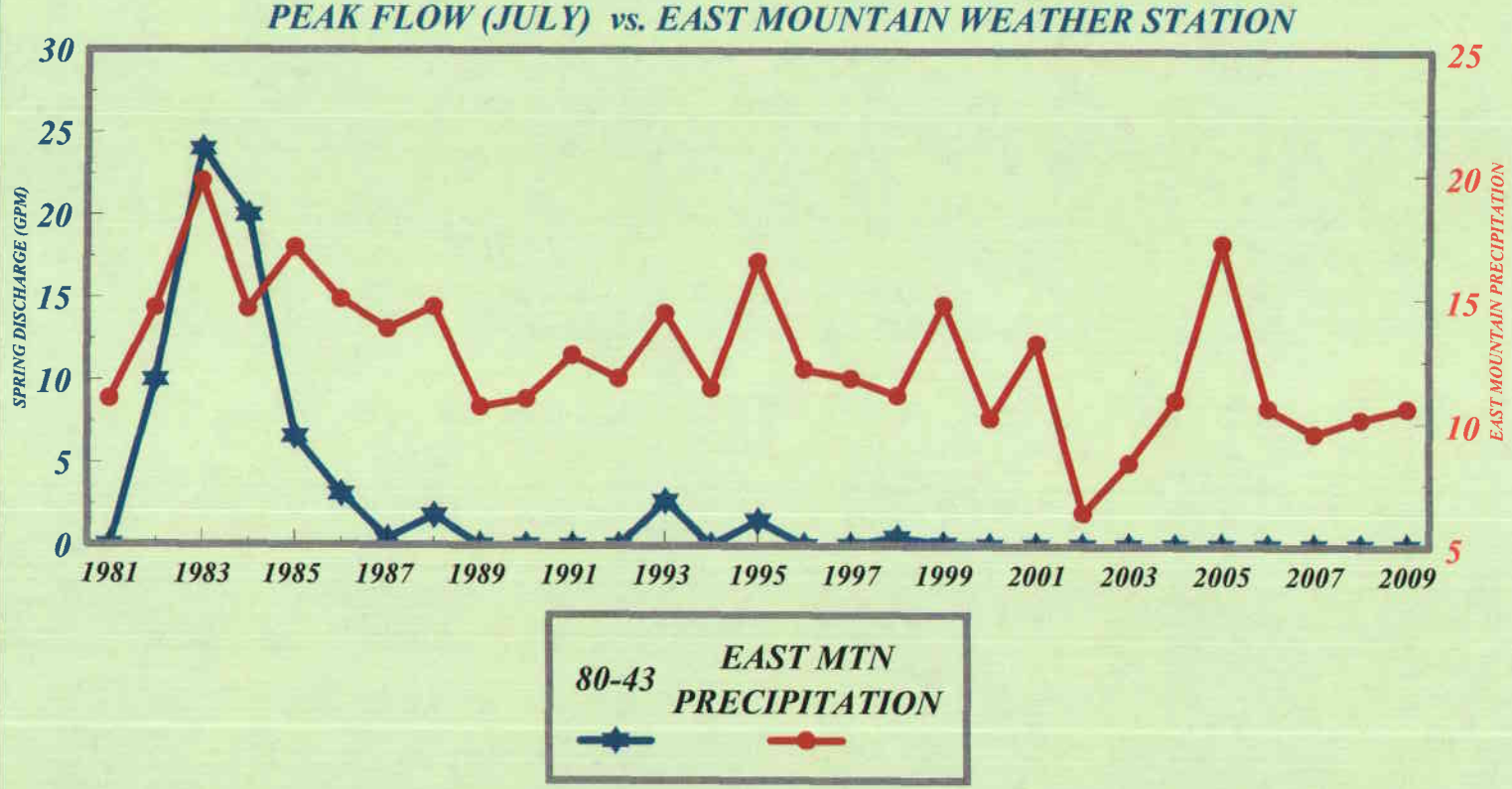
EAST MOUNTAIN SPRINGS

Spring: 80-41 vs. Precipitation



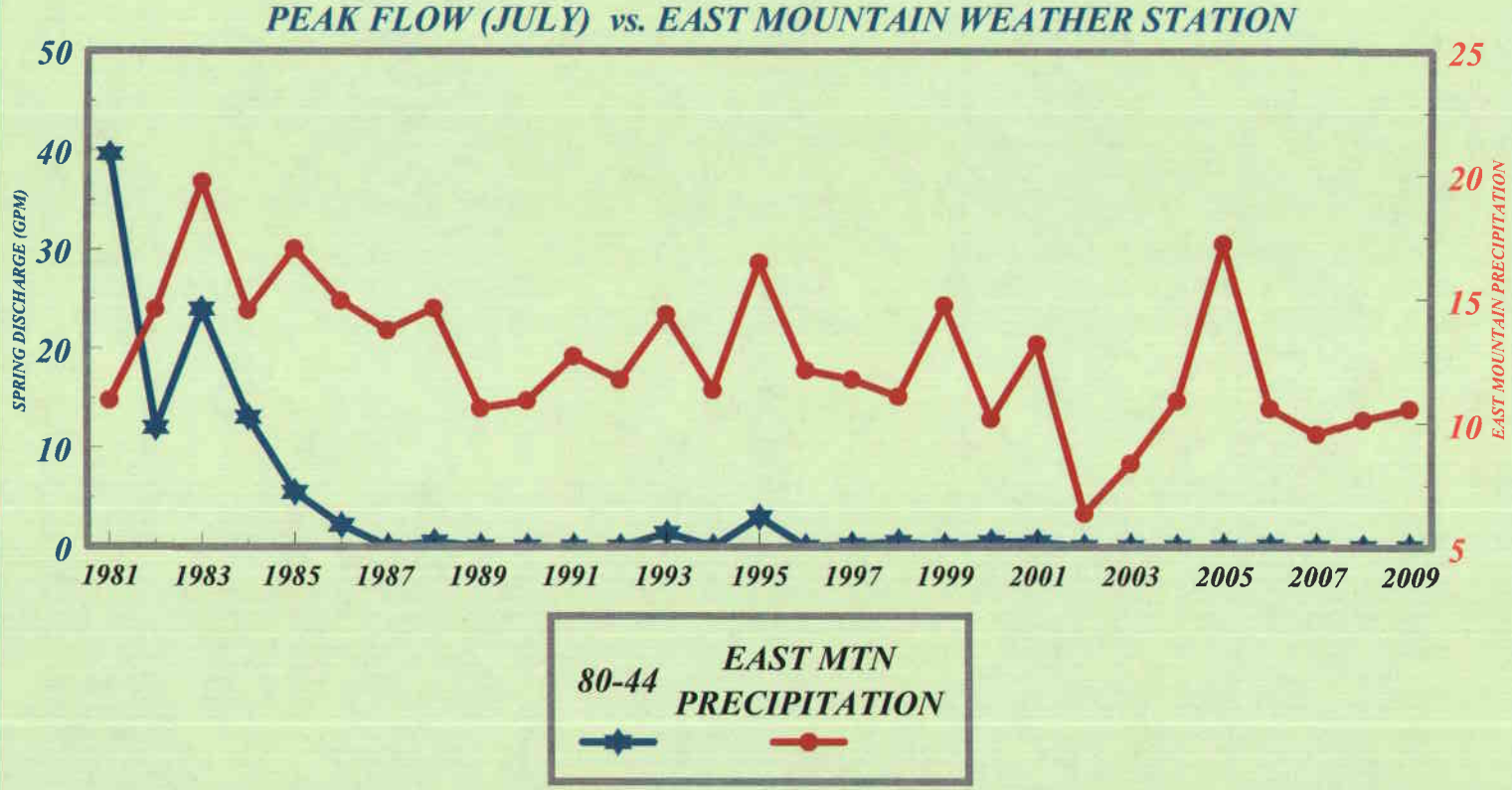
EAST MOUNTAIN SPRINGS

Spring: 80-43 vs. Precipitation



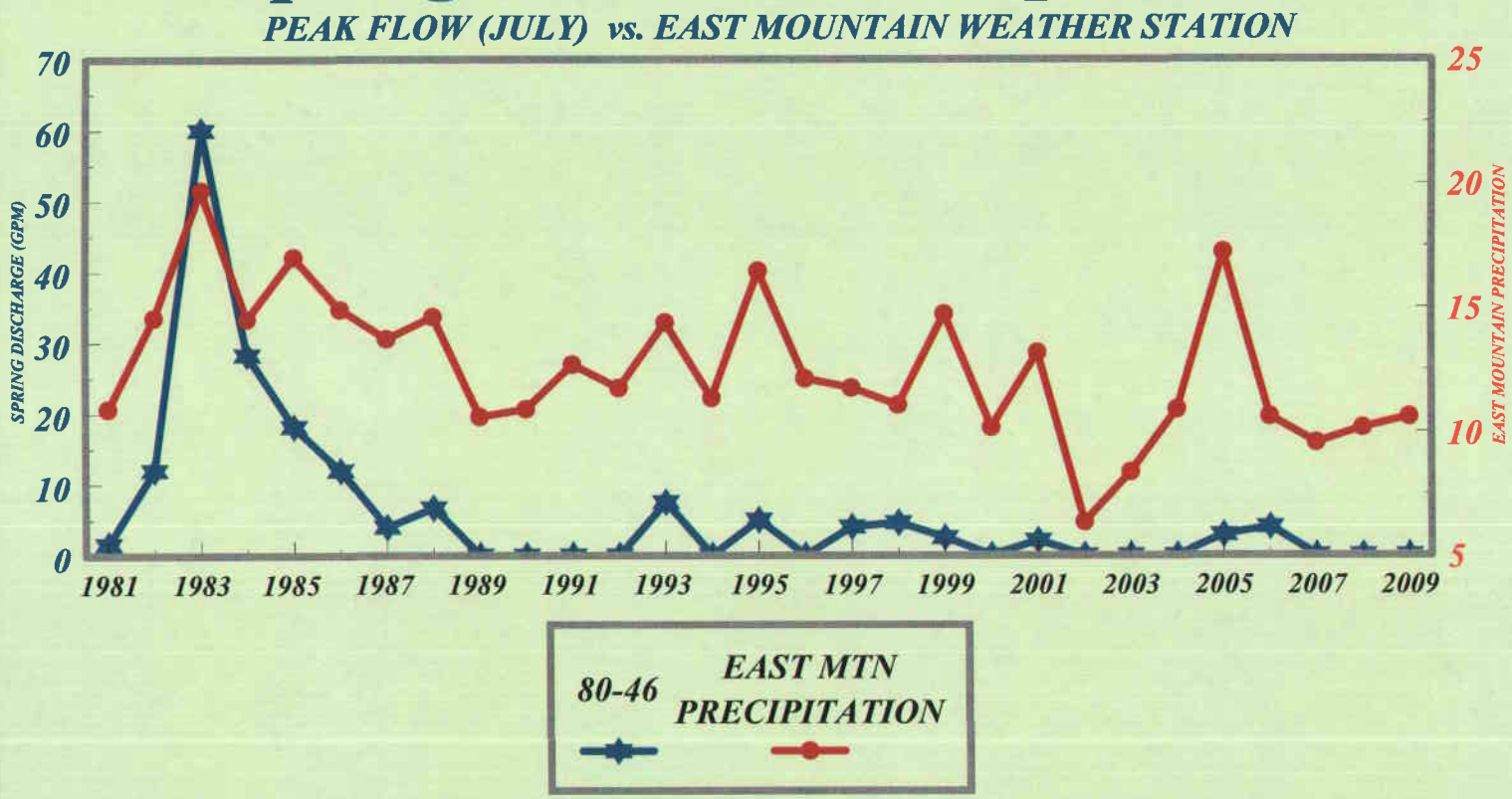
EAST MOUNTAIN SPRINGS

Spring: 80-44 vs. Precipitation



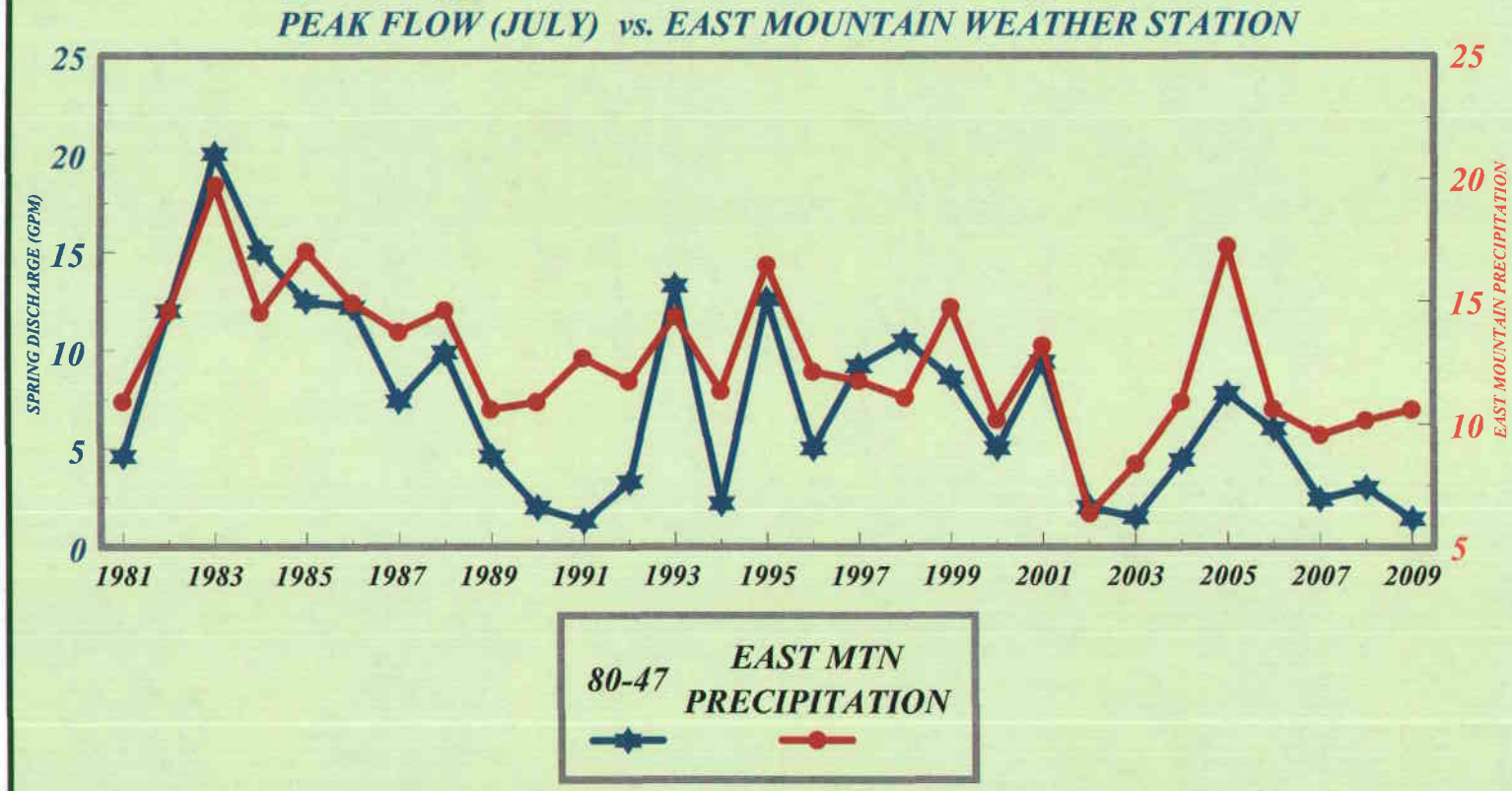
EAST MOUNTAIN SPRINGS

Spring: 80-46 vs. Precipitation



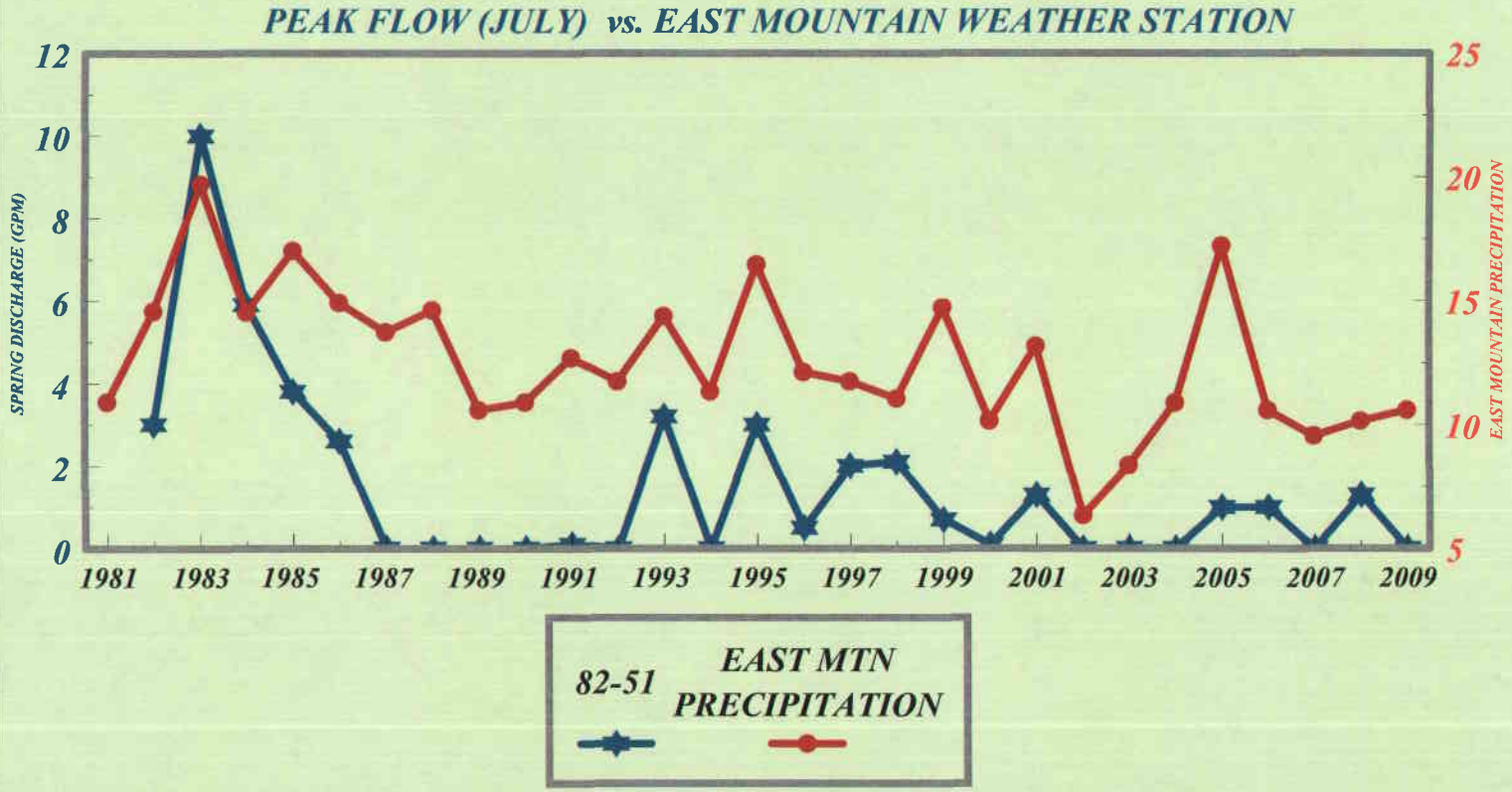
EAST MOUNTAIN SPRINGS

Spring: 80-47 vs. Precipitation



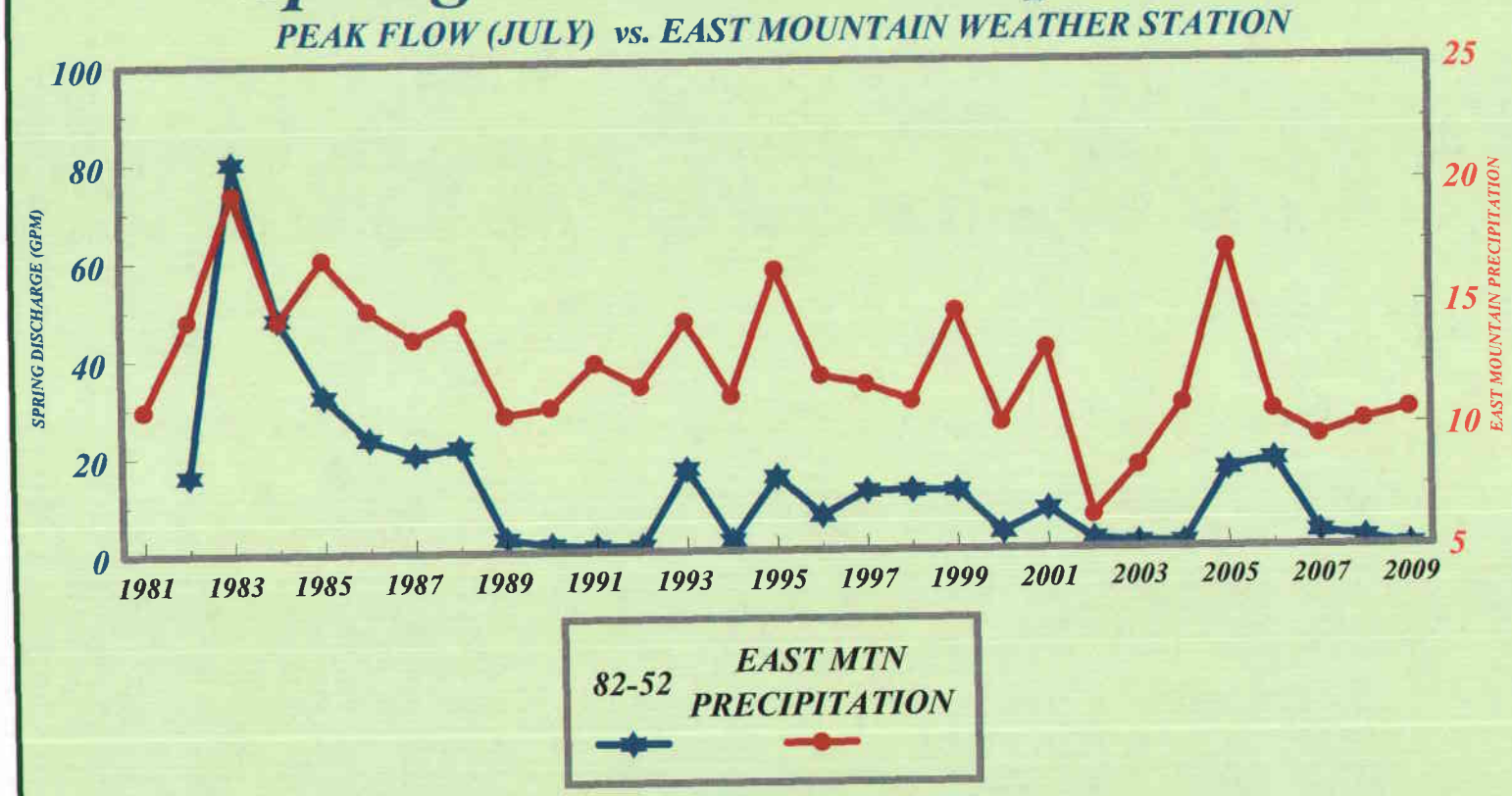
EAST MOUNTAIN SPRINGS

Spring: 82-51 vs. Precipitation



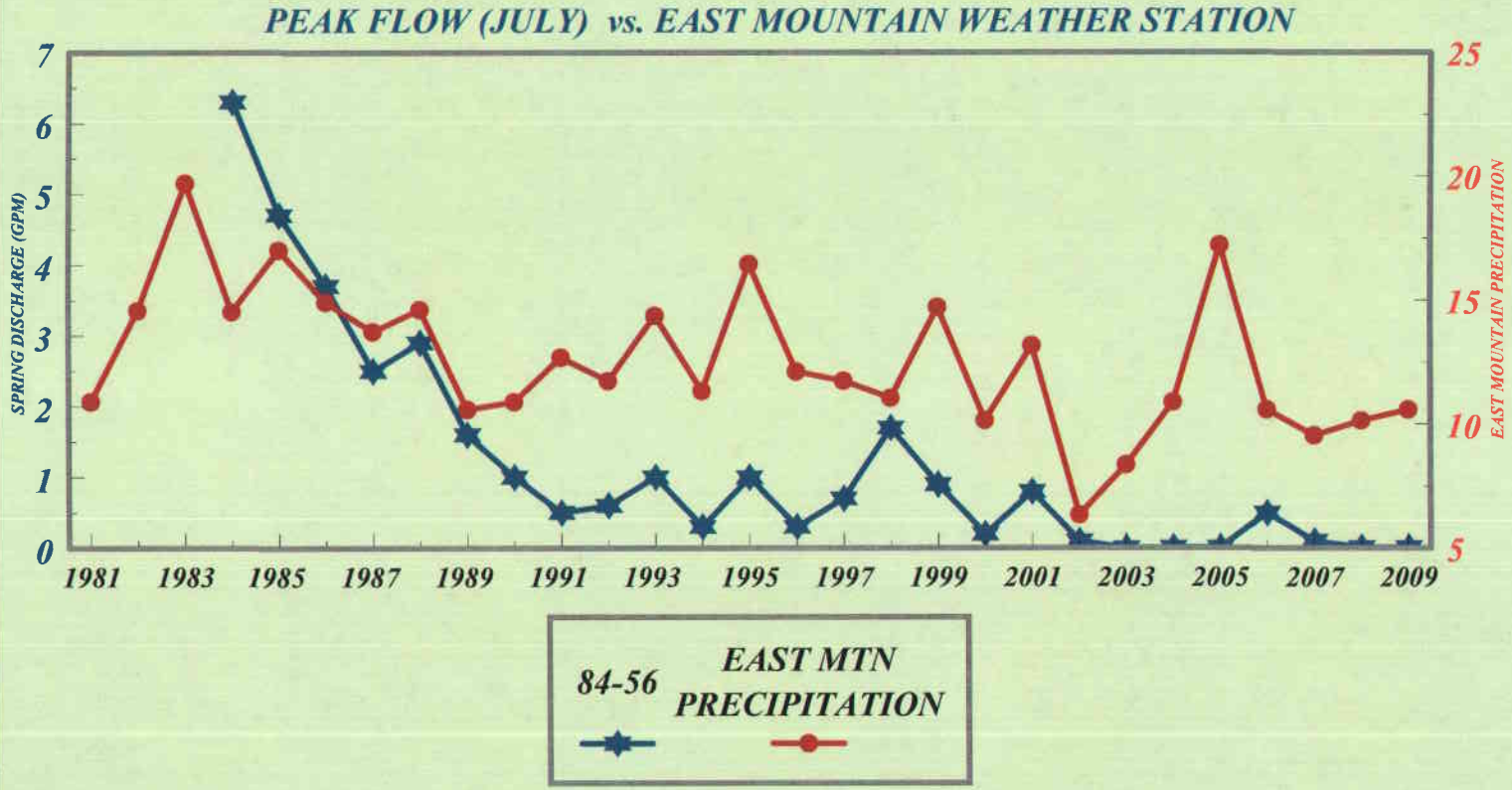
EAST MOUNTAIN SPRINGS

Spring: 82-52 vs. Precipitation



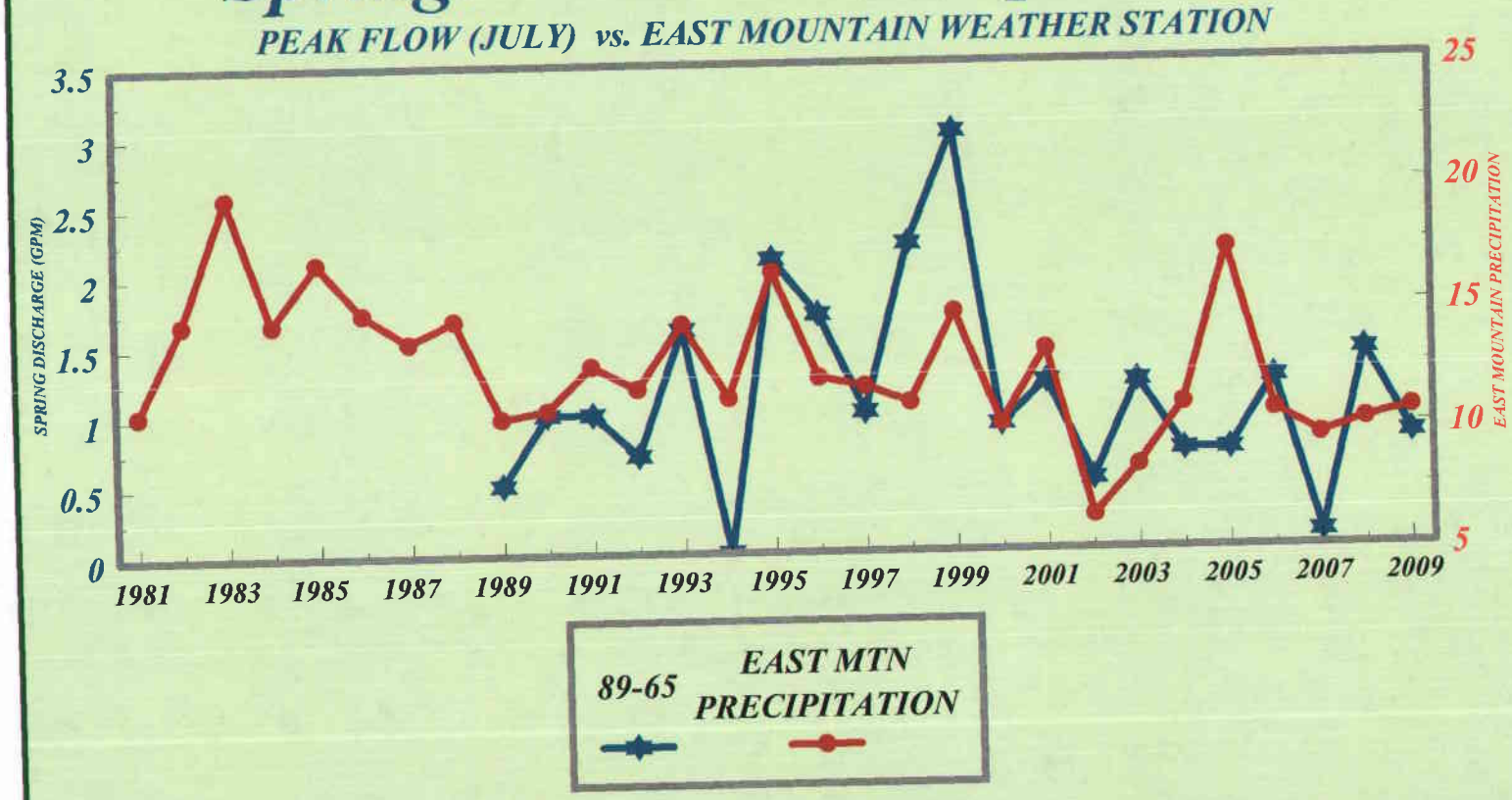
EAST MOUNTAIN SPRINGS

Spring: 84-56 vs. Precipitation



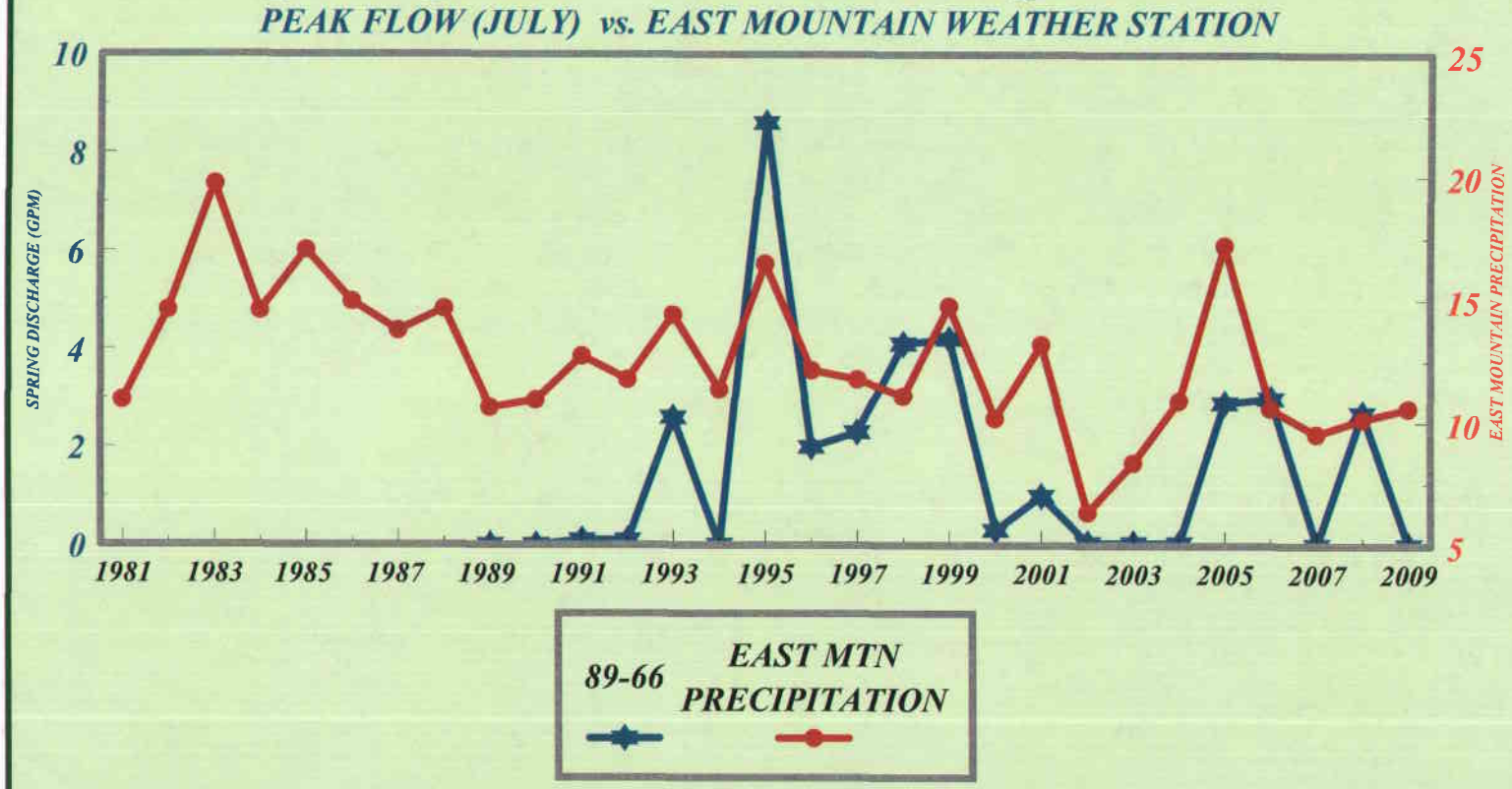
EAST MOUNTAIN SPRINGS

Spring: 89-65 vs. Precipitation



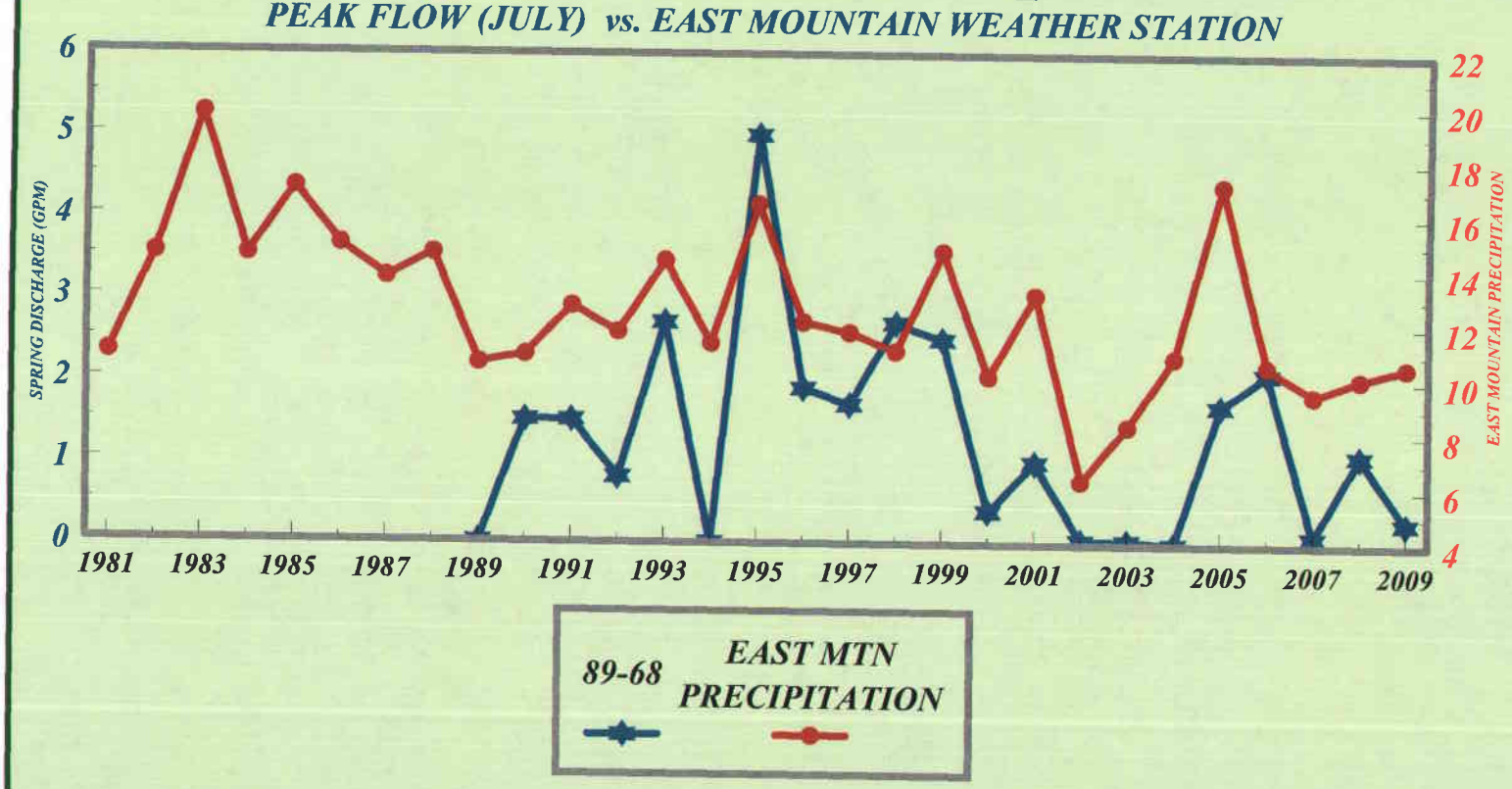
EAST MOUNTAIN SPRINGS

Spring: 89-66 vs. Precipitation



EAST MOUNTAIN SPRINGS

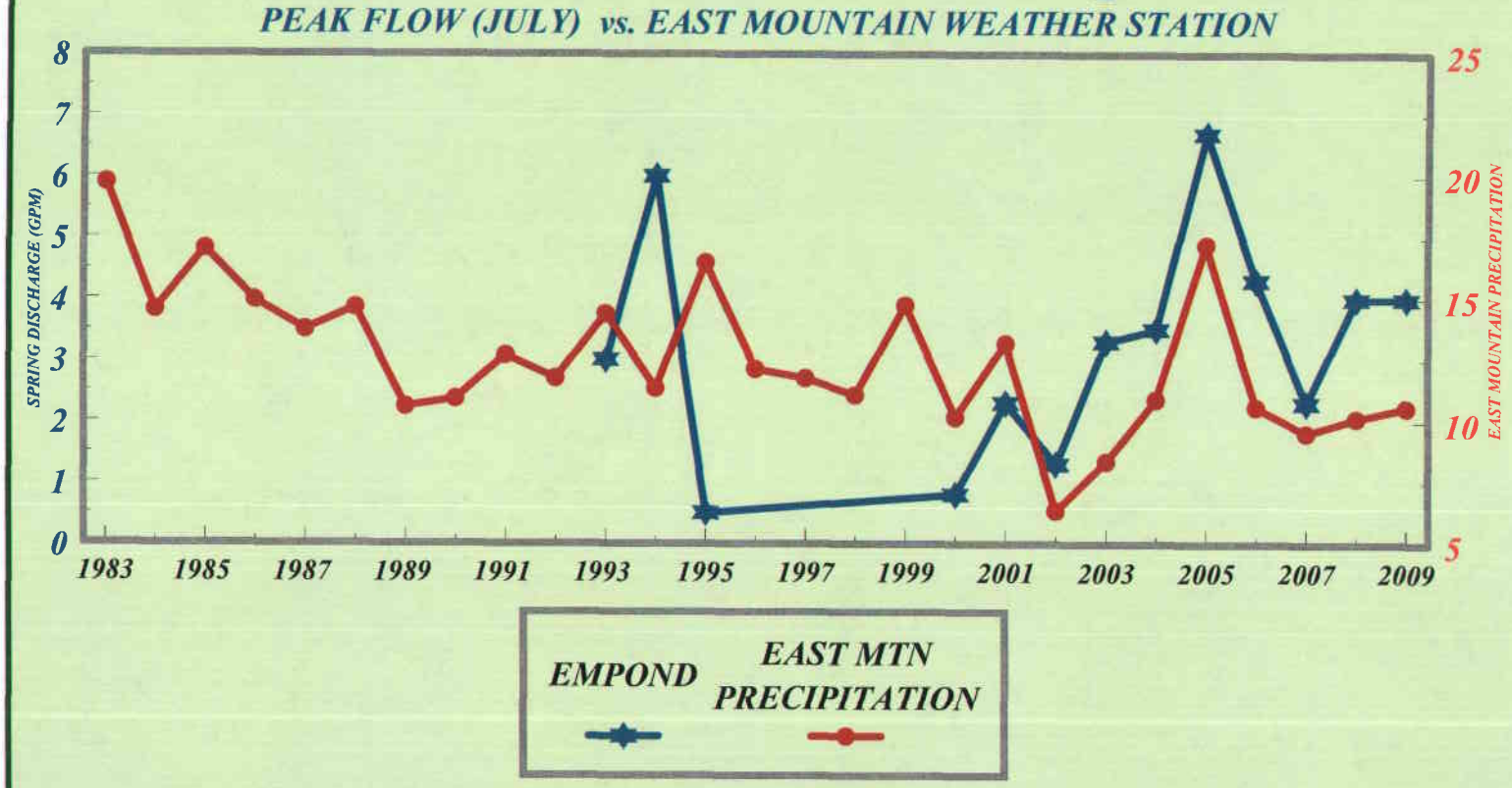
Spring: 89-68 vs. Precipitation



East Mountain Springs
Northern Area

EAST MOUNTAIN SPRINGS

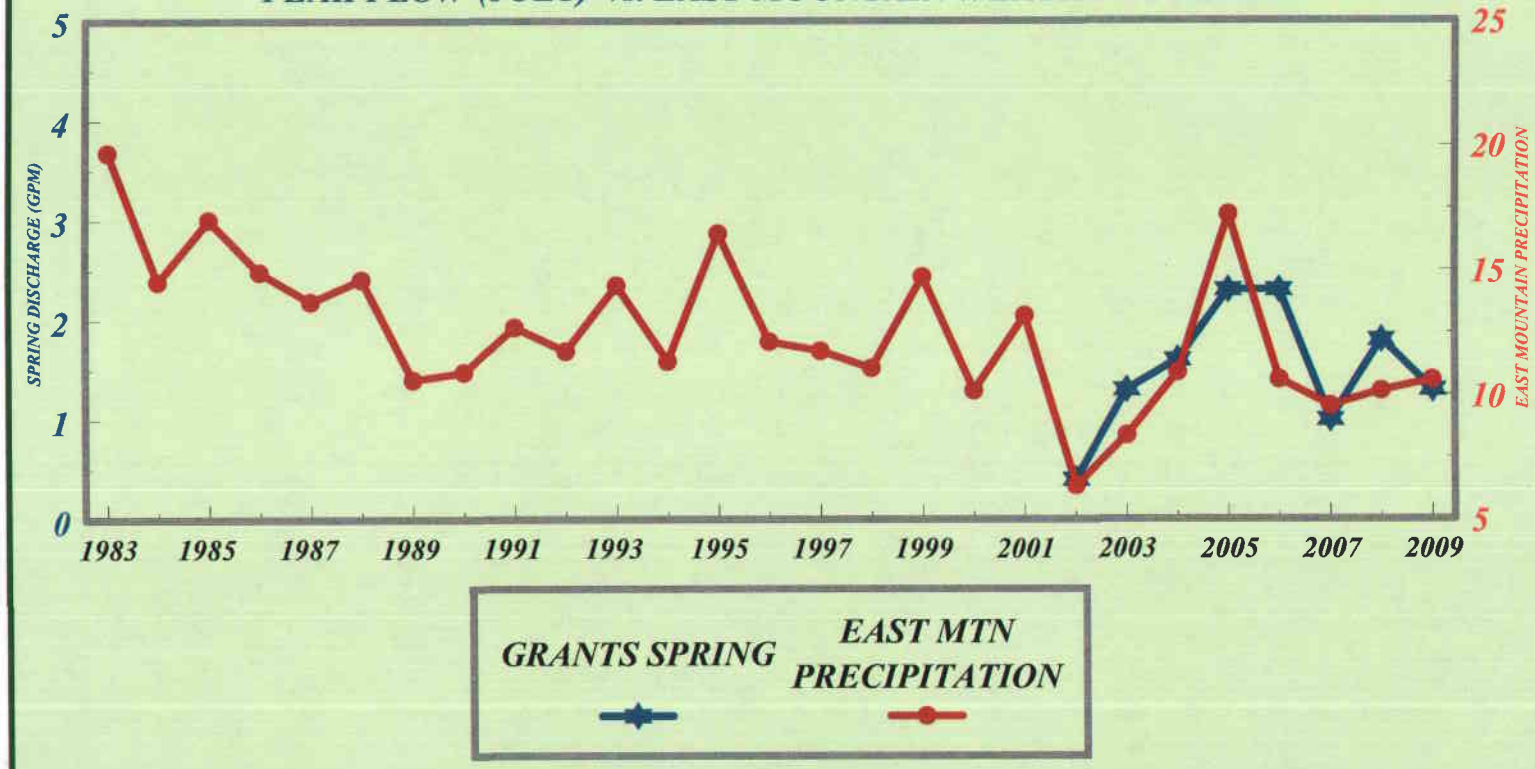
Spring: EMPOND vs. Precipitation



EAST MOUNTAIN SPRINGS

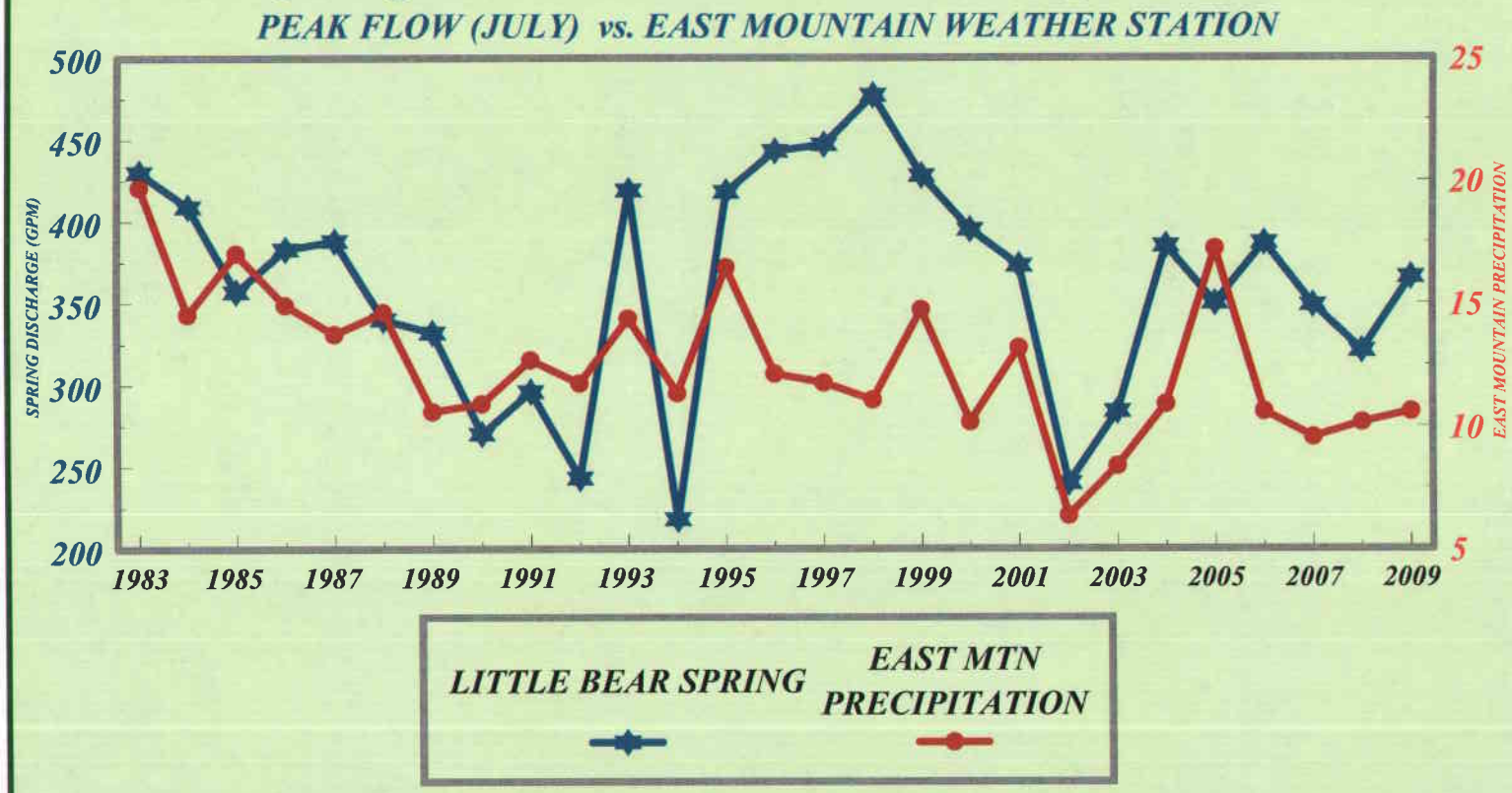
Spring: GRANTS SPRING vs. Precipitation

PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



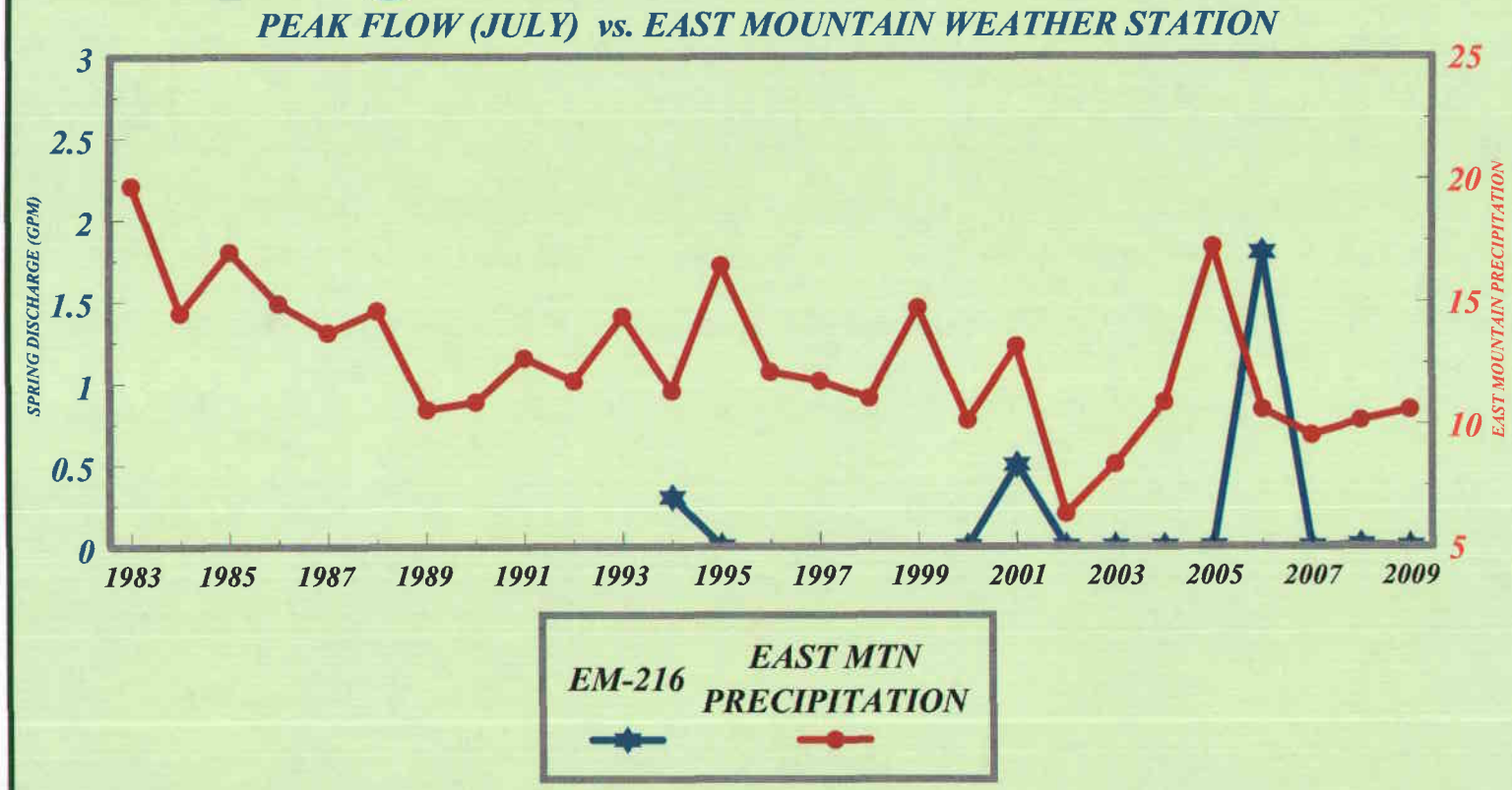
EAST MOUNTAIN SPRINGS

Spring: LITTLE BEAR vs. Precipitation



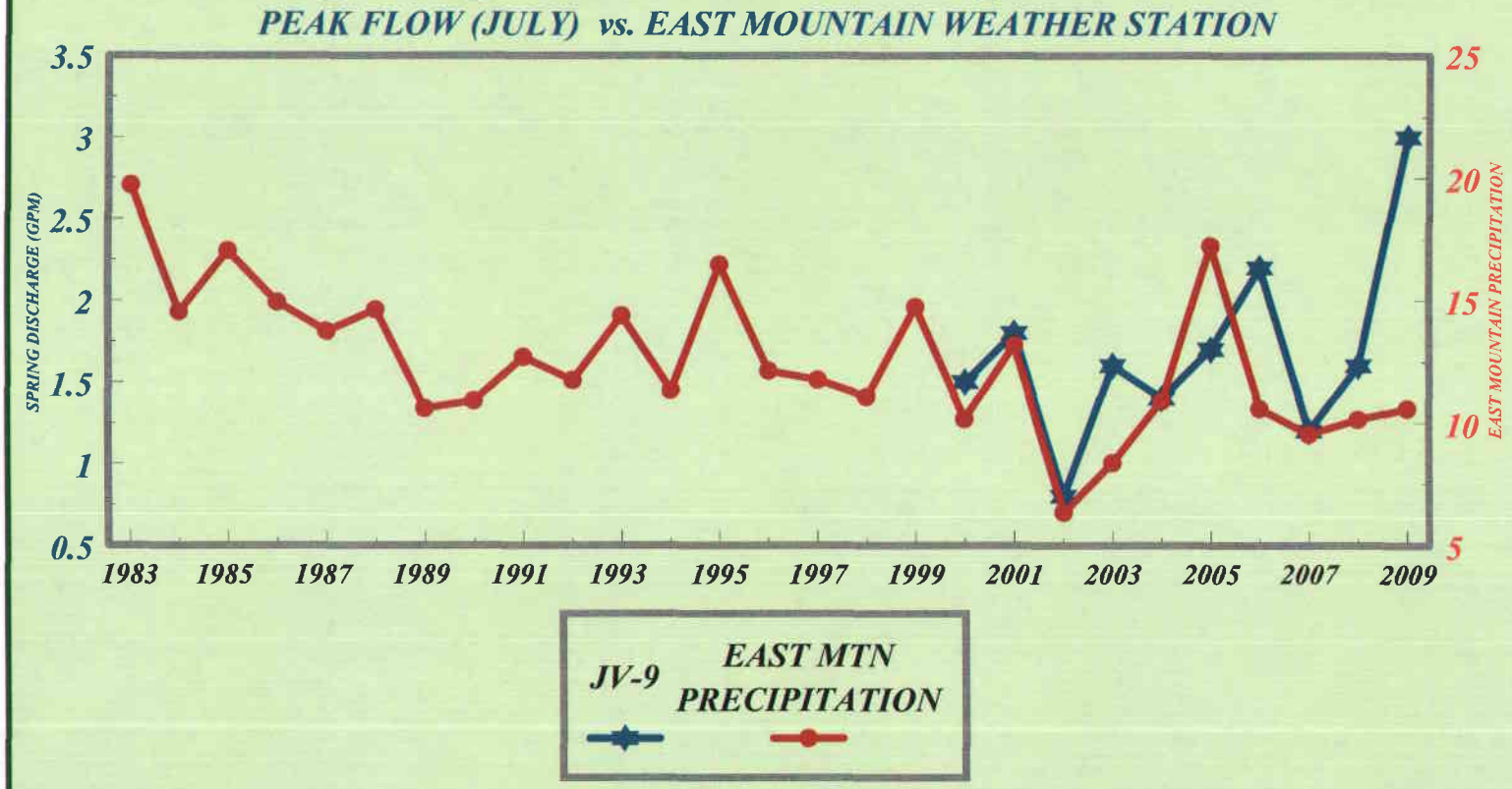
EAST MOUNTAIN SPRINGS

Spring: EM-216 vs. Precipitation



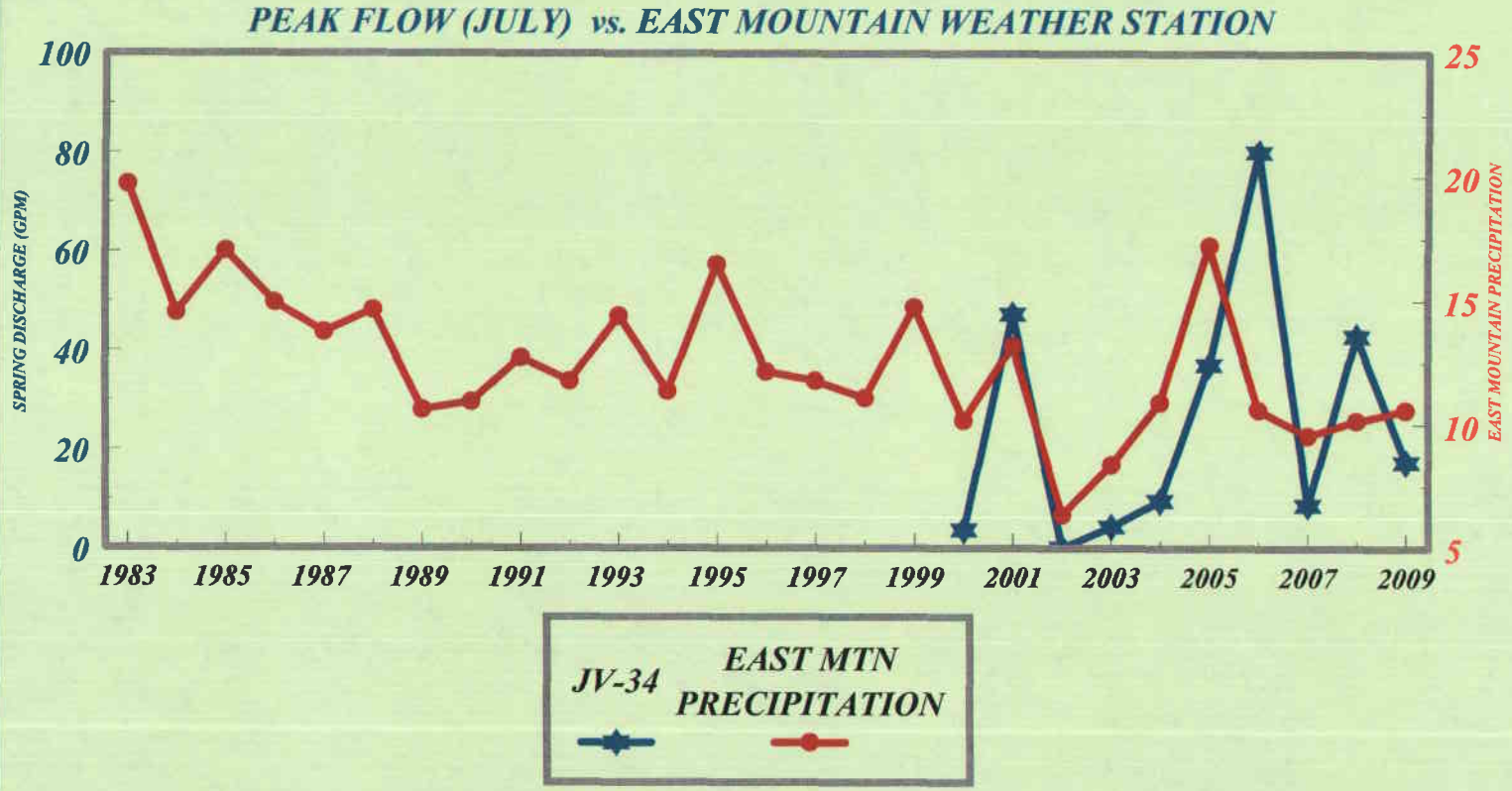
EAST MOUNTAIN SPRINGS

Spring: JV-9 vs. Precipitation



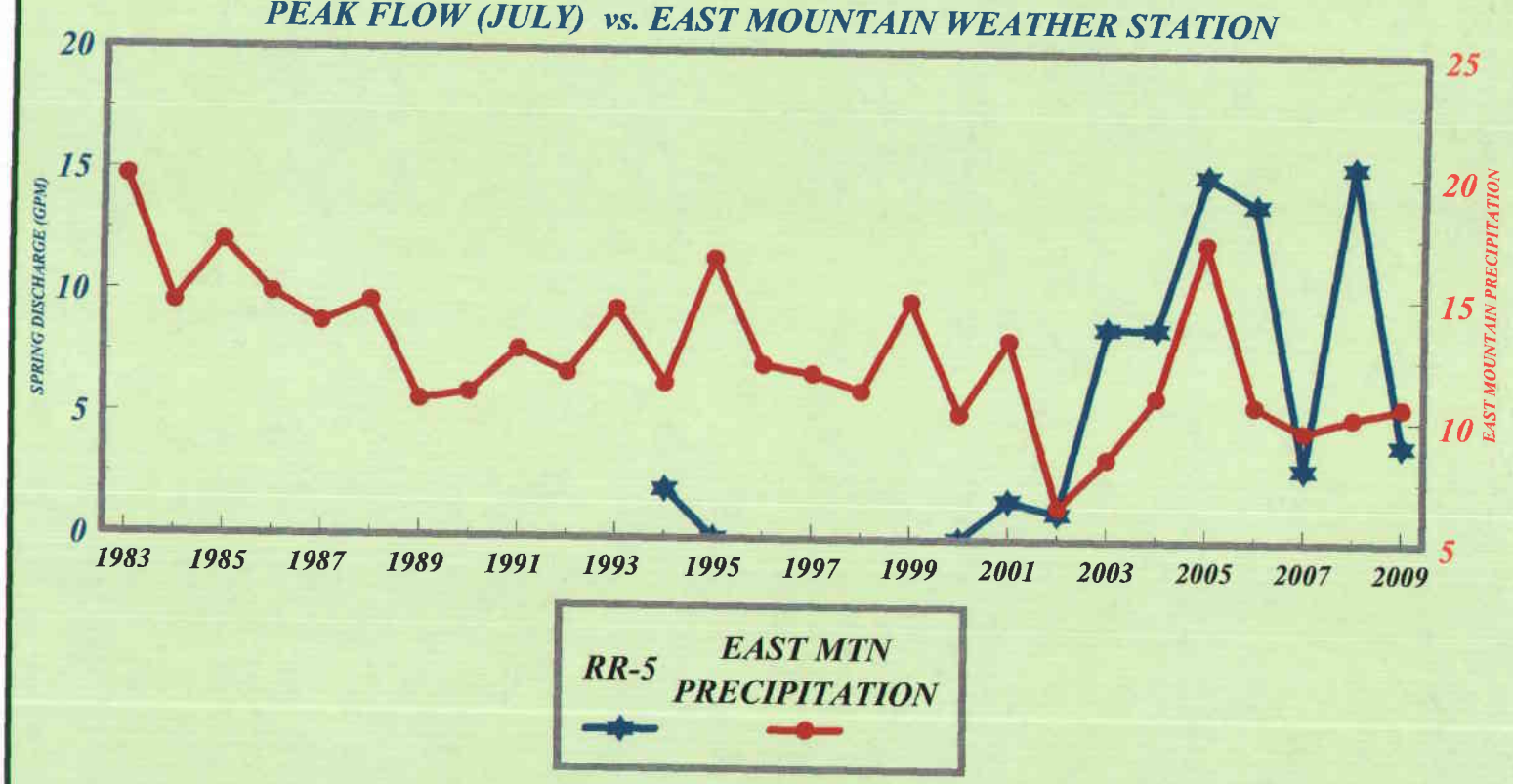
EAST MOUNTAIN SPRINGS

Spring: JV-34 vs. Precipitation



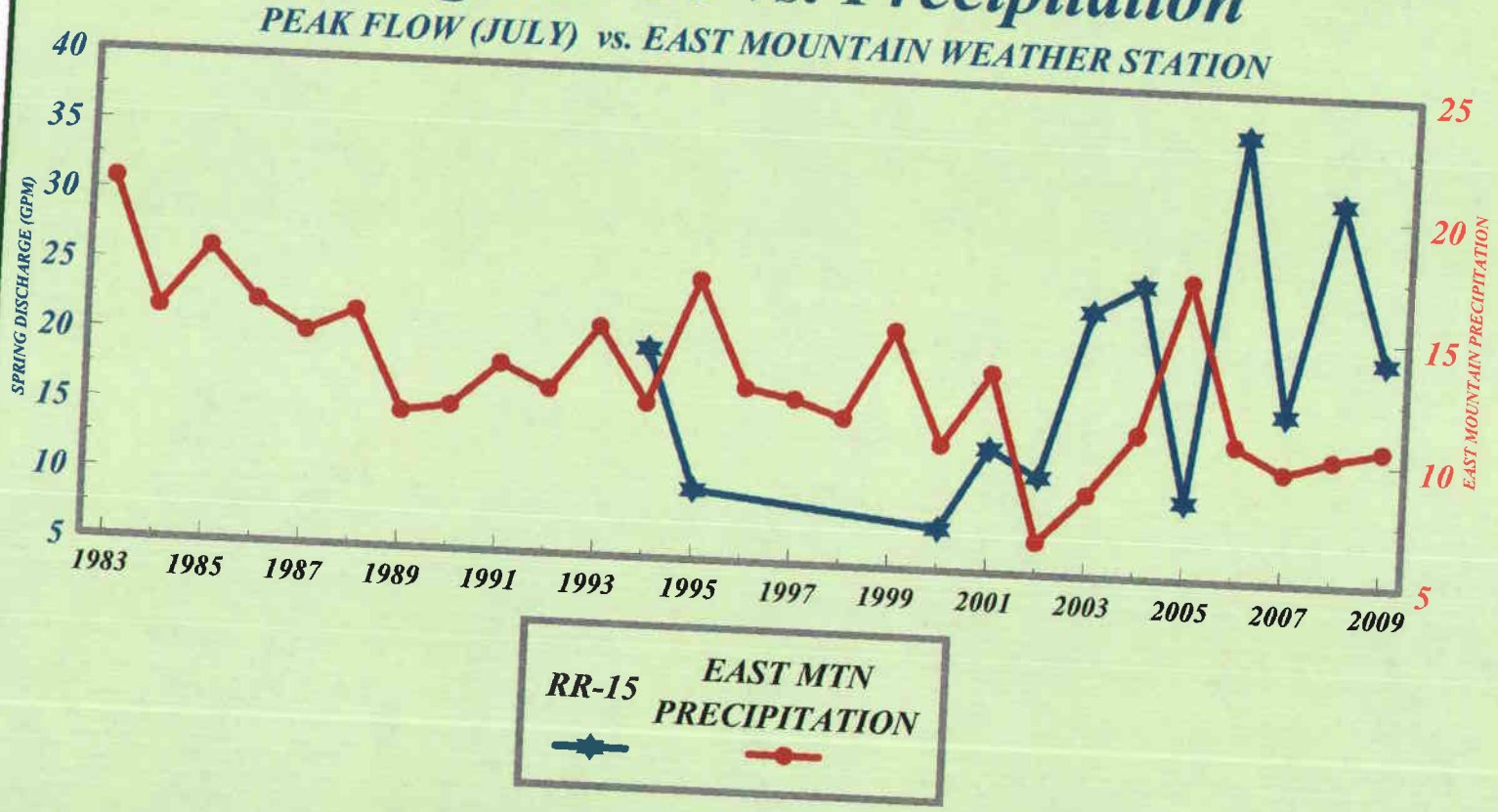
EAST MOUNTAIN SPRINGS

Spring: RR-5 vs. Precipitation



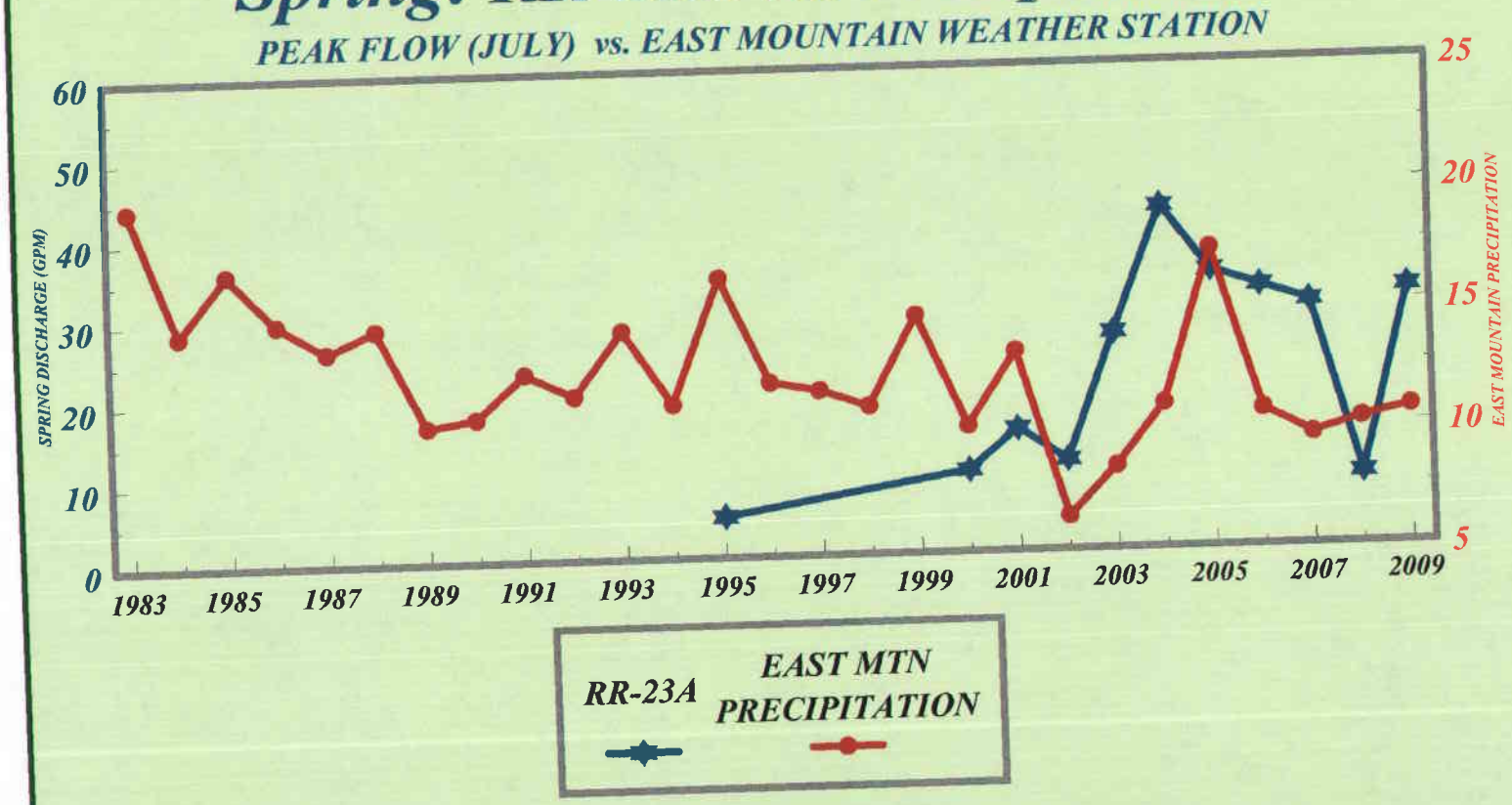
EAST MOUNTAIN SPRINGS

Spring: RR-15 vs. Precipitation



EAST MOUNTAIN SPRINGS

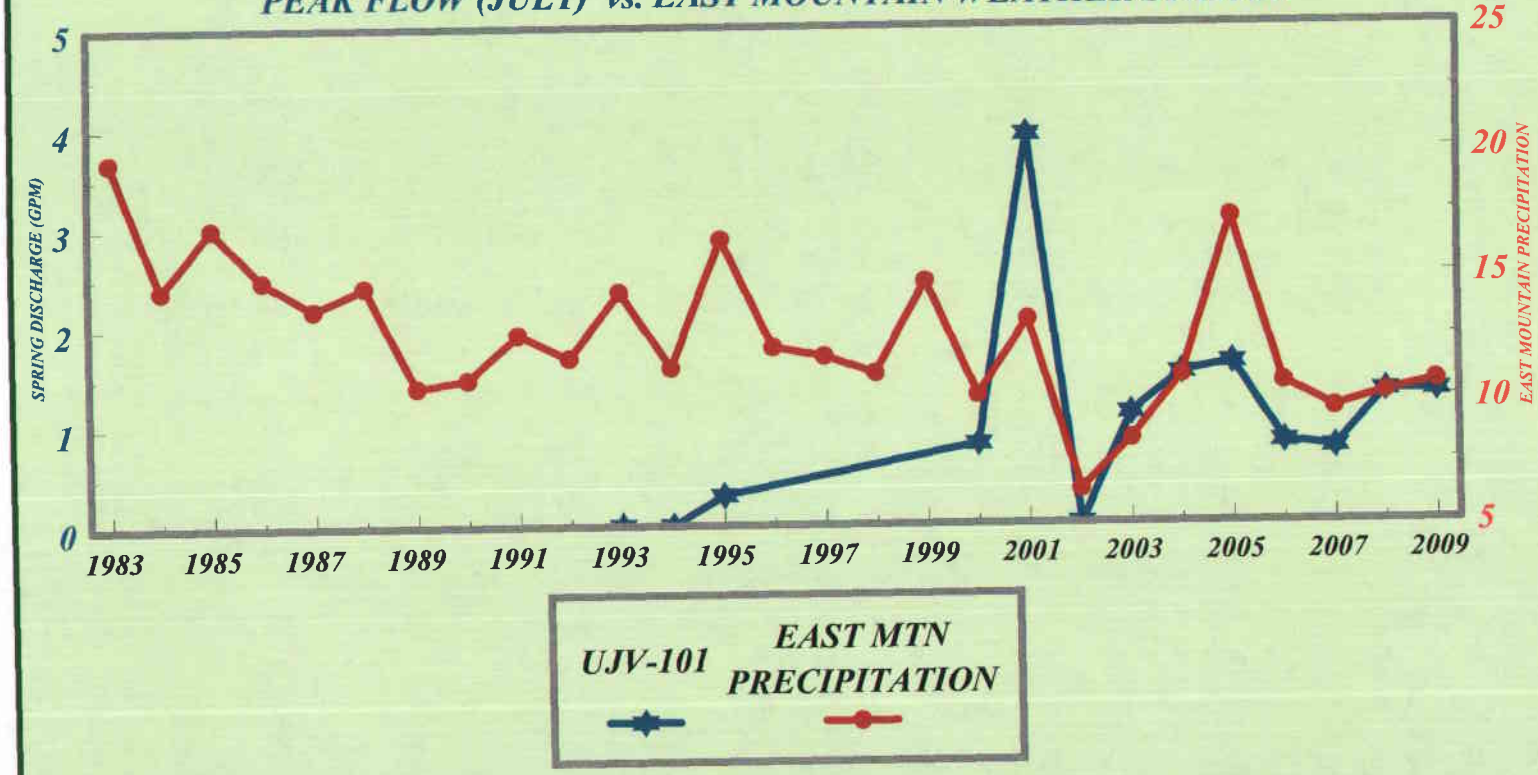
Spring: RR-23A vs. Precipitation



EAST MOUNTAIN SPRINGS

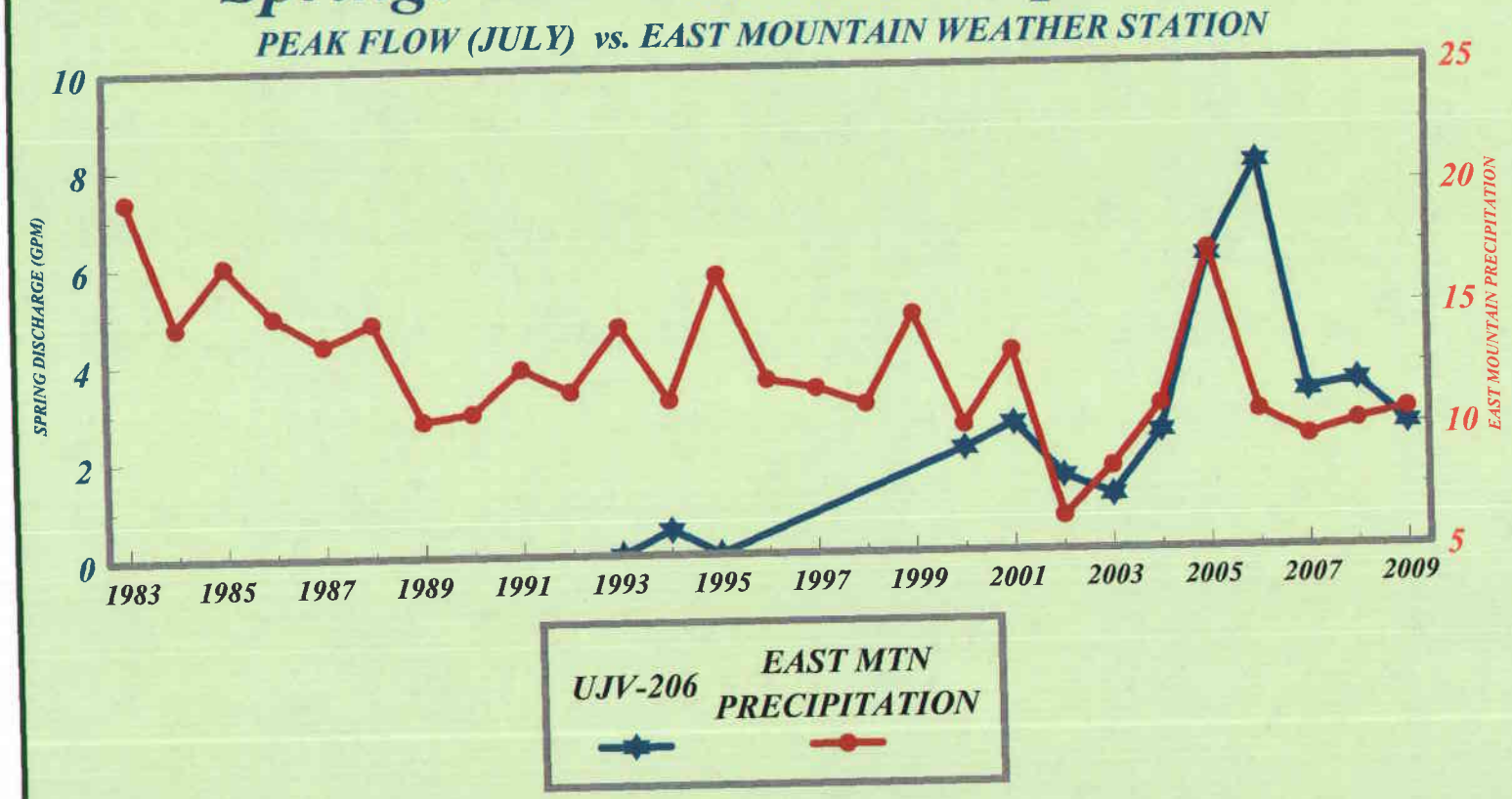
Spring: UJV-101 vs. Precipitation

PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



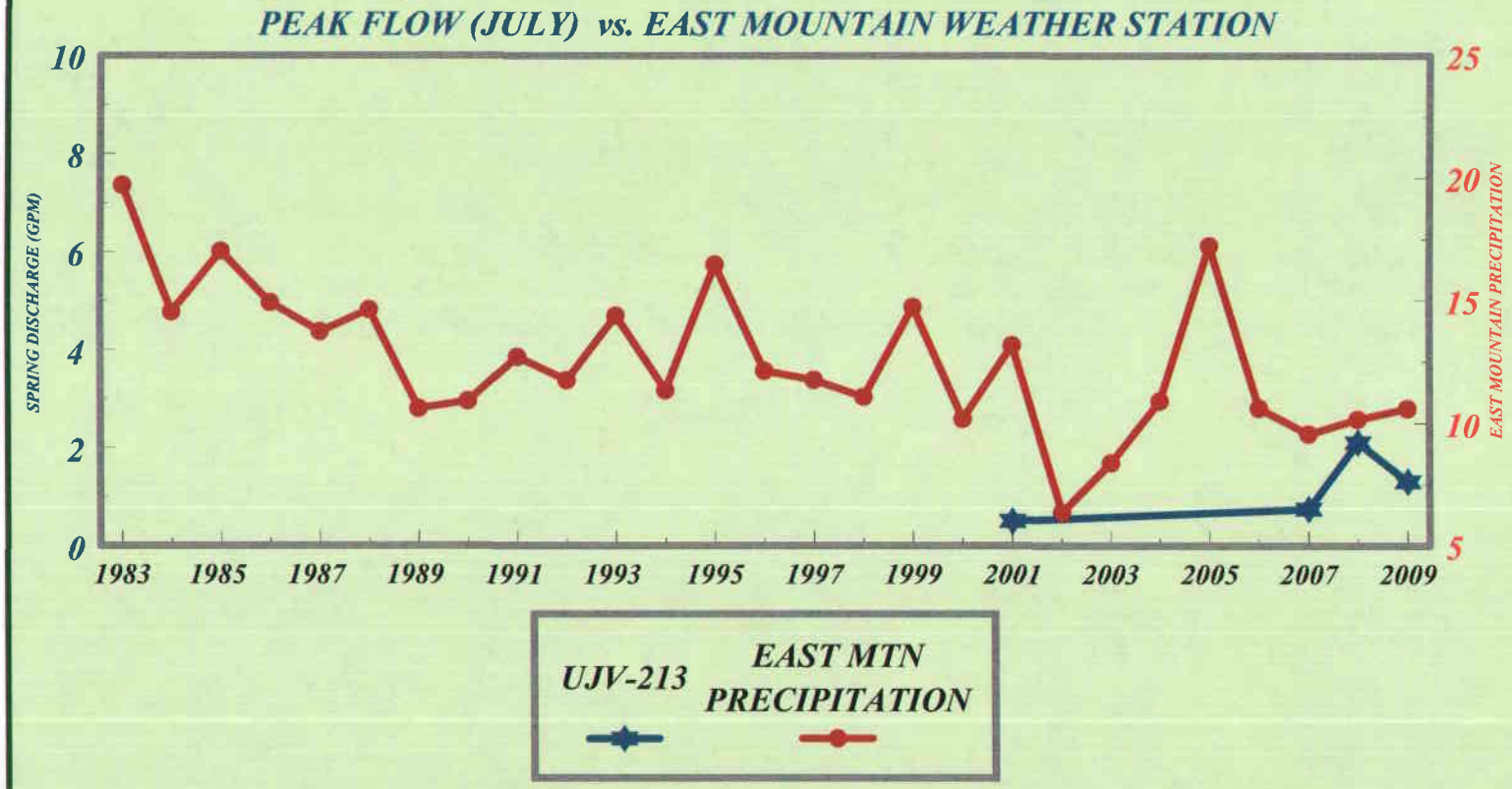
EAST MOUNTAIN SPRINGS

Spring: UJV-206 vs. Precipitation



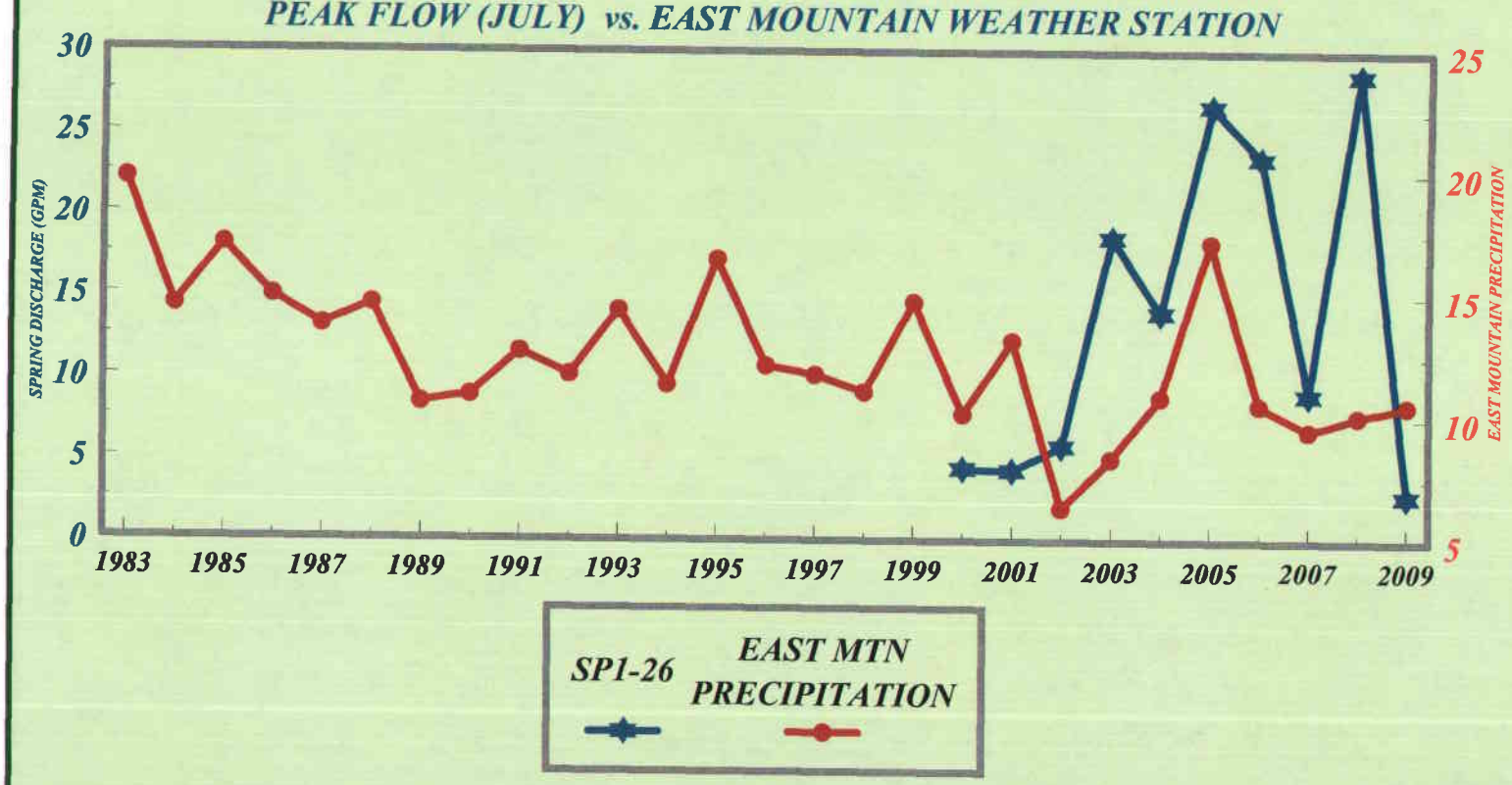
EAST MOUNTAIN SPRINGS

Spring: UJV-213 vs. Precipitation



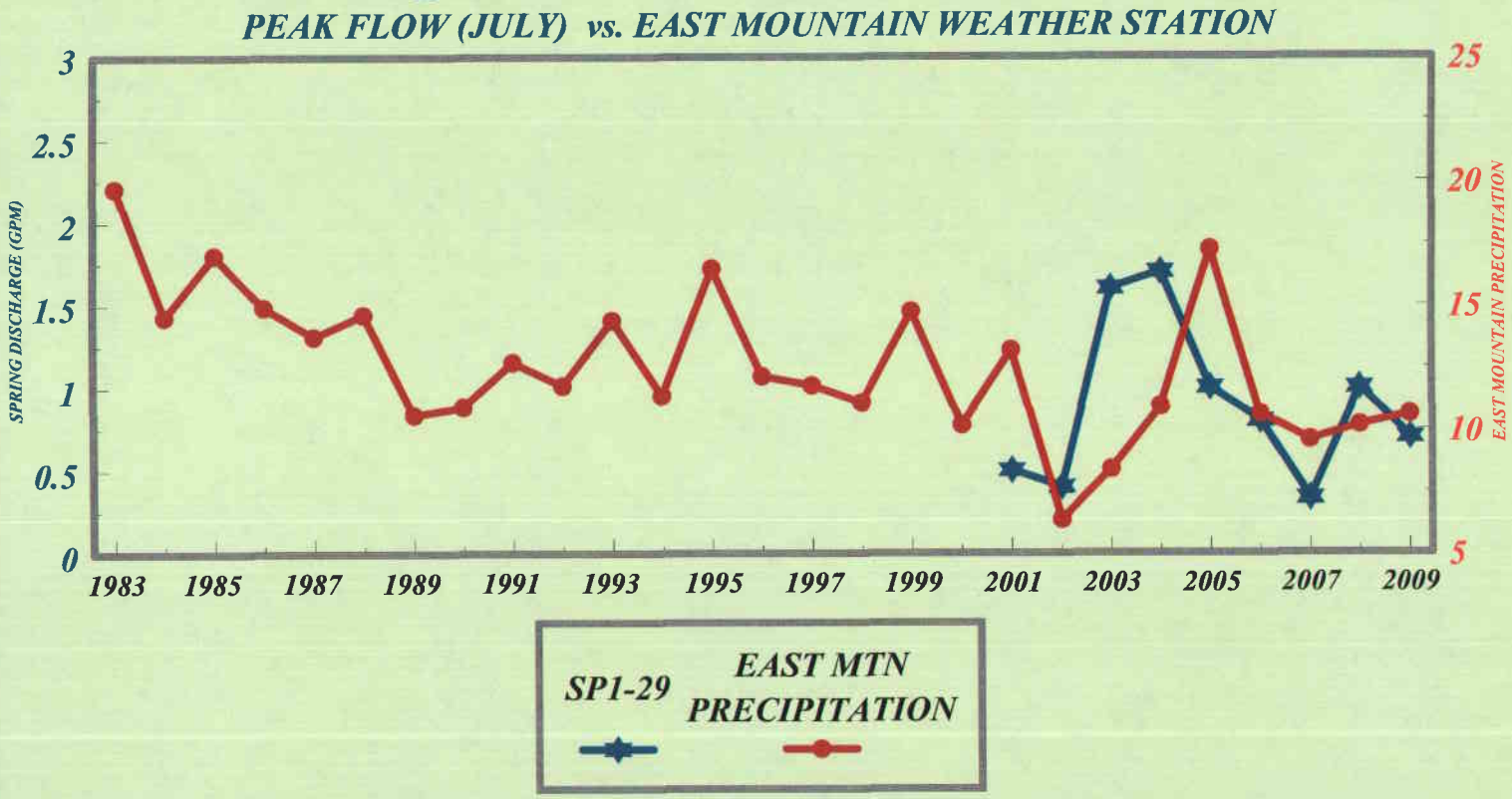
EAST MOUNTAIN SPRINGS

Spring: SP1-26 vs. Precipitation



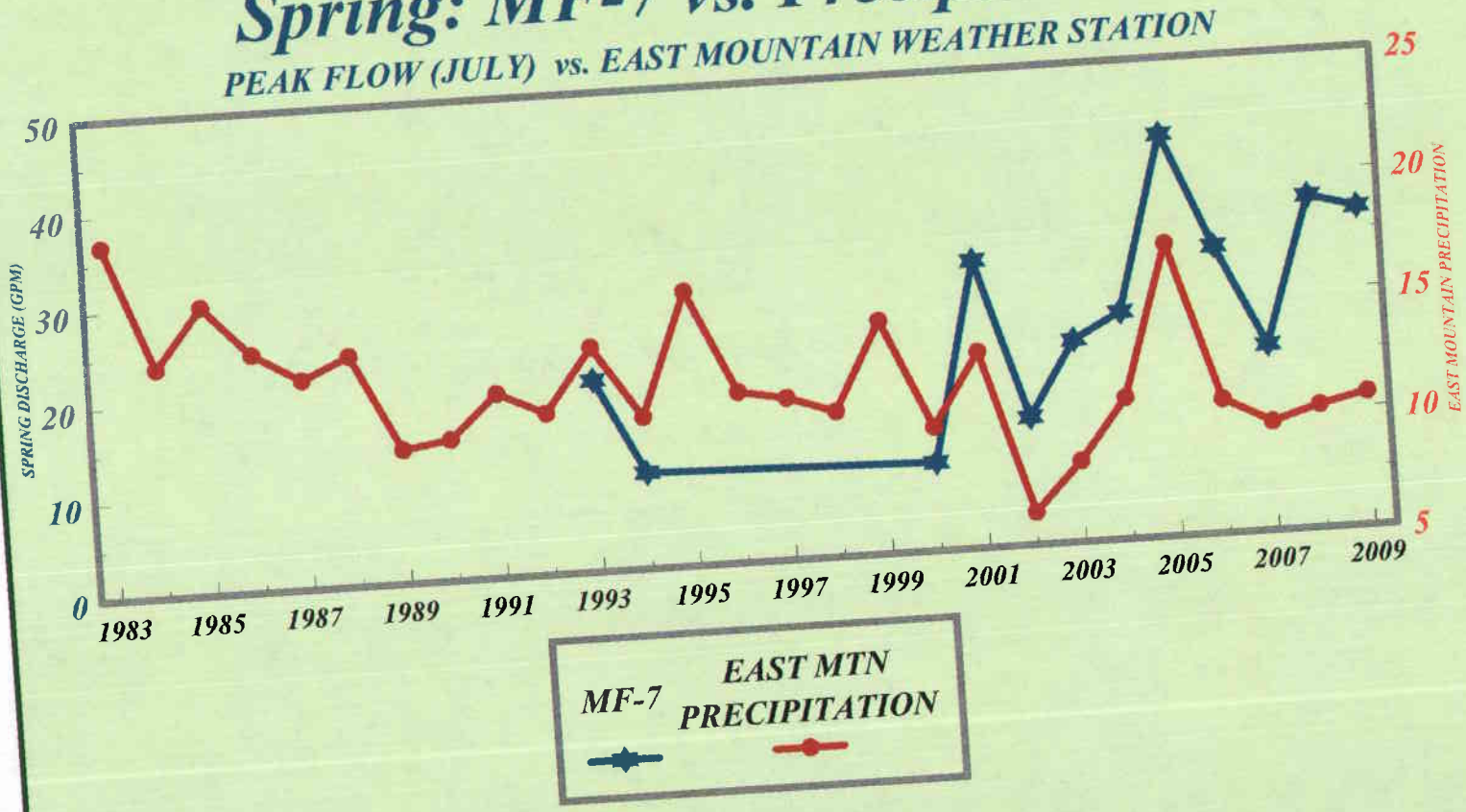
EAST MOUNTAIN SPRINGS

Spring: SP1-29 vs. Precipitation



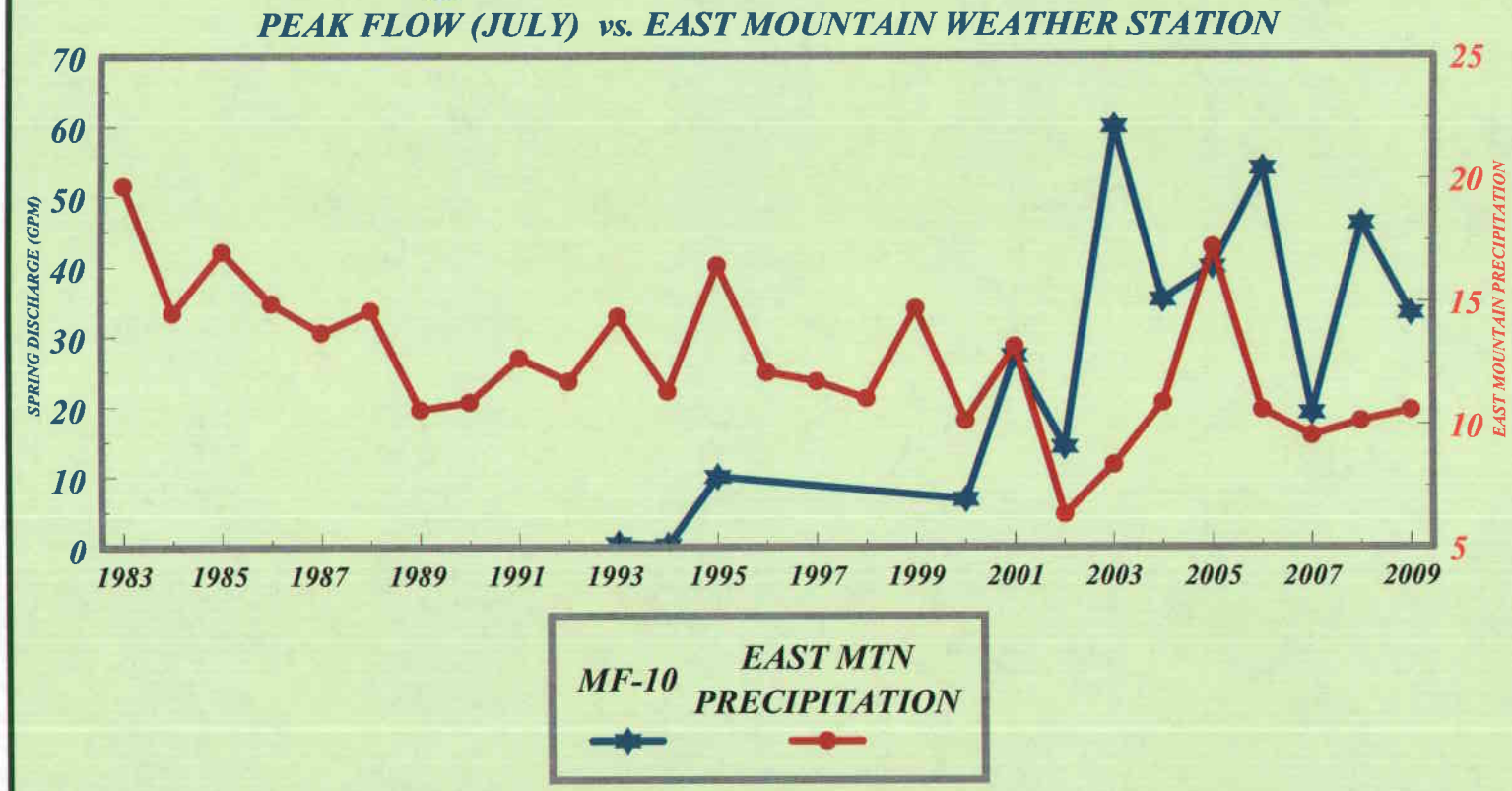
EAST MOUNTAIN SPRINGS

Spring: MF-7 vs. Precipitation



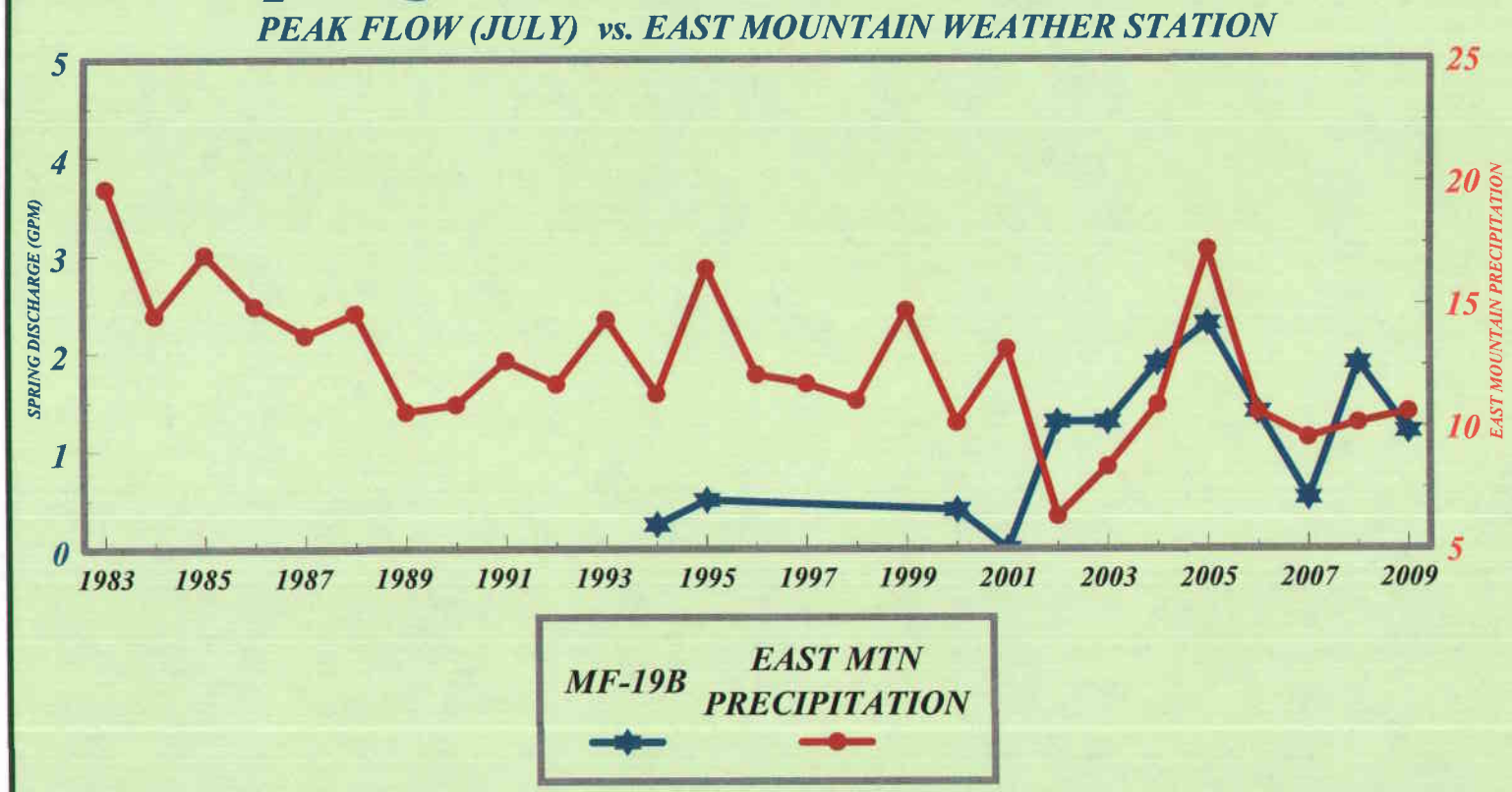
EAST MOUNTAIN SPRINGS

Spring: MF-10 vs. Precipitation



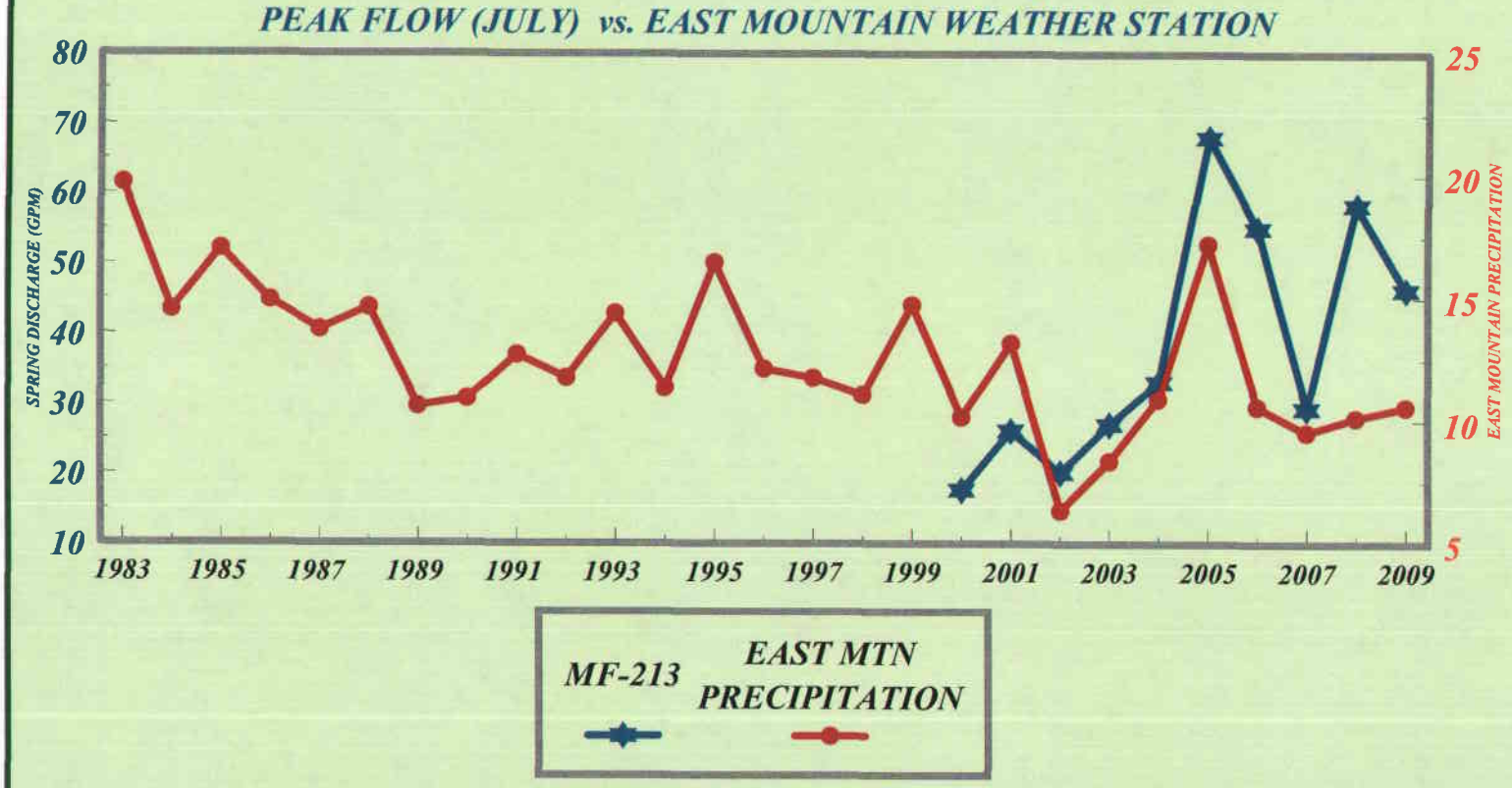
EAST MOUNTAIN SPRINGS

Spring: MF-19B vs. Precipitation



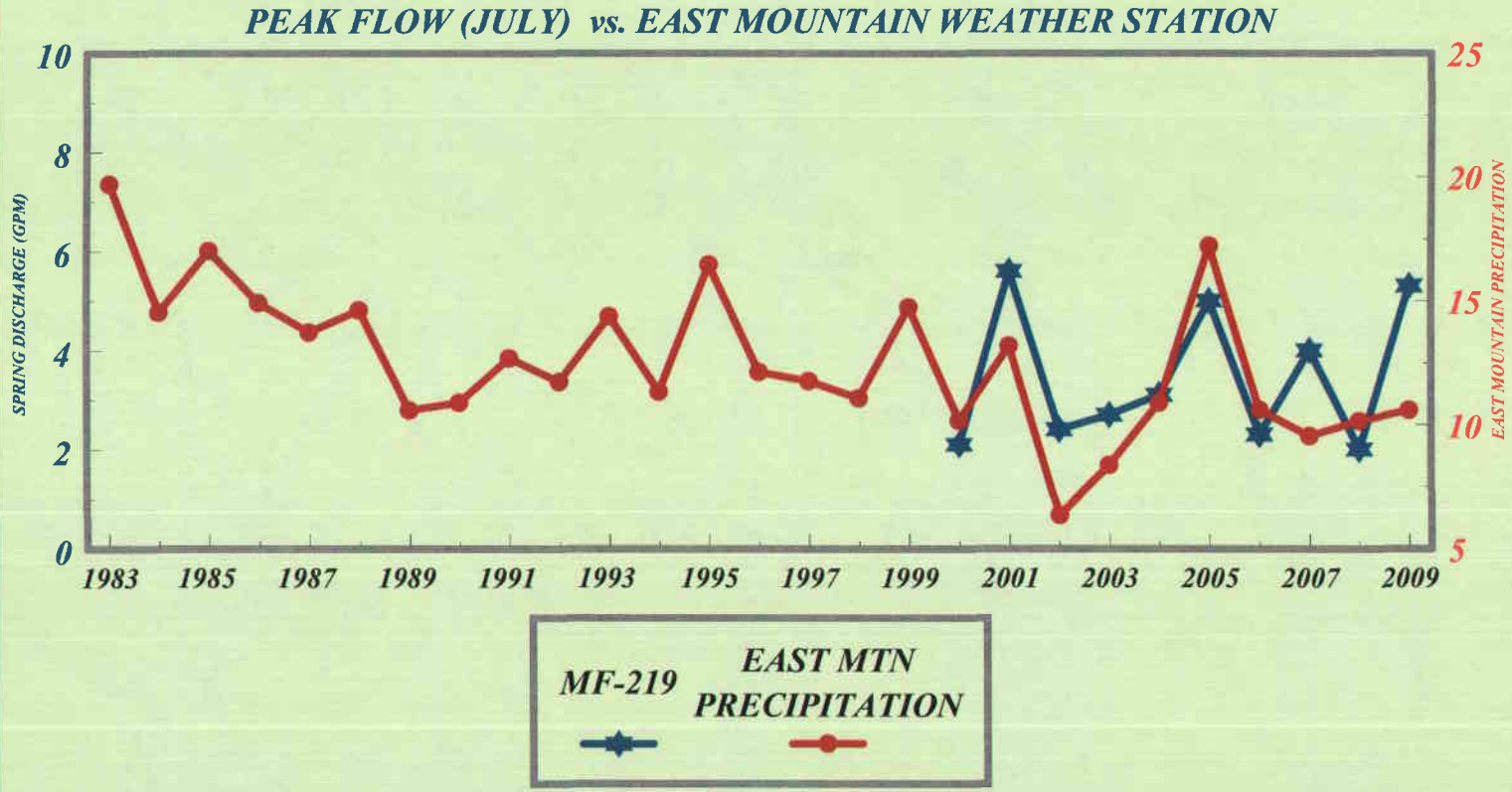
EAST MOUNTAIN SPRINGS

Spring: MF-213 vs. Precipitation



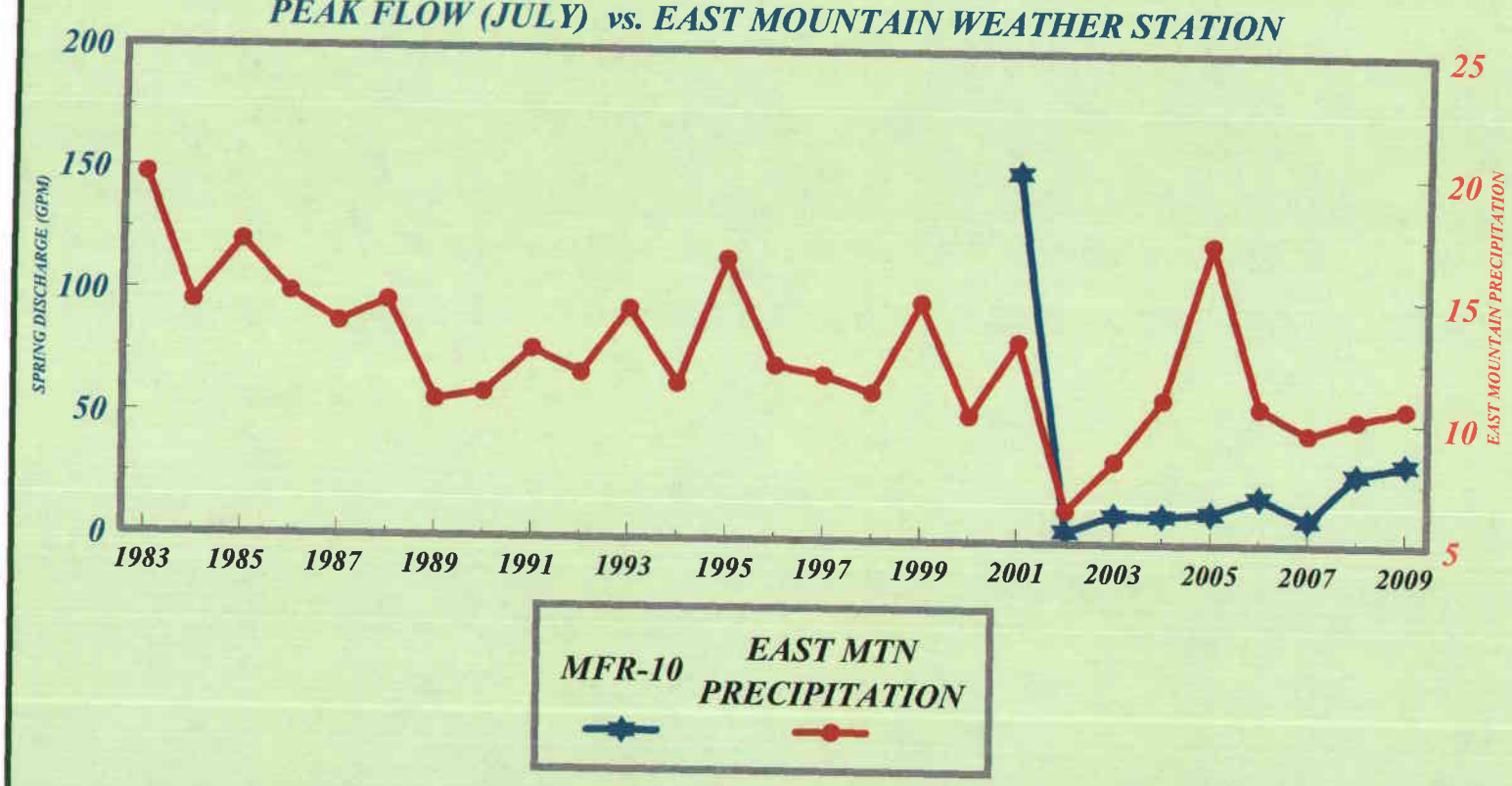
EAST MOUNTAIN SPRINGS

Spring: MF-219 vs. Precipitation



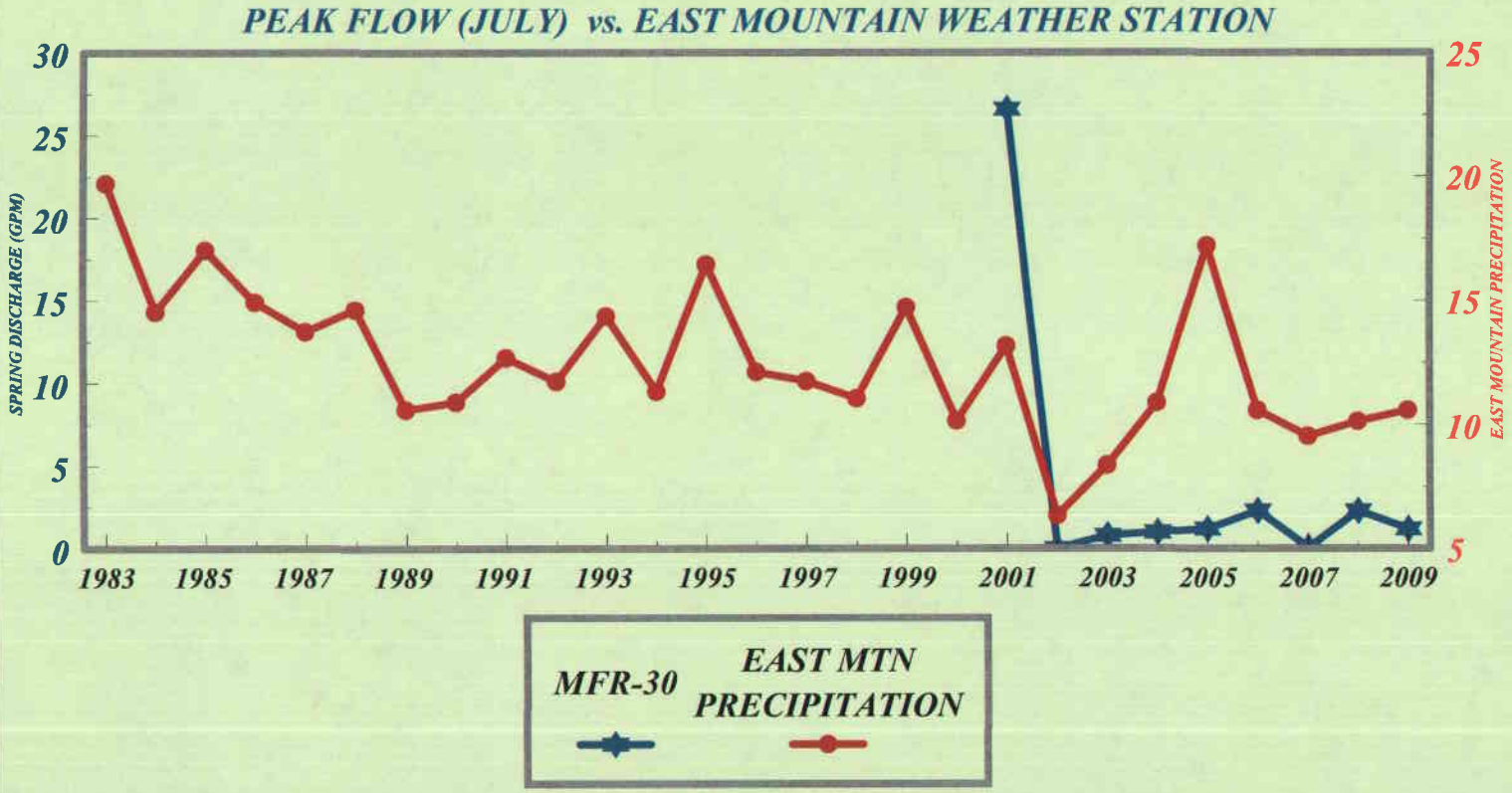
EAST MOUNTAIN SPRINGS

Spring: MFR-10 vs. Precipitation



EAST MOUNTAIN SPRINGS

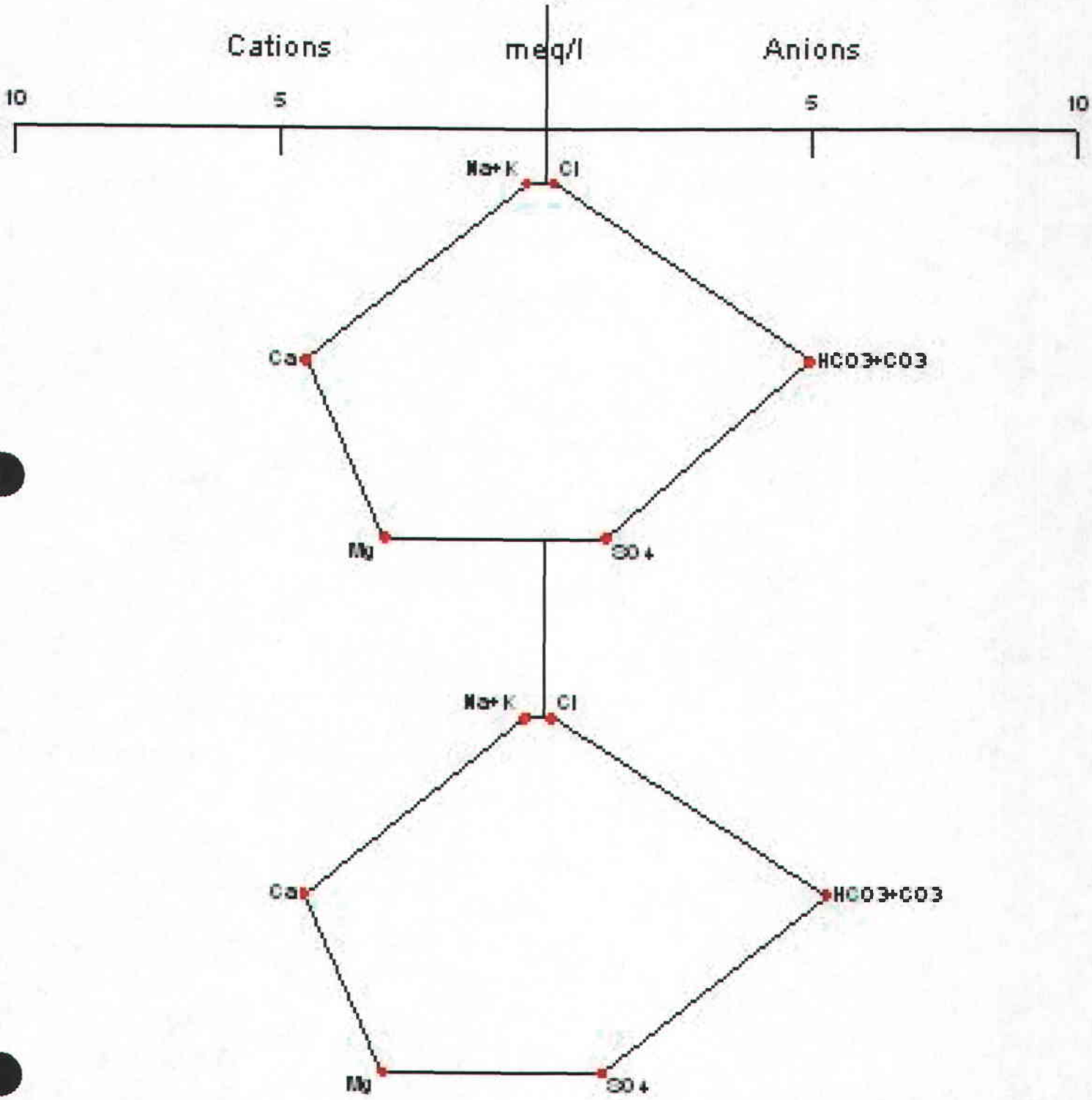
Spring: MFR-30 vs. Precipitation



East Mountain Springs
Stiff Diagrams
Alluvium

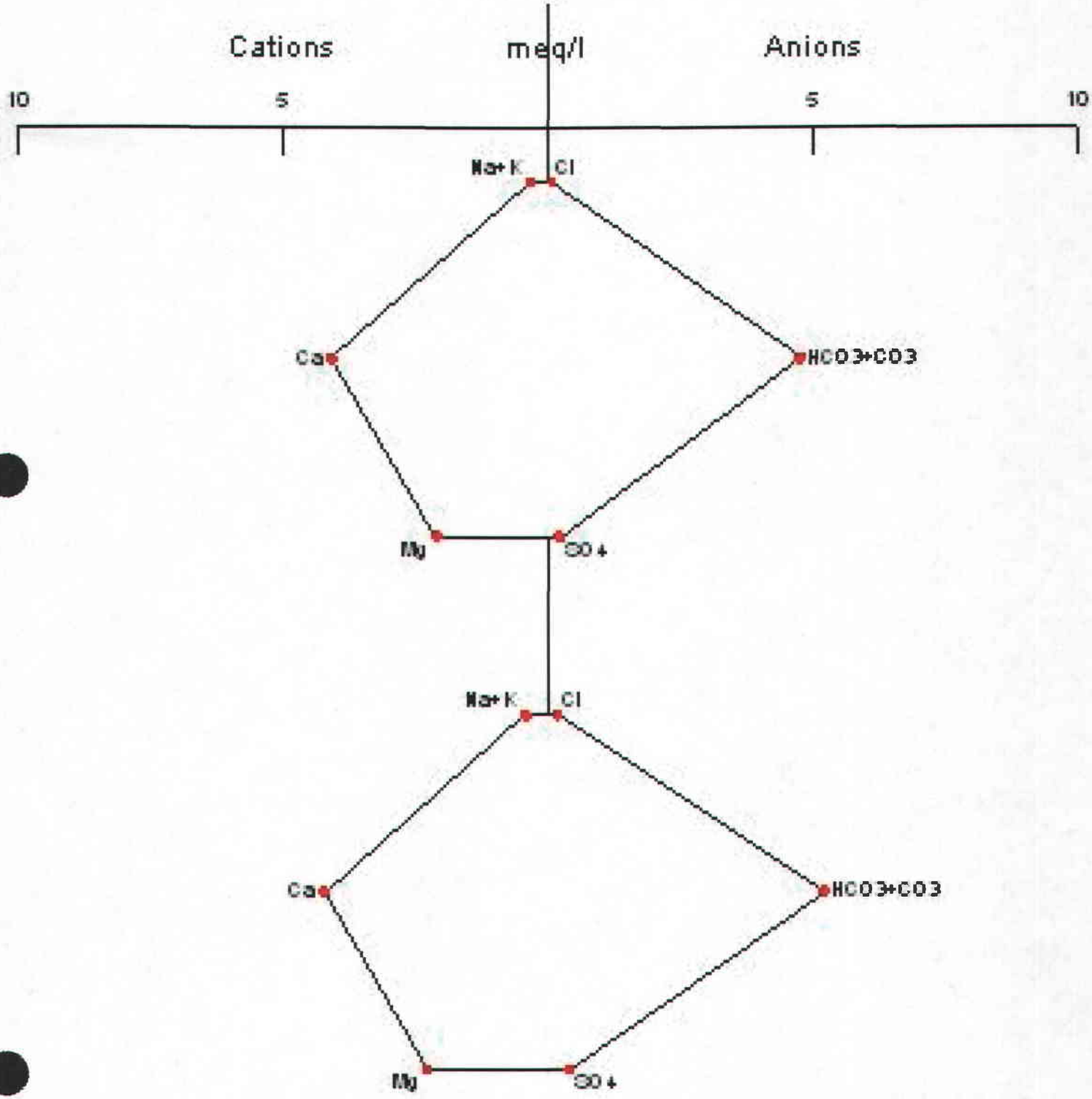
East Mountain Springs

EMS JV9



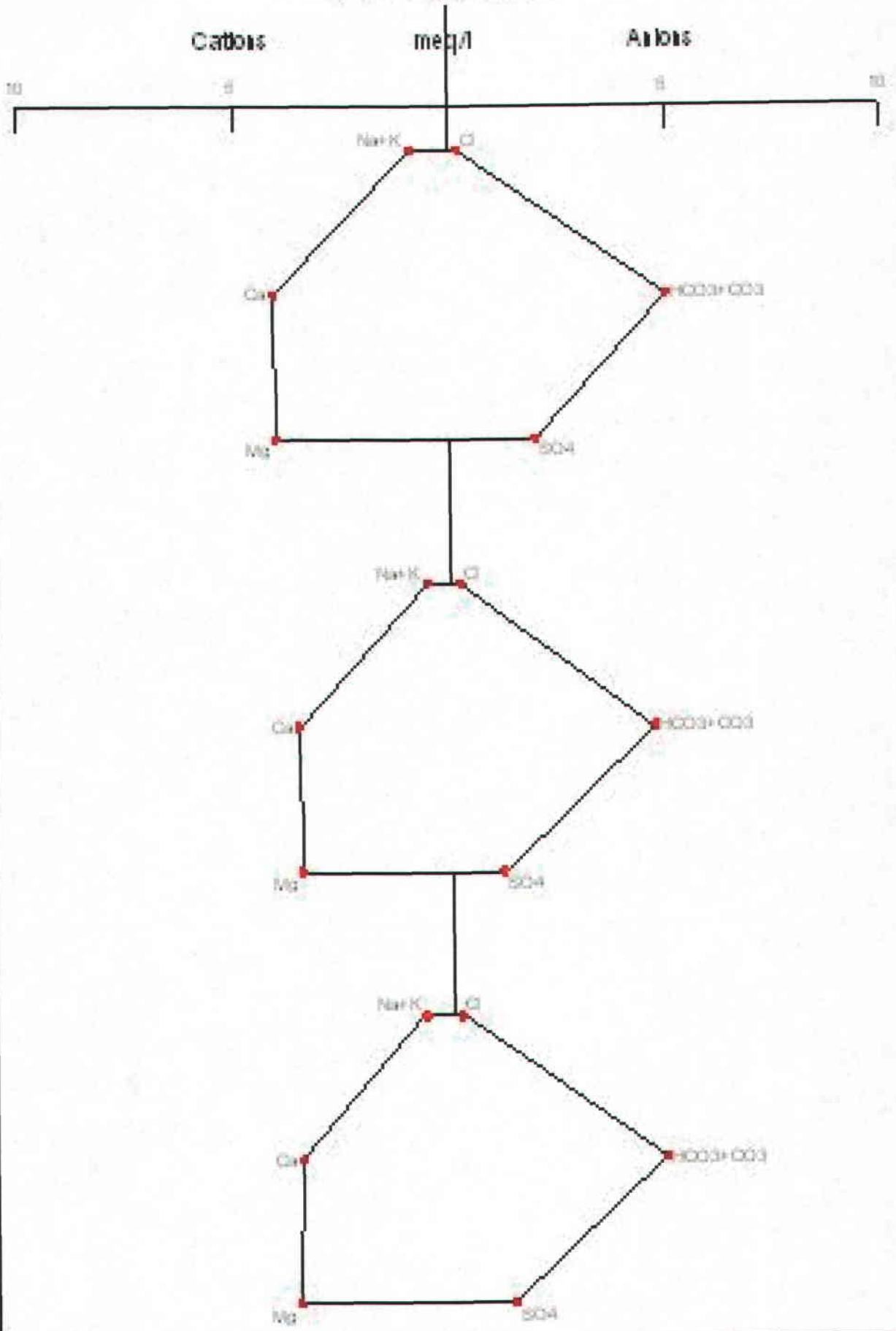
East Mountain Springs

EMS JV34



East Mountain Springs

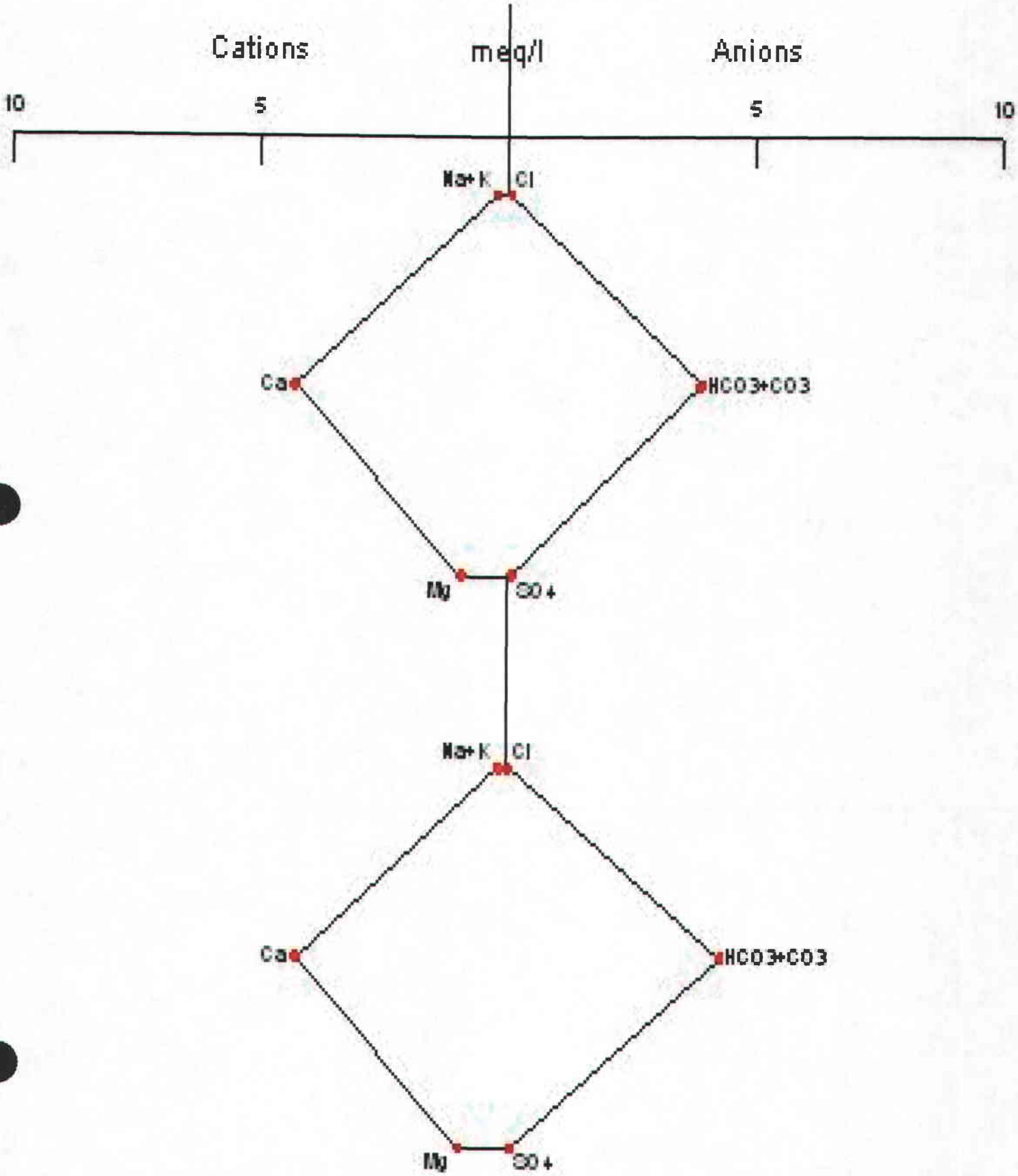
Rilda-Meter 3



East Mountain Springs
Stiff Diagrams
Flagstaff Limestone

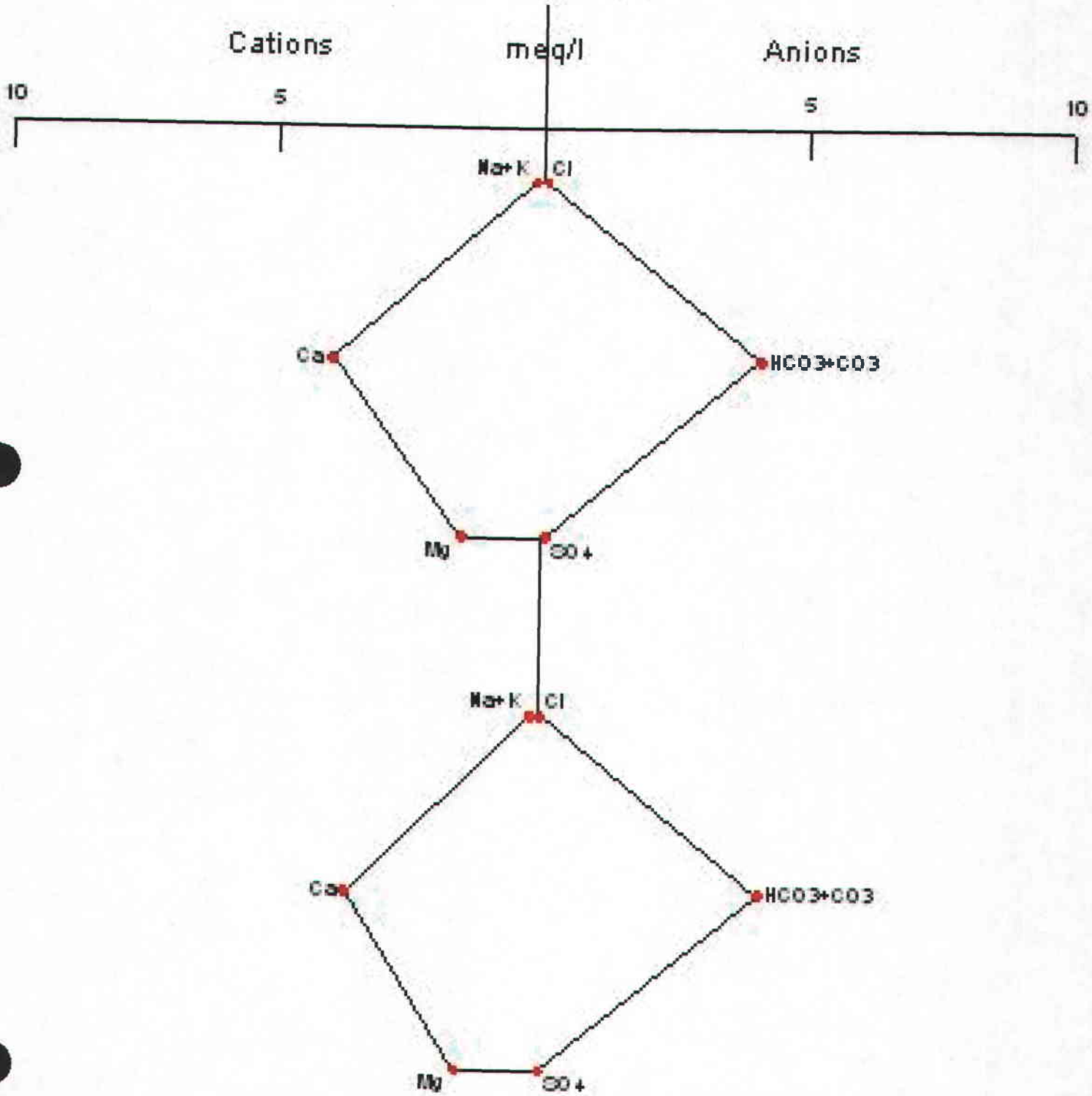
East Mountain Springs

Sheba Springs



East Mountain Springs

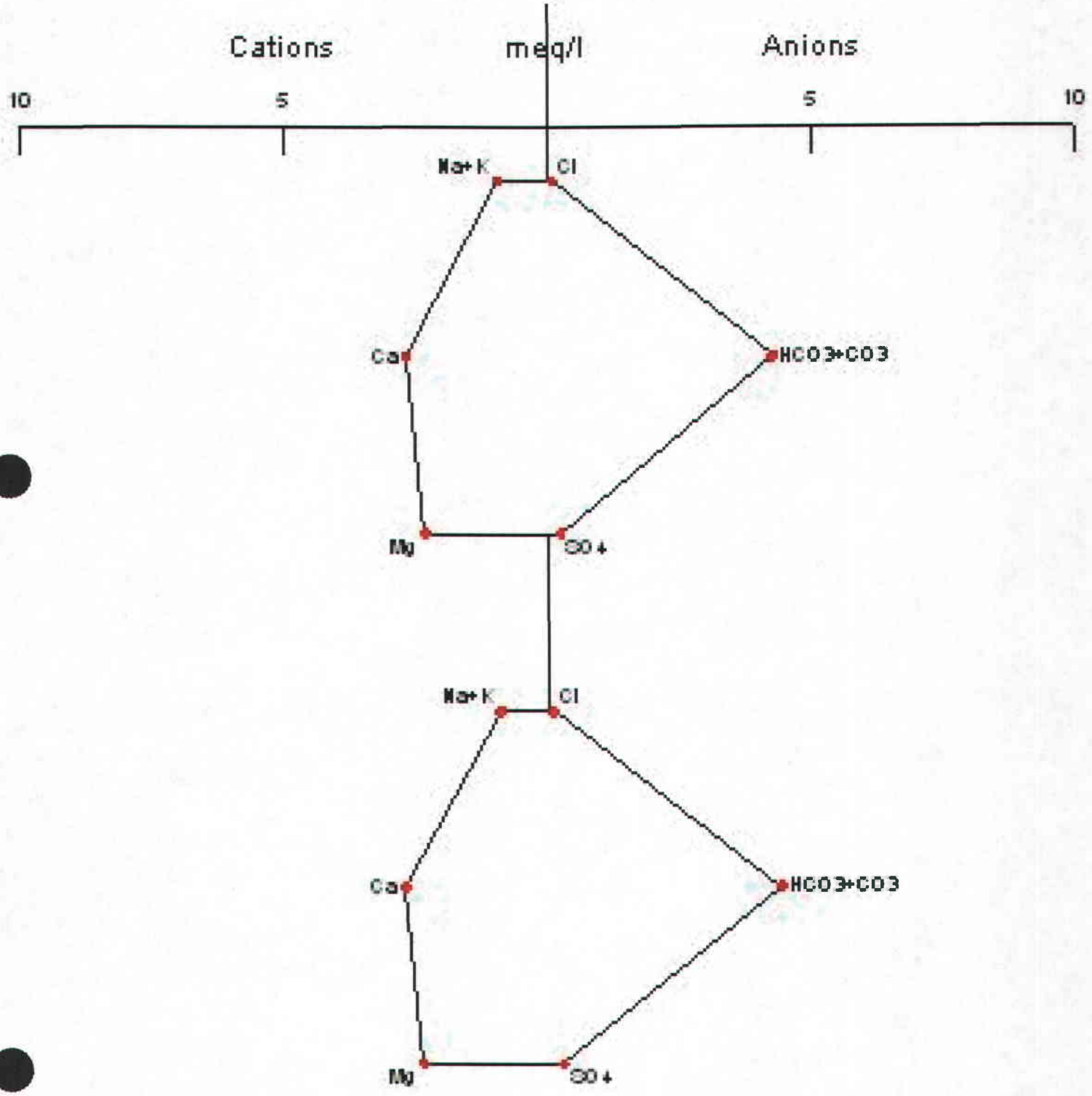
EMS 79-35



East Mountain Springs
Stiff Diagrams
North Horn Formation

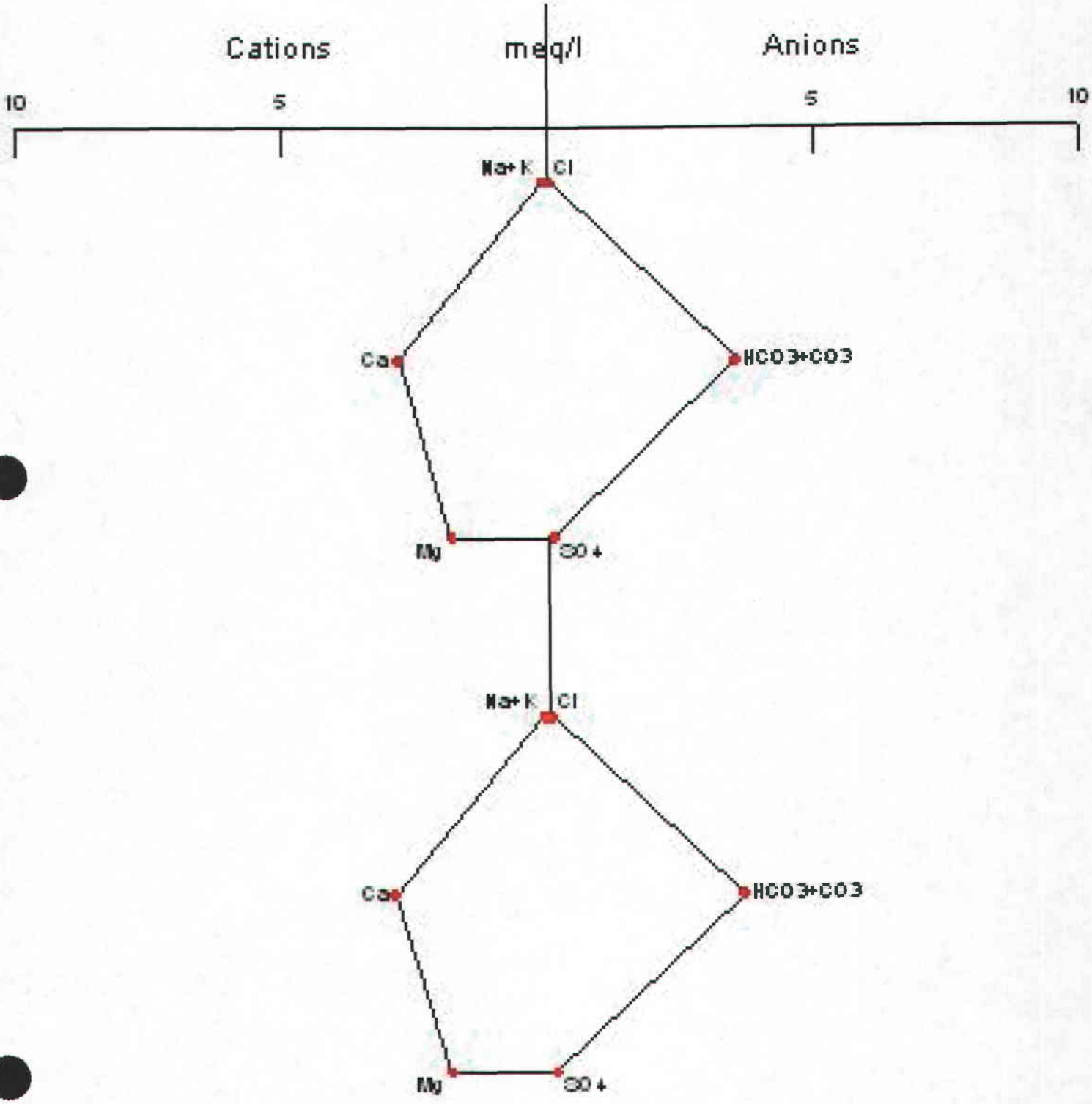
East Mountain Springs

Burnt Tree



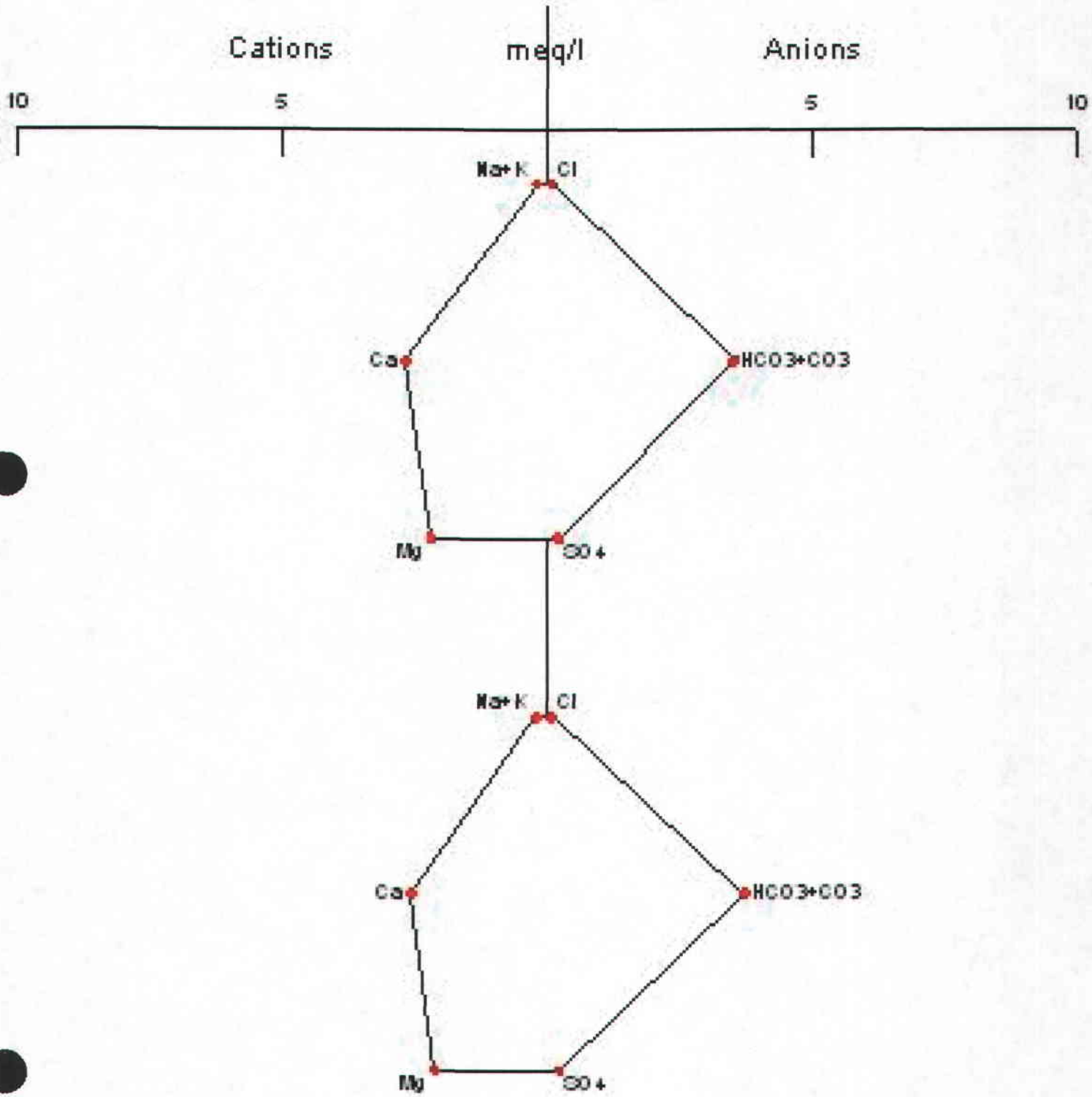
East Mountain Springs

EM Pond



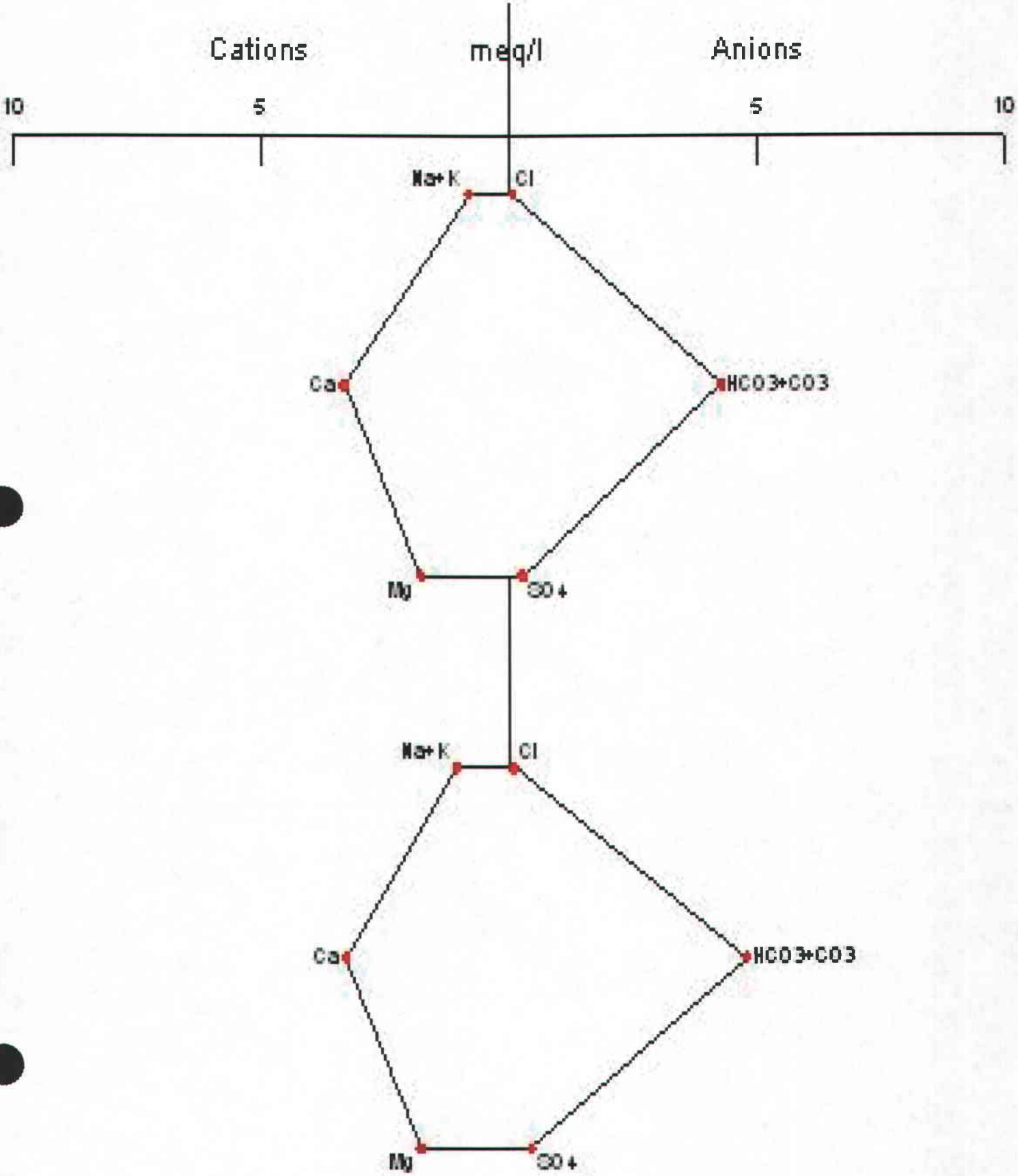
East Mountain Springs

Grant Spring



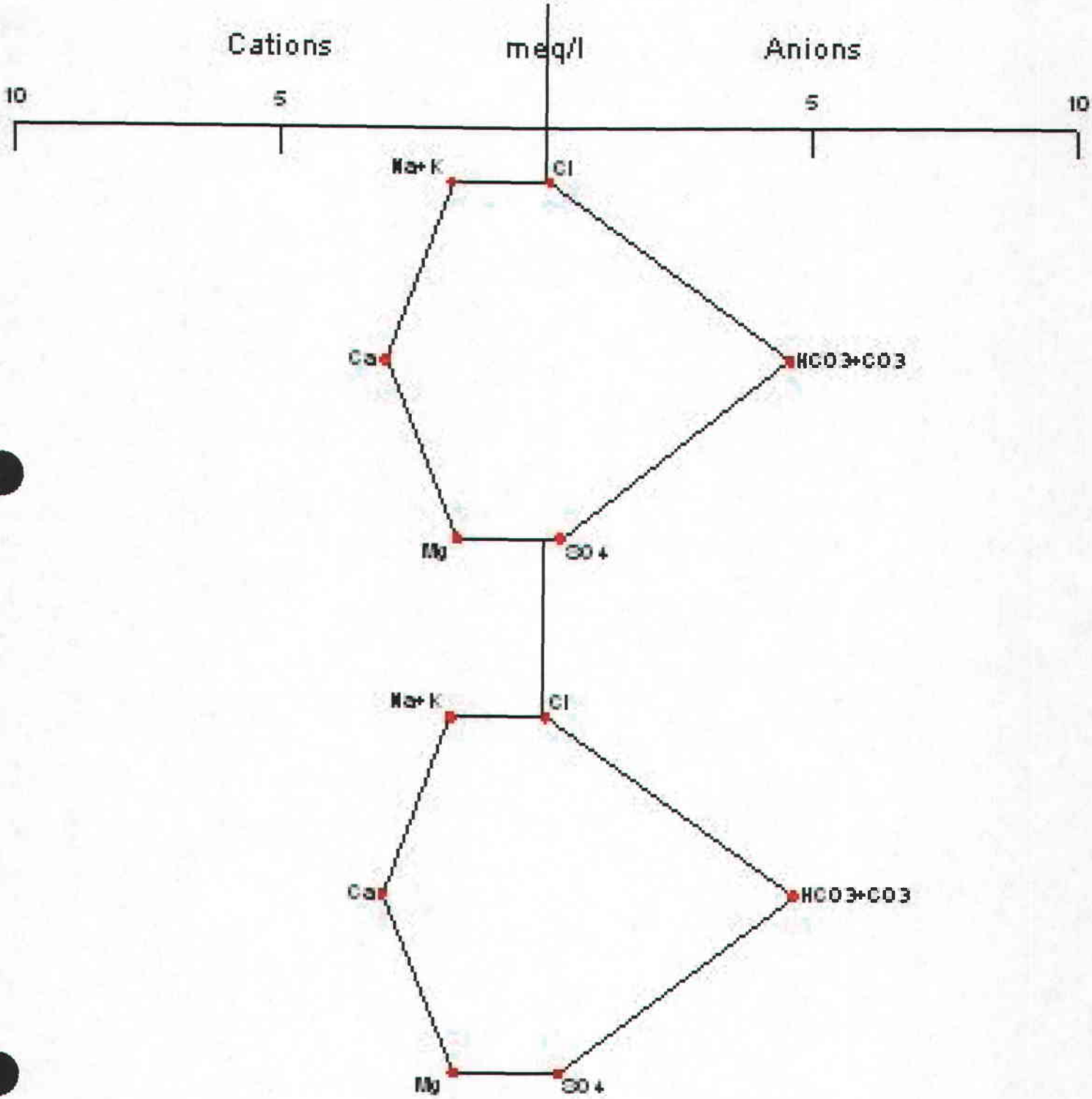
East Mountain Springs

Ted's Tub



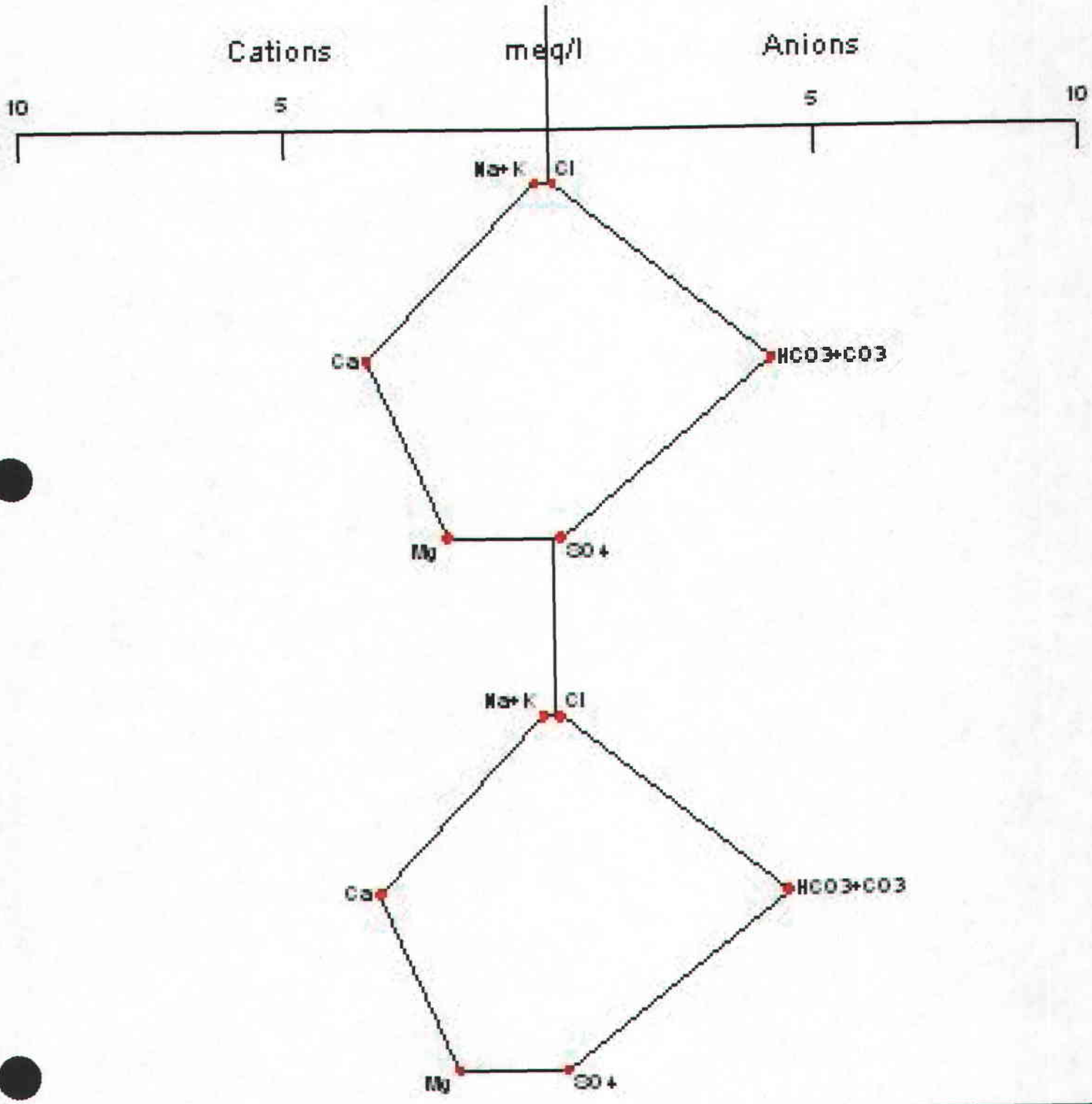
East Mountain Springs

EMS 79-02



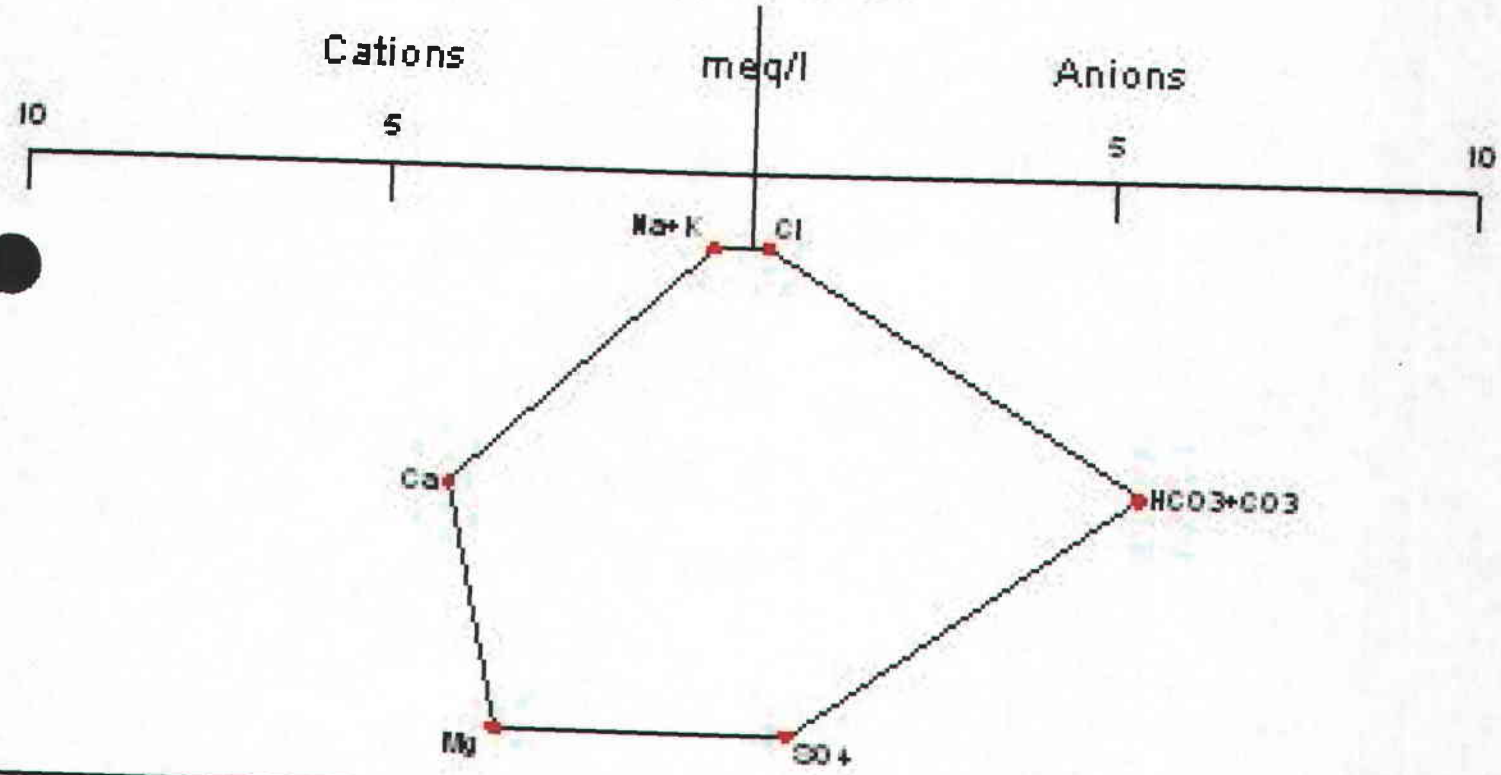
East Mountain Springs

EMS 79-10



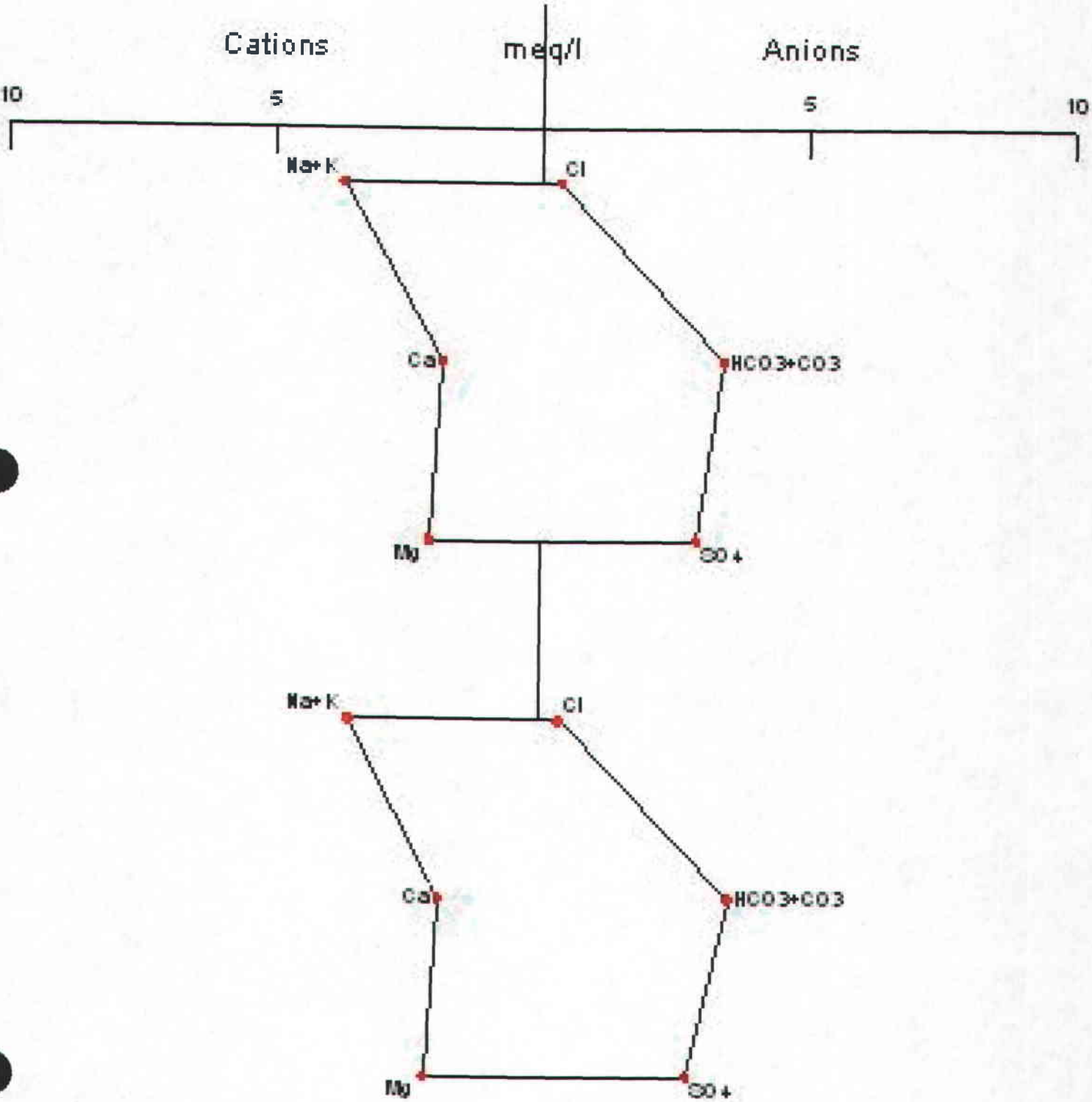
East Mountain Springs

EMS 79-15



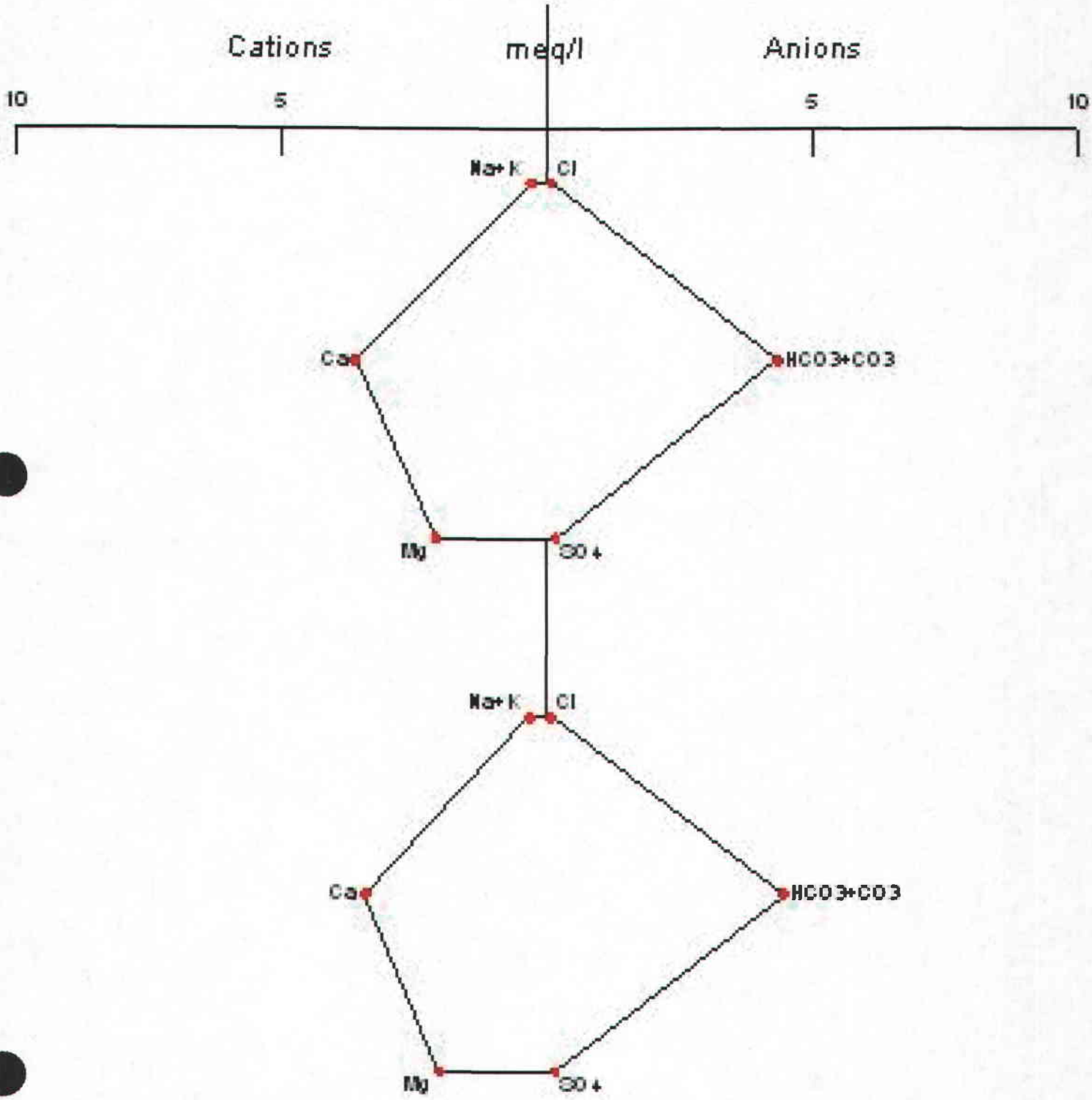
East Mountain Springs

EMS 79-28



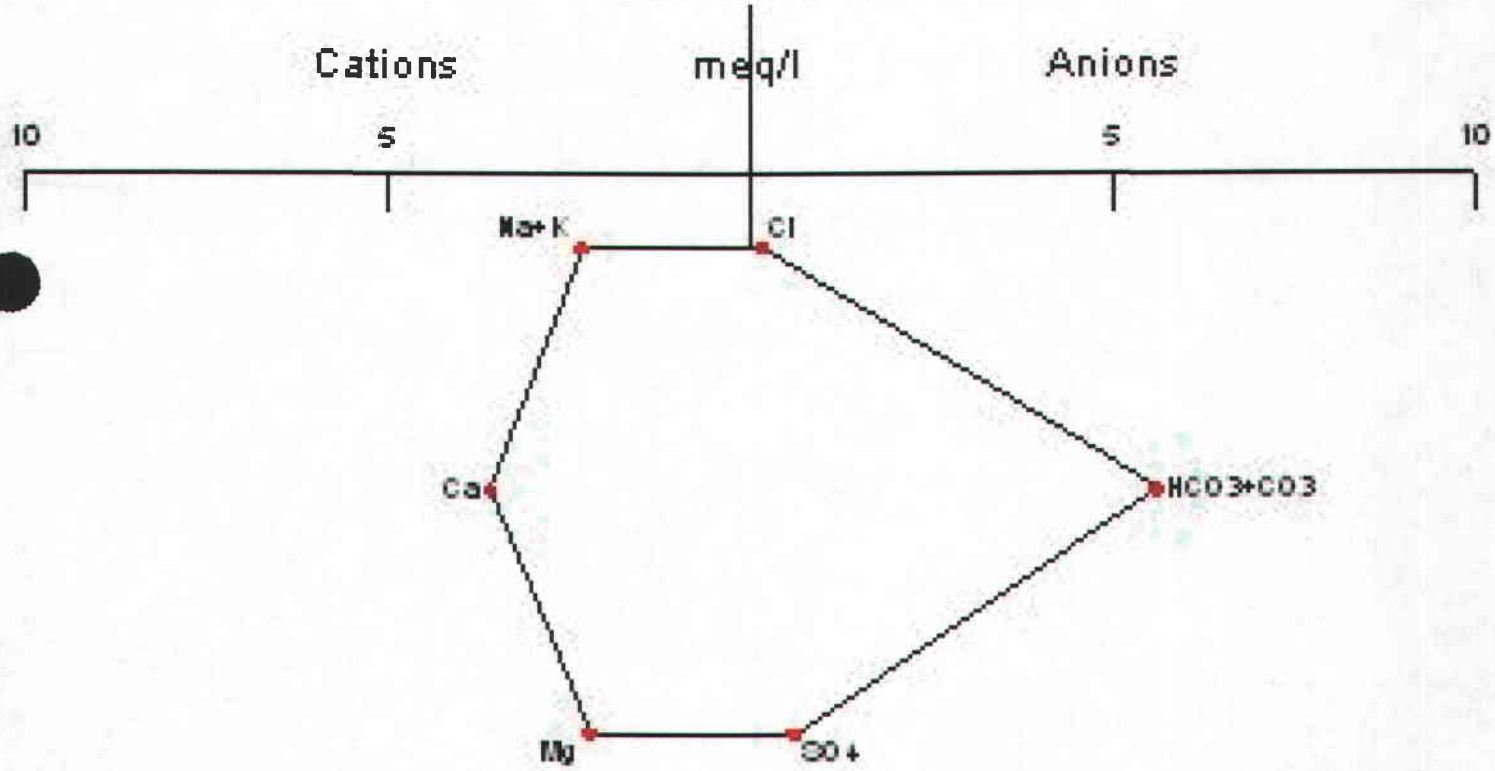
East Mountain Springs

EMS 79-34



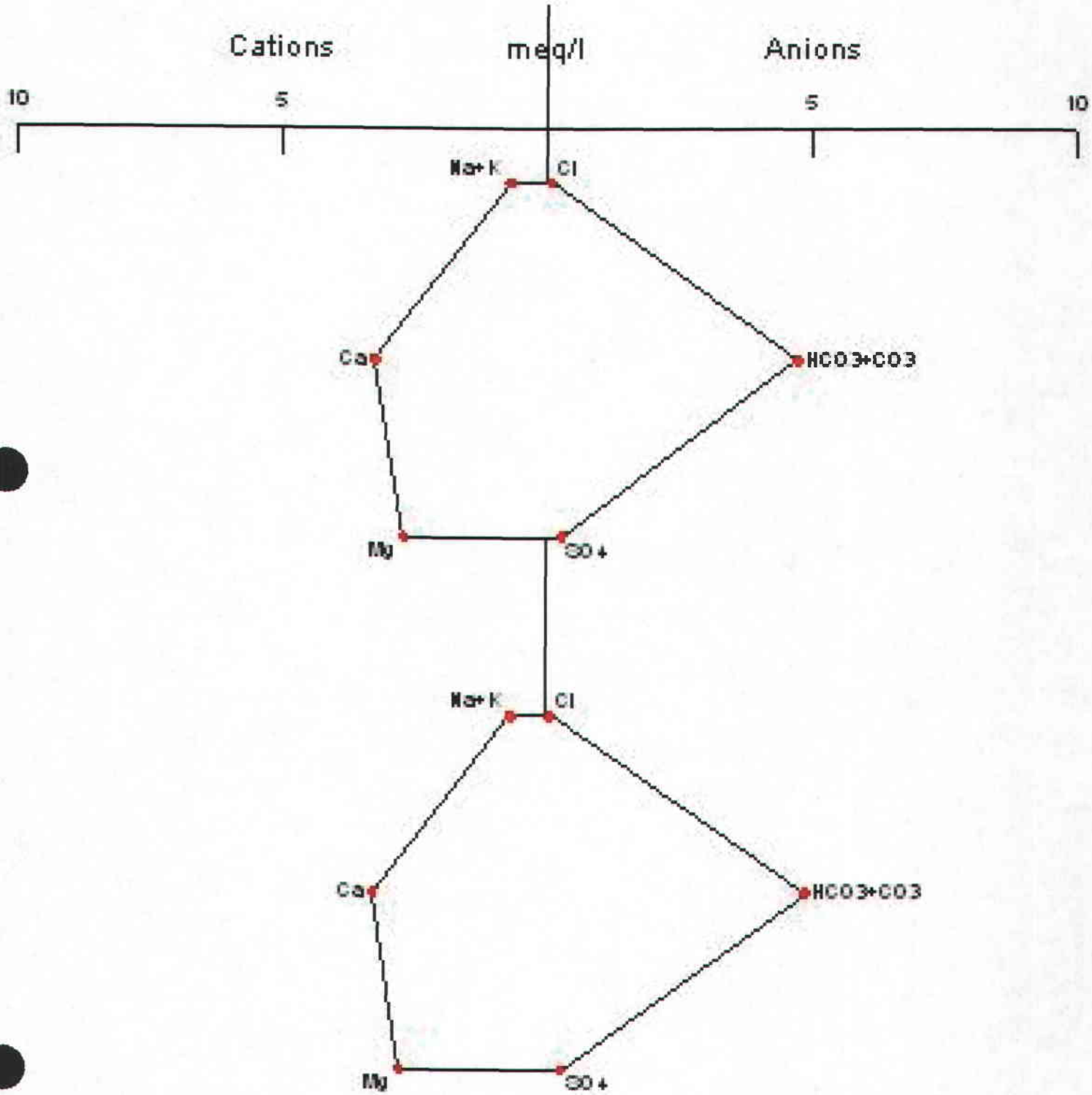
East Mountain Springs

EMS 79-38



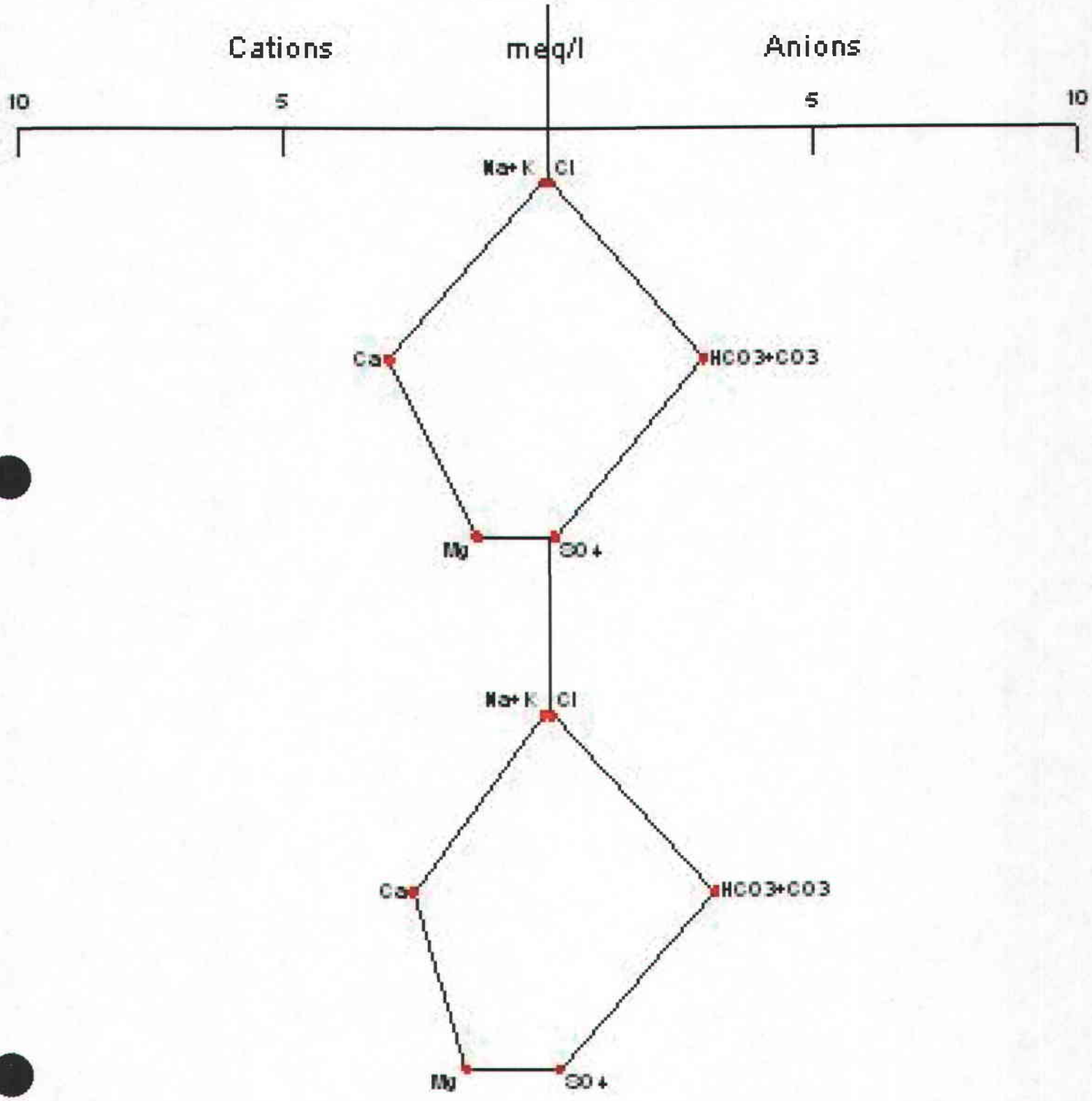
East Mountain Springs

EMS 80-47



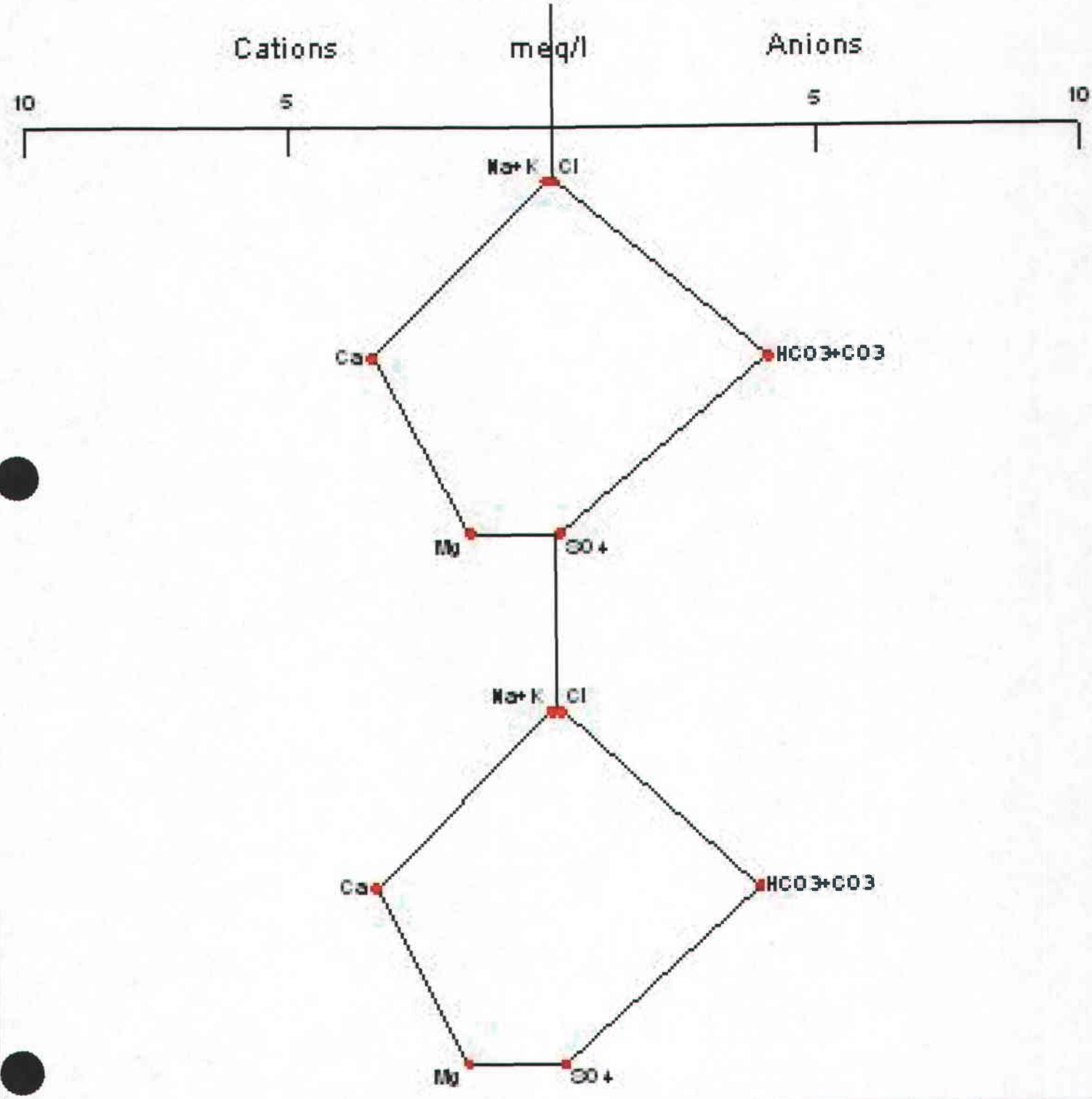
East Mountain Springs

EMS MF-10



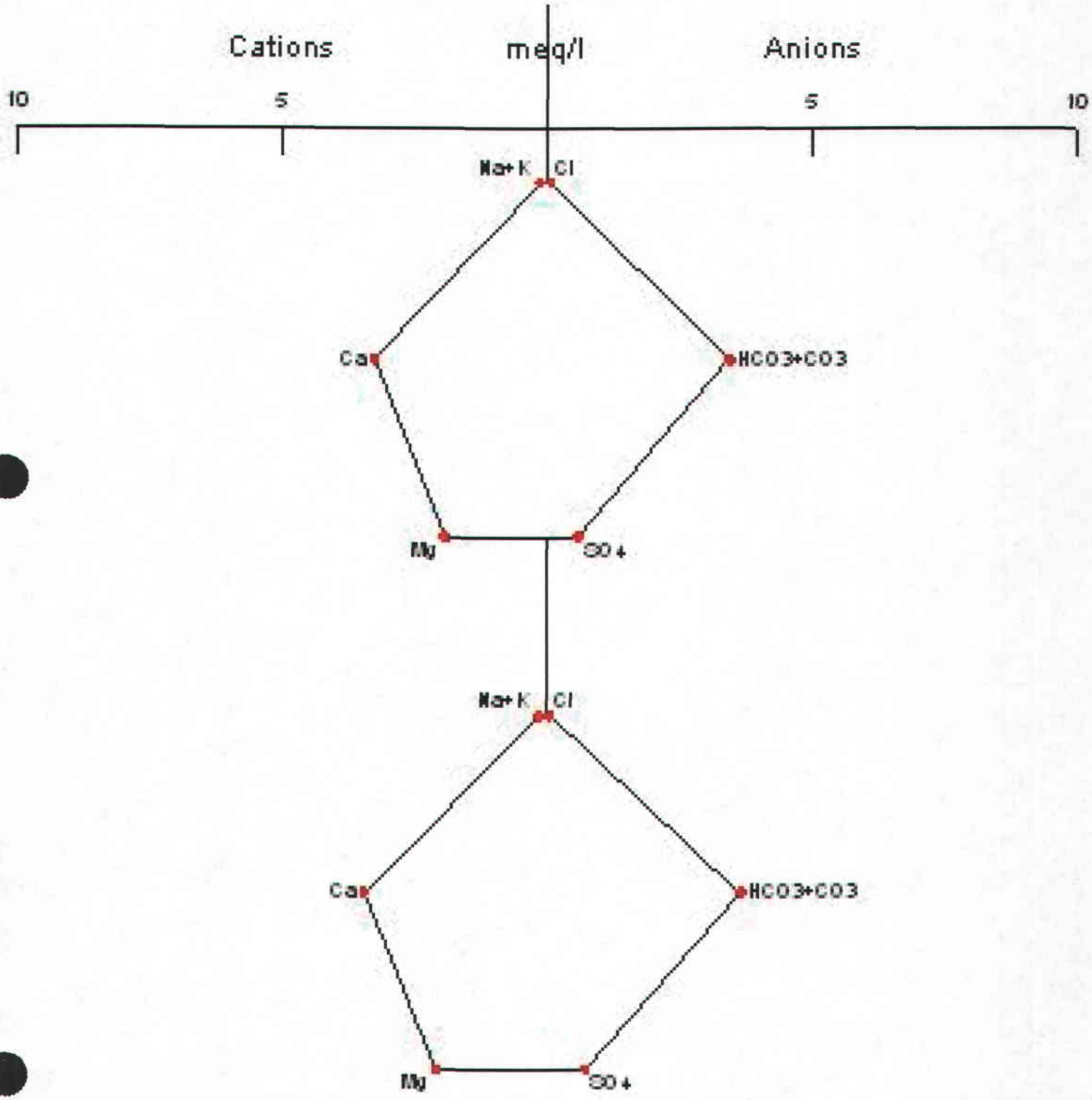
East Mountain Springs

EMS MF19B



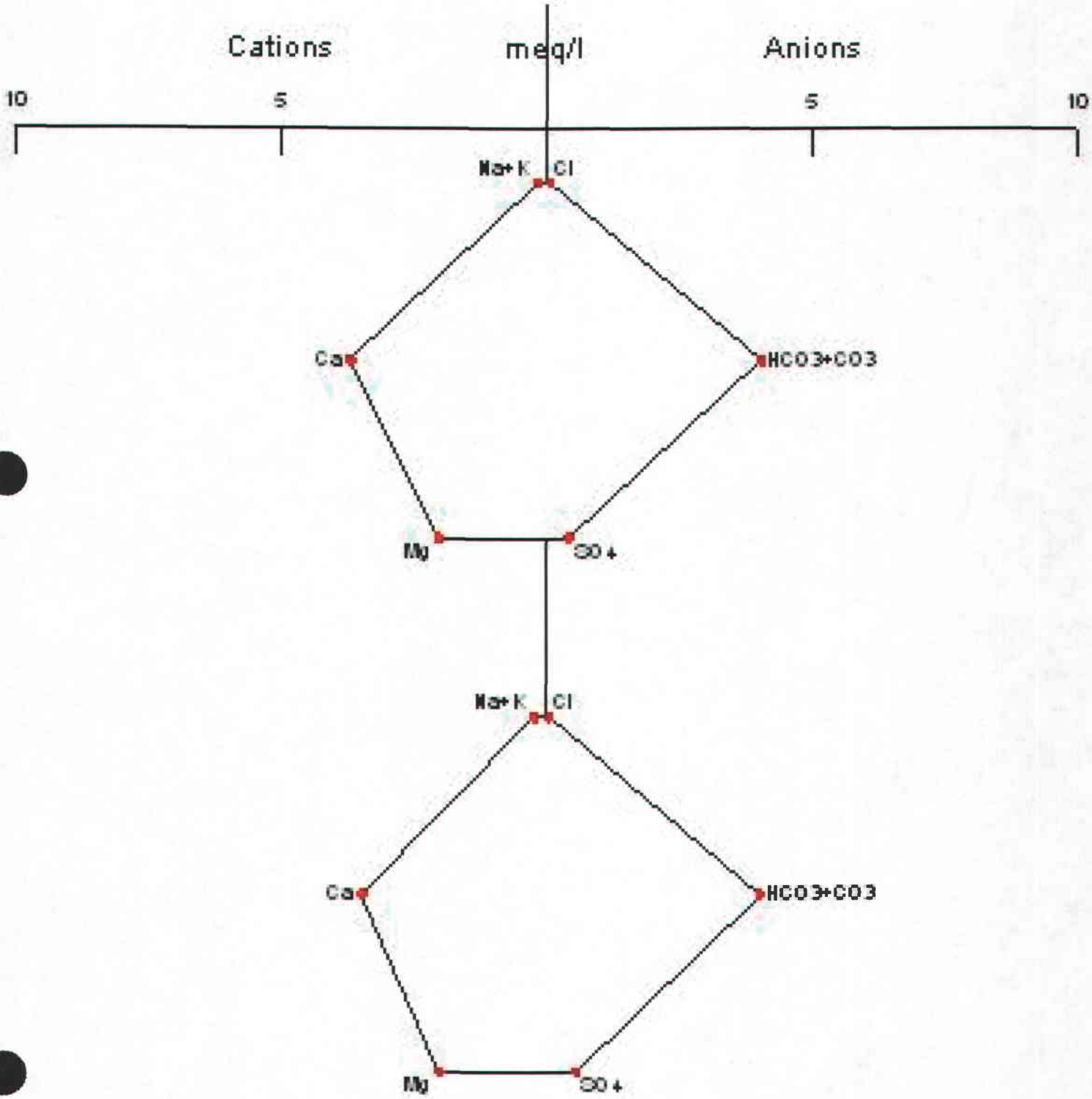
East Mountain Springs

EMS MF219



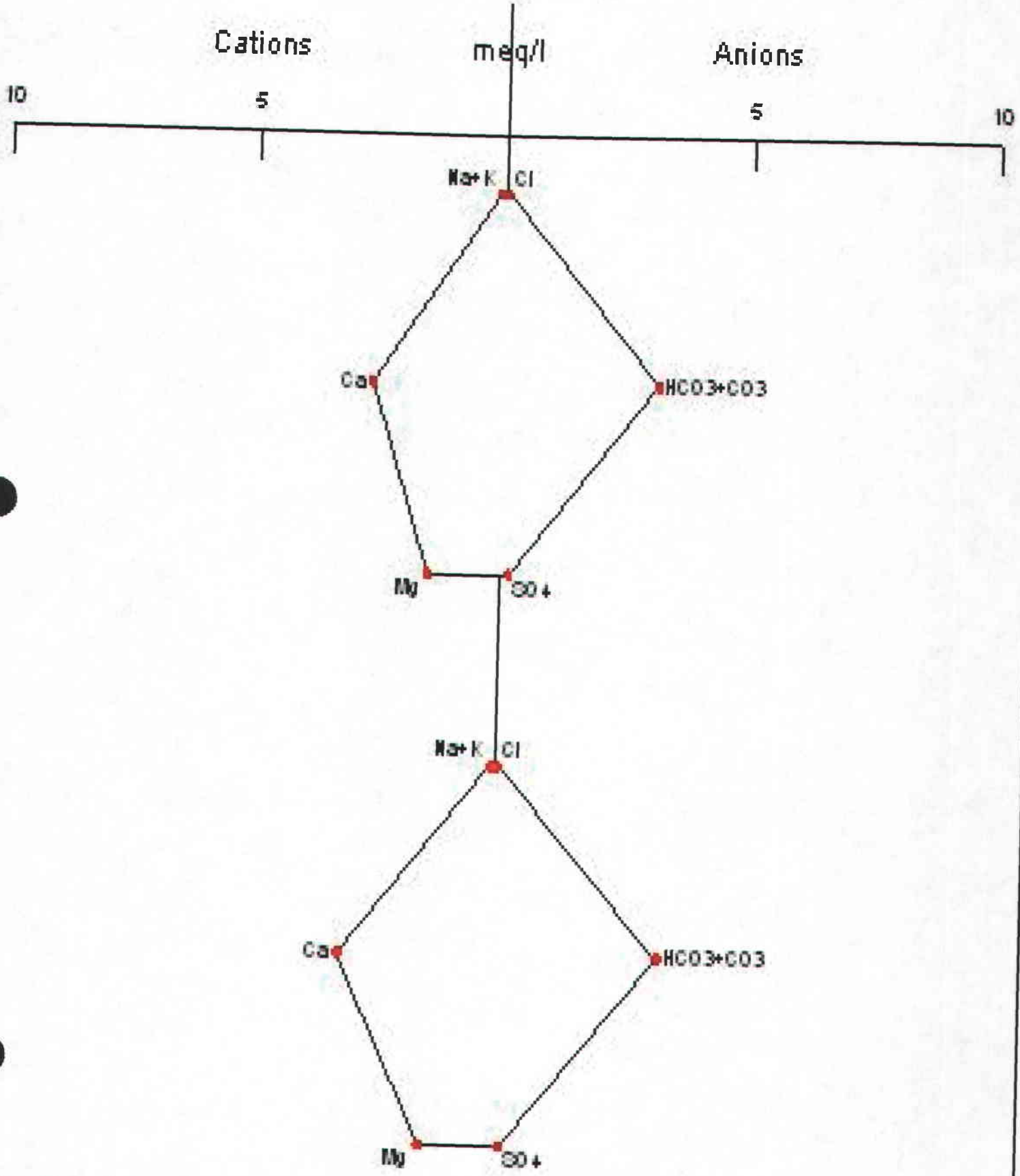
East Mountain Springs

EMS MFR-10



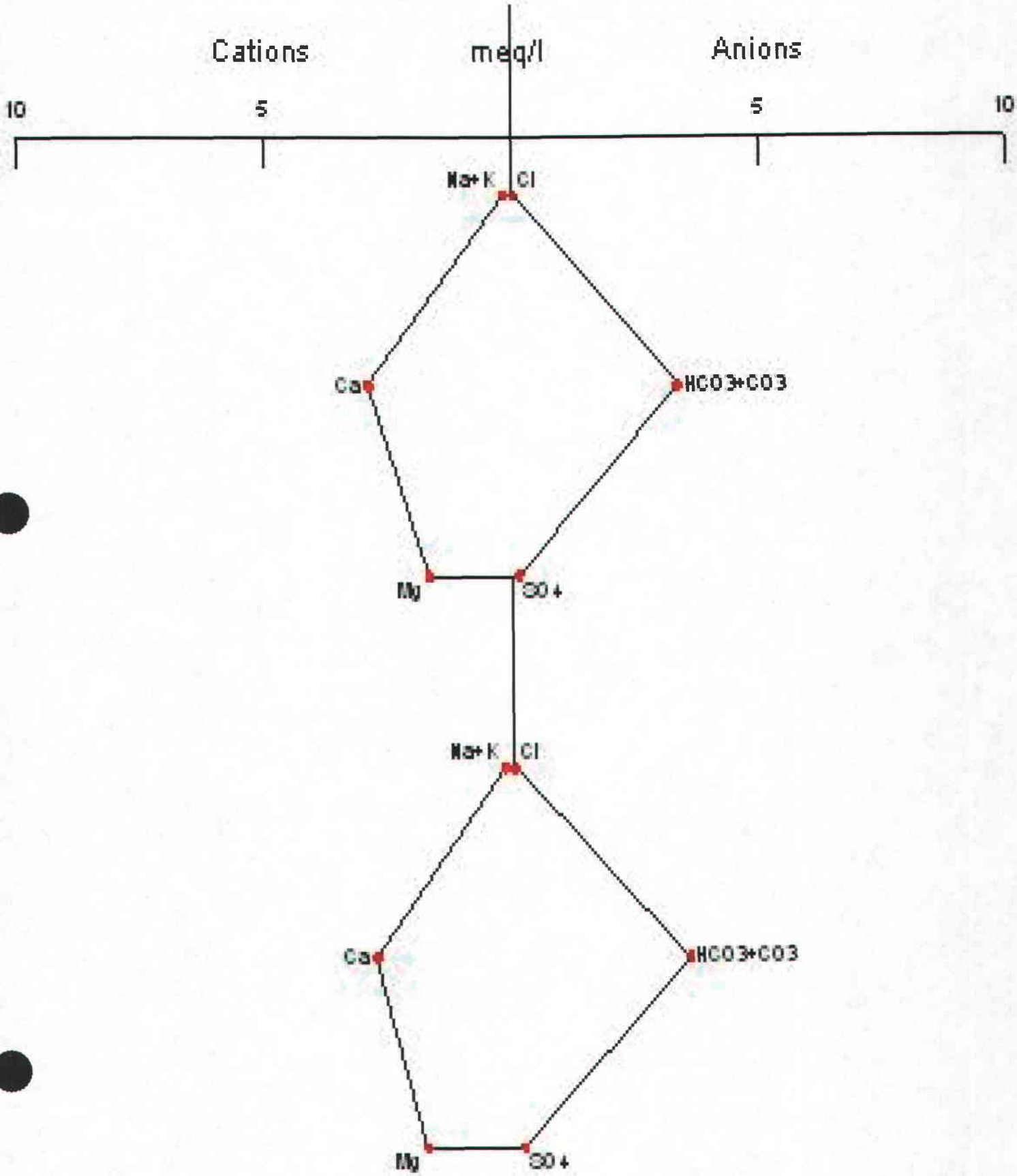
East Mountain Springs

EMS RR-5



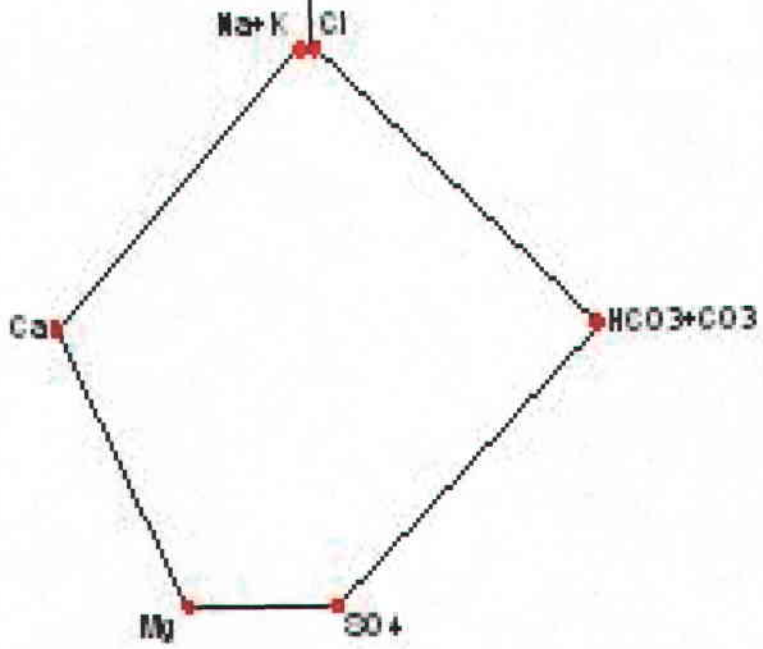
East Mountain Springs

EMS RR-15



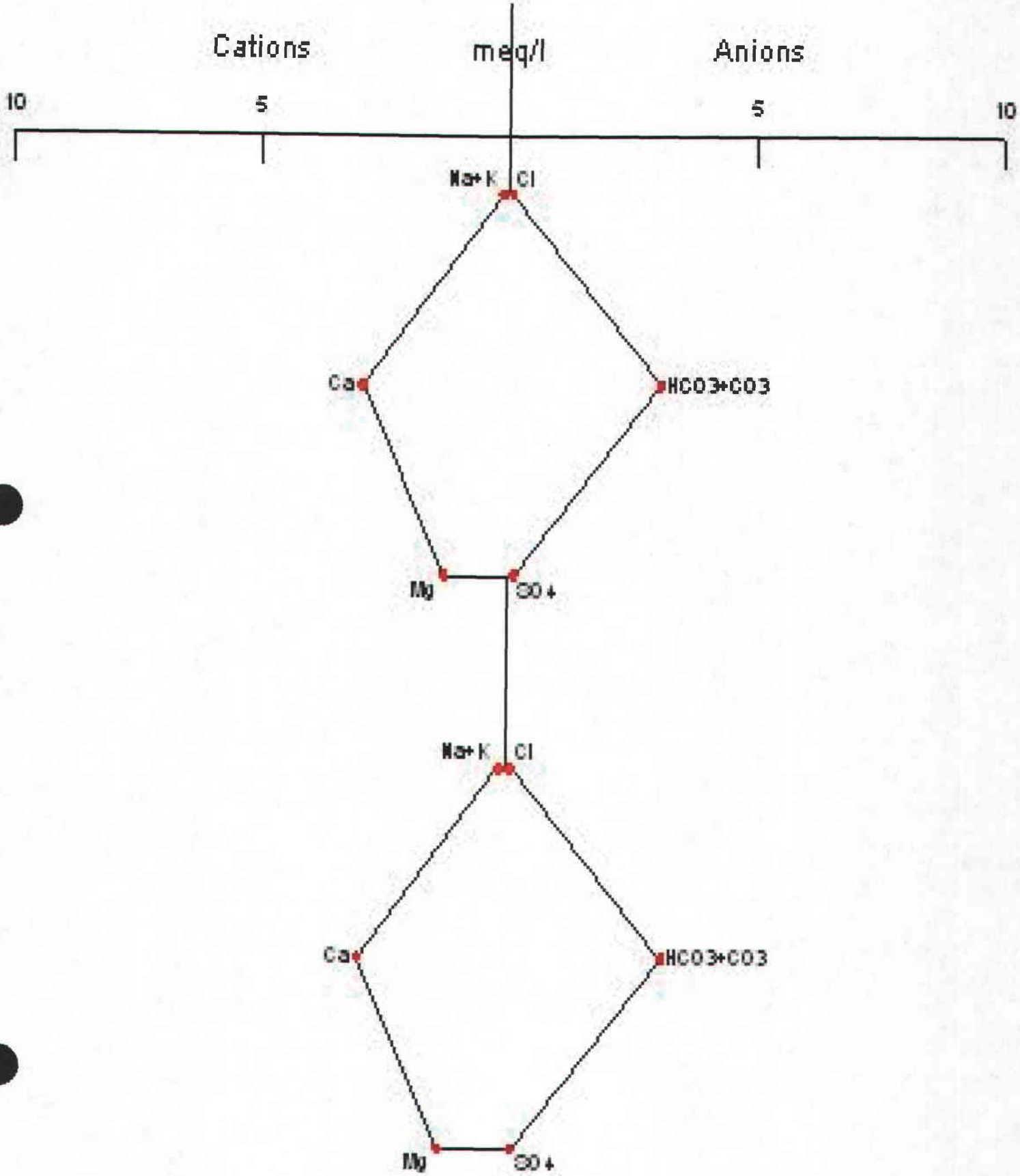
East Mountain Springs

EMS RR-23A



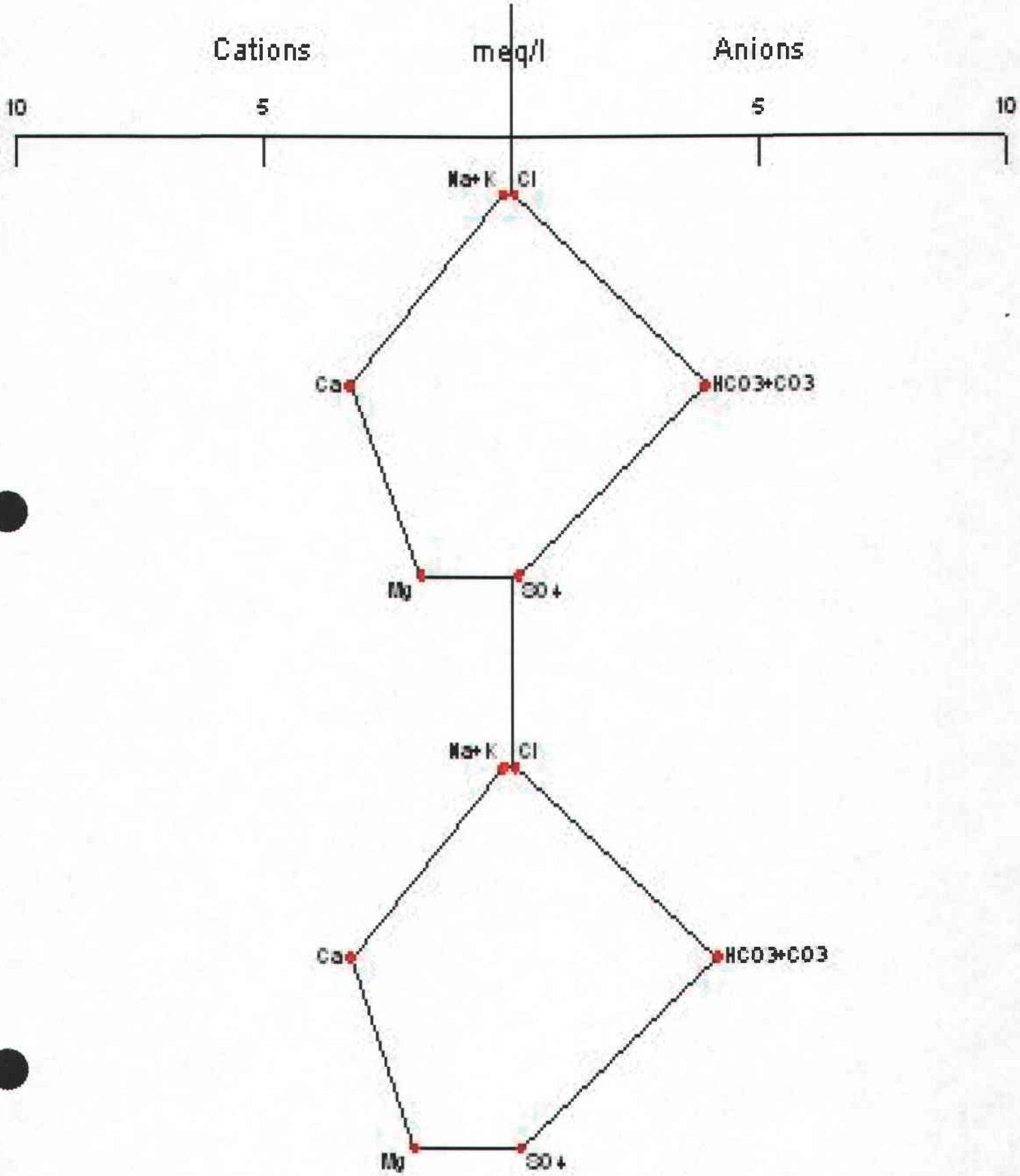
East Mountain Springs

EMS SP1-26



East Mountain Springs

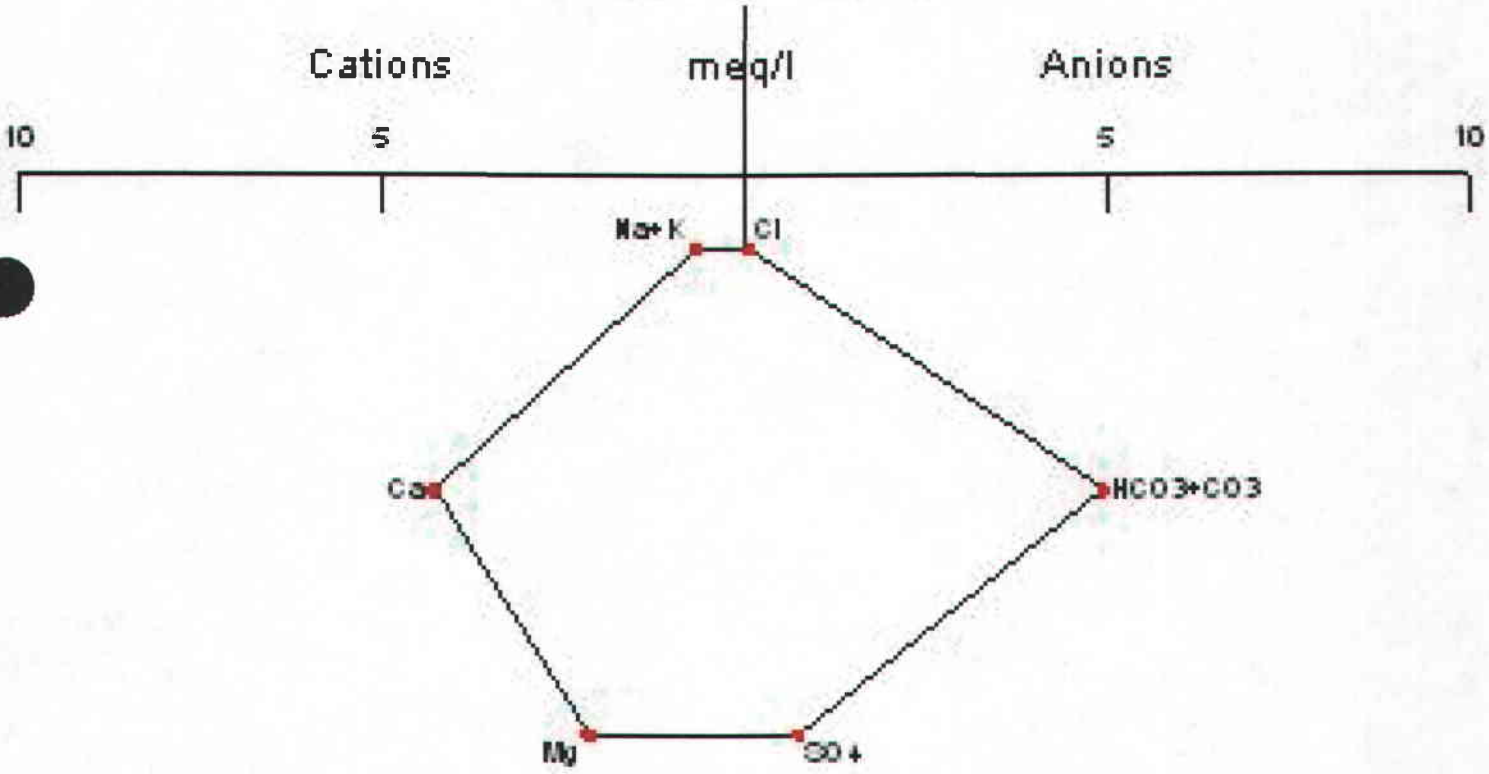
EMS SP1-29



East Mountain Springs
Stiff Diagrams
Price River Formation

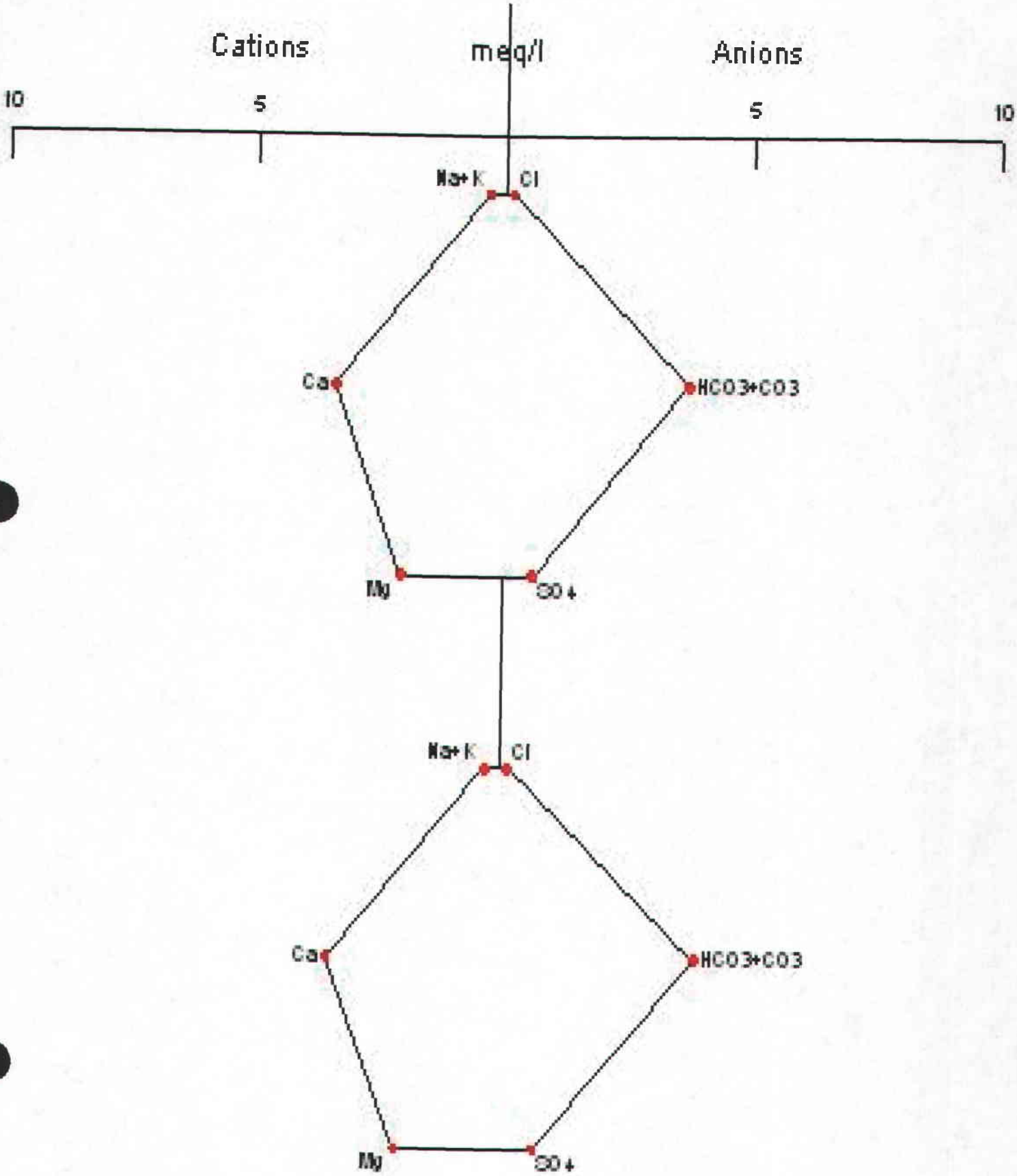
East Mountain Springs

EMS MFR-30



East Mountain Springs

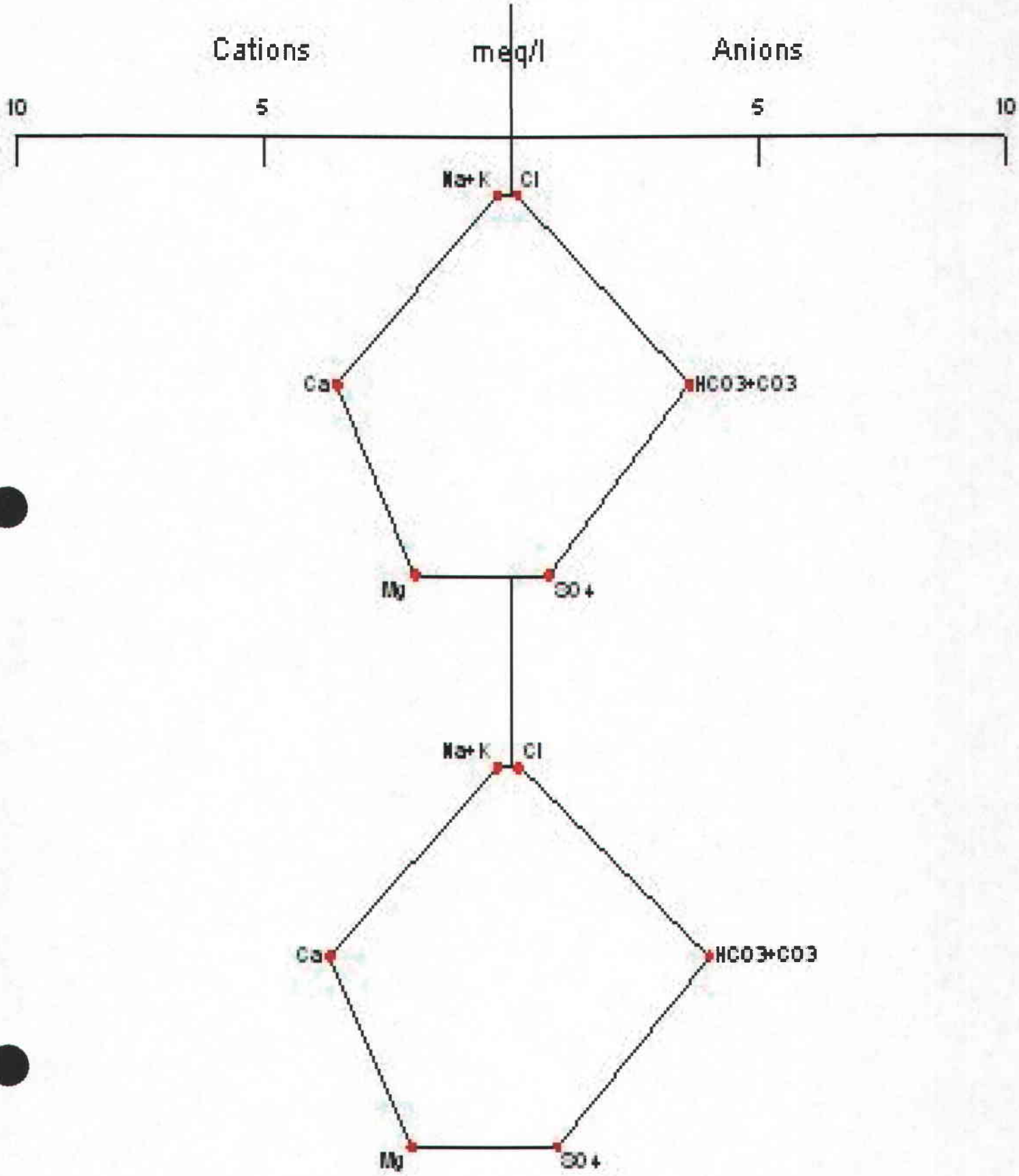
EMS UJV206



East Mountain Springs
Stiff Diagrams
Castlegate Sandstone

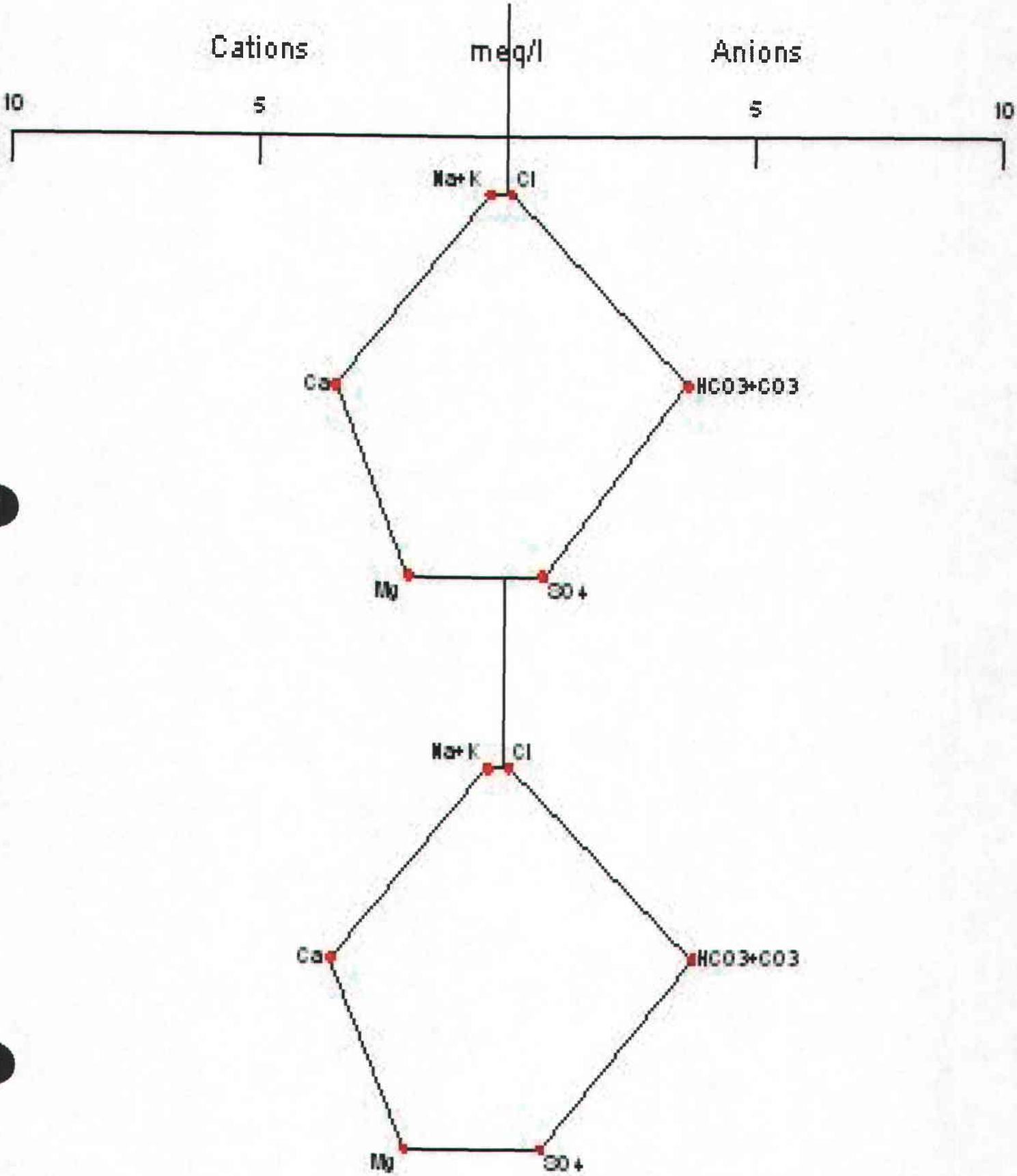
East Mountain Springs

EMS UJV101



East Mountain Springs

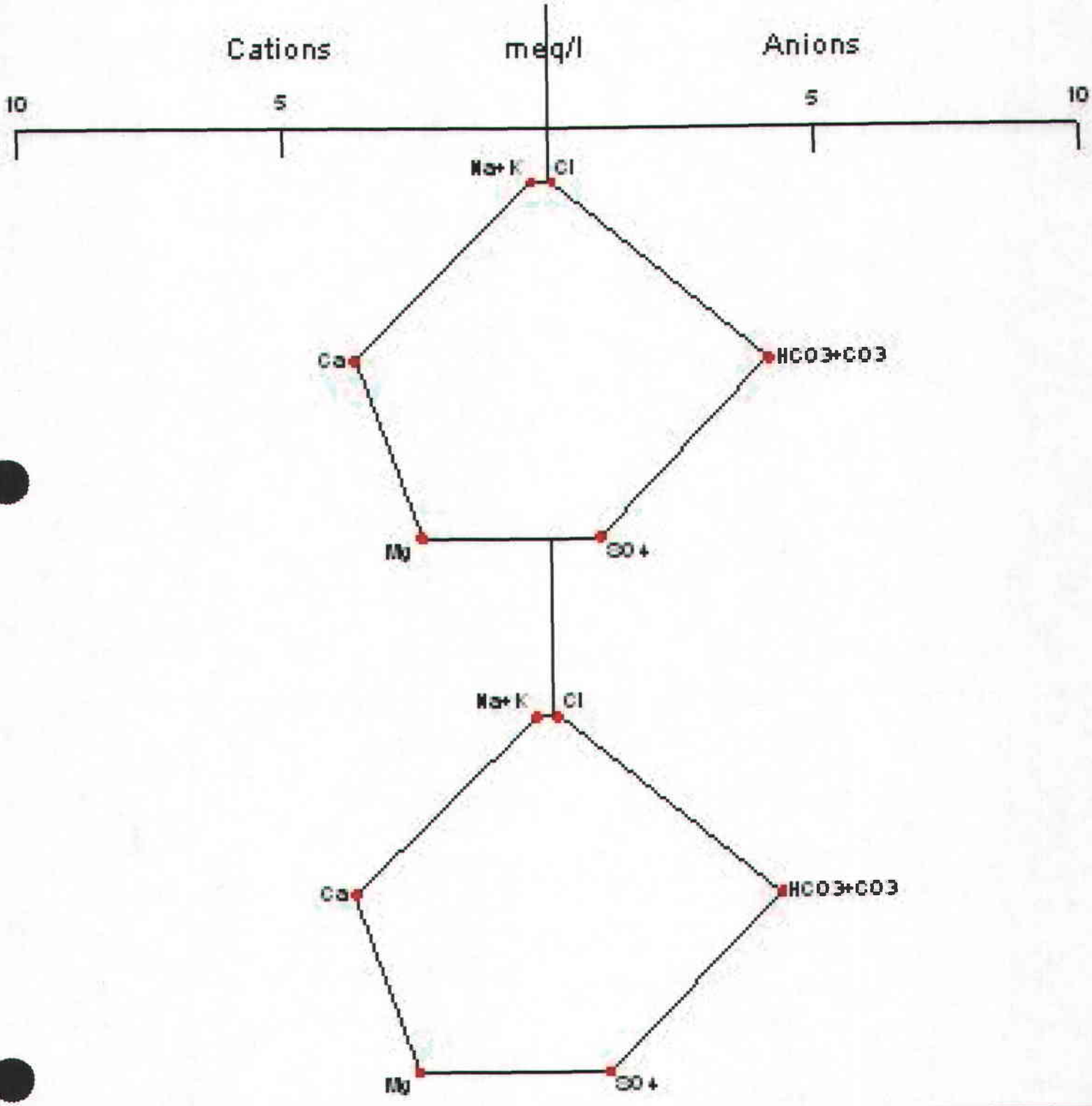
EMS UJV213



East Mountain Springs
Stiff Diagrams
Blackhawk Formation

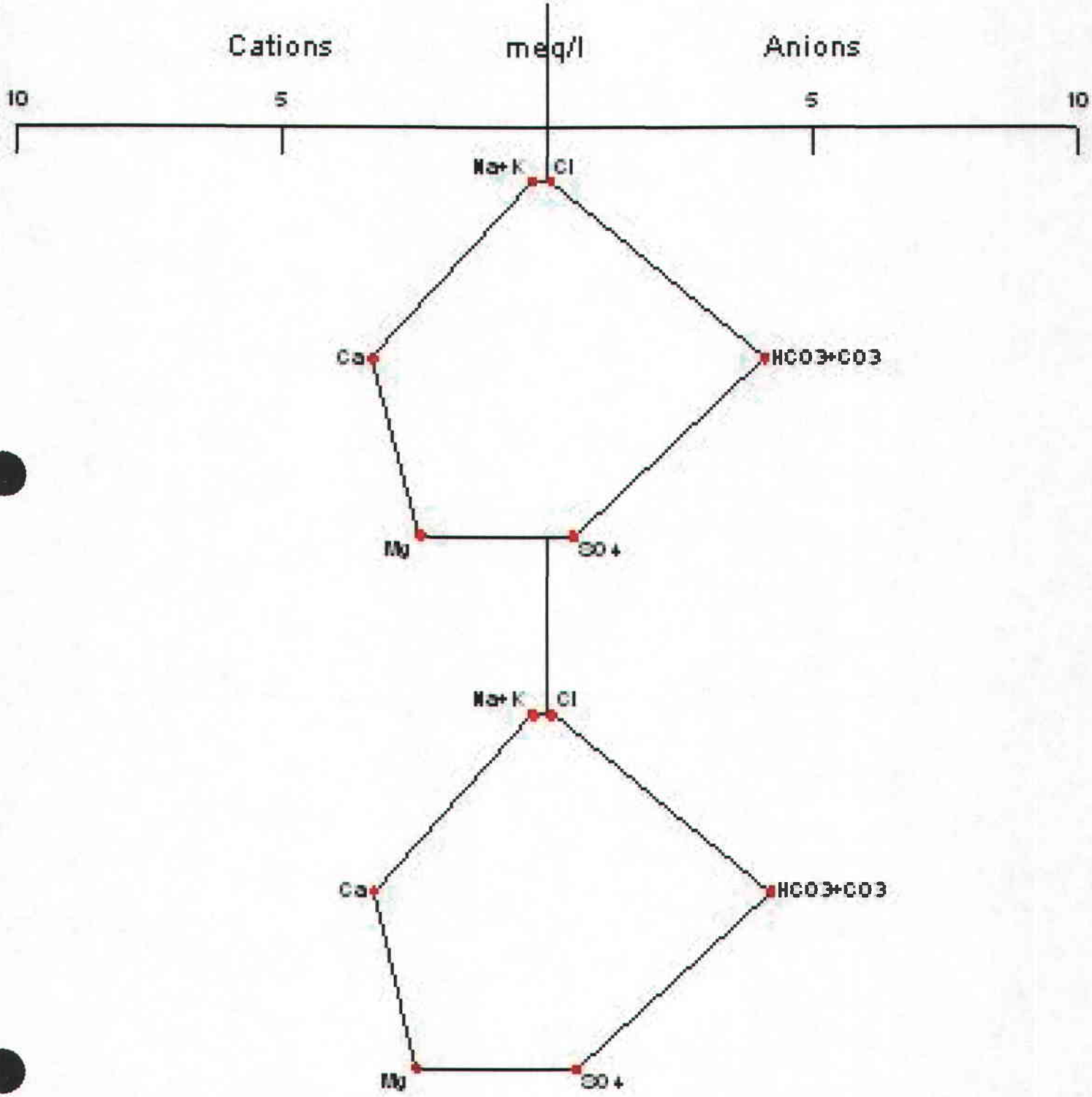
East Mountain Springs

EMS MF-7



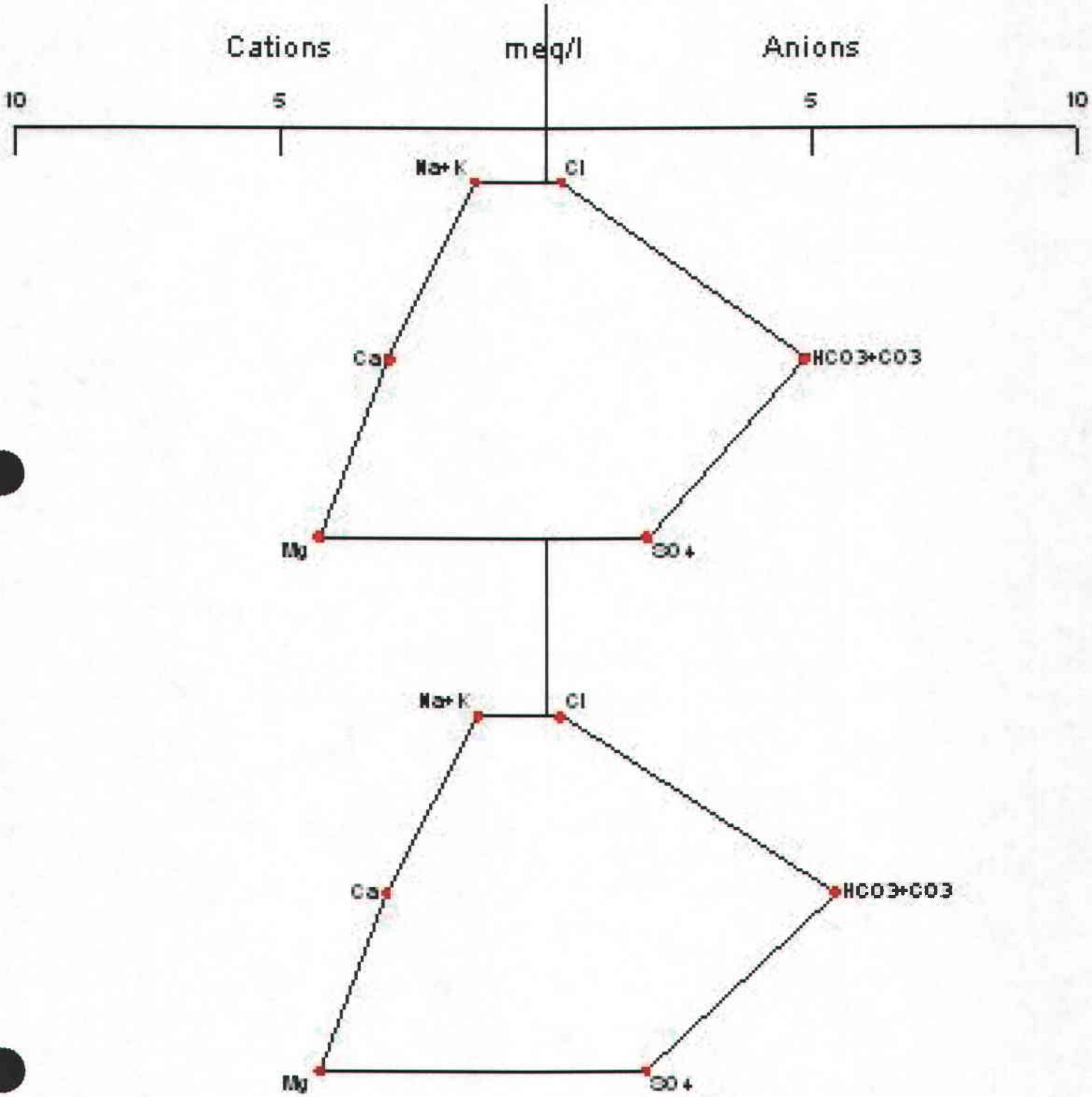
East Mountain Springs

EMS MF213



East Mountain Springs

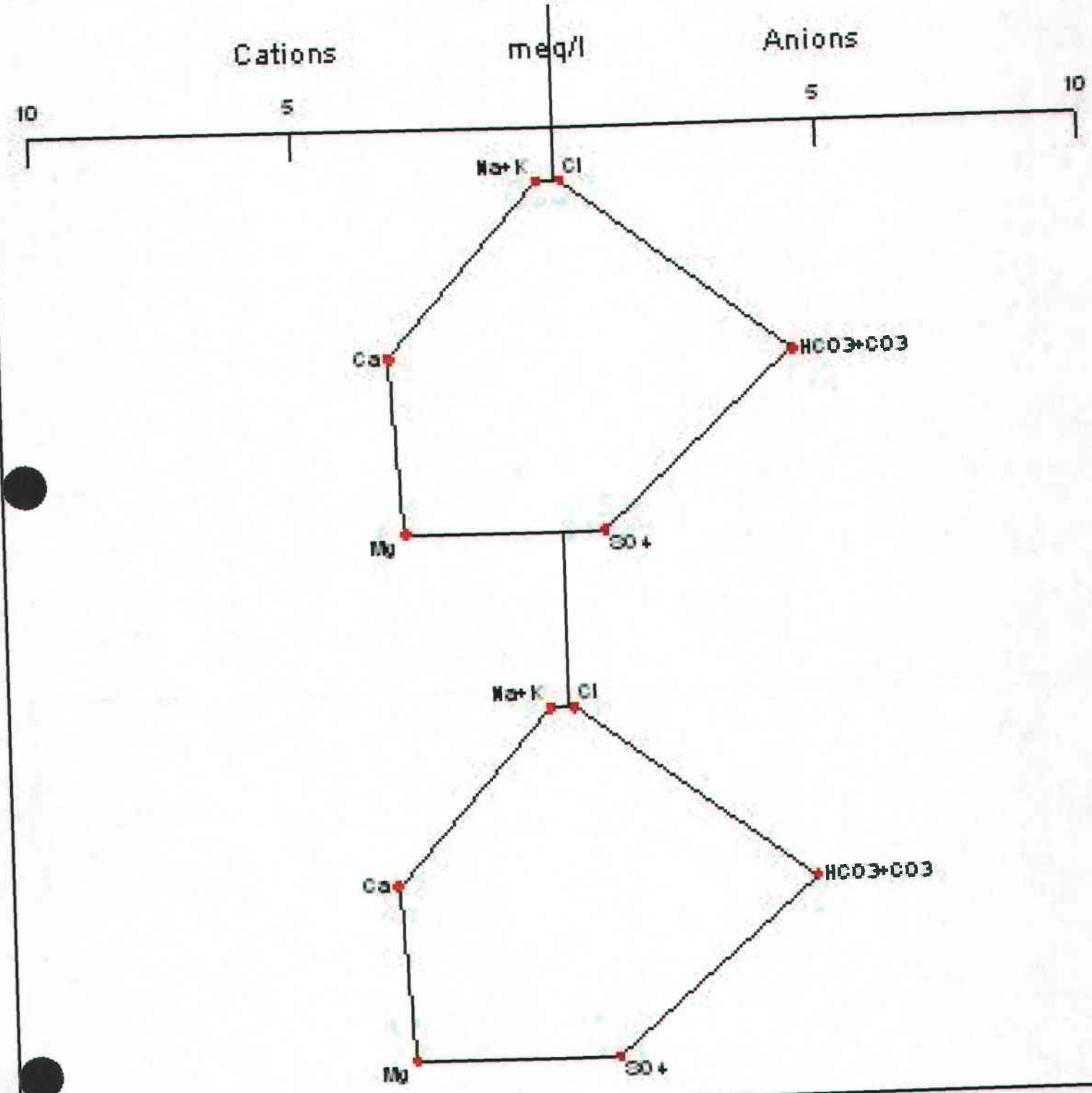
EMS 91-72



East Mountain Springs
Stiff Diagrams
Star Point Sandstone

East Mountain Springs

Little Bear

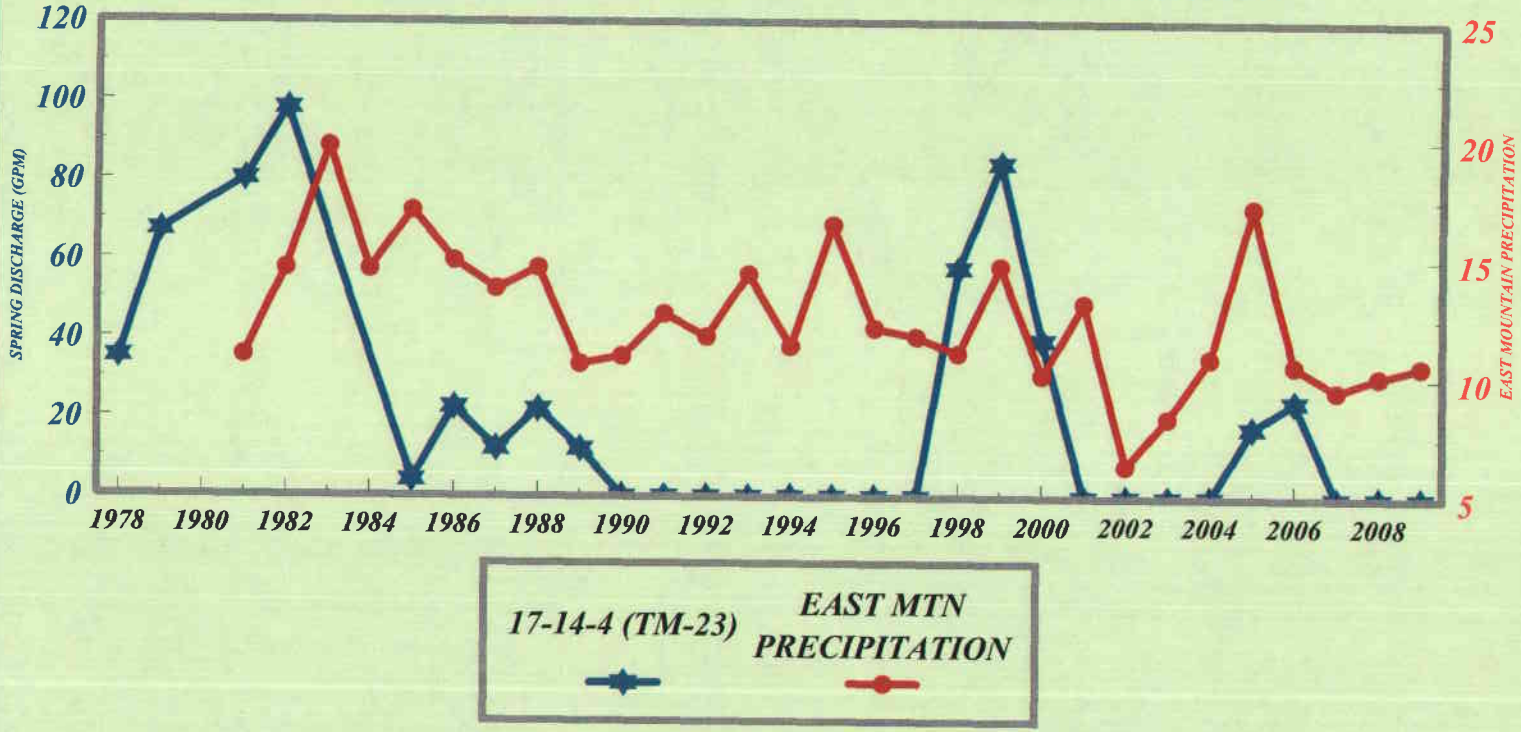


Trail Mountain Springs Flow vs Precipitation

TRAIL MOUNTAIN SPRINGS

Spring 17-14-4 vs. Precipitation

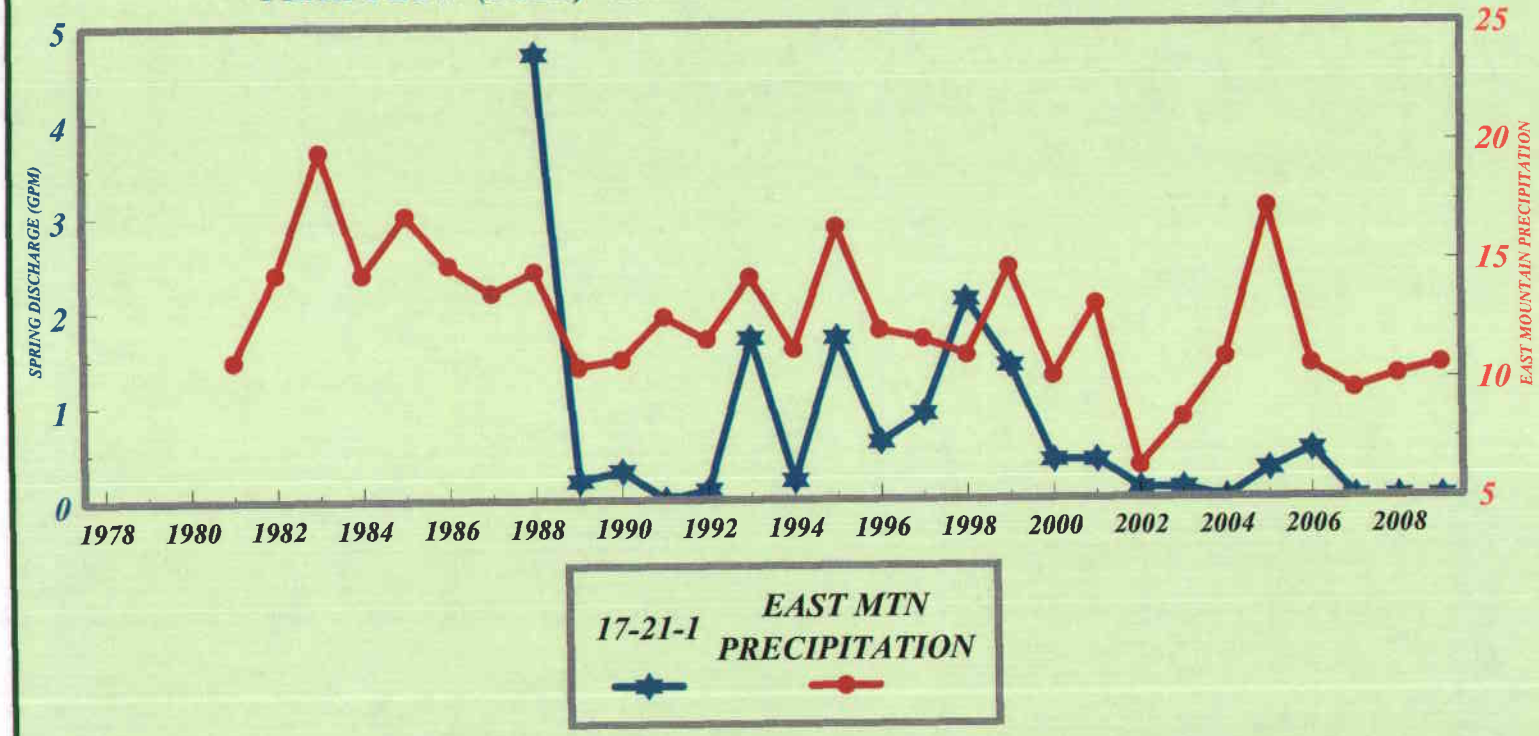
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



TRAIL MOUNTAIN SPRINGS

Spring 17-21-1 vs. Precipitation

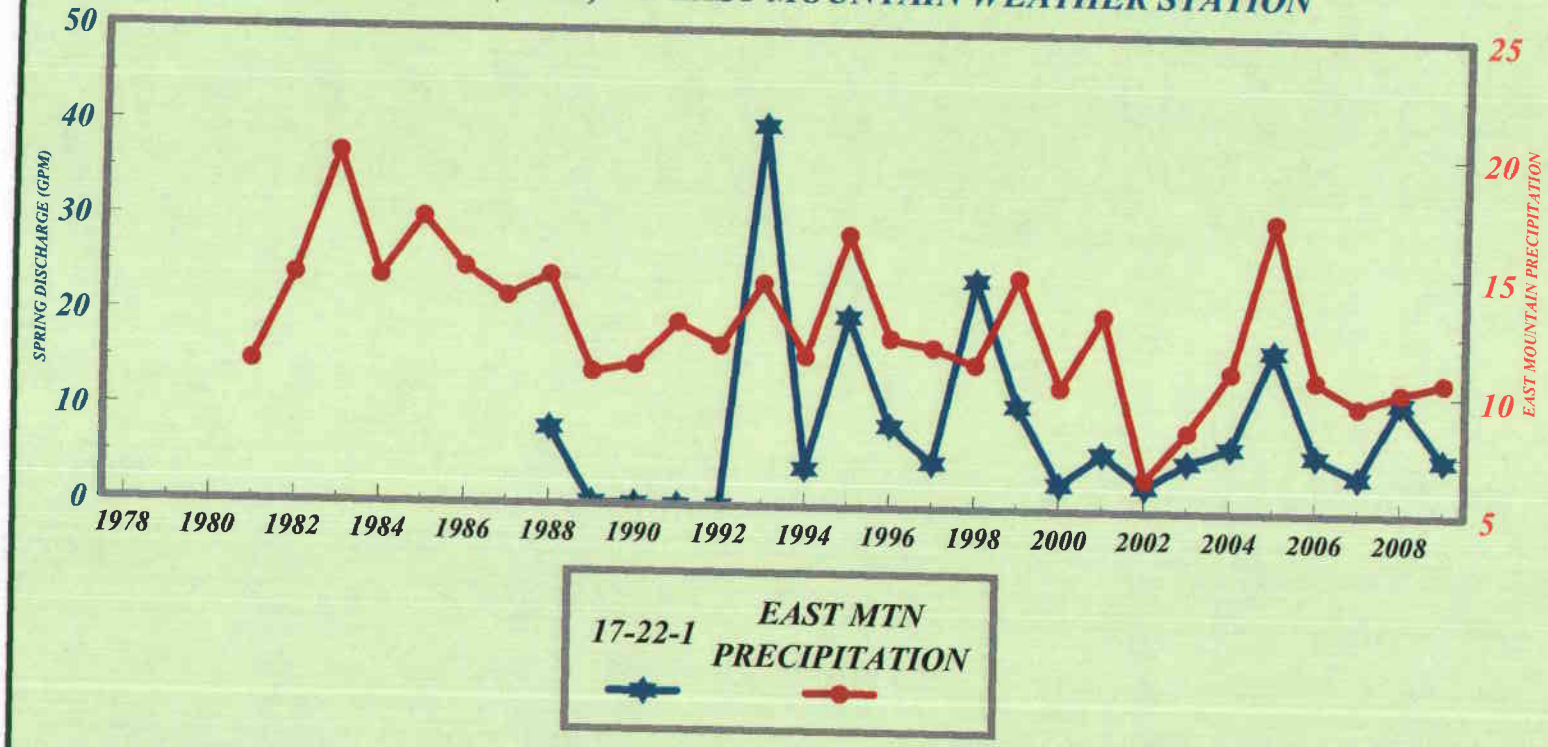
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



TRAIL MOUNTAIN SPRINGS

Spring 17-22-1 vs. Precipitation

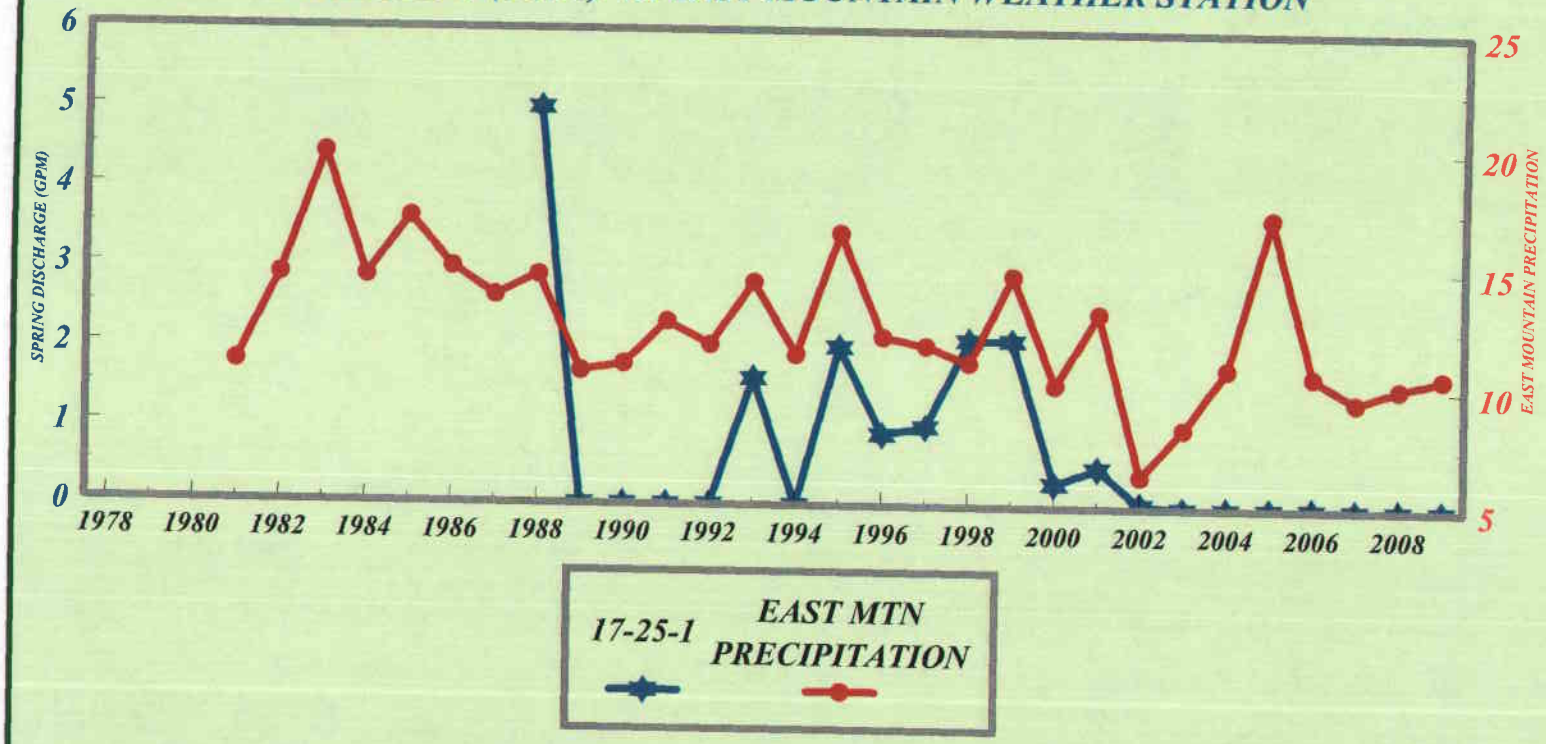
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



TRAIL MOUNTAIN SPRINGS

Spring 17-25-1 vs. Precipitation

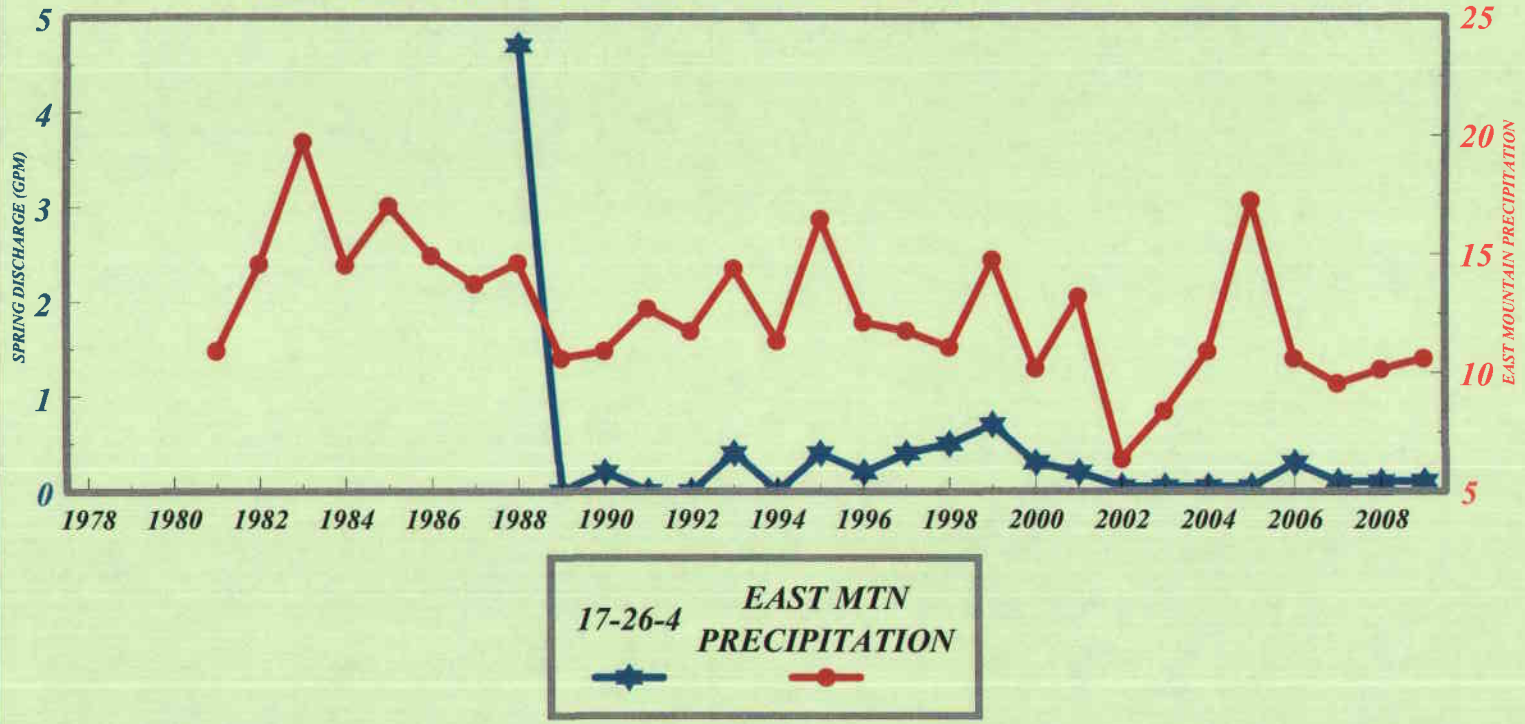
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



TRAIL MOUNTAIN SPRINGS

Spring 17-26-4 vs. Precipitation

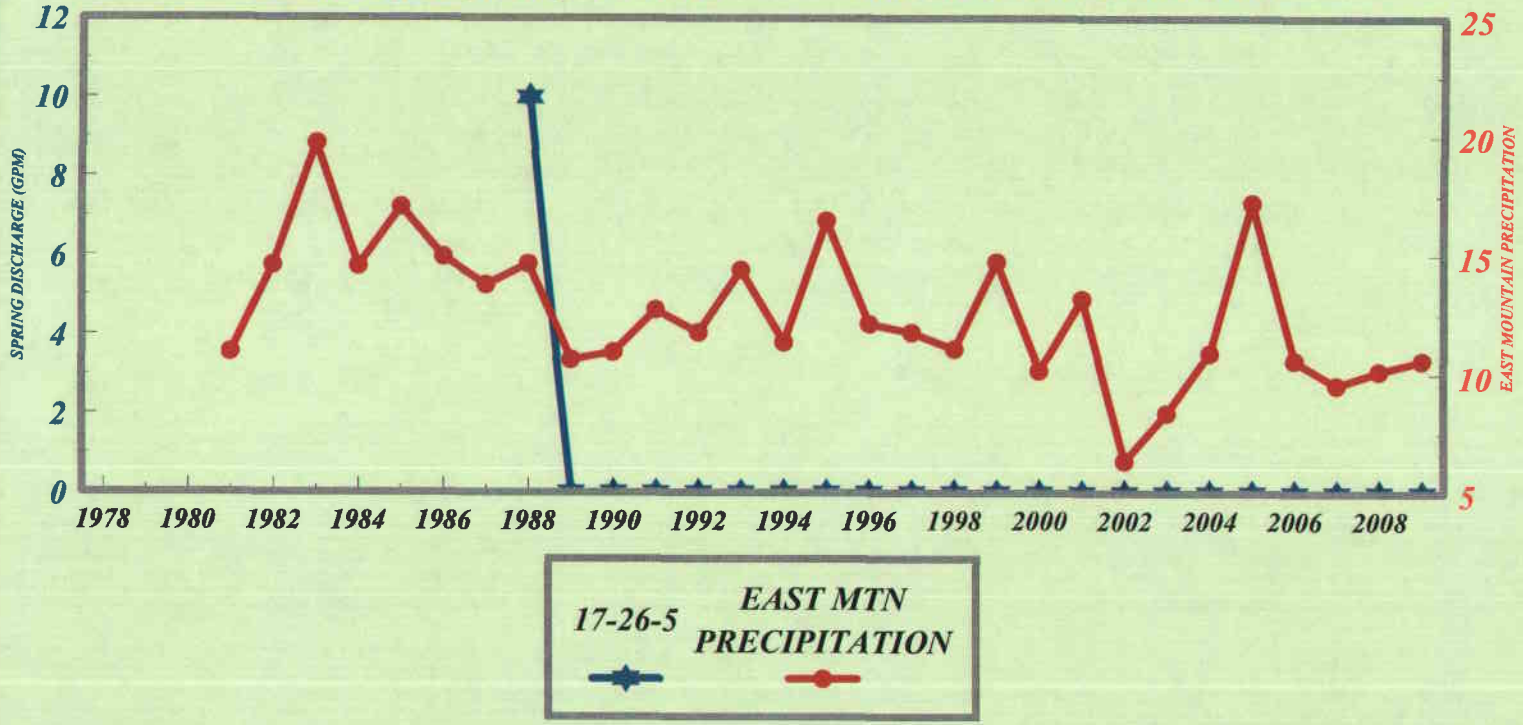
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



TRAIL MOUNTAIN SPRINGS

Spring 17-26-5 vs. Precipitation

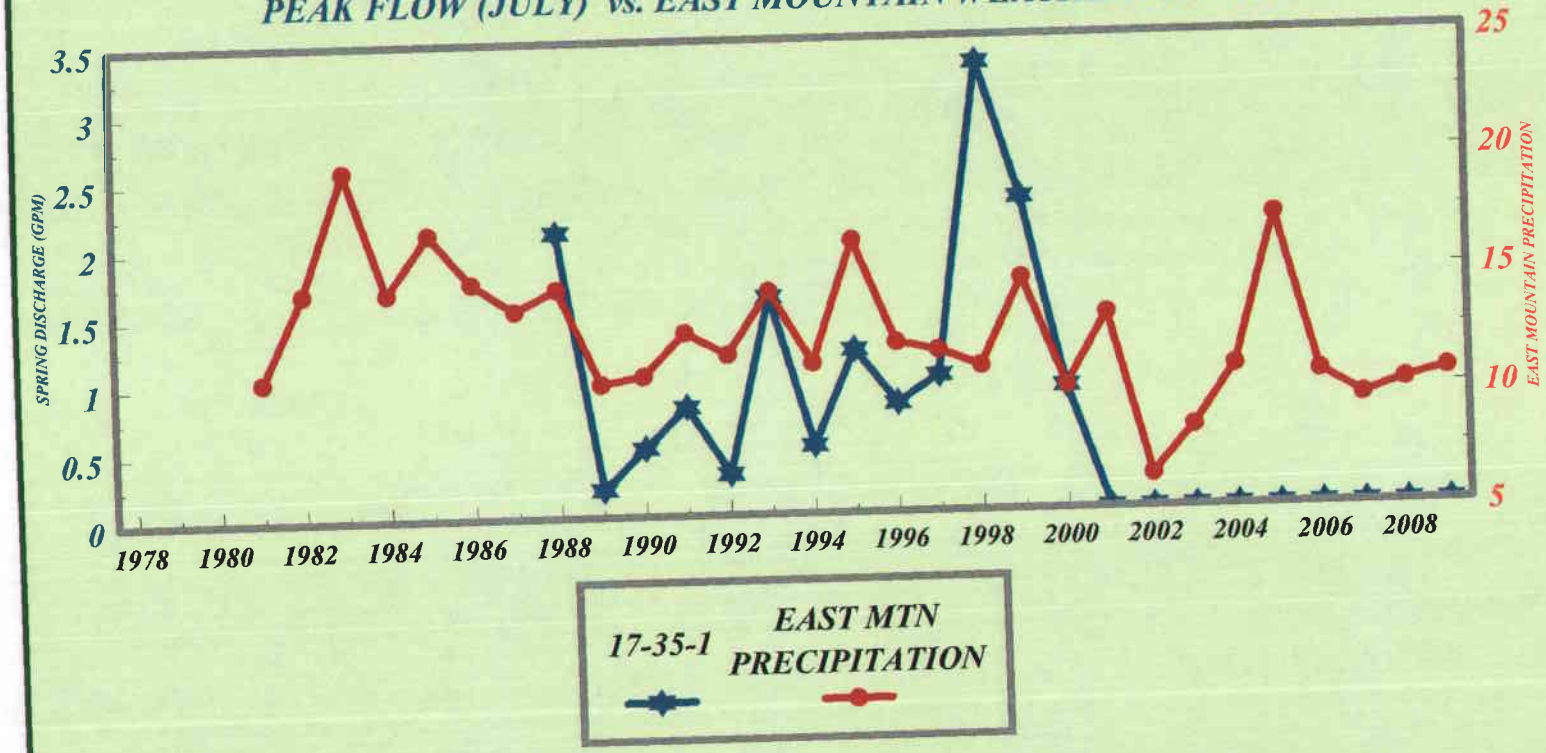
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



TRAIL MOUNTAIN SPRINGS

Spring 17-35-1 vs. Precipitation

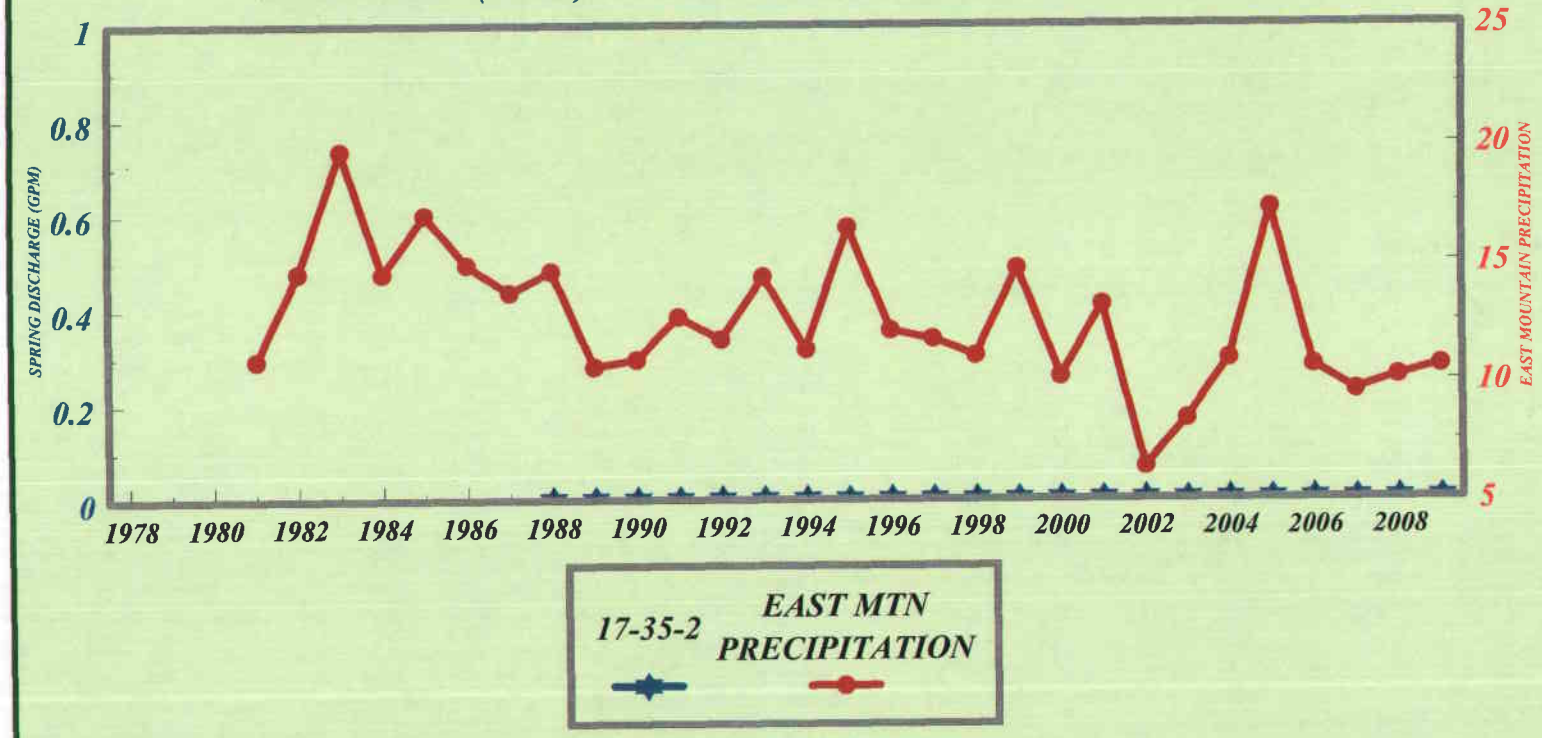
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



TRAIL MOUNTAIN SPRINGS

Spring 17-35-2 vs. Precipitation

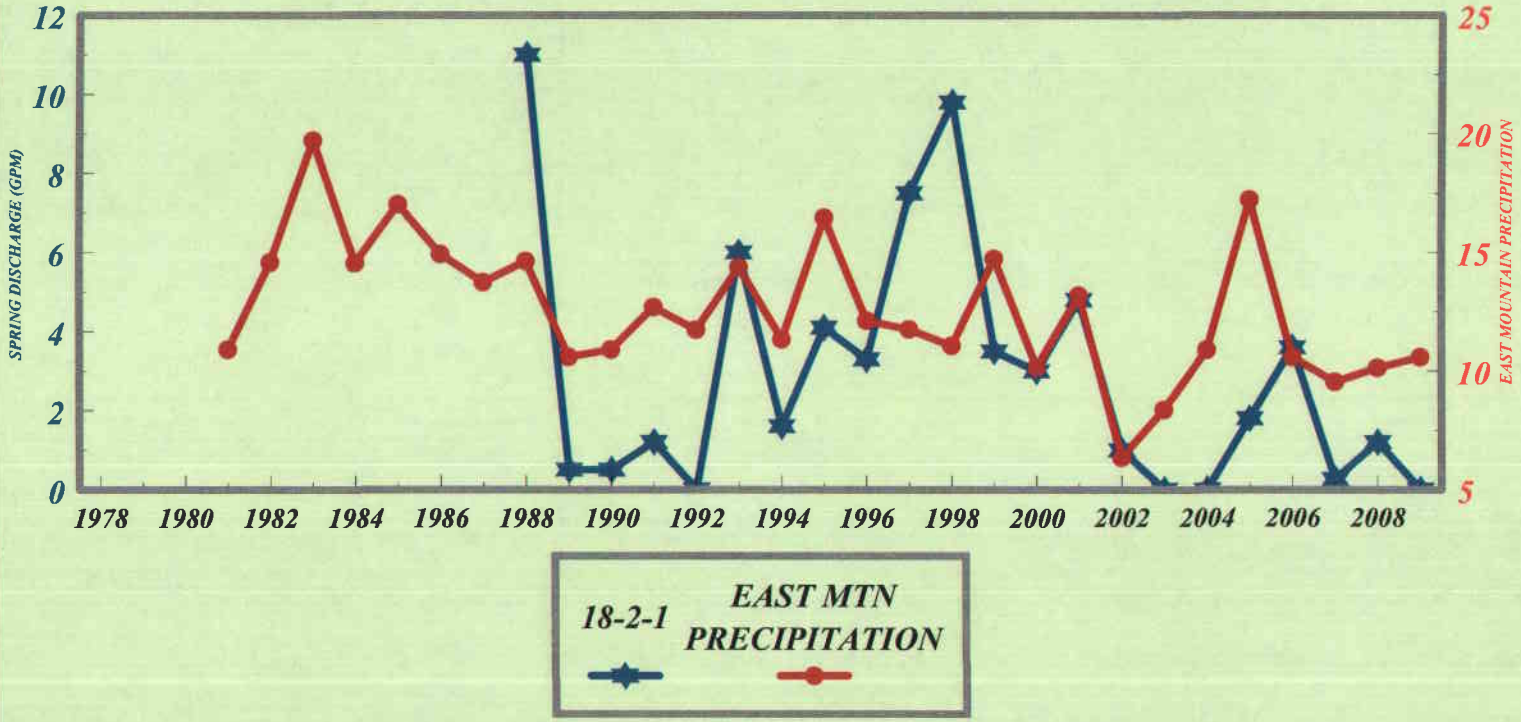
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



TRAIL MOUNTAIN SPRINGS

Spring 18-2-1 vs. Precipitation

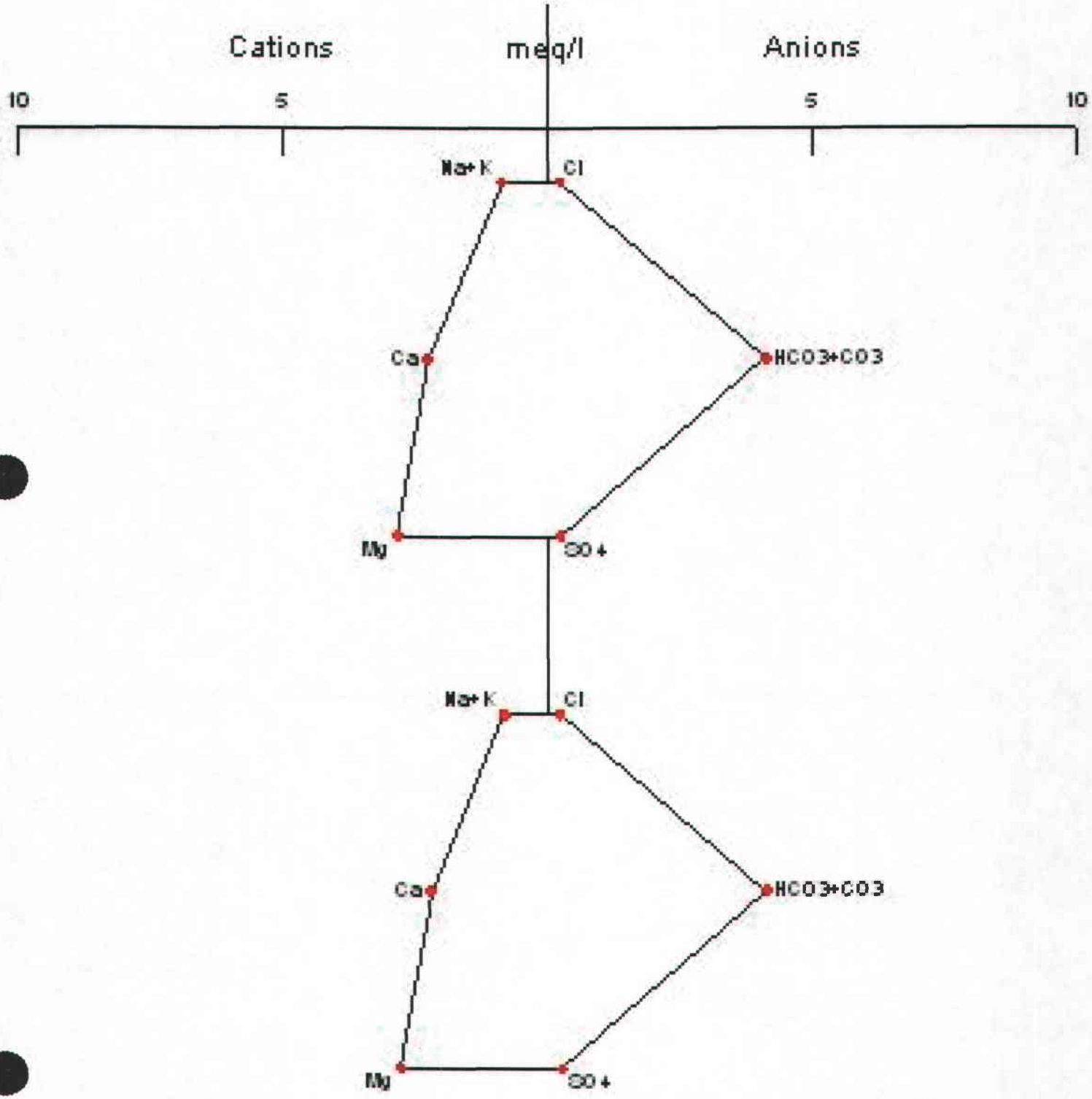
PEAK FLOW (JULY) vs. EAST MOUNTAIN WEATHER STATION



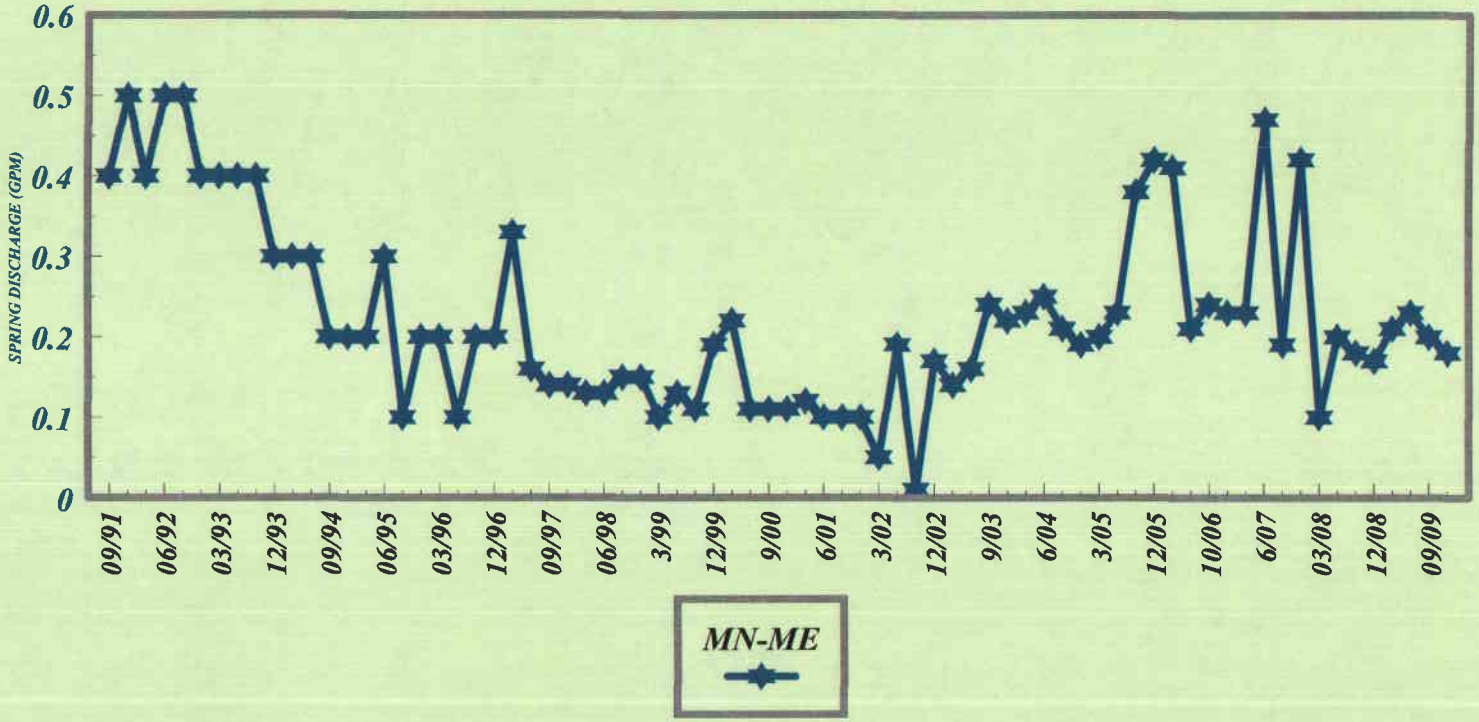
Trail Mountain Springs
Stiff Diagrams
North Horn Formation

Trail Mountain Springs

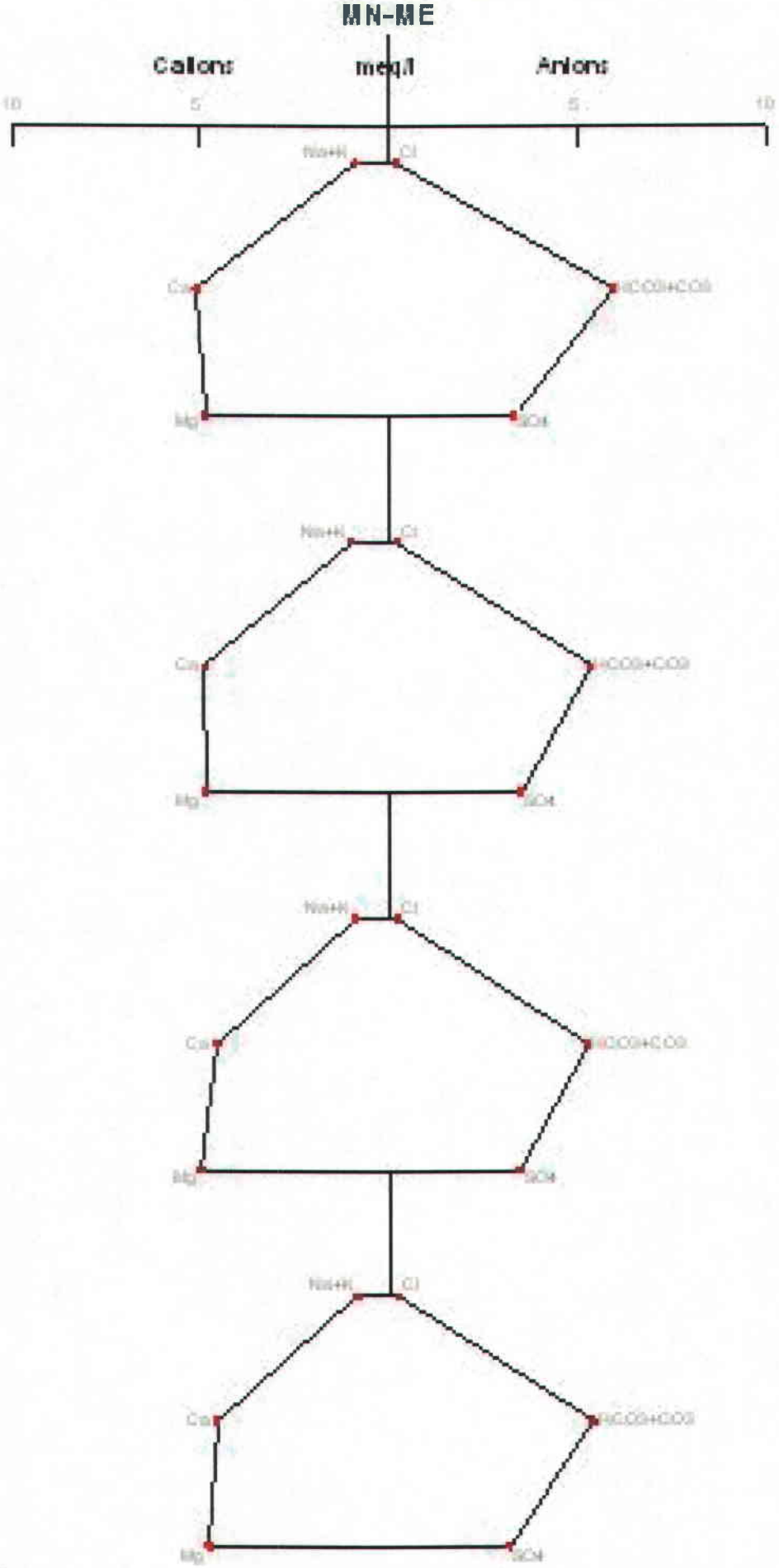
17-22-1



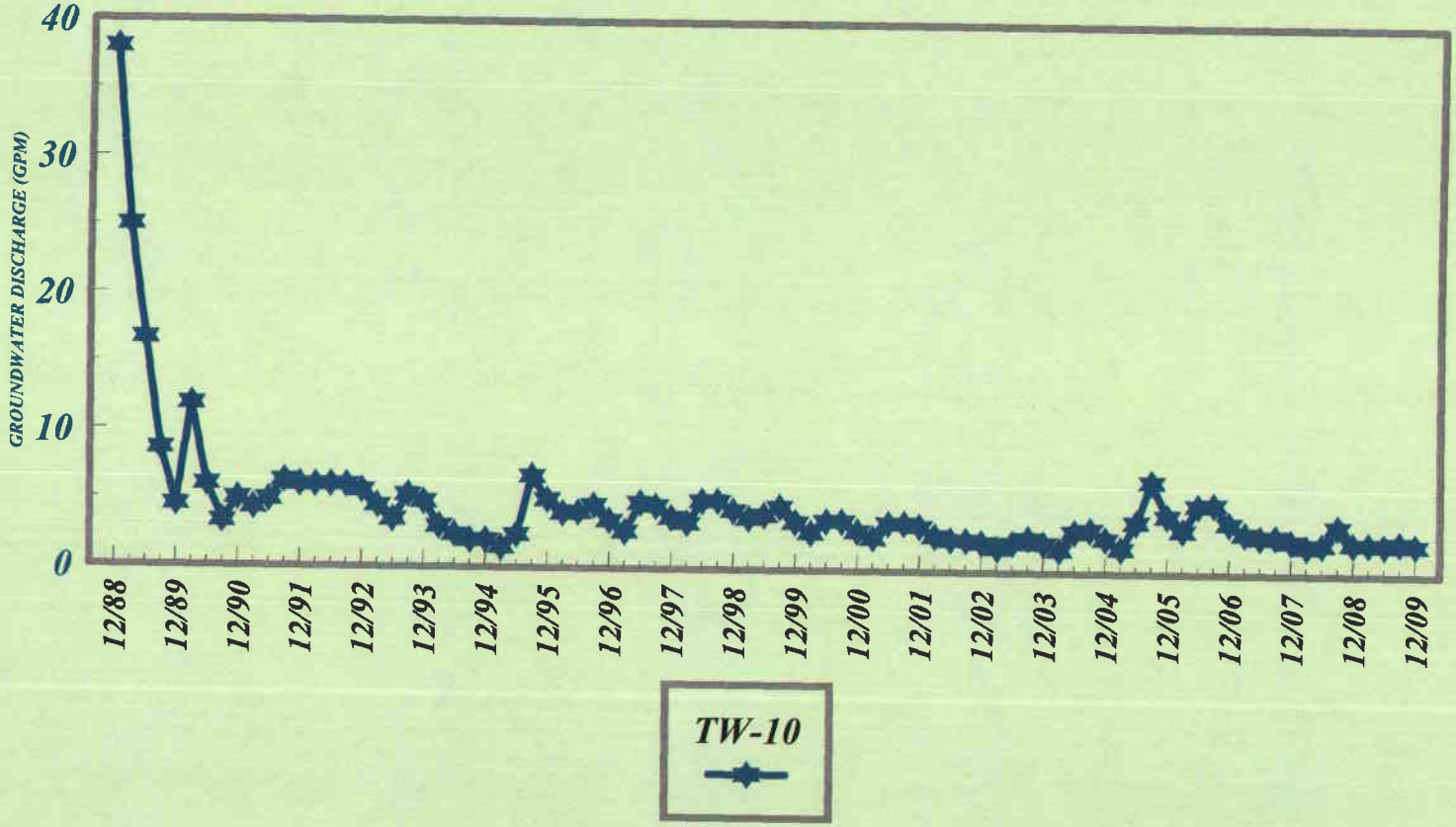
Deer Creek In-Mine Monitoring
Main North - Main East



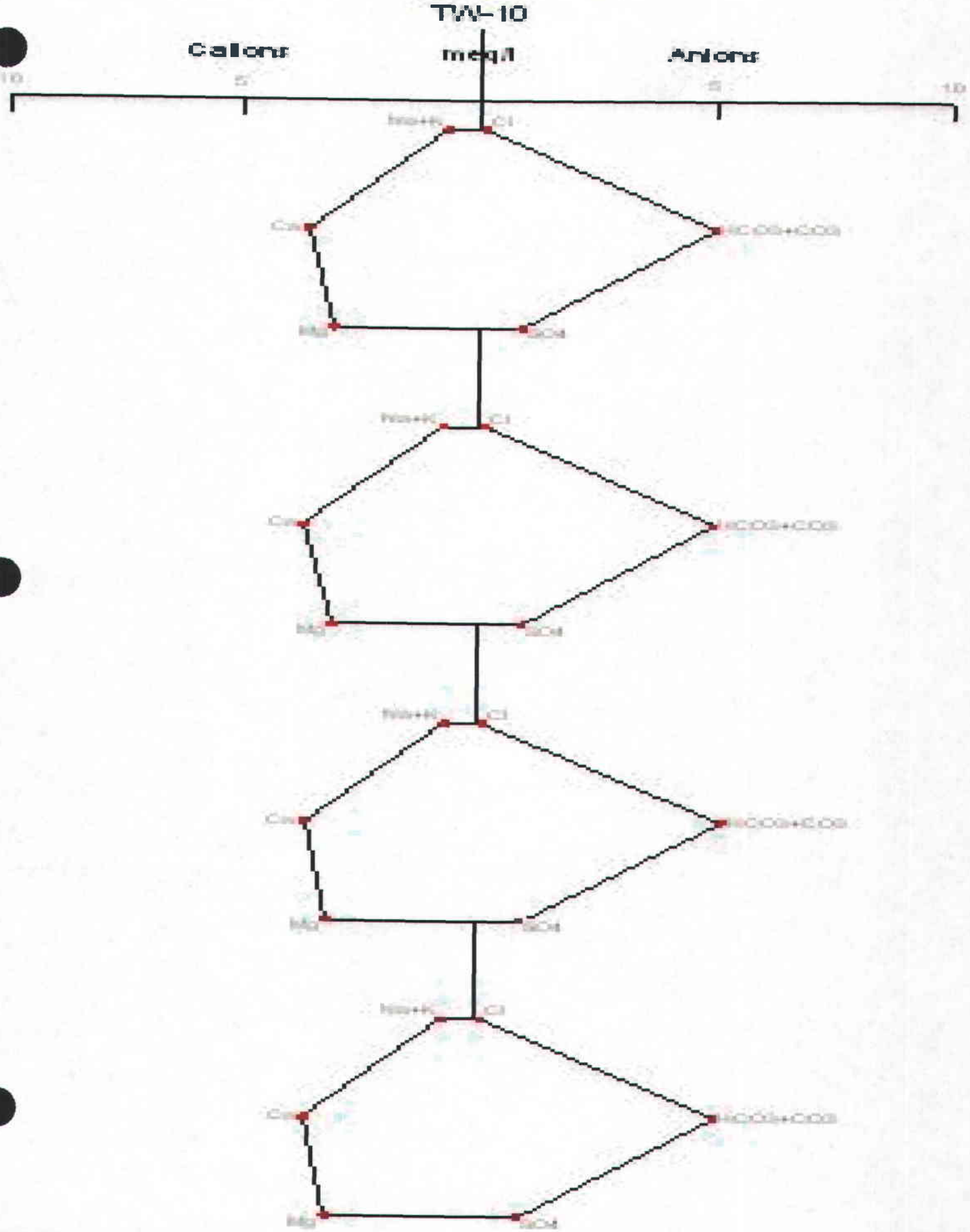
Deer Creek In-Mine



Deer Creek In-Mine Monitoring
3rd North xc-65 (TW-10)



Deer Creek In-Mine



ENERGY WEST MINING COMPANY EAST MOUNTAIN PRECIPITATION HISTORICAL COMPARISON													
YEAR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
1981	1.28	0.39	0.05	0.29	0.52	2.77	0.64	0.87	0.11	0.57	0.85	2.55	**10.90**
1982	1.93	0.53	0.97	3.22	0.14	1.67	0.00	0.45	0.09	1.86	1.10	2.61	**14.57**
1983	0.38	2.90	1.39	1.30	1.81	1.98	0.92	0.71	0.61	1.27	4.83	1.62	**19.71**
1984	0.76	2.43	2.42	0.27	0.65	1.22	0.50	0.22	1.18	1.90	2.33	0.64	**14.53**
1985	3.27	0.97	1.67	0.49	0.59	1.77	1.35	1.73	0.28	2.47	0.12	2.31	**17.02**
1986	1.15	2.38	0.87	0.30	2.10	1.43	1.05	0.38	0.53	0.87	2.24	1.63	**14.92**
1987	1.57	0.39	0.16	1.37	1.37	1.65	1.16	1.77	0.58	2.49	1.16	0.06	**13.73**
1988	2.77	1.91	1.29	1.42	0.00	0.99	2.08	1.03	0.81	0.45	0.96	0.91	**14.62**
1989	0.61	0.43	1.56	1.00	0.68	1.03	0.26	0.47	0.43	1.19	2.44	0.49	**10.59**
1990	0.28	0.39	0.16	0.74	2.08	1.75	1.03	0.26	0.67	0.88	1.03	1.62	**10.90**
1991	0.48	0.26	0.66	0.34	0.39	2.34	0.59	1.83	0.21	1.01	1.48	3.11	**12.69**
1992	0.49	1.07	0.07	0.61	1.73	2.39	0.56	2.19	0.95	0.85	0.48	0.35	**11.74**
1993	1.57	0.57	1.53	4.10	2.34	2.01	0.33	0.72	0.19	0.04	0.82	0.14	**14.37**
1994	2.23	1.12	0.14	0.32	1.35	0.34	2.65	0.36	0.39	0.10	0.83	1.49	**11.33**
1995	1.86	1.42	0.65	1.37	0.66	0.79	3.75	2.29	1.19	0.34	1.52	0.62	**16.46**
1996	0.18	0.46	0.64	1.39	1.18	2.23	0.21	1.14	0.30	0.58	0.35	3.46	**12.12**
1997	1.50	1.63	1.66	2.49	1.56	0.00	0.40	0.91	0.15	0.15	1.30	2.43	**11.75**
1998	0.24	0.84	0.23	0.97	3.34	0.71	0.81	0.37	0.04	0.78	0.57	2.16	**11.05**
1999	3.01	1.08	0.00	0.75	0.34	0.07	2.82	0.36	1.21	2.08	2.24	0.78	**14.73**
2000	0.04	0.05	0.28	0.48	3.27	1.56	0.15	0.72	0.59	0.03	2.03	0.96	**10.16**
2001	3.48	0.62	0.39	1.96	1.21	1.03	1.12	1.39	0.19	0.58	1.09	0.12	**13.17**
2002	0.11	0.40	0.18	0.03	0.19	0.10	0.16	0.00	0.06	0.26	0.69	4.15	**6.34**
2003	0.73	0.82	0.75	0.01	0.96	1.20	0.37	0.57	0.37	0.06	1.59	0.94	**8.36**
2004	0.27	0.86	1.95	0.21	2.73	0.00	1.94	0.12	1.27	0.49	0.67	0.38	**10.89**
2005	2.56	2.06	1.16	3.47	1.41	0.63	1.19	1.04	1.36	0.44	0.83	1.07	**17.22**
2006	1.44	0.64	0.98	0.87	0.41	3.67	0.44	0.03	0.55	0.58	0.50	0.48	**10.59**
2007	3.66	0.21	0.48	0.25	0.18	0.96	0.98	0.19	0.05	0.70	0.89	0.99	**9.54**
2008	0.87	1.74	1.44	0.95	1.36	0.27	0.47	1.06	0.17	0.16	1.53	0.12	**10.14**
2009	0.47	0.54	1.51	0.42	1.48	0.18	0.93	2.10	1.26	0.49	0.75	0.45	**10.58**
MIN	**0.04**	**0.05**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.04**	**0.03**	**0.12**	**0.06**	**6.34**
MEAN	**1.35**	**1.00**	**0.87**	**1.08**	**1.24**	**1.27**	**0.99**	**0.87**	**0.54**	**0.82**	**1.28**	**1.33**	**12.58**
MAX	**3.66**	**2.90**	**2.42**	**4.10**	**3.34**	**3.67**	**3.75**	**2.29**	**1.36**	**2.49**	**4.83**	**4.15**	**19.71**
ST DEV	**1.09**	**0.74**	**0.65**	**1.03**	**0.90**	**0.90**	**0.87**	**0.67**	**0.42**	**0.70**	**0.91**	**1.08**	**2.86**

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR					
DATE	TIME	PRECIPITATION			
10/04/08	11:29 AM	Start			
10/05/08	1:41 AM	Stop	0.43		
10/05/08	11:32 PM	Start			
10/06/08	1:56 AM	Stop	0.04	0.47	Inches Oct-08
11/02/08	4:50 PM	Start			
11/02/08	10:51 PM	Stop	0.05		
11/04/08	11:31 AM	Start			
11/04/08	1:42 PM	Stop	0.03		
11/26/08	1:18 PM	Start			
11/26/08	4:09 PM	Stop	0.38		
11/26/08	10:52 PM	Start			
11/26/08	11:50 PM	Stop	0.04		
11/27/08	10:10 PM	Start			
11/27/08	11:36 PM	Stop	0.04	0.54	Inches Nov-08
12/05/08	7:36 AM	Start			
12/05/08	9:13 AM	Stop	0.02		
12/10/08	2:56 AM	Start			
12/10/08	5:20 AM	Stop	0.05		
12/21/08	9:33 AM	Start			
12/21/08	10:09 AM	Stop	0.61		
12/28/08	9:59 AM	Start			
12/28/08	10:49 AM	Stop	0.83	1.51	Inches Dec-08
01/09/09	2:32 AM	Start			
01/09/09	4:05 AM	Stop	0.08		
01/11/09	1:00 PM	Start			
01/11/09	3:23 PM	Stop	0.02		
01/13/09	8:44 AM	Start			
01/13/09	10:15 AM	Stop	0.05		
01/23/09	12:28 AM	Start			
01/23/09	11:29 AM	Stop	0.06		
01/24/09	7:46 AM	Start			
01/24/09	11:02 AM	Stop	0.08		
01/25/09	5:02 PM	Start			
01/25/09	9:56 PM	Stop	0.08		
01/28/09	8:24 PM	Start			
01/28/09	9:13 PM	Stop	0.01		
01/29/09	1:12 PM	Start			
01/29/09	2:33 PM	Stop	0.04	0.42	Inches Jan-09
02/02/09	1:25 AM	Start			

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR					
DATE	TIME	PRECIPITATION			
02/02/09	2:14 AM	Stop	0.01		
02/06/09	12:37 PM	Start			
02/06/09	1:24 PM	Stop	0.03		
02/09/09	4:57 AM	Start			
02/09/09	9:22 AM	Stop	0.86		
02/11/09	6:12 AM	Start			
02/11/09	6:17 AM	Stop	0.09		
02/13/09	5:12 AM	Start			
02/13/09	7:18 AM	Stop	0.11		
02/18/09	8:41 AM	Start			
02/18/09	9:45 AM	Stop	0.13		
02/19/09	6:29 AM	Start			
02/19/09	7:26 AM	Stop	0.03		
02/20/09	10:57 AM	Start			
02/20/09	12:04 PM	Stop	0.02		
02/22/09	10:24 PM	Start			
02/26/09	8:12 AM	Stop	0.20	1.48	Inches Feb-09
03/09/09	5:01 PM	Start			
03/09/09	6:14 PM	Stop	0.03		
03/27/09	9:07 AM	Start			
03/28/09	12:42 AM	Stop	0.03		
03/31/09	10:33 AM	Start			
04/01/09	3:58 AM	Stop	0.12	0.18	Inches Mar-09
04/02/09	4:40 PM	Start			
04/02/09	10:42 PM	Stop	0.07		
04/03/09	9:57 AM	Start			
04/03/09	1:09 PM	Stop	0.10		
04/04/09	10:33 AM	Start			
04/04/09	3:42 PM	Stop	0.03		
04/08/09	11:11 AM	Start			
04/08/09	3:25 PM	Stop	0.02		
04/11/09	1:52 AM	Start			
04/12/09	5:07 AM	Stop	0.53		
04/15/09	11:27 AM	Start			
04/15/09	2:36 PM	Stop	0.11		
04/25/09	2:52 PM	Start			
04/25/09	9:19 PM	Stop	0.07	0.93	Inches Apr-09
05/02/09	2:09 AM	Start			
05/02/09	6:02 PM	Stop	0.35		
05/03/09	5:50 AM	Start			
05/03/09	12:14 PM	Stop	0.02		
05/22/09	2:12 PM	Start			

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR				
DATE	TIME	PRECIPITATION		
05/24/09	1:43 AM	Stop	1.21	
05/24/09	12:37 PM	Start		
05/24/09	11:38 PM	Stop	0.05	
05/25/09	4:55 PM	Start		
05/25/09	7:38 PM	Stop	0.01	
05/26/09	1:24 PM	Start		
05/26/09	5:07 PM	Stop	0.10	
05/27/09	9:12 AM	Start		
05/27/09	7:40 PM	Stop	0.05	
05/28/09	6:33 PM	Start		
05/28/09	9:15 PM	Stop	0.31	2.10 Inches May-09
06/02/09	1:40 AM	Start		
06/02/09	3:05 AM	Stop	0.05	
06/02/09	11:24 AM	Start		
06/02/09	12:37 PM	Stop	0.03	
06/10/09	1:53 PM	Start		
06/11/09	3:29 AM	Stop	0.08	
06/11/09	5:53 PM	Start		
06/11/09	6:53 PM	Stop	0.07	
06/11/09	10:29 PM	Start		
06/12/09	12:54 AM	Stop	0.16	
06/14/09	11:24 PM	Start		
06/15/09	1:23 AM	Stop	0.01	
06/17/09	9:04 AM	Start		
06/17/09	12:23 PM	Stop	0.04	
06/20/09	7:15 PM	Start		
06/21/09	3:03 AM	Stop	0.42	
06/21/09	11:13 PM	Start		
06/22/09	7:10 AM	Stop	0.04	
06/25/09	12:28 AM	Start		
06/25/09	1:39 AM	Stop	0.04	
06/25/09	5:27 PM	Start		
06/26/09	1:10 AM	Stop	0.17	
06/26/09	6:07 PM	Start		
06/26/09	5:40 PM	Stop	0.15	1.26 Inches Jun-09
07/01/09	11:37 AM	Start		
07/01/09	2:04 PM	Stop	0.03	
07/11/09	9:49 PM	Start		
07/11/09	11:41 PM	Stop	0.05	
07/12/09	2:12 PM	Start		
07/12/09	4:57 PM	Stop	0.06	
07/24/09	2:30 PM	Start		
07/24/09	7:07 PM	Stop	0.07	
07/25/09	5:48 PM	Start		

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR					
DATE	TIME	PRECIPITATION			
07/25/09	7:16 PM	Stop	0.24		
07/26/09	8:33 AM	Start			
07/26/09	9:41 AM	Stop	0.04	0.49	Inches Jul-09
08/06/09	6:04 PM	Start			
08/06/09	7:38 PM	Stop	0.05		
08/07/09	12:30 AM	Start			
08/07/09	1:26 AM	Stop	0.16		
08/15/09	1:39 AM	Start			
08/15/09	1:39 AM	Stop	0.14		
08/23/09	12:20 PM	Start			
08/24/09	2:29 AM	Stop	0.38		
08/26/09	12:39 AM	Start			
08/26/09	1:26 AM	Stop	0.02	0.75	Inches Aug-09
09/05/09	4:50 PM	Start			
09/06/09	1:15 AM	Stop	0.05		
09/13/09	4:25 PM	Start			
09/13/09	11:43 PM	Stop	0.08		
09/14/09	6:44 PM	Start			
09/15/09	2:19 AM	Stop	0.28		
09/19/09	11:44 PM	Start			
09/20/09	1:00 AM	Stop	0.04	0.45	Inches Sep-09
				10.58	TOTAL 2009

EAST MOUNTAIN TEMPERATURES - HISTORICAL SUMMARY

	OCTOBER SUMMARY	
	HIGH	LOW
AVG.	49.6	33.0
MAX.	78.2	55.8
MIN.	11.6	4.3

	NOVEMBER SUMMARY	
	HIGH	LOW
AVG.	35.8	23.1
MAX.	61.6	54.7
MIN.	6.6	-4.8

	DECEMBER SUMMARY	
	HIGH	LOW
AVG.	29.4	15.2
MAX.	62.5	45.0
MIN.	-2.6	-17.6

	JANUARY SUMMARY	
	HIGH	LOW
AVG.	31.0	16.6
MAX.	63.2	53.8
MIN.	2.0	-15.2

	FEBRUARY SUMMARY	
	HIGH	LOW
AVG.	33.2	17.3
MAX.	57.2	40.0
MIN.	-2.3	-14.7

	MARCH SUMMARY	
	HIGH	LOW
AVG.	40.0	21.8
MAX.	70.9	49.8
MIN.	7.4	-6.6

	APRIL SUMMARY	
	HIGH	LOW
AVG.	47.5	27.9
MAX.	77.2	52.9
MIN.	12.7	-0.3

	MAY SUMMARY	
	HIGH	LOW
AVG.	57.6	36.7
MAX.	89.0	64.3
MIN.	15.8	1.8

	JUNE SUMMARY	
	HIGH	LOW
AVG.	68.6	46.2
MAX.	92.6	74.1
MIN.	27.7	13.1

	JULY SUMMARY	
	HIGH	LOW
AVG.	76.19	53.73
MAX.	96.00	72.01
MIN.	48.47	20.39

	AUGUST SUMMARY	
	HIGH	LOW
AVG.	73.5	52.4
MAX.	94.9	73.4
MIN.	35.8	31.8

	SEPTEMBER SUMMARY	
	HIGH	LOW
AVG.	63.5	43.5
MAX.	85.6	65.0
MIN.	31.6	17.6

HISTORICAL SUMMARY - 1981 through 2009		
PARAMETER	DATE	TEMP
AVERAGE HIGH	NA	50.50
MAXIMUM HIGH	07/13/2002	96.00
AVG. MAX. HIGH	NA	77.41
MINIMUM HIGH	12/22/1991	-2.64
AVG. MIN. HIGH	NA	16.23
AVERAGE LOW	NA	32.30
MAXIMUM LOW	06/28/1993	74.12
AVG. MAX. LOW	NA	58.40
MINIMUM LOW	12/22/1990	-17.61
AVG. MIN. LOW	NA	2.47

EAST MOUNTAIN TEMPERATURES- 2009 WATER YEAR

	Oct-08	SUMMARY
	HIGH	LOW
AVG.	59.1	38.9
MAX.	78.2	53.8
MIN.	39.2	16.7

49.0

	Nov-08	SUMMARY
	HIGH	LOW
AVG.	45.1	30.2
MAX.	61.6	45.6
MIN.	25.2	13.2

37.7

	Dec-08	SUMMARY
	HIGH	LOW
AVG.	30.4	14.6
MAX.	52.7	37.8
MIN.	9.8	-1.8

22.5

	Jan-09	SUMMARY
	HIGH	LOW
AVG.	41.0	25.8
MAX.	58.0	37.7
MIN.	18.2	3.9

33.4

	Feb-09	SUMMARY
	HIGH	LOW
AVG.	36.9	20.4
MAX.	53.6	32.1
MIN.	26.2	11.4

Station out of service 3/3 - 3/9/09

	Mar-09	SUMMARY
	HIGH	LOW
AVG.	31.6	17.2
MAX.	63.1	39.3
MIN.	24.3	7.8

	Apr-09	SUMMARY
	HIGH	LOW
AVG.	44.9	23.8
MAX.	63.0	42.5
MIN.	19.5	8.5

	May-09	SUMMARY
	HIGH	LOW
AVG.	65.3	42.7
MAX.	83.1	55.9
MIN.	48.3	33.2

	Jun-09	SUMMARY
	HIGH	LOW
AVG.	65.4	44.0
MAX.	82.5	57.9
MIN.	52.4	35.1

28.6

	Jul-09	SUMMARY
	HIGH	LOW
AVG.	75.2	52.2
MAX.	85.6	59.8
MIN.	64.0	41.9

24.4

	Aug-09	SUMMARY
	HIGH	LOW
AVG.	72.8	48.8
MAX.	85.1	58.9
MIN.	61.2	35.7

34.3

	Sep-09	SUMMARY
	HIGH	LOW
AVG.	71.2	47.9
MAX.	81.1	58.2
MIN.	57.7	22.4

54.0

2009 SUMMARY		
PARAMETER	DATE	TEMP
AVG. HIGH	#N/A	53.2
MAX. HIGH	07/17/09	85.6
MIN. HIGH	12/26/08	9.8
AVG. LOW	#N/A	33.9
MAX. LOW	07/19/09	59.8
MIN. LOW	12/26/08	-1.8

ATABASE AS NEEDED

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR				
DATE	TIME	HIGH	LOW	
10/01/08	12:31 PM		53.8	Low
10/01/08	8:29 PM	78.16		High
10/02/08	11:41 AM		53.08	Low
10/02/08	4:50 PM	71.04		High
10/03/08	10:17 AM		49.21	Low
10/03/08	6:28 PM	65.33		High
10/04/08	1:52 AM	52.86		High
10/04/08	11:01 PM		38.89	Low
10/05/08	3:46 AM		36.6	Low
10/05/08	6:55 PM	46.76		High
10/06/08	9:12 AM		35.07	Low
10/06/08	7:06 PM	58.3		High
10/07/08	1:40 AM		39.6	Low
10/07/08	8:20 PM	62.1		High
10/08/08	5:38 AM		44.4	Low
10/08/08	7:41 PM	65.3		High
10/09/08	8:47 AM		44.0	Low
10/09/08	5:50 PM	67.4		High
10/10/08	8:47 AM		32.7	Low
10/10/08	6:04 PM	60.7		High
10/11/08	5:35 PM	48.13		High
10/11/08	9:45 PM		25.5	Low
10/12/08	9:13 AM		16.7	Low
10/12/08	3:06 PM	39.2		High
10/13/08	3:05 AM		18.0	Low
10/13/08	3:16 PM	43.7		High
10/14/08	5:56 AM		27.0	Low
10/14/08	6:50 PM	54.8		High
10/15/08	9:16 AM		36.1	Low
10/15/08	6:37 PM	58.3		High
10/16/08	9:49 AM		41.2	Low
10/16/08	7:08 PM	63.0		High
10/17/08	6:27 AM		42.1	Low
10/17/08	7:24 PM	65.5		High
10/18/08	9:44 AM		43.9	Low
10/18/08	7:23 PM	63.9		High
10/19/08	10:12 AM		44.2	Low
10/19/08	5:30 PM	60.1		High
10/20/08	9:21 AM		39.4	Low
10/20/08	5:04 PM	55.3		High
10/21/08	2:01 PM	47.9		High
10/21/08	10:58 PM		32.9	Low

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR				
DATE	TIME	HIGH	LOW	
10/22/08	9:20 AM		22.1	Low
10/22/08	7:06 PM	47.4		High
10/23/08	2:54 AM		34.1	Low
10/23/08	8:24 PM	54.0		High
10/24/08	7:40 AM		39.7	Low
10/24/08	6:01 PM	57.7		High
10/25/08	4:47 AM		40.6	Low
10/25/08	8:56 PM	64.3		High
10/26/08	9:59 AM		43.8	Low
10/26/08	6:31 PM	62.7		High
10/27/08	12:23 PM		44.0	Low
10/27/08	7:57 PM	63.6		High
10/28/08	1:50 AM		47.3	Low
10/28/08	8:09 PM	65.4		High
10/29/08	11:39 AM		47.6	Low
10/29/08	8:21 PM	65.5		High
10/30/08	5:43 AM		46.8	Low
10/30/08	6:42 PM	65.4		High
10/31/08	5:18 AM		45.8	Low
10/31/08	5:13 PM	58.1		High
11/01/08	10:56 AM		44.1	Low
11/01/08	5:56 PM	60.21		High
11/02/08	6:17 AM	48.46		High
11/02/08	7:09 PM		37.6	Low
11/03/08	9:49 AM		30.92	Low
11/03/08	11:30 AM	54.19		High
11/04/08	8:48 AM	43.58		High
11/04/08	10:57 PM		20.69	Low
11/05/08	8:45 AM	25.17		High
11/05/08	7:37 PM		16.99	Low
11/06/08	3:51 AM		13.15	Low
11/06/08	12:50 PM	35.65		High
11/07/08	1:52 AM		27.06	Low
11/07/08	10:37 AM	48.25		High
11/08/08	3:04 AM		33.1	Low
11/08/08	10:28 AM	51.5		High
11/09/08	10:32 AM	41.5		High
11/09/08	7:12 PM		27.4	Low
11/10/08	2:25 AM		27.6	Low
11/10/08	10:33 AM	41.0		High
11/11/08	3:56 AM		28.1	Low
11/11/08	10:58 AM	43.2		High
11/12/08	3:08 AM		27.6	Low
11/12/08	12:23 PM	49.66		High
11/13/08	1:30 AM		34.6	Low
11/13/08	9:18 AM	51.3		High

	Oct-08	SUMMARY
	HIGH	LOW
AVG.	61.0	40.2
MAX.	78.2	53.8
MIN.	39.2	16.7

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR				
DATE	TIME	HIGH	LOW	
11/14/08	6:24 AM		32.9	Low
11/14/08	11:30 AM	41.4		High
11/15/08	3:12 AM		34.9	Low
11/15/08	9:59 AM	54.6		High
11/16/08	3:20 AM		41.4	Low
11/16/08	10:42 AM	58.3		High
11/17/08	3:38 AM		45.6	Low
11/17/08	11:21 AM	61.6		High
11/18/08	11:20 AM	56.3		High
11/18/08	4:02 PM		42.5	Low
11/19/08	11:09 AM	54.8		High
11/19/08	6:42 PM		39.0	Low
11/20/08	10:36 AM	45.7		High
11/20/08	9:29 PM		32.4	Low
11/21/08	11:59 AM	46.4		High
11/21/08	11:23 PM		32.2	Low
11/22/08	5:11 AM		30.4	Low
11/22/08	10:52 AM	45.3		High
11/23/08	12:29 PM	46.2		High
11/23/08	10:14 PM		28.5	Low
11/24/08	2:05 AM		26.9	Low
11/24/08	9:29 AM	44.2		High
11/25/08	10:14 AM	43.8		High
11/25/08	7:31 PM		29.7	Low
11/26/08	3:40 AM		29.7	Low
11/26/08	8:56 AM	45.5		High
11/27/08	2:25 AM		31.4	Low
11/27/08	7:25 AM	38.3		High
11/28/08	4:23 AM	34.7		High
11/28/08	6:16 PM		26.1	Low
11/29/08	1:50 AM		30.4	Low
11/29/08	10:56 AM	43.9		High
11/30/08	7:50 AM	43.6		High
11/30/08	2:28 PM		34.8	Low
12/01/08	1:53 AM		37.8	Low
12/01/08	9:19 AM	51.18		High
12/02/08	6:16 AM	45.74		High
12/02/08	7:46 PM		23.77	Low
12/03/08	2:28 AM		20.36	Low
12/03/08	6:05 AM	35		High
12/04/08	6:04 AM	31.84		High
12/04/08	5:28 PM		17.05	Low
12/05/08	1:22 AM		18.81	Low
12/05/08	5:40 PM	36.28		High
12/06/08	7:11 AM	52.65		High
12/06/08	10:31 PM		30.8	Low

	Nov-08	SUMMARY
	HIGH	LOW
AVG.	46.6	31.3
MAX.	61.6	45.6
MIN.	25.2	13.2

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR				
DATE	TIME	HIGH	LOW	
12/07/08	7:22 AM	43.4		High
12/07/08	6:19 PM		28.0	Low
12/08/08	4:31 AM	30.8		High
12/08/08	10:04 PM		13.1	Low
12/09/08	1:56 AM		14.0	Low
12/09/08	10:12 PM	35.7		High
12/10/08	7:28 AM	45.9		High
12/10/08	8:36 PM		27.2	Low
12/11/08	5:59 AM	41.45		High
12/11/08	5:19 PM		23.5	Low
12/12/08	5:09 AM	32.3		High
12/12/08	1:50 PM		18.8	Low
12/13/08	3:32 AM	30.6		High
12/13/08	6:48 PM		2.4	Low
12/14/08	6:57 AM	16.3		High
12/14/08	9:02 PM		0.4	Low
12/15/08	2:06 AM		6.2	Low
12/15/08	9:04 PM	13.0		High
12/16/08	5:29 AM	19.9		High
12/16/08	7:17 PM		5.9	Low
12/17/08	1:58 AM		7.1	Low
12/17/08	4:57 AM	21.8		High
12/18/08	5:39 AM	24.0		High
12/18/08	9:52 PM		8.9	Low
12/19/08	4:39 AM	25.1		High
12/19/08	5:46 PM		7.6	Low
12/20/08	6:35 AM	16.7		High
12/20/08	1:55 PM		7.5	Low
12/21/08	4:35 AM	27.6		High
12/21/08	1:24 PM		12.3	Low
12/22/08	4:55 AM	23.9		High
12/22/08	5:50 PM		5.9	Low
12/23/08	4:05 AM	15.5		High
12/23/08	8:51 PM		4.4	Low
12/24/08	4:02 AM	16.2		High
12/24/08	9:41 AM		9.8	Low
12/25/08	10:57 AM	22.9		High
12/25/08	10:19 PM		5.7	Low
12/26/08	5:22 AM	9.8		High
12/26/08	10:27 PM		-1.8	Low
12/27/08	2:43 AM		6.5	Low
12/27/08	5:29 AM	22.1		High
12/28/08	3:54 AM	34.6		High
12/28/08	10:14 PM		19.7	Low
12/29/08	1:51 AM		19.8	Low
12/29/08	8:08 AM	37.9		High
12/30/08	7:53 AM	42.1		High
12/30/08	10:36 PM		26.2	Low

	Dec-08	SUMMARY
	HIGH	LOW
AVG.	31.4	15.1

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR				
DATE	TIME	HIGH	LOW	
12/31/08	2:20 AM		24.3	Low
12/31/08	8:23 AM	40.9		High
01/01/09	2:18 AM		28.5	Low
01/01/09	8:22 AM	41.69		High
01/02/09	2:17 PM	44.29		High
01/02/09	10:37 PM		24.93	Low
01/03/09	2:45 AM	23.95		High
01/03/09	10:37 PM		4.64	Low
01/04/09	4:05 AM		3.92	Low
01/04/09	10:06 AM	18.2		High
01/05/09	2:06 AM		12.19	Low
01/05/09	1:15 PM	24.89		High
01/06/09	4:38 AM		21.46	Low
01/06/09	10:02 PM	33.18		High
01/07/09	10:15 AM	43.2		High
01/07/09	10:55 PM		32.4	Low
01/08/09	10:14 AM	49.7		High
01/08/09	10:07 PM		24.8	Low
01/09/09	9:23 AM	27.6		High
01/09/09	11:07 PM		17.5	Low
01/10/09	2:22 AM		17.1	Low
01/10/09	12:43 PM	33.8		High
01/11/09	12:57 PM	39.2		High
01/11/09	9:30 PM		30.3	Low
01/12/09	3:49 AM		28.9	Low
01/12/09	10:12 AM	35.6		High
01/13/09	2:17 AM		28.4	Low
01/13/09	10:46 AM	46.5		High
01/14/09	11:13 AM	47.1		High
01/14/09	8:41 PM		31.7	Low
01/15/09	10:32 AM	46.4		High
01/15/09	6:45 PM		29.4	Low
01/16/09	4:32 AM		33.5	Low
01/16/09	11:06 AM	53.7		High
01/17/09	5:01 AM		33.6	Low
01/17/09	11:27 AM	49.4		High
01/18/09	4:37 AM		34.6	Low
01/18/09	11:15 AM	58.0		High
01/19/09	1:53 AM		37.7	Low
01/19/09	11:45 AM	55.5		High
01/20/09	11:24 AM	51.7		High
01/20/09	10:04 PM		33.7	Low
01/21/09	3:17 AM		32.9	Low
01/21/09	10:10 AM	48.0		High
01/22/09	7:39 AM	49.1		High
01/22/09	6:39 PM		36.8	Low

MAX.	52.7	37.8
MIN.	9.8	-1.8

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR				
DATE	TIME	HIGH	LOW	
01/23/09	8:27 AM	45.5		High
01/23/09	9:58 PM		35.7	Low
01/24/09	8:18 AM	43.9		High
01/24/09	10:27 PM		32.4	Low
01/25/09	4:19 AM	39.8		High
01/25/09	10:46 PM		22.1	Low
01/26/09	5:05 AM	27.8		High
01/26/09	10:42 PM		11.4	Low
01/27/09	2:54 AM		10.3	Low
01/27/09	11:06 AM	27.9		High
01/28/09	9:08 AM	31.3		High
01/28/09	9:50 PM		20.0	Low
01/29/09	8:52 AM	39.4		High
01/29/09	6:04 PM		29.6	Low
01/30/09	9:31 AM	47.1		High
01/30/09	10:47 PM		31.0	Low
01/31/09	9:40 AM	48.1		High
01/31/09	11:04 PM		27.7	Low
02/01/09	3:13 AM		26.5	Low
02/01/09	1:51 PM	43.3		High
02/02/09	1:26 AM		27.41	Low
02/02/09	12:02 PM	45.8		High
02/03/09	3:56 AM		29.9	Low
02/03/09	10:57 AM	49.6		High
02/04/09	10:45 AM	46.8		High
02/04/09	8:45 PM		28.2	Low
02/05/09	8:49 AM	43.1		High
02/05/09	8:18 PM		28.4	Low
02/06/09	11:59 AM	41.4		High
02/06/09	7:22 PM		28.6	Low
02/07/09	1:55 AM		27.5	Low
02/07/09	10:33 AM	40.7		High
02/08/09	8:37 AM	41.3		High
02/08/09	7:59 PM		22.5	Low
02/09/09	4:44 AM	33.1		High
02/09/09	8:48 PM		11.4	Low
02/10/09	8:47 AM	26.9		High
02/10/09	6:42 PM		13.1	Low
02/11/09	3:12 AM		17.5	Low
02/11/09	8:58 AM	35.0		High
02/12/09	8:39 AM	31.3		High
02/12/09	10:09 PM		12.6	Low
02/13/09	2:03 AM		12.8	Low
02/13/09	8:08 AM	33.4		High
02/14/09	7:29 AM	26.2		High
02/14/09	6:12 PM		11.5	Low

	Jan-09	SUMMARY
	HIGH	LOW
AVG.	42.4	26.6
MAX.	58.0	37.7
MIN.	18.2	3.9

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR				
DATE	TIME	HIGH	LOW	
02/15/09	2:54 AM		13.2	Low
02/15/09	8:29 AM	35.0		High
02/16/09	12:44 AM		21.2	Low
02/16/09	9:06 AM	38.9		High
02/17/09	8:35 AM	33.2		High
02/17/09	10:10 PM		20.4	Low
02/18/09	8:56 AM	31.8		High
02/18/09	6:21 PM		15.9	Low
02/19/09	2:34 AM		16.1	Low
02/19/09	10:18 AM	41.6		High
02/20/09	1:50 AM		24.1	Low
02/20/09	12:06 PM	44.7		High
02/21/09	2:29 AM		26.5	Low
02/21/09	10:22 AM	48.5		High
02/22/09	3:24 AM		29.5	Low
02/22/09	10:49 AM	46.0		High
02/23/09	8:19 AM	47.2		High
02/23/09	8:40 PM		31.4	Low
02/24/09	1:15 AM		31.7	Low
02/24/09	11:13 AM	53.0		High
02/25/09	7:30 AM	53.6		High
02/25/09	7:03 PM		32.1	Low
02/26/09	8:10 AM	48.7		High
02/26/09	10:38 PM		29.7	Low
02/27/09	11:57 AM	37.2		High
02/27/09	9:32 PM		20.8	Low
02/28/09	5:02 AM		22.1	Low
02/28/09	12:01 PM	45.9		High
03/01/09	2:36 AM		30.8	Low
03/01/09	12:47 PM	53.6		High
03/02/09	4:16 AM		37.2	Low
03/02/09	9:33 AM	54.4		High

	Feb-09	SUMMARY
	HIGH	LOW
AVG.	38.1	21.1
MAX.	53.6	32.1
MIN.	26.2	11.4

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR				
DATE	TIME	HIGH	LOW	
03/11/09	8:24 AM		13.6	Low
03/11/09	2:06 PM	42.1		High
03/12/09	1:23 AM		23.0	Low
03/12/09	12:11 PM	48.1		High
03/13/09	6:33 AM		21.2	Low
03/13/09	12:05 PM	44.7		High
03/14/09	8:04 AM		23.4	Low
03/14/09	1:17 PM	48.5		High
03/15/09	2:51 AM		27.6	Low
03/15/09	1:51 PM	45.5		High
03/16/09	7:22 AM		31.5	Low
03/16/09	1:32 PM	55.0		High
03/17/09	4:25 AM		36.1	Low
03/17/09	1:49 PM	54.3		High
03/18/09	11:40 AM	57.8		High
03/18/09	11:25 PM		34.3	Low
03/19/09	6:44 AM		35.0	Low
03/19/09	1:38 PM	58.9		High
03/20/09	5:54 AM		39.3	Low
03/20/09	2:07 PM	63.1		High
03/21/09	5:07 AM		38.6	Low
03/21/09	11:12 AM	56.9		High
03/22/09	6:49 AM		31.0	Low
03/22/09	10:05 AM	50.3		High
03/23/09	8:10 AM		18.4	Low
03/23/09	3:42 PM	28.7		High
03/24/09	9:33 AM		17.9	Low
03/24/09	1:58 PM	34.6		High
03/25/09	7:53 AM		19.5	Low
03/25/09	4:52 PM	33.7		High
03/26/09	3:36 AM	24.3		High
03/26/09	11:17 AM		13.6	Low
03/27/09	4:17 AM		7.8	Low
03/27/09	3:08 PM	35.0		High
03/28/09	8:46 AM		19.4	Low
03/28/09	2:00 PM	47.8		High
03/29/09	10:04 AM	41.6		High
03/29/09	5:24 PM		15.2	Low

Station out of service 3/3 - 3/10/09

	Mar-09	SUMMARY
	HIGH	LOW
AVG.	32.6	17.8
MAX.	63.1	39.3
MIN.	24.3	7.8

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR				
DATE	TIME	HIGH	LOW	
04/02/09	2:11 PM	42.3		High
04/02/09	9:49 PM		26.2	Low
04/03/09	3:37 PM	27.6		High
04/03/09	10:34 PM	19.5	19.5	Low
04/04/09	8:15 AM		14.7	Low
04/04/09	3:59 PM	28.6		High
04/05/09	12:12 PM		8.5	Low
04/05/09	7:08 PM	38.8		High
04/06/09	11:13 AM		13.4	Low
04/06/09	5:04 PM	44.8		High
04/07/09	8:02 AM		23.6	Low
04/07/09	4:17 PM	50.8		High
04/08/09	11:55 AM	45.5		High
04/08/09	8:49 PM		22.1	Low
04/09/09	3:58 AM		20.8	Low
04/09/09	3:34 PM	38.0		High
04/10/09	3:13 AM		25.4	Low
04/10/09	2:27 PM	44.8		High
04/11/09	7:56 AM		25.1	Low
04/11/09	2:12 PM	34.1		High
04/12/09	10:23 AM		24.6	Low
04/12/09	6:32 PM	39.3		High
04/13/09	7:49 AM		26.7	Low
04/13/09	4:52 PM	51.8		High
04/14/09	8:42 AM		33.3	Low
04/14/09	1:46 PM	42.6		High
04/15/09	11:46 AM	32.4		High
04/15/09	10:21 PM		16.5	Low
04/16/09	10:58 AM		9.7	Low
04/16/09	2:07 PM	30.1		High
04/17/09	2:36 AM		17.8	Low
04/17/09	5:13 PM	36.1		High
04/18/09	8:38 AM		26.3	Low
04/18/09	4:46 PM	43.2		High
04/19/09	6:40 AM		28.1	Low
04/19/09	5:59 PM	53.5		High
04/20/09	4:30 AM		34.5	Low
04/20/09	4:18 PM	58.9		High
04/21/09	6:55 AM		36.2	Low
04/21/09	5:14 PM	62.6		High
04/22/09	3:16 AM		39.7	Low
04/22/09	5:31 PM	60.5		High
04/23/09	2:57 AM		42.5	Low
04/23/09	4:59 PM	63.0		High
04/24/09	8:23 AM		36.3	Low
04/24/09	5:28 PM	57.2		High
04/25/09	12:34 PM	43.8		High
04/25/09	10:51 PM		21.8	Low

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR				
DATE	TIME	HIGH	LOW	
04/26/09	4:09 PM	36.6		High
04/26/09	11:52 PM		17.1	Low
04/27/09	8:19 AM		12.4	Low
04/27/09	6:43 PM	47.5		High
04/28/09	8:02 AM		26.0	Low
04/28/09	6:57 PM	59.6		High
04/29/09	9:19 AM		30.8	Low
04/29/09	6:35 PM	55.5		High
04/30/09	10:02 AM		34.6	Low
04/30/09	4:59 PM	57.3		High
05/01/09	9:41 AM		35.8	Low
05/01/09	3:59 PM	58.0		High
05/02/09	1:08 PM		37.0	Low
05/02/09	5:12 PM	48.6		High
05/03/09	9:01 AM		36.0	Low
05/03/09	3:58 PM	55.8		High
05/04/09	4:50 AM		33.2	Low
05/04/09	1:56 PM	54.1		High
05/05/09	3:57 AM		39.5	Low
05/05/09	3:35 PM	61.1		High
05/06/09	5:51 AM		41.5	Low
05/06/09	12:33 PM	65.2		High
05/07/09	5:11 AM		46.8	Low
05/07/09	1:08 PM	63.0		High
05/08/09	2:22 PM	58.3		High
05/08/09	10:12 PM		37.7	Low
05/09/09	6:39 AM		36.1	Low
05/09/09	3:49 PM	66.4		High
05/10/09	6:25 AM		40.8	Low
05/10/09	1:42 PM	65.9		High
05/11/09	4:03 AM		45.8	Low
05/11/09	3:20 PM	72.8		High
05/12/09	4:24 AM		46.5	Low
05/12/09	1:19 PM	69.9		High
05/13/09	5:50 AM		41.4	Low
05/13/09	2:21 PM	62.6		High
05/14/09	2:44 AM		42.6	Low
05/14/09	1:19 PM	64.4		High
05/15/09	5:40 AM		41.8	Low
05/15/09	2:50 PM	71.2		High
05/16/09	5:01 AM		42.1	Low
05/16/09	2:42 PM	73.6		High
05/17/09	5:46 AM		49.3	Low
05/17/09	4:00 PM	80.3		High
05/18/09	3:58 AM		55.9	Low
05/18/09	2:48 PM	83.1		High

	Apr-09	SUMMARY
	HIGH	LOW
AVG.	44.9	23.8
MAX.	63.0	42.5
MIN.	19.5	8.5

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR				
DATE	TIME	HIGH	LOW	
05/19/09	2:29 PM	70.1		High
05/19/09	9:54 PM		47.8	Low
05/20/09	6:11 AM		45.6	Low
05/20/09	3:39 PM	73.7		High
05/21/09	5:40 AM		50.4	Low
05/21/09	3:02 PM	77.1		High
05/22/09	12:24 PM	63.4		High
05/22/09	9:16 PM		44.1	Low
05/23/09	6:20 AM		41.5	Low
05/23/09	6:22 PM	48.3		High
05/24/09	6:13 AM		42.1	Low
05/24/09	2:38 PM	59.2		High
05/25/09	1:46 AM		41.5	Low
05/25/09	5:59 PM	59.0		High
05/26/09	6:00 AM		39.1	Low
05/26/09	3:03 PM	56.6		High
05/27/09	7:09 AM		39.8	Low
05/27/09	2:08 PM	62.0		High
05/28/09	2:01 PM	67.9		High
05/28/09	7:08 PM		44.3	Low
05/29/09	6:18 AM		46.3	Low
05/29/09	3:01 PM	71.6		High
05/30/09	5:52 AM		43.9	Low
05/30/09	5:48 PM	68.4		High
05/31/09	6:21 AM		46.7	Low
05/31/09	2:27 PM	72.3		High
06/01/09	7:57 AM		49.3	Low
06/01/09	12:04 PM	65.2		High
06/02/09	10:31 AM		43.1	Low
06/02/09	6:25 PM	63.0		High
06/03/09	11:58 AM		43.2	Low
06/03/09	10:59 PM	73.0		High
06/04/09	10:59 AM		48.7	Low
06/04/09	8:33 PM	73.1		High
06/05/09	12:30 PM		51.3	Low
06/05/09	7:16 PM	65.3		High
06/06/09	12:22 PM		38.6	Low
06/06/09	7:50 PM	63.7		High
06/07/09	11:09 AM		35.1	Low
06/07/09	9:50 PM	59.6		High
06/08/09	11:01 AM		41.0	Low
06/08/09	7:23 PM	63.0		High
06/09/09	10:20 AM		44.7	Low
06/09/09	5:02 PM	59.7		High
06/10/09	1:20 PM		38.6	Low
06/10/09	7:34 PM	56.0		High

	May-09	SUMMARY
	HIGH	LOW
AVG.	67.5	44.1
MAX.	83.1	55.9
MIN.	48.3	33.2

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR				
DATE	TIME	HIGH	LOW	
06/11/09	8:59 AM		39.5	Low
06/11/09	3:29 PM	52.4		High
06/12/09	7:48 AM		38.6	Low
06/12/09	9:35 PM	60.3		High
06/13/09	5:14 AM		45.7	Low
06/13/09	5:12 PM	63.2		High
06/14/09	10:43 AM		41.8	Low
06/14/09	6:25 PM	63.1		High
06/15/09	9:34 AM		39.0	Low
06/15/09	8:44 PM	64.9		High
06/16/09	11:44 AM		47.3	Low
06/16/09	6:57 PM	66.3		High
06/17/09	9:29 AM		41.7	Low
06/17/09	7:26 PM	59.9		High
06/18/09	9:11 AM		42.5	Low
06/18/09	8:38 PM	59.1		High
06/19/09	11:03 AM		38.2	Low
06/19/09	11:34 PM	70.5		High
06/20/09	2:27 AM	65.5		High
06/20/09	4:57 PM		44.1	Low
06/21/09	8:37 AM		41.0	Low
06/21/09	10:21 PM	65.8		High
06/22/09	12:30 PM		46.1	Low
06/22/09	11:15 PM	74.2		High
06/23/09	12:46 PM		51.7	Low
06/23/09	10:24 PM	81.6		High
06/24/09	12:12 PM		57.9	Low
06/24/09	11:07 PM	82.5		High
06/25/09	11:57 AM		57.4	Low
06/25/09	10:36 PM	80.8		High
06/26/09	10:24 AM		46.5	Low
06/26/09	5:34 PM	65.6		High
06/27/09	7:11 AM		45.9	Low
06/27/09	10:34 PM	74.0		High
06/28/09	12:20 PM		52.2	Low
06/28/09	10:18 PM	80.0		High
06/29/09	2:20 PM		56.9	Low
06/29/09	8:54 PM	77.7		High
06/30/09	2:53 AM	78.9		High
06/30/09	3:05 PM		57.8	Low
07/01/09	11:33 AM		51.4	Low
07/01/09	2:16 PM	64.6		High
07/02/09	2:57 AM		49.7	Low
07/02/09	10:56 AM	64.0		High
07/03/09	4:29 AM		41.9	Low
07/03/09	3:19 PM	66.8		High

	Jun-09	SUMMARY
	HIGH	LOW
AVG.	67.6	45.5
MAX.	82.5	57.9
MIN.	52.4	35.1

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR				
DATE	TIME	HIGH	LOW	
07/04/09	4:07 AM		49.5	Low
07/04/09	1:57 PM	70.7		High
07/05/09	2:01 AM		43.9	Low
07/05/09	3:05 PM	74.2		High
07/06/09	3:38 AM		47.7	Low
07/06/09	2:23 PM	76.7		High
07/07/09	4:22 AM		54.5	Low
07/07/09	2:46 PM	78.3		High
07/08/09	3:44 AM		52.5	Low
07/08/09	2:25 PM	75.3		High
07/09/09	6:03 AM		54.6	Low
07/09/09	1:59 PM	78.7		High
07/10/09	4:53 AM		54.9	Low
07/10/09	3:23 PM	80.8		High
07/11/09	11:22 AM	76.2		High
07/11/09	10:11 PM		50.0	Low
07/12/09	2:03 AM		48.3	Low
07/12/09	4:31 PM	71.2		High
07/13/09	12:37 PM	78.3		High
07/13/09	10:20 PM		54.1	Low
07/14/09	5:20 AM		49.6	Low
07/14/09	1:13 PM	74.0		High
07/15/09	3:26 AM		49.8	Low
07/15/09	3:03 PM	74.5		High
07/16/09	4:19 AM		53.8	Low
07/16/09	12:25 PM	79.2		High
07/17/09	3:47 AM		57.1	Low
07/17/09	12:53 PM	85.6		High
07/18/09	4:47 AM		58.5	Low
07/18/09	11:40 AM	83.1		High
07/19/09	5:31 AM		59.8	Low
07/19/09	4:57 PM	80.3		High
07/20/09	1:59 PM	76.3		High
07/20/09	10:17 PM		57.9	Low
07/21/09	4:31 AM		53.3	Low
07/21/09	10:35 AM	73.9		High
07/22/09	4:51 AM		54.6	Low
07/22/09	12:45 PM	79.8		High
07/23/09	4:01 AM		57.2	Low
07/23/09	1:43 PM	85.2		High
07/24/09	8:59 AM	74.9		High
07/24/09	12:14 PM		53.6	Low
07/25/09	1:33 AM		52.4	Low
07/25/09	11:12 AM	71.5		High
07/26/09	2:11 AM		51.5	Low
07/26/09	2:38 PM	74.1		High
07/27/09	2:05 AM		50.4	Low
07/27/09	3:05 PM	78.0		High

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR				
DATE	TIME	HIGH	LOW	
07/28/09	2:55 PM	73.8		High
07/28/09	10:05 PM		51.2	Low
07/29/09	3:26 PM	72.0		High
07/29/09	10:44 PM		50.6	Low
07/30/09	3:47 AM		50.7	Low
07/30/09	4:21 PM	68.6		High
07/31/09	5:10 AM		52.4	Low
07/31/09	3:42 PM	70.1		High
08/01/09	5:51 AM		49.9	Low
08/01/09	3:50 PM	77.8		High
08/02/09	3:22 AM		54.0	Low
08/02/09	5:42 PM	79.2		High
08/03/09	7:53 AM		57.7	Low
08/03/09	12:00 PM	76.0		High
08/04/09	1:37 AM	79.2		High
08/04/09	1:51 PM		56.7	Low
08/05/09	4:17 AM	78.0		High
08/05/09	4:28 PM		56.3	Low
08/06/09	1:21 AM	79.3		High
08/06/09	5:48 PM		47.8	Low
08/07/09	3:06 AM	72.6		High
08/07/09	5:39 PM		41.7	Low
08/08/09	1:35 AM	69.6		High
08/08/09	4:26 PM		37.7	Low
08/09/09	1:41 PM		37.2	Low
08/09/09	10:46 PM	62.3		High
08/10/09	2:54 AM	65.8		High
08/10/09	4:29 PM		45.5	Low
08/11/09	2:02 AM	73.3		High
08/11/09	3:25 PM		49.7	Low
08/12/09	4:22 AM	78.7		High
08/12/09	4:53 PM		52.0	Low
08/13/09	1:59 AM	73.7		High
08/13/09	8:12 AM		51.6	Low
08/14/09	3:41 PM		42.6	Low
08/14/09	9:39 PM	65.4		High
08/15/09	3:19 AM	62.3		High
08/15/09	4:35 PM		47.6	Low
08/16/09	1:38 AM	62.6		High
08/16/09	4:36 PM		35.7	Low
08/17/09	5:13 PM		39.8	Low
08/17/09	12:14 AM	66.2		High
08/18/09	1:54 AM	66.4		High
08/18/09	4:43 PM		48.6	Low
08/19/09	5:23 PM		45.2	Low
08/19/09	11:46 PM	70.8		High

	Jul-09	SUMMARY
	HIGH	LOW
AVG.	77.7	53.9
MAX.	85.6	59.8
MIN.	64.0	41.9

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR				
DATE	TIME	HIGH	LOW	
08/20/09	5:39 PM		50.3	Low
08/20/09	11:34 PM	72.2		High
08/21/09	4:01 AM	80.2		High
08/21/09	5:34 PM		54.5	Low
08/22/09	3:26 AM	85.1		High
08/22/09	5:45 PM		58.9	Low
08/23/09	6:35 AM	84.9		High
08/23/09	3:13 PM		48.1	Low
08/24/09	2:36 PM		44.4	Low
08/24/09	11:12 PM	63.3		High
08/25/09	3:35 AM	61.2		High
08/25/09	3:37 PM		44.7	Low
08/26/09	10:43 AM		45.5	Low
08/26/09	10:10 PM	65.0		High
08/27/09	3:47 PM		48.7	Low
08/27/09	10:15 PM	71.3		High
08/28/09	3:57 AM	76.1		High
08/28/09	6:10 PM		53.0	Low
08/29/09	3:43 AM	80.4		High
08/29/09	4:12 PM		55.7	Low
08/30/09	3:19 AM	78.0		High
08/30/09	4:27 PM		55.8	Low
08/31/09	3:39 AM	79.7		High
08/31/09	8:03 PM		56.1	Low
09/01/09	5:04 AM	73.9		High
09/01/09	12:07 PM		55.7	Low
09/02/09	11:01 AM		58.2	Low
09/02/09	5:32 PM	79.9		High
09/03/09	9:29 AM		55.6	Low
09/03/09	4:30 PM	79.2		High
09/04/09	9:57 AM		55.4	Low
09/04/09	6:41 PM	81.1		High
09/05/09	1:56 PM	66.0		High
09/05/09	9:41 PM		49.8	Low
09/06/09	9:05 AM		47.2	Low
09/06/09	8:50 PM	71.2		High
09/07/09	9:55 AM		49.8	Low
09/07/09	7:17 PM	79.6		High
09/08/09	9:50 AM		53.8	Low
09/08/09	6:34 PM	80.6		High
09/09/09	9:51 AM		54.0	Low
09/09/09	5:58 PM	81.1		High
09/10/09	9:04 AM		57.3	Low
09/10/09	3:59 PM	78.2		High
09/11/09	9:40 AM		54.8	Low
09/11/09	7:02 PM	80.6		High

	Aug-09	SUMMARY
	HIGH	LOW
AVG.	75.2	50.4
MAX.	85.1	58.9
MIN.	61.2	35.7

ENERGY WEST MINING COMPANY EAST MOUNTAIN WEATHER STATION 2009 WATER YEAR				
DATE	TIME	HIGH	LOW	
09/12/09	8:49 AM		53.0	Low
09/12/09	3:59 PM	75.9		High
09/13/09	11:59 AM	59.8		High
09/13/09	10:18 PM		44.5	Low
09/14/09	5:32 AM		43.4	Low
09/14/09	2:24 PM	60.0		High
09/15/09	6:15 AM		37.3	Low
09/15/09	5:45 PM	59.7		High
09/16/09	6:14 AM		41.1	Low
09/16/09	5:38 PM	67.7		High
09/17/09	7:04 AM		43.9	Low
09/17/09	6:02 PM	68.5		High
09/18/09	7:29 AM		44.9	Low
09/18/09	6:00 PM	70.9		High
09/19/09	7:33 AM		46.7	Low
09/19/09	5:52 PM	70.0		High
09/20/09	4:00 AM		48.6	Low
09/20/09	3:49 PM	66.5		High
09/21/09	8:39 AM		40.1	Low
09/21/09	2:51 PM	58.2		High
09/22/09	2:38 AM		36.3	Low
09/22/09	5:45 PM	59.7		High
09/23/09	3:10 AM		38.3	Low
09/23/09	7:07 PM	63.3		High
09/24/09	4:46 AM		42.1	Low
09/24/09	5:08 PM	67.9		High
09/25/09	1:34 AM		46.8	Low
09/25/09	6:17 PM	70.5		High
09/26/09	9:40 AM		54.9	Low
09/26/09	6:47 PM	75.1		High
09/27/09	9:16 AM		56.3	Low
09/27/09	7:24 PM	80.1		High
09/28/09	10:02 AM		53.2	Low
09/28/09	7:33 PM	78.4		High
09/29/09	10:03 AM		50.9	Low
09/29/09	5:52 PM	76.1		High
09/30/09	2:22 AM	57.7		High
09/30/09	11:21 PM		22.4	Low
10/01/09	7:54 AM		20.0	Low

	Sep-09	SUMMARY
	HIGH	LOW
AVG.	71.2	47.9
MAX.	81.1	58.2
MIN.	57.7	22.4

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK FLOW & QUALITY

ABOVE THE MINE - DCR01

	<——— Field Measurements ———>							
Date	Time	Temp. (°C)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
01/25/2005	1347			Dry			ptcloudy40;s	
02/25/2005	1008			Dry			ptcloudy30's	
03/21/2005	1029			Dry			cloudy40's	
04/21/2005	933			Dry			cloudy30's	
05/25/2005	1248			353			ptcloudy60's	
06/22/2005	1057	10.9		971	8.6	361	cloudy70's	
07/16/2005	1251			445			clear80's	
08/02/2005	1109			296			clear70's	
09/23/2005	814	4.8		134	7.49	595	cloudy40's	
10/13/2005	1521			134			clear40's	
11/17/2005	1451			Frozen			clear40's	
12/13/2005	1102			Frozen			ptcloudy20's	
01/20/2006	938			Frozen			clear 20's	
02/23/2006	1115			Frozen			clear20's	
03/14/2006	1110			Frozen			ptcloudy20's	
04/25/2006	1400			Dry			cloudy40's	
05/24/2006	1249			1227			clear70's	
06/20/2006	1552	14.4		675	8.48	518	clear70's	
07/11/2006	1417			368			clear80's	
08/08/2006	1331			190			ptcloudy90's	
09/27/2006	1334	5.8		117	9.1	654	clear60's	
10/24/2006	1358			frozen			clear30's	
11/17/2006	1441			frozen			clear40's	
12/07/2006	1044			frozen			clear20's	
01/24/2007	1358			frozen			cloudy20's	
02/20/2007	1000			frozen			clear19	
03/26/2007	1341			frozen			ptcloudy40's	
04/18/2007	1021			45			clear50's	
05/11/2007	841			Dry			clear60's	
06/29/2007	1220			Dry			clear70's	
07/17/2007	1058			Dry			cloudy70's	
08/06/2007	1110			Dry			cloudy60's	
09/20/2007	1339			Dry			clear60's	
10/26/2007	1424			Dry			clear50's	
11/14/2007	1218			Dry			clear40's	
12/05/2007	1300			Dry			cloudy30's	
01/10/2008	1405			Dry			cloudy20's	
02/20/2008	1118			Dry			cloudy20's	
03/24/2008	1300			Dry			ptcloudy40's	
04/23/2008	1324			Frozen			ptcloudy50's	
05/28/2008	1500			134			clear60's	
06/17/2008	1412	13.1		210	8.83	468	clear80's	
07/07/2008	1227			152			clear80's	
08/18/2008	1132			70			clear80's	
09/22/2008	1403			DRY			ptcloudy60's	
10/22/2008	1318			DRY			clear50's	
11/18/2008	1359			DRY			clear50's	
12/04/2008	1225			DRY			cloudy40's	
01/13/2009	1053			DRY			clear30's	
02/17/2009	1400			Frozen			clear30's	
03/24/2009	1126			Frozen			ptcloudy30's	
04/16/2009	1127			Frozen			cloudy20's	snowing
05/07/2009	1146			DRY			clear60's	
06/18/2009	1204			DRY			cloudy60's	
07/14/2009	1127			DRY			clear70's	
08/20/2009	1247			DRY			clear70's	
09/09/2009	1217			DRY			clear70's	
10/26/2009	1155			DRY			clear30's	
11/06/2009	1106			DRY			clear50's	
12/02/2009	1235			DRY			clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK FLOW & QUALITY

@ PERMIT BOUNDARY - DCR04

	<----------	Field Measurements ------>						
Date	Time	Temp. (°C)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
01/25/2005	1353			1333			ptcloudy40's	
02/25/2005	1015			817			ptcloudy30's	
03/21/2005	1038	6.4		433	8.64	1079	cloudy40's	
04/21/2005	936			653			cloudy30's	
05/25/2005	1255			3081			ptcloudy60's	
06/22/2005	1112	15.2		1876	8.58	420	cloudy70's	
07/16/2005	1256			1282			clear80's	
08/02/2005	1115			1282			clear70's	
09/23/2005	827	10.3		1087	7.48	724	cloudy40's	
10/13/2005	1526			1135			clear40's	
11/17/2005	1459			994			clear40's	
12/13/2005	1109	7.4		503	8.25	590	ptcloudy20's	
01/20/2006	942			1489			clear20's	
02/21/2006	1120			817			clear20's	
03/14/2006	1116	4.2		817	8.2	3260	ptcloudy20's	
04/25/2006	1405			904			cloudy40's	
05/24/2006	1258			2420			clear70's	
06/20/2006	1607	15.8		1183	8.52	664	clear70's	
07/11/2006	1410			860			clear80's	
08/08/2006	1401			994			ptcloudy90's	
09/27/2006	1353	13.7		433	8.72	738	clear60's	
10/24/2006	1418			1040			clear30's	
11/17/2006	1446			503			clear40's	
12/07/2006	1049	6.4		1282	8.56	1061	clear20's	
01/24/2007	1403			433			cloudy20's	
02/20/2007	1007			904			clear19	
03/26/2007	1351	14.6		734	8.66	876	ptcloudy40's	
04/18/2007	1028			994			clear50's	
05/11/2007	849			571			clear60's	
06/29/2007	1243	18.7		904	8.67	833	clear70's	
07/17/2007	1103			1087			cloudy70's	
08/06/2007	1118			140			cloudy60's	
09/20/2007	1345	11.1		817	7.58	884	clear60's	
10/26/2007	1430			2677			clear50's	
11/14/2007	1223			1087			clear40's	
12/05/2007	1315	11.2		2677	8.5	883	cloudy30's	
01/15/2008	1411			2420			cloudy20's	
02/20/2008	1133			1384			cloudy20's	
03/24/2008	1330	10.2		1280	8.62	1242	ptcloudy40's	
04/23/2008	1406			1135			ptcloudy50's	
05/28/2008	1515			614			clear60's	
06/17/2008	1430	15.1		1282	8.54	643	clear80's	
07/07/2008	1240			1542			clear80's	
08/18/2008	1139			1934			clear80's	
09/22/2008	1420	13.8		1651	8.35	755	ptcloudy60's	
10/22/2008	1326			1087			clear50's	
11/18/2008	1406			1282			clear50's	
12/04/2008	1238	7.2		734	8.49	987	cloudy40's	
01/13/2009	1059			1183			clear30's	
02/17/2009	1406			2612			clear30's	
03/24/2009	1139	10.7		2743	7.55	940	ptcloudy30's	
04/16/2009	1132			1384			cloudy20's	snowing
05/07/2009	1149			1489			clear60's	
06/18/2009	1215	13.8		2743	8.53	899	cloudy60's	
07/14/2009	1136			2052			clear70's	
08/20/2009	1256			2612			clear70's	
09/09/2009	1230	14.5		3081	8.74	1028	clear70's	
10/26/2009	1205			2112			clear30's	
11/06/2009	1116			3220			clear50's	
12/02/2009	1245	9.4		2743	8.51	958	clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK FLOW & QUALITY

BELOW THE MINE - DCR06

	<——— Field Measurements ———>							
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
01/25/2005	1357			1325			ptcloudy40's	
02/25/2005	1020			810			ptcloudy30's	
03/21/2005	1052	6.4		430	8.59	1219	cloudy40's	
04/18/2005	941			652			cloudy30's	
05/25/2005	1301			3090			ptcloudy60's	
06/22/2005	1125	14.5		1870	8.52	474	cloudy70's	
07/16/2005	1301			1280			clear80's	
08/02/2005	1121			1280			clear70's	
09/23/2005	840	8.9		1080	6.34	746	cloudy40's	
10/13/2005	1533			1130			clear40's	
11/17/2005	1505			991			clear40's	
12/13/2005	1129	4.1		491	8.22	688	ptcloudy20's	
01/20/2006	948			1400			clear20's	
02/23/2006	1131			810			clear20's	
03/14/2006	1151	2.1		810	8.16	1505	ptcloudy20's	
04/25/2006	1408			900			cloudy40's	
05/24/2006	1306			2400			clear70's	
06/20/2006	1627	22.1		1170	8.39	935	clear70's	
07/11/2006	1401			860			clear80's	
08/08/2006	1444			995			ptcloudy90's	
09/27/2006	1406	16.6		420	8.92	833	clear60's	
10/24/2006	1418			1031			clear30's	
11/17/2006	1454			500			clear40's	
12/07/2006	1107	3.7		1273	8.53	1161	clear20's	
01/24/2007	1411			428			cloudy20's	
02/20/2007	1014			900			clear19	
03/26/2007	1407	14.5		969	8.51	969	ptcloudy40's	
04/18/2007	1035			990			clear50's	
05/11/2007	855			570			clear60's	
06/29/2007	1243	23		889	8.86	829	clear70's	
07/17/2007	1107			1080			cloudy70's	
08/06/2007	1123			137			cloudy60's	
09/20/2007	1404	16.3		808	7.35	1246	clear60's	
10/26/2007	1437			2600			clear50's	
11/14/2007	1227			1080			clear40's	
12/05/2007	1328	8.8		2600	8.6	985	cloudy20's	
01/15/2008	1414			2410			cloudy20's	
02/20/2008	1133			1370			cloudy20's	
03/24/2008	1348	11.1		1200	8.31	1242	ptcloudy40's	
04/23/2008	1437			1050			ptcloudy50's	
05/28/2008	1520			535			clear60's	
06/18/2008	850	12.5		1220	8.7	785	clear80's	
07/07/2008	1250			1460			clear70's	
08/18/2008	1147			1850			clear70's	
09/22/2008	1435	12.5		1850	8.7	785	ptcloudy60's	
10/22/2008	1358			1007			clear50's	
11/18/2008	1415			1200			clear50's	
12/04/2008	1250	4.8		654	8.49	1048	cloudy40's	
01/13/2009	1105			1100			clear30's	
02/17/2009	1410			2530			clear30's	
03/24/2009	1148	7.5		2660	8.49	1228	ptcloudy30's	
04/16/2009	1137			1304			cloudy20's	snowing
05/07/2009	1150			1400			clear60's	
06/18/2009	1229	15.3		2660	8.48	917	cloudy60's	
07/14/2009	1140			1970			clear70's	
08/20/2009	1301			2530			clear70's	
09/09/2009	1240	16.5		3000	9	950	clear70's	
10/26/2009	1212			2030			clear30's	
11/06/2009	1125			3140			clear50's	
12/04/2009	1300	5.2		2660	8.68	886	clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

GRIMES WASH FLOW & QUALITY

RIGHT FORK - GWR01

		<—— Field Measurements ——>						
Date	Time	Temp. (°C)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
12/14/2004	928		no flow				clear20's	
01/19/2005	1106		no flow				clear30's	
02/03/2005	1456		no flow				cloudy30's	
03/07/2005	1104		no flow				clear40's	
04/18/2005	1315		no flow				cloudy50's	
05/24/2005	952		24				clear60's	
06/20/2005	1428		Damp				ptcloudy70's	
07/16/2005	931		no flow				clear70's	
08/01/2005	1301		no flow				cloudy60's	
09/22/2005	1010		no flow				clear50's	
10/06/2005	1215		no flow				clear40's	
11/07/2005	1503		no flow				cloudy40's	
12/06/2005	1243		no flow				cloudy20's	
01/10/2006	1446		no flow				clear20's	
02/21/2006	1122		no flow				clear30's	
03/13/2006	1405		no flow				ptcloudy30's	
04/10/2006	1432		DAMP				clear40's	
05/23/2006	1412		9				ptcloudy50's	
06/15/2006	1424		DAMP				cloudy60's	
07/26/2006	1102		no flow				sunny80's	
08/02/2006	1114		no flow				clear80's	
09/26/2006	1200		no flow				clear50's	
10/24/2006	1048		no flow				clear30's	
11/16/2006	1500		no flow				clear30's	
12/06/2006	1121		no flow				clear30's	
01/09/2007	1028		no flow				clear20's	
02/12/2007	1149		no flow				ptcloudy30's	
03/20/2007	1358		no flow				ptcloudy60's	
04/04/2007	1020		no flow				cloudy40's	
05/08/2007	1415		no flow				clear60's	
06/28/2007	1415		no flow				clear80's	
07/16/2007	1346		no flow				cloudy80's	
08/02/2007	1401		no flow				cloudy70's	
09/21/2007	1227		no flow				clear50's	
10/26/2007	1131		no flow				clear50's	
11/13/2007	1538		no flow				ptcloudy50's	
12/10/2007	1202		no flow				clear20's	
01/10/2008	1100		no flow				cloudy20's	
02/11/2008	1122		no flow				cloudy20's	
03/20/2008	1054		no flow				ptcloudy40's	
04/22/2008	1011		no flow				clear40's	
05/23/2008	1225		no flow				cloudy40's	
06/16/2008	1355		no flow				clear80's	
07/08/2008	1145		no flow				clear80's	
08/19/2008	1400		no flow				clear80's	
09/29/2008	1356		no flow				clear80's	
10/21/2008	1145		no flow				clear50's	
11/12/2008	1500		no flow				ptcloudy40's	
12/08/2008	1415		no flow				ptcloudy40's	
01/13/2009	1417		no flow				clear30's	
02/18/2009	1250		no flow				clear30's	
03/25/2009	1245		no flow				cloudy40's	
04/17/2009	1210		no flow				cloudy40's	
05/08/2009	1139		no flow				clear60's	
06/17/2009	1340		no flow				cloudy60's	
07/10/2009	1415		no flow				clear80's	
08/21/2009	1050		no flow				clear70's	
09/08/2009	1340		no flow				clear70's	
10/21/2009	1452		no flow				clear60's	
11/09/2009	1140		no flow				clear40's	
12/03/2009	1230		no flow				clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

GRIMES WASH FLOW & QUALITY

LEFT FORK - GWR02

	<----	Field Measurements ---->						
Date	Time	Temp. (°C)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
01/19/2005	1110			Dry			clear30's	
02/03/2005	1459			Dry			cloudy30's	
03/07/2005	1109			Dry			clear40's	
04/18/2005	1321			Dry			cloudy50's	
05/24/2005	956			1014			clear60's	
06/20/2005	1444	14.7		108	9.64	714	ptcloudy70's	
07/16/2005	937			124			clear70's	
08/01/2005	1312			110			cloudy60's	
09/22/2005	1021	12.4		24	7.85	705	clear50's	
10/06/2005	1219			24			clear40's	
11/07/2005	1510			24			cloudy40's	
12/06/2005	1251			Frozen			cloudy20's	
01/10/2006	1514			Frozen			clear20's	
02/21/2006	1126			Frozen			clear30's	
03/13/2006	1409			Dry			ptcloudy30's	
04/10/2006	1434			13.8			clear40's	
05/23/2006	1418			100			ptcloudy50's	
06/15/2006	1433	9.6		168	8.12	775	cloudy60's	
07/26/2006	1109			67			sunny80's	
08/02/2006	1124			73			clear80's	
09/26/2006	1208	14.7		17	8.84	672	clear50's	
10/24/2006	1055			41			clear30's	
11/16/2006	1516			10			clear30's	
12/06/2006	1127			Frozen			clear30's	
01/09/2007	1034			Frozen			clear20's	
02/12/2007	1200			Dry			ptcloudy30's	
03/20/2007	1404			Dry			ptcloudy60's	
04/04/2007	1024			Dry			cloudy40's	
05/08/2007	1420			1			clear60's	
06/28/2007	1422	22.9		4	8.5	776	clear80's	
07/16/2007	1355			19			cloudy80's	
08/02/2007	1405			<1gpm			cloudy70's	
09/21/2007	1233			Damp			clear50's	
10/26/2007	1135			Damp			clear50's	
11/13/2007	1545			Damp			ptcloudy50's	
12/10/2007	1204			Dry			clear20's	
01/10/2008	1108			Dry			cloudy20's	
02/11/2008	1125			Dry			cloudy20's	
03/20/2008	1055			Dry			ptcloudy40's	
04/22/2008	956			Dry			clear40's	
05/23/2008	1212			Dry			cloudy40's	
06/16/2008	1358			Dry			clear80's	
07/08/2008	1150			Dry			clear80's	
08/19/2008	1410			Dry			clear80's	
09/29/2008	1338			Dry			clear80's	
10/21/2008	1136			Dry			clear50's	
11/12/2008	1451			Dry			ptcloudy40's	
12/08/2008	1355			Dry			ptcloudy40's	
01/13/2009	1407			Dry			clear30's	
02/18/2009	1237			Dry			clear30's	
03/25/2009	1234			Dry			cloudy30's	
04/17/2009	1150			Dry			cloudy40's	
05/08/2009	1146			Dry			clear60's	
06/17/2009	1335			Dry			cloudy60's	
07/10/2009	1418			Dry			clear80's	
08/21/2009	1225			Dry			clear70's	
09/08/2009	1329			Dry			clear70's	
10/21/2009	1438			Dry			clear60's	
11/09/2009	1130			Dry			clear40's	
12/03/2009	1218			Dry			clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

GRIMES WASH FLOW & QUALITY

BELOW THE MINE - GWR03
**** FLOW INCLUDES MINE DISCHARGE**

	<----	Field Measurements ---->						
Date	Time	Temp. (°C)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
01/19/2005	1116			frozen			clear30's	
02/03/2005	1503			frozen			cloudy30's	
03/07/2005	1214	7.6		6	8.82	2210	clear40's	
04/18/2005	1325			5			cloudy50's	
05/24/2005	1012			1030			clear60's	
06/20/2005	1455	14.6		115	9.39	777	ptcloudy70's	
07/16/2005	941			129			clear70's	
08/01/2005	1318			116			cloudy60's	
09/22/2005	1124	11.6		25	8	1097	clear50's	
10/06/2005	1229			25			clear40's	
11/07/2005	1516			27			cloudy40's	
12/06/2005	1255			Frozen			cloudy20's	
01/10/2006	1518			Frozen			clear20's	
02/21/2006	1131			Frozen			clear30's	
03/13/2006	1413			Frozen			ptcloudy30's	
04/10/2006	1438			15			clear40's	
05/23/2006	1429			120			ptcloudy50's	
06/15/2006	1455	10		170	8.37	845	cloudy60's	
07/26/2006	1116			75			sunny80's	
08/02/2006	1130			80			clear80's	
09/26/2006	1232	12.2		23	8.9	995	clear50's	
10/24/2006	1100			44			clear30's	
11/16/2006	1520			12			clear30's	
12/06/2006	1129			Frozen			clear30's	
01/09/2007	1039			Frozen			clear20's	
02/12/2007	1203			Frozen			ptcloudy30's	
03/20/2007	1413	14.2		10	7.8	2640	ptcloudy60's	
04/04/2007	1027			10			cloudy40's	
05/08/2007	1426			11			clear60's	
06/28/2007	1431	24.1		5	8.61	1619	clear80's	
07/16/2007	1401			29			cloudy80's	
08/02/2007	1410			3			cloudy70's	
09/21/2007	1240	18.1		1	7.93	3470	clear50's	
10/26/2007	1138			1			clear50's	
11/13/2007	1552			1			ptcloudy50's	
12/10/2007	1209			Frozen			clear20's	
01/10/2008	1112			Frozen			cloudy20's	
02/20/2008	1128			Frozen			cloudy20's	
03/20/2008	1100			Frozen			ptcloudy40's	
04/22/2008	947			3.75			clear40's	
05/23/2008	1204			4.6			cloudy40's	
06/16/2008	1400			damp			clear80's	
07/08/2008	1200			damp			clear80's	
08/19/2008	1415			damp			clear80's	
09/29/2008	1330			<.1			clear80's	
10/21/2008	1130			0.27			clear50's	
11/12/2008	1443			0.43			ptcloudy40's	
12/08/2008	1342	1.5		0.9	7.9	2540	ptcloudy40's	
01/13/2009	1403			frozen			clear30's	
02/18/2009	1236			frozen			clear30's	
03/25/2009	1227			<.1			clear30's	
04/17/2009	1145			0.57			cloudy40's	
05/08/2009	1159			0.1			clear60's	
06/17/2009	1330	16.2		0.49	6.25	2250	cloudy60's	
07/10/2009	1430			Dry			clear80's	
08/21/2009	1220			Dry			clear70's	
09/08/2009	1326			Dry			clear70's	
10/21/009	1434			0.22			clear60's	
11/09/2009	1124			0.3			clear40's	
12/03/2009	1215			Frozen			clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

HUNTINGTON CREEK FLOW & QUALITY

HUNTINGTON CREEK - HCC01

Date	Time	Temp. (oC)	Field Measurements Flow CFS	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
03/09/2004	1357	6	17	8.88	456	13.1	clear50's	
06/03/2004	1230	13.6	80	9.5	385	9.4	clear70's	
09/09/2004	1357		50	8.52	322	8.9	ptcloudy70's	
12/14/2004	1319	1.9	18	8.17	435	10.6	clear30's	
03/21/2005	1101	4.4	18	7.09	551	11.2	cloudy40's	
06/22/2005	1134	10.8	224.91	9.68	335	9.7	cloudy70's	
09/23/2005	849	8.6	74.49	6.63	342		cloudy40's	DO Run at Lab
12/13/2005	1140	2.2	17.98	8.1	367		ptcloudy20's	DO Run at Lab
03/14/2006	1203	3.7	27.5	8.02	584		ptcloudy20's	DO Run at Lab
06/22/2006	947	11.4	173.45	8.45	378	5.7	clear70's	
09/27/2006	1428	11.7	103.76	8.65	340	7.38	clear60's	
12/07/2006	1123	2	26.81	8.68	604	11.13	clear20's	
03/26/2007	1417	11.3	34.96	7.72	461	8.02	cloudy50's	
06/29/2007	1253	16.5	88.19	8.7	342		clear70's	DO Run at Lab
09/19/2007	1051	9.5	84.65	8.59	386	9.36	clear60's	
12/05/2007	1342	2.3	43.06	8.42	533	11.75	cloudy30's	
03/24/080	1350	7.4	28.74	8.6	604	10.85	clear40's	
06/18/2008	937	9.7	380.96	8.7	301	8.86	clear80's	
09/23/2008	1021	8.34	56.2	8.34	420	11.68	ptcloudy60's	
12/04/2008	1311	2.6	39.48	8.82	596	12.82	cloudy40's	
03/24/2009	1225	5.1	20	7.89	644	11.6	ptcloudy30's	
06/18/2009	1307	12.7	186	8.64	334	8.34	cloudy60's	
09/09/2009	1307	13.9	73	9.08	348		clear70's	DO Run at Lab
12/02/2009	1320	1.3		8.14	570	12.83	clear30's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

HUNTINGTON CREEK FLOW & QUALITY

HUNTINGTON CREEK - HCC02

	<----------		Field Measurements			------>		
Date	Time	Temp. (oC)	Flow CFS	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
03/09/2004	1423	7.4	17	9.5	574	14.1	clear50's	
06/03/2004	1241	14.3	80	9.42	392	8	clear70's	
09/09/2004	1409	14.4	50	8.75	327	7.6	ptcloudy70's	
12/14/2004	1327	4.2	18	8.24	455	10.2	clear30's	
03/21/2005	1112	5.7	18	7.92	589	9.9	cloudy40's	
06/22/2005	1143	10.7	224.91	9.7	350	12	cloudy70's	
09/23/2005	900	8.8	74.49	6.5	350		cloudy40's	DO Run at Lab
12/13/2005	1151	2.3	17.98	7.91	369		ptcloudy20's	DO Run at Lab
03/14/2006	1218	2.5	27.5	8.07	738		ptcloudy20's	DO Run at Lab
06/22/2006	1001	11.4	173.45	8.35	386	4.8	clear70's	
09/27/2006	1438	12.6	103.76	8.83	345	7.24	clear60's	
12/07/2006	1140	2.6	26.81	8.37	627	11.1	clear20's	
03/26/2007	1434	11.6	34.96	8.24	493	8.24	cloudy50's	
06/29/2007	1305	16.4	88.19	8.83	341		clear70's	DO Run at Lab
09/19/2007	1101	9.8	84.65	8.39	389	8.69	clear60's	
12/05/2007	1350	3.6	43.06	8.56	549	11.83	cloudy30's	
03/24/2008	1402	8.9	28.74	8.26	659	10.38	clear40's	
06/18/2008	949	10.9	380.96	8.52	336	9.18	clear80's	
09/23/2008	1009	6.3	56.2	8.2	440	9.3	ptcloudy60's	
12/04/2008	1320	2.9	39.48	8.33	597	12.7	cloudy40's	
03/24/2009	1235	6.5	20	8.25	800	11.6	ptcloudy30's	
06/18/2009	1322	12.6	186	8.42	346	8	cloudy60's	
09/09/2009	1325	15.9	73	9.28	386		clear70's	DO Run at Lab
12/02/2009	1330	2.3		8.57	640	12.23	clear30's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

HUNTINGTON CREEK FLOW & QUALITY

HUNTINGTON CREEK - HCC04

	<----------		Field Measurements			------>		
Date	Time	Temp. (oC)	Flow CFS	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
03/09/2004	1423	8.9	17	9.31	600	13.9	clear50's	
06/03/2004	1252	14.3	80	9.3	401	8.1	clear70's	
09/09/2004	1421	15.1	50	8.37	353	6.7	ptcloudy70's	
12/14/2004	1342	4.4	18	8.55	514	10.8	clear30's	
03/21/2005	1122	6.9	18	7.64	698	9.8	cloudy40's	
06/22/2005	1152	11.1	224.91	9.32	360	12.3	cloudy70's	
09/23/2005	913	9.1	74.49	6.05	369		cloudy40's	DO Run at Lab
12/13/2005	1204	2.2	17.98	8.12	405		ptcloudy20's	DO Run at Lab
03/14/2006	1231	1.4	27.5	8.07	877		ptcloudy20's	DO Run at Lab
06/22/2006	1016	12.2	173.45	8.45	397	5.4	clear70's	
09/27/2006	1458	15.8	103.76	8.58	366	7.07	clear60's	
12/07/2006	1157	2.6	26.81	8.62	706	11.38	clear20's	
03/26/2007	1451	14.2	34.96	8.66	508	7.94	cloudy50's	
06/29/2007	1317	17.5	88.19	8.63	367		clear70's	DO Run at Lab
09/19/2007	1112	10.5	84.65	8.63	401	9.18	clear60's	
12/05/2007	1414	4.1	43.06	8.54	614	11.94	cloudy30's	
03/24/2008	1411	9.8	28.74	8.59	690	10.36	clear40's	
06/18/2008	1001	10.3	380.96	8.84	336	9.18	clear80's	
09/23/2008	953	8.5	56.2	8.35	482	10.5	ptcloudy60's	
12/04/2008	1334	3.6	39.48	8.81	635	11.93	cloudy40's	
03/24/2009	1252	7.4	20	8.42	898	11.64	ptcloudy40's	
06/18/2009	1338	12.4	186	8.72	352	8.1	cloudy60's	
09/09/2009	1335	15.3	73	9.12	397		clear70's	DO Run at Lab
12/02/2009	1342	3.6		8.36	725	11.07	clear30's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

MEETINGHOUSE CANYON
MHC01

	<-------- Field Measurements			----------	----------	-->		
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
01/25/2005	1342			Dry			ptcloudy40's	
02/25/2005	1002			Dry			cloudy40's	
03/21/2005	1021			Dry			cloudy30's	
04/21/2005	926			Dry			cloudy30's	
05/25/2005	1233			3700			ptcloudy60's	
06/21/2005	1601	16.6		1399	8.89	442	ptcloudy80's	
07/16/2005	1230			663			clear80's	
08/02/2005	1158			241			clear70's	
09/23/2005	744	7.2		83	8.3	466	cloudy40's	
10/13/2005	1507			68			clear40's	
11/17/2005	1434			Frozen			clear40's	
12/13/2005	1058			Frozen			ptcloudy20's	
01/20/2006	934			Frozen			clear20's	
02/23/2006	1106			Frozen			clear20's	
03/14/2006	1102			Frozen			ptcloudy20's	
04/27/2006	945			47			cloudy40's	
05/22/2006	1300			1737			ptcloudy50's	expro water r
06/20/2006	1519	18.9		887	8.51	424	clear70's	
07/11/2006	1435			463			clear80's	
08/08/2006	1423			230			ptcloudy90's	
09/27/2006	1304	10		83	8.9	450	clear60's	
10/24/2006	1341			83			clear30's	
11/17/2006	1434			Frozen			clear40's	
12/07/2006	1038			Frozen			clear20's	
01/24/2007	1340			Frozen			cloudy20's	
02/20/2007	953			Frozen			clear19	
03/26/2007	1108			Frozen			clear60's	
04/18/2007	1005			Dry			clear50's	
05/11/2007	824			20			clear60's	
06/29/2007	1201	19.7		41	8.84	408	clear70's	
07/17/2007	1050			20			cloudy70's	
08/06/2007	1059			61			cloudy60's	
09/20/2007	1330			<1gpm			clear60's	
10/26/2007	1418			6			clear50's	
11/14/2007	1234			6			clear40's	
12/05/2007	1256			Dry			cloudy30's	
01/15/2008	1402			Dry			cloudy20's	
02/20/2008	1118			Dry			cloudy20's	
03/24/2008	1133			Dry			cloudy40's	
04/23/2008	1426			Dry			cloudy50's	
05/28/2008	1540			730			clear60's	
06/18/2008	915	10.9		631	8.46	406	clear80's	
07/07/2008	1256			326			clear80's	
08/180/08	1152			92			clear70's	
09/23/2008	1056	7.8		18.6	7.94	407	ptcloudy60's	
10/22/2008	1342			15			clear50's	
11/18/2008	1425			2			clear50's	
12/04/2008	1301			Frozen			cloudy40's	
01/13/2009	1120			Frozen			clear30's	
02/17/2009	1416			Frozen			clear30's	
03/24/2009	1208			Dry			cloudy30's	Developed E
04/16/2009	1145			Dry			cloudy20's	snowing
05/07/2009	1200			Damp			clear60's	
06/18/2009	1248			Dry			cloudy60's	
07/14/2009	1149			Dry			clear70's	
08/20/2009	1310			Dry			clear70's	
09/09/2009	1252			Dry			clear70's	
10/26/2009	1220			Dry			clear30's	
11/06/2009	1135			Dry			clear50's	
12/02/2009	1315			Dry			clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

MILL FORK CANYON FLOW & QUALITY

MILL FORK CANYON ABOVE MINE (MFA1)

	<----------		Field Measurements			----------	------>		
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
01/25/2005	1320			INACCESSIBLE SNOW				ptcloudy40's	
02/25/2005	930			INACCESSIBLE SNOW				ptcloudy30's	
03/21/2005	900			INACCESSIBLE SNOW				cloudy40's	
04/19/2005	1413			INACCESSIBLE SNOW				cloudy40's	
05/25/2005	1019			3100				ptcloudy60's	
06/21/2005	1114	9.7		2300	9.51	400	12.3	ptcloudy80's	
07/16/2005	1041			1020				clear80's	
08/02/2005	946			160				clear70's	
09/22/2005	1321			Dry				clear60's	
10/13/2005	955			Dry				clear40's	
11/17/2005	1322			Dry				clear40's	
12/13/2005	916			Dry				ptcloudy20's	
01/20/2006	830			INACCESSIBLE SNOW				clear20's	
02/23/2006	838			INACCESSIBLE SNOW				clear20's	
03/14/2006	900			INACCESSIBLE SNOW				ptcloudy20's	
04/25/2006	1315			Dry				cloudy40's	
05/24/2006	904			10574				clear50's	
06/20/2006	1519	18.9		887	8.51	424		clear70's	
07/11/2006	926			120				clear80's	
08/23/2006	1000			Dry				clear90's	
09/27/2006	921			Dry				clear60's	
10/24/2006	1320			Dry				clear30's	
11/17/2006	1215			Dry				clear40's	
12/07/2006	833			Dry				clear20's	
01/10/2007	1316			Dry				ptcloudy20's	
02/20/2007	848			Dry				clear20's	
03/26/2007	931			Dry				ptcloudy40's	
04/18/2007	838			Dry				clear50's	
05/10/2007	1027			Dry				ptcloudy60's	
06/29/2007	839			Dry				clear70's	
07/17/2007	951			Dry				cloudy70's	
08/06/2007	1034			Dry				cloudy60's	
09/19/2007	1016			Dry				clear60's	
10/26/2007	1301			Dry				clear50's	
11/14/2007	1038			Dry				clear40's	
12/05/2007	918			Dry				cloudy30's	
01/15/2008	1327			INACCESSIBLE SNOW				ptcloudy20's	
02/20/2008	1041			INACCESSIBLE SNOW				ptcloudy20's	
03/24/2008	1018			INACCESSIBLE SNOW				ptcloudy40's	
04/23/2008	947			INACCESSIBLE SNOW				ptcloudy40's	
05/28/2008	1225			1200				clear60's	
06/17/2008	934	6.4		2000	8.56	396	8.56	clear80's	
07/07/2008	920			310				clear80's	
08/15/2008	1215			Dry				clear80's	
09/22/2008	1052			Dry				ptcloudy60's	
10/22/2008	1051			Dry				clear40's	
11/13/2008	1353			Dry				ptcloudy40's	
12/02/2008	1350			Dry				clear50's	
01/13/2009	950			Dry				clear30's	
02/17/2009	1023			INACCESSIBLE SNOW				clear30's	
03/24/2009	921			INACCESSIBLE SNOW				ptcloudy30's	
04/16/2009	938			INACCESSIBLE SNOW				cloudy20's	snowing
05/07/2009	912			Dry				clear60's	
06/22/2009	857	5.1		250	8.27	437		clear60's	
07/14/2009	856			Dry				clear70's	
08/20/2009	1002			Dry				clear70's	
09/09/2009	910			Dry				clear70's	
10/26/2009	940			Dry				clear30's	
11/06/2006	905			Dry				clear40's	
12/02/2009	940			Dry				clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

MILL FORK CANYON FLOW & QUALITY

MILL FORK CANYON BELOW MINE (MFB2)

	<----------		Field Measurements			----------	------>		
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
01/25/2005	1334			Dry				ptcloudy40's	
02/25/2005	934			Dry				ptcloudy30's	
03/21/2005	900			Dry				cloudy40's	
04/19/2005	1420			Dry				cloudy40's	
05/25/2005	1027			3150				ptcloudy60's	
06/21/2005	1144	9.9		2370	9.76	440	12.2	ptcloudy80's	
07/16/2005	1048			900				clear80's	
08/02/2005	955			130				clear70's	
09/22/2005	1334	10.2		7	8.08	685		clear60's	
10/13/2005	1004			7				clear40's	
11/17/2005	1325			7				clear40's	
12/13/2005	926			Frozen				ptcloudy20's	
01/20/2006	845			Frozen				clear20's	
02/23/2006	853			Frozen				clear20's	
03/14/2006	937			Frozen				ptcloudy20's	
04/25/2006	1327			13.3				cloudy40's	
05/22/2006	1020			9960				ptcloudy50's	
06/20/2006	1207	11		420	8.4	537		clear70's	
07/11/2006	951			180				clear80's	
08/23/2006	1009			95				clear90's	
09/27/2006	931	5.4		35	9.13	880	8.52	clear60's	
10/24/2006	1327			35				clear30's	
11/17/2006	1220			35				clear40's	
12/07/2006	840			Frozen				clear20's	
01/10/2007	1335			Frozen				ptcloudy20's	
02/20/2007	906			Frozen				clear19	
03/26/2007	945	5.4		150	8.42	1016	10.2	ptcloudy40's	
04/18/2007	848			120				clear50's	
05/10/2007	1034			120				ptcloudy60's	
06/29/2007	856	9.2		130	8.76	860	8.46	clear70's	
07/17/2007	957			130				cloudy70's	
08/06/2007	1043			140				cloudy60's	
09/19/2007	1028	7.6		160	8.35	1015	9.18	clear60's	
10/26/2007	1310			153				clear50's	
11/14/2007	1047			139				clear40's	
12/05/2007	928			Frozen				cloudy30's	
01/15/2008	928			INACCESSIBLE SNOW				ptcloudy20's	
02/20/2008	1041			INACCESSIBLE SNOW				ptcloudy20's	
03/24/2008	1018			INACCESSIBLE SNOW				ptcloudy40's	
04/23/2008	1004			86				ptcloudy40's	
05/28/2008	1240			1400				clear60's	
06/17/2008	1000	7.9		2000	8.85	427	8.25	clear80's	
07/07/2008	945			400				clear80's	
08/15/2008	1224			103				clear80's	
09/22/2008	1106	9		47.6	8.77	734	11.35	ptcloudy60's	
10/22/2008	1101			47				clear40's	
11/13/2008	1409			41.8				ptcloudy40's	
12/02/2008	1407	2.2		32.93	8.7	1150	9.7	clear50's	
01/13/2009	1000			Frozen				clear30's	
02/17/2009	1023			INACCESSIBLE SNOW				clear30's	
03/24/2009	928			Frozen				ptcloudy30's	
04/16/2009	946			Frozen				cloudy20's	snowing
05/07/2009	930			8.79				clear60's	
06/22/2009	925	6.8		545	8.83	592		clear60's	
07/14/2009	911			150				clear70's	
08/20/2009	1016			26.7				clear70's	
09/09/2009	928	9.2		15.75	9.3	778		clear70's	
10/26/2009	956			30				clear30's	
11/06/2009	920			17.75				clear40's	
12/02/2009	955			Frozen				clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

MILL FORK CANYON FLOW & QUALITY

MILL FORK CANYON ABOVE MILL FORK FAULT (MFU03)

	<----------		Field Measurements			----------	------>		
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
01/25/2005	1320			INACCESSIBLE SNOW				ptcloudy40's	
02/25/2005	930			INACCESSIBLE SNOW				ptcloudy30's	
03/21/2005	900			INACCESSIBLE SNOW				cloudy40's	
04/19/2005	1346			INACCESSIBLE SNOW				cloudy40's	
05/25/2005	953			3000				ptcloudy60's	
06/21/2005	1058	10.3		2000	9.5	402	8.8	ptcloudy80's	
07/16/2005	1030			1000				clear80's	
08/02/2005	935			200				clear70's	
09/22/2005	1308			Dry				clear60's	
10/13/2005	940			Dry				clear40's	
11/17/2005	1310			Dry				clear40's	
12/13/2005	901			Dry				ptcloudy20's	
01/20/2006	830			INACCESSIBLE SNOW				clear20's	
02/23/2006	838			INACCESSIBLE SNOW				clear20's	
03/14/2006	900			INACCESSIBLE SNOW				ptcloudy20's	
04/25/2006	1314			Dry				clear40's	
05/24/2006	941			6441				clear50's	
06/20/2006	1116	9.5		400	8.3	453		clear70's	
07/11/2006	926			150				clear80's	
08/23/2006	943			Dry				clear90's	
09/27/2006	910			Dry				clear60's	
10/24/2006	1258			Dry				clear30's	
11/17/2006	1208			Dry				clear40's	
12/07/2006	826			Dry				clear20's	
01/10/2007	1258			Dry				ptcloudy20's	
02/20/2007	836			Dry				clear19	
03/26/2007	920			Dry				ptcloudy40's	
04/18/2007	814			Dry				clear50's	
05/10/2007	1020			Dry				ptcloudy60's	
06/29/2007	810			Dry				clear70's	
07/17/2007	940			Dry				cloudy70's	
08/06/2007	1020			Dry				cloudy60's	
09/19/2007	1000			Dry				clear60's	
10/26/2007	1248			Dry				clear50's	
11/14/2007	1015			Dry				clear40's	
12/05/2007	900			Dry				cloudy30's	
01/15/2008	1327			INACCESSIBLE SNOW				ptcloudy20's	
02/20/2008	1041			INACCESSIBLE SNOW				ptcloudy20's	
03/24/2008	1018			INACCESSIBLE SNOW				ptcloudy40's	
04/23/2008	930			INACCESSIBLE SNOW				ptcloudy40's	
05/28/2008	1210			1200				clear60's	
06/17/2008	910	5.3		1800	8.61	450	10.46	clear80's	
07/07/2008	910			314				clear80's	
08/15/2008	1156			6				clear80's	
09/22/2008	1042			Dry				ptcloudy60's	
10/22/2008	1039			Dry				clear40's	
11/13/2008	1347			Dry				ptcloudy40's	
12/02/2008	1340			Dry				clear50's	
01/13/2009	940			Dry				clear30's	
02/17/2009	1023			INACCESSIBLE SNOW				clear30's	
03/24/2009	921			INACCESSIBLE SNOW				ptcloudy30's	
04/16/2009	938			INACCESSIBLE SNOW				cloudy20's	snowing
05/07/2009	900			Dry				clear60's	
06/22/2009	840	4.7		375	8.7	530		clear60's	
07/14/2009	840			46.15				clear70's	
08/20/2009	951			4.51				clear70's	
09/09/2009	900			Dry				clear70's	
10/26/2009	931			Dry				clear30's	
11/06/2009	850			Dry				clear40's	
12/02/2009	920			Dry				clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - FLUME #1(RCF1)

	<---- Field Measurements ---->							
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
04-17-89	1120		DRY				PC 60's	
01/26/2005	1337			INACCESSIBLE SNOW			ptcloudy40's	
02/25/2005	943			INACCESSIBLE SNOW			ptcloudy30's	
03/21/2005	942			INACCESSIBLE SNOW			cloudy40's	
04/19/2005	1435			INACCESSIBLE SNOW			cloudy40's	
05/25/2005	1141			4500			ptcloudy60's	
06/21/2005	1223	5.8		2945	9.68	404	ptcloudy80's	
07/16/2005	1114			556			clear80's	
08/02/2005	1000			432			clear70's	
09/22/2005	1412	7.4		90	7.91	441	clear60's	
10/13/2005	1037			101			clear40;'s	
11/17/2005	1339			Frozen			clear40;'s	
12/13/2005	936			INACCESSIBLE SNOW			ptcloudy20's	
01/20/2006	853			INACCESSIBLE SNOW			clear20's	
02/23/2006	900			INACCESSIBLE SNOW			clear20's	
03/14/2006	945			INACCESSIBLE SNOW			ptcloudy20's	
04/25/2006	1332			INACCESSIBLE SNOW			cloudy40's	
05/24/2006	1130			9632			clear50's	xpro water measurments
06/20/2006	1242	11.8		1227	8.44	415	clear70's	
07/11/2006	1245			445			clear80's	
08/09/2006	1049			171			cloudy80's	
09/27/2006	1010	4		55	8.76	437	clear560's	
10/27/2006	1029			50			clear30's	
11/27/2006	1427			Frozen			clear40's	
12/07/2006	858			Frozen			clear20's	
01/10/2007	1345			INACCESSIBLE SNOW			ptcloudy20's	
02/20/2007	915			INACCESSIBLE SNOW			clear20's	
03/26/2007	1000			INACCESSIBLE			ptcloudy40's	Gate locked
04/17/2007	1522			45			clear50's	
05/10/2007	1105			900			ptcloudy60's	
06/29/2007	945	10		200	8.55	420	clear70's	
07/25/2007	852			70			ptcloudy70's	
08/20/2007	1407			45			clear80's	
09/20/2007	1120	6.6		20	8.58	606	clear60's	
10/26/2007	1331			19			clear50's	
11/14/2007	1117			Dry			clear40's	
12/05/2007	941			Dry			cloudy30's	
01/15/2008	1334			INACCESSIBLE			ptcloudy20's	
02/20/2008	1051			INACCESSIBLE			cloudy20's	
03/24/2008	1018			INACCESSIBLE			clear40's	
04/23/2008	1018			INACCESSIBLE			ptcloudy40's	
05/28/2008	1324			2066			clear60's	
06/17/2008	1052	8.2		2299	8.86	399	clear80's	
07/07/2008	1019			556			clear80's	
08/18/2008	936			152			clear60's	
09/22/2008	1153	8.5		67	8.15	417	ptcloudy60's	
10/22/2008	1134			Dry			clear50's	
11/13/2008	1445			Dry			ptcloudy40's	
12/02/2008	1440			Dry			clear50's	
01/13/2009	1010			INACCESSIBLE			clear30's	
02/17/2009	1030			INACCESSIBLE			clear30's	
03/24/2009	936			INACCESSIBLE			ptcloudy30's	
04/16/2009	957			INACCESSIBLE			cloudy20's	snowing
05/07/2009	1008			1042			clear60's	
06/22/2009	1010	5.8		835	8.53	437	clear60's	
07/14/2009	944			190			clear70's	
08/20/2009	1050			15			clear70's	
09/09/2009	1014	8.9		6.3	8.86	444	clear70's	
10/26/2009	1025			Dry			clear30's	
11/06/2009	952			Dry			clear40's	
12/02/2009	1031			Dry			clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - FLUME #2 (RCF2)

	<——	Field Measurements ——>						
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
01/26/2005	1337			INACCESSIBLE SNOW			ptcloudy40's	
02/25/2005	943			INACCESSIBLE SNOW			ptcloudy30's	
03/21/2005	942			INACCESSIBLE SNOW			cloudy40's	
04/19/2005	1440			Dry			cloudy40's	
05/25/2005	1208			5000			ptcloudy60's	
06/21/2005	1508	12.7		2903	9.74	404	ptcloudy80's	
07/16/2005	1155			559			clear80's	
08/02/2005	1035			227			clear70's	
09/22/2005	1506			Damp			clear60's	
10/13/2005	1122			Dry			clear40's	
11/17/2005	1408			Dry			clear40's	
12/13/2005	956			Dry			ptcloudy20's	
01/20/2006	910			Dry			clear20's	
02/23/2006	932			Dry			clear20's	
03/14/2006	1003			Dry			ptcloudy20's	
04/25/2006	1340			Dry			cloudy40's	
05/22/2006	1043			15530			ptcloudy50's	expro water measurments
06/20/2006	1354	12.5		956	8.48	425	clear70's	
07/11/2006	1122			359			clear80's	
08/09/2006	1248			78			cloudy80's	
09/27/2006	1126			Dry			clear60's	
10/27/2006	1109			Dry			clear30's	
11/17/2006	1246			Dry			clear40's	
12/07/2006	948			Dry			clear20's	
01/10/2007	1403			Dry			ptcloudy20's	
02/20/2007	920			Dry			clear20's	
03/26/2007	1000			INACCESSIBLE			ptcloudy40's	Gate locked
04/18/2007	930			Dry			clear50's	
05/10/2007	1150			927			ptcloudy60's	
06/29/2007	1030	16.3		90	8.71	394	clear70's	
07/25/2007	930			Dry			ptcloudy70's	
08/20/2007	1443			Dry			clear80's	
09/20/2007	1212			Dry			clear60's	
10/26/2007	1347			Dry			clear50's	
11/14/2007	1203			Dry			clear40's	
12/05/2007	1000			Dry			cloudy30's	
01/15/2008	1334			INACCESSIBLE			ptcloudy20's	
02/20/2008	1051			INACCESSIBLE			ptcloudy20's	
03/24/2008	1018			INACCESSIBLE			clear40's	
04/23/2008	1045			Dry			ptcloudy40's	
05/28/2008	1420			2251			clear60's	
06/17/2008	1240	8.6		2903	8.59	384	clear80's	
07/07/2008	1143			658			clear80's	
08/18/2008	1039			90			clear70's	
09/22/2008	1248			Dry			ptcloudy60's	
10/22/2008	1231			Dry			clear50's	
11/13/2008	1516			Dry			ptcloudy40's	
12/02/2008	1508			Dry			clear50's	
01/13/2009	1019			Dry			clear30's	
02/17/2009	1030			INACCESSIBLE			clear30's	
03/24/2009	958			Dry			ptcloudy30's	
04/16/2009	1023			Dry			cloudy20's	snowing
05/07/2009	1107			709			clear60's	
06/18/2009	1040	7.2		956	8.24	425	cloudy60's	
07/14/2009	1047			90			clear70's	
08/20/2009	1144			Dry			clear70's	
09/09/2009	1110			Dry			clear70's	
10/26/2009	1115			Dry			clear30's	
11/06/2009	1030			Dry			clear40's	
12/02/2009	1116			Dry			clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - FLUME #3 (RCF3)

	<----------		Field Measurements			---------->			
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
01/26/2005	1341			78				ptcloudy40's	
02/25/2005	945			78				ptcloudy30's	
03/21/2005	954	4.8		78	8.73	808	7.8	cloudy40's	
04/18/2005	1442			78				cloudy40's	
05/25/2005	1210			5000				ptcloudy60's	
06/21/2005	1521	12.8		2290	9.52	420	8.7	ptcloudy80's	
07/16/2005	1210			512				clear80's	
08/02/2005	1039			227				clear70's	
09/22/2005	1514	11.1		65	7.8	806		clear60's	
10/13/2005	1134			78				clear40's	
11/17/2005	1415			78				clear40's	
12/13/2005	1020	3.9		78	7.74	717		ptcloudy20's	
01/20/2006	915			70				clear20's	
02/23/2006	939			74				clear20's	
03/14/2006	1018	3.1		78	7.6	869		ptcloudy20's	DO run at lab
04/25/2006	1345			78				cloudy40's	
05/23/2006	912			15592				ptcloudy50's	expro water measurments
06/20/2006	1421	13		1227	8.25	456		clear70's	
07/11/2006	1057			584				clear80's	
08/09/2006	1402			193				cloudy80's	
09/27/2006	1135	8.8		90	8.39	975		clear60's	
10/27/2006	1118			88				clear30's	
11/17/2006	1255			80				clear40's	
12/07/2006	959	5.5		78	8.32	1096	7.22	clear20's	
01/10/2007	1405			78				ptcloudy20's	
02/20/2007	927			90				clear19's	
03/26/2007	1010	8.5		131	7.7	1008	7.83	ptcloudy40's	
04/18/2007	934			78				clear50's	
05/10/2007	1153			1104				ptcloudy60's	
06/29/2007	1052	12.2		176	8.08	689		clear70's	DO run at lab
07/17/2007	1012			101				cloudy70's	
08/20/2007	1456			101				clear80's	
09/20/2007	1239	10.5		101	7.59	1232	7.71	clear60's	
10/26/2007	1349			101				clear50's	
11/14/2007	1206			90				clear40's	
12/05/2007	1006	5.8		100	7.89	1055	8.65	cloudy30's	
01/15/2008	1340			90				ptcloudy20's	
02/20/2008	1056			75				ptcloudy20's	
03/24/2008	1052	5.9		78	8.01	814	9.43	ptcloudy40's	
04/23/2008	1129			90				ptcloudy40's	
05/28/2008	1435			2251				clear60's	
06/17/2008	1306	8.8		2693	8.36	415	10.6	clear80's	
07/07/2008	1143			633				clear80's	
08/18/2008	1041			131				clear70's	
09/22/2008	1258	10.2		944	7.97	944	8.4	ptcloudy60's	
10/22/2008	1243			60				clear50's	
11/18/2008	1314			70				clear50's	
12/02/2008	1511	6.3		65	7.85	1074	7.78	clear50's	
01/13/2009	1023			65				clear30's	
02/17/2009	1035			60				clear30's	
03/24/2009	1012	4.8		60	8.35	869	12.03	ptcloudy30's	
04/16/2009	1028			60				cloudy20's	snowing
05/07/2009	1112			633				clear60's	
06/18/2009	940	7.3		927	8.64	481	12.2	cloudy60's	
07/14/2009	1051			131				clear70's	
08/20/2009	1154			60				clear70's	
09/09/2009	1123	10.8		60	8.42	922		clear70's	DO Run at lab
10/26/2009	1120			80				clear30's	
11/06/2009	1042			60				clear50's	
12/02/2009	1126	1.9		70	7.82	928	11.79	clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - LEFT FORK (RCLF1)

	<——	Field Measurements ——>						
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
01/26/2005	1337			INACCESSIBLE SNOW			ptcloudy40's	
02/25/2005	943			INACCESSIBLE SNOW			ptcloudy30's	
03/21/2005	942			INACCESSIBLE SNOW			cloudy40's	
04/19/2005	1436			Dry			cloudy40's	
05/25/2005	1115			150			ptcloudy60's	
06/21/2005	1305	13.8		353	9.46	505	ptcloudy80's	
07/16/2005	1130			20			clear80's	
08/02/2005	1015			9			clear70's	
09/22/2005	1445			Dry			clear60's	
10/13/2005	1001			Dry			clear40's	
11/17/2005	1359			Dry			clear40's	
12/20/2006	945			Dry			ptcloudy20's	
01/20/2006	856			Dry			clear20's	
02/23/2006	910			Dry			clear20's	
03/14/2006	949			Dry			ptcloudy20's	
04/25/2006	1334			Dry			cloudy40's	
05/22/2006	1055			408			ptcloudy50's	expro water measurments
06/20/2006	1322	14.8		62	8.43	533	clear70's	
07/11/2006	1210			16			clear80's	
08/09/2006	1156			Damp			cloudy80's	
09/27/2006	1100			Dry			clear60's	
10/27/2006	1048			Dry			clear30's	
11/17/2006	1235			Dry			clear40's	
12/07/2006	926			Dry			clear20's	
01/10/2007	1346			Dry			ptcloudy20's	
02/20/2007	916			Dry			clear19	
03/26/2007	1000			INACCESSIBLE			ptcloudy40's	Gate locked
04/18/2007	912			12			clear50's	
05/10/2007	1130			25			ptcloudy60's	
06/29/2007	1007			Dry			clear70's	
07/25/2007	912			Dry			ptcloudy70's	
08/20/2007	1428			Dry			clear80's	
09/20/2007	1200			Dry			clear60's	
10/26/2007	1340			Dry			clear50's	
11/14/2007	1138			Dry			clear40's	
12/05/2007	955			Dry			cloudy30's	
01/15/2008	1334			INACCESSIBLE			ptcloudy20's	
02/20/2008	1051			INACCESSIBLE			ptcloudy20's	
03/24/2008	1018			INACCESSIBLE			clear40's	
04/23/2008	1023			No flow			ptcloudy40's	
05/28/2008	1357			167			clear60's	
06/17/2008	1202	11.1		200	8.42	556	clear80's	
07/07/2008	1105			21.4			clear80's	
08/18/2008	1014			Dry			clear60's	
09/22/2008	1242			Dry			ptcloudy60's	
10/22/2008	1205			Dry			clear50's	
11/13/2008	1458			Dry			ptcloudy40's	
12/02/2008	1504			Dry			clear50's	
01/13/2009	1017			Dry			clear30's	
02/17/2009	1030			INACCESSIBLE			clear30's	
03/24/2009	942			Dry			ptcloudy30's	
04/16/2009	959			Dry			cloudy20's	snowing
05/07/2009	1032			4.52			clear60's	
06/22/2009	1027	8.2		70	8.6	578	cloudy60's	
07/14/2009	1018			Dry			clear70's	
08/20/2009	1119			Dry			clear70's	
09/09/2009	1048			Dry			clear70's	
10/26/2009	1100			Dry			clear30's	
11/06/2009	1012			Dry			clear40's	
12/02/2009	1057			Dry			clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - LEFT FORK (RCLF2)

	<----	Field Measurements ---->						
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Weather	Comments
01/26/2005	1337			INACCESSIBLE SNOW			ptcloudy40's	
02/25/2005	943			INACCESSIBLE SNOW			ptcloudy30's	
03/21/2005	942			INACCESSIBLE SNOW			cloudy40's	
04/19/2005	1438			Dry			cloudy40's	
05/25/2005	1121			152			ptcloudy60's	
06/21/2005	1255	13.1		350	9.49	504	ptcloudy80's	
07/16/2005	1141			23			clear80's	
08/02/2005	1010			8			clear70's	
09/22/2005	1450			Dry			clear60's	
10/13/2005	1005			Dry			clear40's	
11/17/2005	1405			Dry			clear40's	
12/13/2005	947			Dry			ptcloudy20's	
01/20/2006	858			Dry			clear20's	
02/23/2006	913			Dry			clear20's	
03/14/2006	951			Dry			ptcloudy20's	
04/25/2006	1337			Dry			cloudy40's	
05/22/2006	1114			1014			ptcloudy50's	expro water measurments
06/20/2006	1330	15		53	8.38	528	clear70's	
07/11/2006	1326			13			clear80's	
08/09/2006	1211			Damp			cloudy80's	
09/27/2006	1105			Dry			clear60's	
10/27/2006	1053			Dry			clear30's	
11/17/2006	1238			Dry			clear40's	
12/07/2006	930			Dry			clear20's	
01/10/2007	1346			Dry			ptcloudy20's	
02/20/2007	918			Dry			clear20's	
03/26/2007	1000			INACCESSIBLE			ptcloudy40's	Gate locked
04/18/2007	915			Damp			clear50's	
05/10/2007	1133			30			ptcloudy60's	
06/29/2007	1010			Dry			clear70's	
07/25/2007	914			Dry			ptcloudy70's	
08/20/2007	1432			Dry			clear80's	
09/20/2007	1209			Dry			clear60's	
10/26/2007	1342			Dry			clear50's	
11/14/2007	1142			Dry			clear40's	
12/05/2007	958			Dry			cloudy30's	
01/15/2008	1334			INACCESSIBLE			ptcloudy20's	
02/20/2008	1051			INACCESSIBLE			ptcloudy20's	
03/24/2008	1018			INACCESSIBLE			clear40's	
04/23/2008	1030			Dry			ptcloudy40's	
05/28/2008	1350			240			clear60's	
06/17/2008	1142	10.8		207	8.78	524	clear80's	
07/07/2008	1050			32.6			clear80's	
08/18/2008	1008			Dry			clear60's	
09/22/2008	1248			Dry			ptcloudy60's	
10/22/2008	1158			Dry			clear50's	
11/13/2008	1458			Dry			ptcloudy40's	
12/02/2008	1508			Dry			clear50's	
01/13/2009	1015			Dry			clear30's	
02/17/2009	1030			INACCESSIBLE			clear30's	
03/24/2009	939			Dry			ptcloudy30's	
04/16/2009	959			Dry			cloudy20's	snowing
05/07/2009	1041			15.58			clear60's	
06/18/2009	1009	7.7		53.95	8.08	604	cloudy60's	
07/14/2009	1009			Dry			clear70's	
08/20/2009	1113			Dry			clear70's	
09/09/2009	1042			Dry			clear70's	
10/26/2009	1050			Dry			clear30's	
11/06/2009	1000			Dry			clear40's	
12/02/2009	1053			Dry			clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

RILDA CANYON FLOW & QUALITY

RILDA CANYON - WEIR #4 (RCW4)

		Field Measurements							
Date	Time	Temp. (oC)	Flow ft.	GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
01/26/2005	1357			117				ptcloudy40's	
02/25/2005	951			116				ptcloudy30's	
03/21/2005	1009	3.7		140	8.3	956	9.7	cloudy40's	
04/19/2005	1447			140				cloudy40's	
05/25/2005	1220			6000				ptcloudy60's	
06/21/2005	1539	12.3		3015	9.34	466	9.7	ptcloudy80's	
07/16/2005	1215			665				clear80's	
08/02/2005	1046			305				clear70's	
09/22/2005	1534	10.4		157	7.29	949		clear60's	
10/13/2005	1210			117				clear40's	
11/17/2005	1426			117				clear40's	
12/13/2005	1051			Frozen				ptcloudy20's	
01/20/2006	928			Frozen				clear20's	
02/23/2006	954			125				clear20's	
03/14/2006	1050	2.3		110	7.89	1079		ptcloudy20's	DO run at lab
04/25/2006	1351			165				cloudy40's	
05/22/2006	1028			35767				ptcloudy50's	expro water measurments
06/20/2006	1504	12.9		2538	8.32	560		clear70's	
07/11/2006	1029			588				clear80's	
08/09/2006	1521			213				cloudy80's	
09/27/2006	1218	7.7		205	8.76	1137	8.16	clear60's	
10/27/2006	1142			241				clear30's	
11/17/2006	1330			234				clear40's	
12/07/2006	1031			Frozen				clear20's	
01/10/2007	1420			200				ptcloudy20's	
02/20/2007	940			223				clear19	
03/26/2007	1047	7.2		292	8.08	1726	8.39	ptcloudy40's	
04/18/2007	951			280				clear50's	
05/10/2007	1202			1762				ptcloudy60's	
06/29/2007	1135	14.1		481	8.53	1146		clear70's	DO run at lab
07/17/2007	1032			417				cloudy70's	
08/20/2007	1513			372				clear80's	
09/20/2007	1311	8.1		268	7.77	1993	9.03	clear60's	
10/26/2007	1406			292				clear50's	
11/14/2007	1213			280				clear40's	
12/05/2007	1050	2.4		256	8.31	1954	11.5	cloudy30's	
01/15/2008	1354			203				ptcloudy20's	
02/20/2008	1109			174				ptcloudy20's	
03/24/2008	1113	3.8		180	8.04	1844	11.3	ptcloudy40's	
04/23/2008	1159			224				ptcloudy40's	
05/28/2008	1442			2317				clear60's	
06/17/2008	1343	10		3500	8.46	542	10.3	clear80's	
07/07/2008	1208			817				clear80's	
08/18/2008	1056			203				clear70's	
09/22/2008	1341	9.8		1565	8.27	1565	10.8	ptcloudy60's	
10/22/2008	1302			140				clear50's	
11/18/2008	1342			157				clear50's	
12/04/2008	1209	2.1		157	7.97	1799	10.7	cloudy40's	
01/13/2009	1043			140				clear30's	
02/17/2009	1340			148				clear30's	
03/24/2009	1102	3.1		148.6	8.58	1693	12.95	ptcloudy30's	
04/16/2009	1105			148				cloudy20's	snowing
05/07/2009	1132			708				clear60's	
06/18/2009	1115	8.9		1150	8.57	638	11.62	cloudy60's	
07/14/2009	1113			223				clear60's	
08/20/2009	1230			97.4				clear60's	
09/09/2009	1200	11.3		97.4	8.8	1350		clear60's	DO run at lab
10/26/2009	1142			111				clear60's	
11/06/2009	1058			125				clear50's	
12/02/2009	1213	0.8		111	8.52	1640	11.97	clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

COTTONWOOD CANYON CREEK FLOW & QUALITY

SW-1

	<———		Field Measurements			———>		
Date	Time	Temp. (oC)	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
01/19/2005	1140		INACCESSIBLE SNOW				clear30's	
02/03/2005	1433		INACCESSIBLE SNOW				cloudy30's	
03/07/2005	1108		INACCESSIBLE SNOW				clear40's	
04/18/2005	1235		2.5				cloudy50's	
05/24/2005	911		390				clear60's	
06/20/2005	1254	16.2	500	9.23	485	8.8	ptcloudy70's	
07/16/2005	859		150				clear70's	
08/01/2005	1137		50				cloudy60's	
09/22/2005	901	7.5	5	7.79	667		clear50's	
10/06/2005	1128		5				clear40's	
11/07/2005	1434		5				cloudy40's	
12/06/2005	1151		Frozen				cloudy20's	
01/10/2006	1440		Frozen				clear20's	
02/21/2006	1052		Frozen				clear20's	
03/13/2006	1315		INACCESSIBLE SNOW				ptcloudy30's	
04/10/2006	1333		6				clear40's	
05/23/2006	1226		143				ptcloudy50's	
06/15/2006	1237	9.9	260	8.27	526	11	cloudy60's	
07/26/2006	906		130				sunny80's	
08/07/2006	1048		33				clear90's	
09/26/2006	1038	9.6	15	8.3	15		clear50's	DO run at lab
10/24/2006	1017		10				clear30's	
11/16/2006	1433		10				clear30's	
12/06/2006	1008	5.2	10	8.08	822	7.81	clear30's	
01/09/2007	959		10				clear20's	
02/12/2007	1113		5				ptcloudy30's	
03/20/2007	1217	11.7	5.1	7.94	1020	7.22	ptcloudy60's	
04/04/2007	948		10				cloudy40's	
05/08/2007	1335		10				clear60's	
06/28/2007	1244	26.3	3	8.31	987	6.22	clear80's	
07/16/2007	1307		3				cloudy80's	
08/02/2007	1333		3				cloudy70's	
09/21/2007	1036		Seep				clear50's	
10/26/2007	1109		Seep				clear50's	
11/13/2007	1517		Damp				ptcloudy50's	
12/10/2007	1103		Damp				clear20's	
01/10/2008	1029		INACCESSIBLE SNOW				ptcloudy20's	
02/11/2008	1102		INACCESSIBLE SNOW				ptcloudy20's	
03/20/2008	938		<.1				ptcloudy40's	LOW FLOW
04/17/2008	1215		2				clear40's	
05/28/2008	1025		85				clear50's	
06/16/2008	1201	15.4	22	8.15	840	7	clear80's	
07/08/2008	1045		9				clear80's	
08/19/2008	1255		Seep				clear80's	
09/29/2008	1139		Seep				clear80's	
10/21/2008	1031		Damp				cloudy40's	
11/12/2008	1345		Damp				cloudy40's	
12/08/2008	1126		Damp				ptcloudy40's	
01/13/2009	1312		Frozen				clear30's	
02/18/2009	1150		Damp				clear30's	
03/25/2009	1113	4.1	1.8	7.29	1066		cloudy30's	
04/17/2009	1058		1.74				cloudy30's	
05/08/2009	1054		1.94				clear60's	
06/17/2009	1140	14.8	5.77	8.17	1006		cloudy60's	
07/10/2009	1321		0.64				clear80's	
08/21/2009	1128		Damp				clear70's	
09/08/2009	1220		Damp				clear70's	
10/21/2009	1346		Damp				clear60's	
11/09/2009	1041		Damp				clear40's	
12/03/2009	1108		Dry				clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

COTTONWOOD CANYON CREEK FLOW & QUALITY

SW-2

	<----------		Field Measurements			------>		
Date	Time	Temp. (oC)	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
01/19/2005	1051		15				clear30's	
02/03/2005	1441		22				cloudy30's	
03/07/2005	1144	8.6	30	8.71	1030	15.3	clear40's	
04/18/2005	1243		25				cloudy50's	
05/24/2005	925		400				clear60's	
06/20/2005	1331	14.4	516	9.43	516	13.4	ptcloudy70's	
07/16/2005	913		250				clear70's	
08/01/2005	1249		70				cloudy60's	
09/22/2005	924	9.1	20	8.21	895		clear50's	
10/06/2005	1155		22				clear40's	
11/07/2005	1444		21				cloudy40's	
12/06/2005	1227	5.3	20	8.13	881		cloudy20's	
01/10/2006	1451		20				clear20's	
02/21/2006	1108		18				clear20's	
03/13/2006	1349	4.2	20	8.1	832		ptcloudy30's	DO run at lat
04/10/2006	1352		30				clear40's	
05/23/2006	1250		150				ptcloudy50's	
06/15/2006	1321	9.4	265	8.43	567	11.2	cloudy60's	
07/26/2006	943		220				sunny80's	
08/07/2006	1114		70				clear90's	
09/26/2006	1118	10.4	45	8.69	854		clear50's	DO run at lat
10/24/2006	1029		35				clear30's	
11/16/2006	1444		30				clear30's	
12/06/2006	1055	6.6	15	8.25	974	8.81	clear30's	
01/09/2007	1013		15				clear20's	
02/12/2007	1124		18				ptcloudy30's	
03/20/2007	1307	9.7	45	8.52	946	8.56	ptcloudy60's	
04/04/2007	1001		45				cloudy50's	
05/08/2007	1350		45				clear60's	
06/28/2007	1332	20.7	18	8.24	1003	6.89	clear80's	
07/16/2007	1331		15				cloudy80's	
08/02/2007	1340		14				cloudy70's	
09/21/2007	1150	14.1	15	8.22	997	7.96	clear60's	
10/26/2007	1119		15				clear50's	
11/13/2007	1527		17				ptcloudy50's	
12/10/2007	1145	5.7	17	8.32	1077	10.47	clear20's	
01/10/2008	1034		15				ptcloudy20's	
02/11/2008	1112		17				ptcloudy20's	
03/20/2008	1028	6.4	15	8.28	1064	10.97	ptcloudy40's	
04/17/2008	1242		30				clear40's	
05/23/2008	1106		214				ptcloudy40's	
06/16/2008	1310	14.7	54	8.5	809	8.2	clear80's	
07/08/2008	1114		34.8				clear80's	
08/19/2008	1325		18.3				clear80's	
09/29/2008	1215	16.2	14.7	8.5	834	9.73	clear80's	
10/21/2008	1049		22				cloudy50's	
11/12/2008	1404		16.8				ptcloudy40's	
12/08/2008	1157	6.9	21	7.96	1039		ptcloudy40's	
01/13/2009	1335		16				clear30's	
02/18/2009	1211		15				clear30's	
03/25/2009	1154	7.8	27.3	8.19	1274		cloudy30's	
04/17/2009	1124		26.67				cloudy30's	
05/08/2009	1112		22.3				clear60's	
06/17/2009	1238	12.3	22.72	5.26	9.8		cloudy60's	
07/10/2009	1346		14.28				clear80's	
08/21/2009	1155		12.76				clear70's	
09/08/2009	1300	17.8	21	8.79	905		clear70's	
10/21/2009	1404		13.64				clear60's	
11/09/2009	1100		12.82				clear40's	
12/03/2009	1148	2.8	11.32	8.26	1077		clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

COTTONWOOD CANYON CREEK FLOW & QUALITY

SW-3

	<————		Field Measurements —			——>		
Date	Time	Temp. (oC)	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
01/19/2005	1058		Dry				clear30's	
02/03/2005	1447		Dry				cloudy30's	
03/07/2005	1153		Dry				clear40's	
04/18/2005	1251		Dry				cloudy50's	
05/24/2005	941		410				clear60's	
06/20/2005	1353	18.3	953	9.55	533	10.3	ptcloudy70's	
07/16/2005	921		260				clear70's	
08/01/2005	1255		84				cloudy60's	
09/22/2005	952	11.6	21	7.33	2430		clear50's	
10/06/2005	1204		21				clear40's	
11/07/2005	1453		18				cloudy40's	
12/06/2005	1237		Dry				cloudy20's	
01/10/2006	1459		Dry				clear20's	
02/21/2006	1115		Dry				clear20's	
03/13/2006	1359		Dry				ptcloudy30's	
04/10/2006	1403		5				clear40's	
05/23/2006	1259		158				ptcloudy50's	
06/15/2006	1410	13.4	267	8.23	674		cloudy60's	
07/26/2006	1020		227				sunny80's	
08/07/2006	1439		74				clear90's	
09/26/2006	1137	13.7	20	8.54	1736		clear50's	DO run at lat
10/24/2006	1037		19				clear30's	
11/16/2006	1448		15				clear30's	
12/06/2006	1112		Frozen				clear30's	
01/09/2007	1019		Frozen				clear20's	
02/12/2007	1129		Frozen				ptcloudy30's	
03/20/2007	1307		Dry				ptcloudy60's	
04/04/2007	1010		42				cloudy40's	
05/08/2007	1359		43				ptcloudy60's	
06/28/2007	1351	26.5	10	8.24	2250	7.64	clear80's	
07/16/2007	1338		12				cloudy80's	
08/02/2007	1350		10				cloudy70's	
09/21/2007	1218	16.6	8	8.27	2620	9.02	clear50's	
10/26/2007	1125		5				clear50's	
11/13/2007	1531		4				ptcloudy50's	
12/10/2007	1157		Dry				clear20's	
01/10/2008	1042		Dry				ptcloudy20's	
02/11/2008	1117		Dry				ptcloudy20's	
03/20/2008	1039		Dry				ptcloudy40's	
04/17/2008	1253		Dry				clear40's	
05/23/2008	1056		Dry				ptcloudy40's	
06/16008	1330		Dry				clear80's	
07/08/2008	1128		Dry				clear80's	
08/19/2008	1337		5.5				clear80's	
09/29/2008	1258	20.2	5.45	8.13	1996	7.35	clear80's	
10/21/2008	1110		3.1				cloudy50's	
11/12/2008	1420		2.87				ptcloudy40's	
12/08/2008	1226	2.2	0.33	7.78	2250		ptcloudy40's	
01/13/2009	1348		Frozen				clear30's	
02/18/2009	1222		DRY				clear30's	
03/25/2009	1213		DRY				cloudy30's	
04/17/2009	1130		DRY				cloudy30's	
05/08/2009	1120		DRY				clear60's	
06/17/2009	1258		DRY				cloudy60's	
07/10/2009	1356		DRY				clear80's	
08/21/2009	1207		DRY				clear70's	
09/08/2009	1314		DRY				clear70's	
10/21/2009	1414		DRY				clear60's	
11/09/2009	1109		DRY				clear40's	
12/03/2009	1203		DRY				clear20's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

COTTONWOOD CANYON CREEK
@ USGS FLUME
CCC01

	<--------		Field Measurements ---- ------->					
Date	Time	Temp. (°C)	Flow ft.	GPM	pH	Cond. (uS)	Dis. Oxygen	Weather Comments
01/19/2005	1056			Dry				clear30's
02/03/2005	1444			Dry				cloudy30's
03/07/2005	1150			Dry				clear40's
04/18/2005	1248			Dry				cloudy50's
05/24/2005	935			Over Capacity				clear60's
06/20/2005	1341	15.3		940	9.17	512	11.6	ptcloudy70's
07/16/2005	917			127				clear70's
08/01/2005	1251			83				cloudy60's
09/22/2005	939	9.5		20	7.75	943		clear50's
10/06/2005	1159			20				clear40's
11/07/2005	1448			21				cloudy40's
12/06/2005	1234			Dry				cloudy20's
01/10/2006	1456			Dry				clear20's
02/21/2006	1112			Dry				clear20's
03/13/2006	1354			Dry				ptcloudy30's
04/10/2006	1357			33				clear40's
05/23/2006	1253			155				ptcloudy50's
06/15/2006	1335	9.5		265	8.33	547		clear70's
07/26/2006	1008			222				sunny80's
08/07/2006	1132			73				clear90's
09/26/2006	1127	9		25	8.72	815		clear50's
10/24/2006	1033			20				clear30's
11/16/2006	1446			16				clear30's
12/06/2006	1108			frozen-no flow				clear30's
01/09/2007	1015			frozen-no flow				clear20's
02/12/2007	1126			frozen-no flow				ptcloudy30's
03/20/2007	1337	12.5		41	8.46	8.3	822	ptcloudy60's
04/04/2007	1005			41				cloudy40's
05/08/2007	1355			43				clear60's
06/28/2007	1338			Damp				clear80's
07/16/2007	1334			Damp				cloudy80's
08/02/2007	1344			Damp				cloudy70's
09/21/2007	1201			Dry				clear50's
10/26/2007	1121			Dry				clear50's
11/13/2007	1529			Dry				ptcloudy50's
12/10/2007	1150			Dry				clear20's
01/10/2008	1037			Dry				ptcloudy20's
02/11/2008	1114			Dry				clear20's
03/20/2008	1135			<.2				ptcloudy40's
04/17/2008	1253			<.2				clear40's
05/23/2008	1132			155				clear50's
06/16/2008	1320			54				clear80's
07/08/2008	1123			35				clear80's
08/18/2008	1332			10				clear80's
09/29/2008	1235	11		6.7	8.93	615		clear80's
10/21/2008	1100			4.5				cloudy50's
11/12/2008	1413			11				ptcloudy40's
12/08/2008	1216	1.2		35	8.45	915		ptcloudy40's
01/13/2009	1342			frozen-no flow				clear30's
02/18/2009	1216			frozen-no flow				clear30's
03/25/2009	1202	5		8	7.97	1118		ptcloudy30's
04/17/2009	1128			Dry				cloudy30's
05/08/2009	1117			3				clear60's
06/17/2009	1249	15		6	5.52	1505		cloudy60's
07/10/2009	1350			1.25				clear80's
08/21/2009	1200			4.9				clear70's
09/08/2009	1312	16		5.18	9.25	848		clear70's
10/21/2009	1406			Damp				clear60's
11/09/2009	1103			Damp				clear40's
12/03/2009	1156			frozen				clear20's

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

INDIAN CREEK ABOVE CAMP GROUND

ICA

	<----------		Field Measurements			------>		
Date	Time	Temp. (oC)	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
10/15/2001	1400		111	8.21	633		clear60's	
10/30/2002	1410	4.2	65	8.25	483		cloudy30's	
11/11/2003	1130	2.1	27	8.24	493		cloudy30's	
12/08/2004	1420	16	150	8.34	373		cloudy20's	
10/19/2005	1510	8.4	318	7.8	488	9.5	clear30's	
10/26/2006	1140	3.7	359	8.77	456	9.09	clear30's	
10/08/2007	1310	10.2	74	8.44	488	8.9	clear40's	
10/09/2008	1145	6.8	141	8.22	473	8.53	clear60's	
10/07/2009	1045	4.1	125	8.03	506	8.72	clear40's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

INDIAN CREEK BELOW CROSS OVER ROAD

ICB

	<----------		Field Measurements			------->		
Date	Time	Temp. (oC)	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
10/15/2001	1500		268	8.26	559		clear60's	
10/30/2002	1357	3.8	136	8.21	432		cloudy30's	
11/11/2003	1319	1.2	56	8.13	427		cloudy30's	
12/08/2004	743	0.3	213	7.94	490		cloudy20's	
10/19/2005	1335	7.1	607	8.36	381	9.4	clear30's	
10/26/2006	1228	3.5	481	8.79	465	8.79	clear30's	
10/08/2007	1420	8.1	148.6	8.61	458	10.7	clear40's	
10/09/2008	1310	7.8	223.8	8.43	440	8.8	clear60's	
10/07/2009	1200	4.7	268	8.38	446	6.7	clear40's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

INDIAN CREEK DITCH ABOVE CROSS OVER ROAD

ICD

	<----------		Field Measurements			------>		
Date	Time	Temp. (oC)	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
10/15/2001	1440		31	8.29	753		clear60's	
10/30/2002	1350	4.1	12	8.28	740		cloudy30's	
11/11/2003	1255	1.2	21	8.21	624		cloudy30's	
12/08/2004	1420		No Flow				cloudy20's	
10/19/2005	1416	8.6	91	7.95	674		clear30's	
10/26/2006	1248	5.5	85	8.79	663	9	clear30's	
10/08/2007	1400	14.9	23	8.29	733	11	clear40's	
10/09/2008	1230	11.8	22	8.34	590	11	clear60's	
10/07/2009	1130	4.5	15	7.9	646	7	clear40's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

INDIAN CREEK FLUME BELOW CAMP GROUND

ICF

	<----------		Field Measurements			------->		
Date	Time	Temp. (oC)	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
10/15/2001	1510		614				clear60's	
10/24/2002	1120		305				snow30's	checked w/90° vnotch157g
11/11/2003	1210		433				cloudy30's	
12/08/2004	1420		539				cloudy20's	
10/19/2005	1525		668				clear30's	
10/26/2006	1202	4.4	986	8.42	500	8.64	clear30's	
10/08/2007	1335	10.2	410.7	8.34	474	9.67	clear40's	
10/09/2008	1210	8.4	693	8.34	445	9.4	clear60's	
10/07/2009	1105	5.5	655	8.25	471	7.77	clear40's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

UN-NAMED DRAINAGE OFF STRAIGHT CANYON CREEK

T-19

	<----------		Field Measurements			------>		
Date	Time	Temp. (oC)	Flow GPM	pH	Cond. (uS)	Dis. Oxygen	Weather	Comments
01/19/2005	1028		20				clear30's	
02/03/2005	1418		20				cloudy30's	
03/07/2005	1041	3.3	30	9.66	1146	9.6	clear40's	
04/18/2005	1240		40				cloudy50's	
05/24/2005	813		95				clear60's	
06/20/2005	1113	13.7	146	9.72	743		ptcloudy70's	
07/16/2005	800		101				clear70's	
08/01/2005	1010		80				cloudy60's	
09/22/2005	749	7.7	17.2	8.32	684		clear40's	
10/06/2005	953		24				clear40's	
11/07/2005	1334		85				cloudy40's	
12/06/2005	1041		Frozen				cloudy20's	
01/10/2006	1333		Frozen				clear20's	
02/21/2006	1007		Frozen				clear20's	
03/13/2006	1257	2.7	30	8.22	833		ptcloudy30's	DO run at lab
04/10/2006	1256		200				clear40's	
05/23/2006	1310		70				ptcloudy50's	
06/15/2006	1109	11.2	250	8.5	776	10.8	cloudy60's	
07/26/2006	1037		125				sunny80's	
08/07/2006	1501		150				clear90's	
09/26/2006	1009	5.6	25	8.8	804		clear50's	DO run at lab
10/24/2006	925		25				clear30's	
11/16/2006	1455		25				clear30's	
12/04/2006	1350		Frozen				clear20's	
01/08/2007	1110		Frozen				clear20's	
02/12/2007	1138		20				ptcloudy30's	
03/20/2007	1057	8.6	120	8.43	1130	9.09	ptcloudy60's	
04/04/2007	1306		125				cloudy40's	
05/07/2007	1424		135				clear60's	
06/28/2007	1107	18.5	40	8.74	1213	7.42	clear80's	
07/16/2007	1139		20.6				cloudy80's	
08/02/2007	1136		35				cloudy70's	
09/21/2007	938	9.5	20	7.48	1513	9.04	clear50's	
10/26/2007	1013		20				clear50's	
11/13/2007	1427		31				ptcloudy50's	
12/10/2007	932	0.2	20	8.3	1572	11.72	cloudy20's	
01/10/2008	1002		Frozen				clear20's	
02/11/2008	1052		Frozen				cloudy20's	
03/20/2008	908	2.6	89.5	8.55	1080	12.3	ptcloudy40's	
04/17/2008	1112		30				clear40's	
05/23/2008	1024		95				ptcloudy40's	
06/16/2008	941	11.4	65	8.42	924	8.1	clear80's	
07/08/2008	910		33.8				clear80's	
08/19/2008	1127		10.2				clear70's	
09/29/2008	1105	11.7	13	8.54	1180	10.3	clear80's	
10/21/2008	935		24.4				cloudy40's	
11/12/2008	1237		26.2				cloudy40's	
12/08/2008	1008	1.5	27.85	8.37	1450		ptcloudy40's	
01/13/2009	1150		23				clear30's	
02/18/2009	1015		21.4				clear30's	
03/25/2009	945	1.7	25.5	7.7	1220		cloudy30's	
04/17/2009	941		26.79				cloudy30's	
05/08/2009	954		51.99				clear60's	
06/17/2009	1013	12.8	34.2	8.52	1132		cloudy60's	
07/10/2009	1207		8.15				clear80's	
08/21/2009	1015		7.2				clear70's	
09/08/2009	1052	15.2	8.42	8.79	1568		clear70's	
10/21/2009	1242		13.73				clear60's	
11/09/2009	936		16.25				clear30's	
12/03/2009	945	0.4	12.77	8.3	1690		clear10's	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

SURFACE PIEZOMETRIC DATA
COTTONWOOD CANYON

	EM-31		CCCW-1A		CCCW-1S		CCCW-2A		CCCW-3A		CCCW-3S U		CCCW-3S L		TM-1B		TM-3		
Collar Elevation	7417.8		7843.2		7844.5		8133.9		8369.7		8367.6		8366.0		7295.0 EST		6750.0 EST		
Date	Reading	Level	Reading	Level	Reading	Level	Reading	Level	Reading	Level	Reading	Level	Reading	Level	Reading	Level	Reading	Level	
01/10/2006	-53.3	7364.5	-104.9	7738.3	-194.7	7649.8	-22.2	8111.6	-51.5	8318.2	-73.6	8294.0	-613.5	7752.5	-22.4	7272.6	6lbs. Pres.	6763.8	6.0
02/21/2006	-54.2	7363.6	-106.9	7736.3	-194.5	7650.0	Inaccessible		Inaccessible		Inaccessible		Inaccessible		-21.3	7273.7	6lbs. Pres.	6763.8	6.0
03/13/2006	-54.3	7363.5	Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		-21.3	7273.7	6lbs. Pres.	6763.8	6.0
04/10/2006	-53.6	7364.2	-105.8	7737.4	-194.6	7649.9	Inaccessible		Inaccessible		Inaccessible		Inaccessible		-21.5	7273.6	6lbs. Pres.	6763.8	6.0
05/23/2006	-54.2	7363.6	-92.5	7750.7	-194.6	7649.9	-18.0	8115.9	-47.3	8322.4	-68.8	8298.7	-613.5	7752.6	-21.2	7273.8	6lbs. Pres.	6763.8	6.0
06/15/2006	-54.9	7362.9	-84.3	7758.9	-193.7	7650.8	-16.9	8116.9	-46.2	8323.5	-66.7	8300.8	-613.3	7752.8	-21.6	7273.4	6lbs. Pres.	6763.8	6.0
07/26/2006	-55.6	7362.2	-92.2	7751.0	-192.6	7651.9	-16.8	8117.1	-46.9	8322.8	-68.1	8299.5	-613.3	7752.8	-21.6	7273.4	6lbs. Pres.	6763.8	6.0
08/07/2006	-55.8	7362.0	-92.9	7750.4	-192.5	7652.0	-17.0	8116.8	-47.4	8322.3	-68.6	8299.0	-613.4	7752.6	-21.5	7273.5	6lbs. Pres.	6763.8	6.0
09/08/2006	-56.1	7361.7	-93.6	7749.6	-191.4	7653.1	-17.6	8116.2	-49.2	8320.5	-70.9	8296.7	-613.9	7752.1	-21.9	7273.1	6lbs. Pres.	6763.8	6.0
10/24/2006	-55.6	7362.2	-94.3	7748.9	-190.8	7653.7	-18.2	8115.6	-48.4	8321.3	-69.9	8297.6	-612.7	7753.3	-22.3	7272.7	6lbs. Pres.	6763.8	6.0
11/16/2006	-55.6	7362.2	-95.4	7747.8	-190.4	7654.1	-18.3	8115.5	-48.5	8321.3	-70.1	8297.5	-612.5	7753.5	-22.3	7272.7	6lbs. Pres.	6763.8	6.0
12/04/2006	-55.4	7362.4	-96.2	7747.0	-191.2	7653.3	-19.0	8114.9	-48.6	8321.1	-70.2	8297.4	-612.7	7753.3	-21.8	7273.2	6lbs. Pres.	6763.8	6.0
01/09/2007	-54.3	7363.5	-99.0	7744.2	-190.2	7654.3	-18.7	8115.2	-48.5	8321.2	-70.3	8297.3	-612.7	7753.3	-20.9	7274.1	21lbs. Pres	6799.6	21.5
02/12/2007	-53.9	7363.9	-101.8	7741.4	-189.6	7654.9	-18.8	8115.1	-48.8	8320.9	-70.4	8297.1	-612.2	7753.8	-21.6	7273.4	24lbs. Pres	6805.4	24.0
03/20/2007	-53.5	7364.3	-103.0	7740.2	-189.4	7655.1	-18.9	8115.0	-48.1	8321.6	-70.1	8297.4	-612.2	7753.9	-20.7	7274.3	24lbs. Pres	6805.4	24.0
04/04/2007	-53.2	7364.6	-103.3	7739.9	-190.0	7654.5	-19.0	8114.9	-48.5	8321.2	-70.2	8297.3	-612.4	7753.7	-20.9	7274.1	22lbs. Pres	6800.8	22.0
05/08/2007	-54.7	7363.1	-104.5	7738.7	-189.3	7655.2	-19.1	8114.8	-48.5	8321.2	-70.6	8297.0	-612.2	7753.8	-21.3	7273.7	23lbs. Pres	6803.1	23.0
06/28/2007	-55.0	7362.8	-110.6	7732.7	-189.2	7655.3	-19.6	8114.3	-49.7	8320.0	-71.5	8296.1	-612.2	7753.8	-21.0	7274.0	22lbs. Pres	6800.8	22.0
07/16/2007	-56.6	7361.2	-111.7	7731.6	-189.2	7655.3	-19.8	8114.0	-50.0	8319.7	-71.9	8295.7	-612.3	7753.7	-21.0	7274.0	24lbs. Pres	6805.4	24.0
08/02/2007	-56.9	7361.0	-112.3	7730.9	-190.5	7653.9	-20.1	8113.8	-50.2	8319.5	-72.2	8295.4	-612.2	7753.8	-21.1	7273.9	25lbs.Pres.	6807.7	25.0
09/21/2007	-57.8	7360.0	-113.8	7729.4	-189.8	7654.7	-21.0	8112.9	-50.7	8319.0	-72.9	8294.7	-612.4	7753.7	-21.8	7273.2	28lbs.Pres.	6814.6	28.0
10/26/2007	-56.9	7360.9	-113.3	7729.9	-189.9	7654.6	-21.5	8112.4	-51.0	8318.7	-73.3	8294.2	-612.3	7753.7	-21.9	7273.1	28lbs.Pres.	6814.6	28.0
11/13/2007	-56.3	7361.5	-112.9	7730.4	-190.0	7654.5	-21.7	8112.2	-51.1	8318.6	-73.4	8294.2	-612.3	7753.7	-22.0	7273.0	28lbs.Pres.	6814.6	28.0
12/10/2007	-55.0	7362.8	-112.5	7730.7	-190.1	7654.4	-21.9	8112.0	-50.7	8319.0	-73.4	8294.2	-612.1	7753.9	-21.5	7273.5	28lbs.Pres.	6814.6	28.0
01/10/2008	Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		-21.8	7273.2	31lbs.Pres.	6821.5	31.0
02/11/2008	Inaccessibl		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		-21.4	7273.6	31lbs.Pres.	6821.5	31.0
03/20/2008	-51.7	7366.1	Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		-20.1	7275.0	31lbs.Pres.	6821.5	31.0
04/17/2008	-54.1	7363.7	-111.3	7731.9	-191.5	7653.0	Inaccessible		Inaccessible		Inaccessible		Inaccessible		-19.6	7275.4	30lbs.Pres.	6819.2	30.0
05/28/2008	-53.3	7364.5	-111.6	7731.6	-191.6	7652.8	-22.6	8111.3	-51.7	8318.0	-73.8	8293.8	-612.8	7753.3	-20.0	7275.0	31lbs.Pres.	6821.5	31.0
06/16/2008	-55.6	7362.2	-111.9	7731.3	-191.9	7652.6	-22.6	8111.3	-51.8	8317.9	-73.7	8293.8	-613.0	7753.0	-19.9	7275.1	29lbs.Pres.	6816.9	29.0
07/08/2008	-56.4	7361.4	-112.7	7730.5	-191.9	7652.6	-22.1	8111.8	-50.5	8319.2	-72.2	8295.4	-613.1	7753.0	-19.1	7275.9	32lbs.Pres.	6823.8	32.0
08/19/2008	-57.5	7360.4	-113.1	7730.1	-192.0	7652.5	-21.4	8112.5	-50.9	8318.8	-73.2	8294.4	-613.1	7752.9	-19.6	7275.4	28lbs.Pres.	6814.6	28.0
09/25/2008	-58.1	7359.7	-112.8	7730.4	-192.0	7652.5	-22.3	8111.6	-51.4	8318.3	-73.9	8293.7	-613.3	7752.8	-20.3	7274.7	34lbs.Pres.	6828.4	34.0
10/21/2008	-54.2	7363.6	-112.2	7731.0	-192.1	7652.4	-22.9	8111.0	-51.7	8318.0	-74.2	8293.4	-613.3	7752.7	-20.6	7274.4	34lbs.Pres.	6828.4	34.0
11/12/2008	-56.3	7361.5	-111.6	7731.6	-192.1	7652.4	-23.3	8110.6	-53.9	8315.8	-74.4	8293.1	-613.2	7752.8	-20.7	7274.3	32lbs.Pres.	6823.8	32.0
12/08/2008	-54.8	7363.1	-111.3	7731.9	-191.8	7652.7	-23.8	8110.1	-52.0	8317.7	-74.6	8293.0	-612.9	7753.1	-20.3	7274.7	35lbs.Pres.	6830.7	35.0
01/13/2009	-59.4	7358.4	-111.3	7731.9	-192.2	7652.3	-24.3	8109.6	-51.9	8317.8	-74.7	8292.9	-613.4	7752.6	-20.0	7275.0	32lbs.Pres.	6823.8	32.0
02/18/2009	-54.8	7363.0	-111.4	7731.9	-192.4	7652.1	-24.6	8109.3	-51.8	8317.9	-74.7	8292.8	-613.3	7752.7	-19.1	7275.9	34lbs.Pres.	6828.4	34.0
02/25/2009	-53.5	7364.3	-111.5	7731.8	-192.5	7652.0	-24.9	8109.0	-52.1	8317.6	-74.8	8292.8	-613.2	7752.8	-18.7	7276.3	36lbs.Pres.	6833.1	36.0
04/17/2009	-53.7	7364.1	-111.5	7731.7	-192.7	7651.8	-25.0	8108.8	-52.2	8317.5	-74.9	8292.6	-613.2	7752.8	-18.6	7276.4	36lbs.Pres.	6833.1	36.0
05/08/2009	-54.2	7363.6	-111.7	7731.6	-192.9	7651.6	-25.4	8108.5	-52.4	8317.3	-75.0	8292.6	-613.5	7752.5	-18.3	7276.7	34lbs.Pres.	6828.4	34.0
06/17/2009	-55.5	7362.3	-112.7	7730.5	-193.0	7651.5	-25.4	8108.5	-52.9	8316.8	-75.0	8292.6	-613.6	7752.4	-18.2	7276.8	35lbs.Pres.	6830.7	35.0
07/10/2009	-56.4	7361.4	-113.3	7729.9	-193.3	7651.2	-25.7	8108.2	-53.1	8316.6	-75.6	8292.0	-613.8	7752.2	-18.4	7276.6	30lbs.Pres.	6819.2	30.0
08/21/2009	-58.1	7359.8	-114.3	7729.0	-193.4	7651.1	-26.2	8107.7	-53.5	8316.2	-76.2	8291.3	-613.9	7752.1	-18.7	7276.3	36lbs.Pres.	6833.1	36.0
09/08/2009	-58.3	7359.6	-114.1	7729.1	-193.4	7651.0	-26.5	8107.4	-53.7	8316.0	-76.4	8291.1	-613.8	7752.2	-19.2	7275.8	36lbs.Pres.	6833.1	36.0
10/21/2009	-58.5	7359.3	-112.6	7730.6	-193.7	7650.8	-27.3	8106.5	-53.9	8315.8	-76.7	8290.8	-613.8	7752.2	-19.9	7275.1	35lbs.Pres.	6830.7	35.0
11/09/2009	-58.6	7359.2	-112.4	7730.8	-193.9	7650.6	-27.7	8106.2	-54.0	8315.7	-76.8	8290.8	-614.1	7751.9	-19.7	7275.3	38lbs.Pres.	6837.7	38.0
12/03/2009	-57.9	7360.0	-112.5	7730.7	-194.1	7650.4	-28.0	8105.9	-54.0	8315.7	-76.9	8290.7	-613.9	7752.1	-19.5	7275.5	40lbs.Pres.	6842.3	40.0

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

SURFACE PIEZOMETRIC DATA
RILDA CANYON

	Rilda Canyon (EM-47)		P - 1		P - 4		P - 5		P - 6		P - 7	
Collar Elevation	**8,059.0**		**7,516.8**		**7,579.3**		**7,564.8**		**7,615.5**		**7,634.9**	
Date	**Reading**	**Level**	**Reading**	**Level**	**Reading**	**Level**	**Reading**	**Level**	**Reading**	**Level**	**Reading**	**Level**
01/20/2006	Inaccessible		22.8	7,494.0	DAMP		8.3	7,556.5	46.2	7,569.3	45.6	7,589.3
02/23/2006	Inaccessible		22.6	7,494.2	DAMP		7.8	7,557.0	46.2	7,569.4	45.1	7,589.9
03/14/2006	Inaccessible		22.6	7,494.3	DAMP		7.9	7,556.9	46.1	7,569.4	44.7	7,590.2
04/25/2006	Inaccessible		22.4	7,494.4	DAMP		7.3	7,557.5	43.7	7,571.8	42.9	7,592.0
05/23/2006	212.0	7,847.0	22.6	7,494.2	DAMP		7.0	7,557.8	38.2	7,577.3	25.8	7,609.1
06/20/2006	212.9	7,846.1	22.5	7,494.4	DAMP		7.7	7,557.2	37.0	7,578.5	23.6	7,611.3
07/11/2006	213.9	7,845.1	22.6	7,494.2	DAMP		7.0	7,557.8	35.1	7,580.4	23.5	7,611.4
08/09/2006	214.2	7,844.8	22.9	7,493.9	DAMP		7.0	7,557.8	35.1	7,580.4	24.3	7,610.6
09/27/2006	216.7	7,842.3	22.9	7,493.9	DAMP		7.1	7,557.7	38.7	7,576.8	31.7	7,603.2
10/27/2006	218.5	7,840.5	22.8	7,494.0	DAMP		7.1	7,557.7	39.9	7,575.6	33.0	7,601.9
11/27/2006	218.9	7,840.1	22.9	7,493.9	DAMP		7.8	7,557.0	41.5	7,574.0	39.3	7,595.6
12/07/2006	219.0	7,840.0	23.0	7,493.8	DAMP		7.2	7,557.6	41.9	7,573.6	40.4	7,594.5
01/10/2007	Inaccessible		22.7	7,494.1	DAMP		8.0	7,556.9	42.8	7,572.7	42.3	7,592.6
02/20/2007	Inaccessible		22.9	7,493.9	DAMP		7.4	7,557.4	43.1	7,572.4	43.2	7,591.7
03/26/2007	Inaccessible		22.6	7,494.2	Inaccessible		Inaccessible		Inaccessible		Inaccessible	
04/17/2007	217.2	7,841.8	22.5	7,494.3	DAMP		7.4	7,557.4	43.9	7,571.6	44.5	7,590.4
05/10/2007	213.5	7,845.5	23.0	7,493.8	DAMP		7.2	7,557.6	41.4	7,574.1	36.8	7,598.1
06/29/2007	210.6	7,848.4	22.3	7,494.5	DAMP		5.2	7,559.6	37.0	7,578.5	24.3	7,610.6
07/25/2007	214.1	7,844.9	22.5	7,494.3	DAMP		6.1	7,558.7	37.6	7,577.9	26.7	7,608.2
08/20/2007	212.3	7,846.7	22.8	7,494.0	DAMP		7.4	7,557.4	39.2	7,576.3	32.2	7,602.7
09/20/2007	214.0	7,845.0	22.8	7,494.0	DAMP		7.2	7,557.7	41.0	7,574.5	38.2	7,596.7
10/26/2007	213.8	7,845.2	22.7	7,494.2	DAMP		6.9	7,558.0	42.9	7,572.6	42.7	7,592.3
11/14/2007	217.2	7,841.8	22.8	7,494.0	DAMP		7.3	7,557.5	43.6	7,571.9	43.8	7,591.1
12/05/2007	217.0	7,842.0	23.1	7,493.7	DAMP		8.1	7,556.7	44.5	7,571.0	45.0	7,589.9
01/15/2008	Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible	
02/20/2008	Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible	
03/24/2008	Inaccessible		21.4	7,495.4	DAMP		7.4	7,557.4	46.2	7,569.3	46.3	7,588.6
04/23/2008	Inaccessible		21.6	7,495.2	DAMP		7.5	7,557.3	46.5	7,569.0	46.4	7,588.5
05/28/2008	216.1	7,842.9	22.5	7,494.3	DAMP		7.0	7,557.8	40.5	7,575.0	30.5	7,604.5
06/17/2008	211.2	7,847.8	22.6	7,494.2	DAMP		7.0	7,557.8	38.9	7,576.6	26.2	7,608.7
07/07/2008	210.7	7,848.3	22.9	7,493.9	DAMP		7.1	7,557.7	38.4	7,577.1	25.1	7,609.8
08/18/2008	211.4	7,847.6	23.1	7,493.7	DAMP		6.8	7,558.0	38.1	7,577.4	25.9	7,609.0
09/08/2008	213.8	7,845.2	23.0	7,493.8	DAMP		7.8	7,557.0	39.2	7,576.3	29.4	7,605.5
10/22/2008	216.2	7,842.8	22.8	7,494.0	DAMP		6.9	7,557.9	43.1	7,572.4	40.8	7,594.1
11/13/2008	216.8	7,842.2	22.8	7,494.0	DAMP		7.2	7,557.7	44.9	7,570.6	44.3	7,590.6
12/05/2008	216.7	7,842.3	23.0	7,493.8	DAMP		7.5	7,557.3	46.1	7,569.4	46.7	7,588.2
01/13/2009	Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible	
02/17/2009	Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible		Inaccessible	
03/24/2009	Inaccessible		22.9	7,493.9	DAMP		7.6	7,557.3	47.1	7,568.4	46.6	7,588.3
04/16/2009	Inaccessible		22.6	7,494.2	DAMP		7.3	7,557.5	46.9	7,568.6	46.4	7,588.5
05/07/2009	216.8	7,842.2	22.7	7,494.1	DAMP		7.5	7,557.4	46.0	7,569.5	44.6	7,590.3
06/18/2009	209.9	7,849.1	22.5	7,494.3	DAMP		6.5	7,558.3	39.0	7,576.5	27.3	7,607.6
07/14/2009	209.8	7,849.3	23.2	7,493.7	DAMP		7.0	7,557.8	38.8	7,576.7	26.6	7,608.3
08/20/2009	209.0	7,850.0	23.1	7,493.7	DAMP		6.8	7,558.0	39.5	7,576.0	30.1	7,604.8
09/09/2009	209.6	7,849.4	23.0	7,493.8	DAMP		6.9	7,557.9	41.5	7,574.0	36.9	7,598.0
10/26/2009	212.0	7,847.1	22.9	7,493.9	DAMP		7.1	7,557.7	45.0	7,570.6	44.3	7,590.6
11/06/2009	212.6	7,846.4	23.0	7,493.8	DAMP		7.3	7,557.5	45.5	7,570.0	45.1	7,589.8
12/02/2009	214.2	7,844.8	23.8	7,493.0	DAMP		7.4	7,557.4	46.2	7,569.3	45.8	7,589.1

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

WASTE ROCK DISPOSAL WELLS DATA

	DEER CREEK DCWR1		WILBERG\COTTONWOOD WCWR1 CWWR1		
* Collar Elevation	6313.4	Elevations Adjusted 12/90		6774.5	
Date	**Reading**	**Level**	**Date**	**Reading**	**Level**
06/03/2004	-7.3	6306.1	03/07/2005	-48.72	6725.8
09/09/2004	-8.6	6304.8	06/20/2005	-46.26	6728.2
12/14/2004	-5.0	6308.4	09/22/2005	-47.3	6727.2
03/21/2005	-4.4	6309.0	12/06/2005	-49.62	6724.9
06/22/2005	-3.6	6309.8	03/13/2006	-50.45	6724.1
09/23/2005	-8.0	6305.4	06/15/2006	-50.28	6724.2
12/13/2005	-5.9	6307.5	09/26/2006	-51.82	6722.7
03/14/2006	-7.1	6306.3	12/06/2006	-44.05	6730.5
06/22/2006	-5.6	6307.8	03/20/2007	-46.5	6728.0
09/27/2006	-7.6	6305.8	06/28/2007	-50.23	6724.3
12/07/2006	-9.0	6304.4	09/21/2007	-52.52	6722.0
03/26/2007	-9.9	6303.5	12/10/2007	-53	6721.5
06/29/2007	-9.3	6304.1	03/20/2008	-52.8	6721.7
09/19/2007	-10.0	6303.4	06/16/2008	-52.2	6722.3
12/05/2007	-10.9	6302.5	09/30/2008	-52.58	6721.9
03/24/2008	-8.5	6304.9	12/08/2008	-53.5	6721.0
06/18/2008	-10.1	6303.3	03/25/2009	-53.57	6720.93
09/23/2008	-11.5	6301.9	06/17/2009	-53.4	6721.1
12/04/2008	-10.3	6303.1	09/08/2009	-54.03	6720.47
03/24/2009	-11.43	6301.97	12/03/2009	-55.5	6719
06/18/2009	-11.8	6301.6			
09/09/2009	-12.57	6300.83			
12/02/2009	-13.5	6299.9			

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

Sediment Pond Analysis

Wilberg Mine
Permit # 0022896-003A

Date	Time	GPM	Temp. (°C)	Weather	Comments
01/09/2001	1405	25	1	cloudy30's	
02/05/2001	1610	25	0	sunny30's	
03/20/2001	1325	19	5	sunny50's	
April-Dec,2001		No Discharge			
Jan-Dec.2002		No Discharge			
Jan-Dec.2003		No Discharge			
Jan-Dec.2004		No Discharge			
Jan-Dec.2005		No Discharge			
Jan-Dec.2006		No Discharge			
Jan-Dec.2007		No Discharge			
Jan-Dec.2008		No Discharge			
Jan-Dec.2009		No Discharge			

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

WILBERG MINE - MILLER CANYON
PERMIT # 0022896-004A

Miller Canyon Breakou
(MILLER)

		Quality				Quantity
Date	Time	GPM	Temp. (°C)	Comments	Month	Gallons/day
01/06/2005	951	Dry			January 2005	No Discharge
02/21/2005	1220	Dry			February	No Discharge
03/27/2005	1000	Dry			March	No Discharge
04/05/2005	1330	Dry			April	No Discharge
05/09/2005	845	Dry			May	No Discharge
06/23/2005	930	Dry			June	No Discharge
07/10/2005	1006	Dry			July	No Discharge
08/29/2005	920	Dry			August	No Discharge
09/17/2005	1345	Dry			September	No Discharge
10/10/2005	1324	Dry			October	No Discharge
11/08/2005	1123	Dry			November	No Discharge
12/04/2005	1247	Dry			December	No Discharge
01/10/2006	1500	Dry			January 2006	No Discharge
02/21/2006	1231	Dry			February	No Discharge
03/13/2006	1350	Dry			March	No Discharge
04/10/2006	1348	Dry			April	No Discharge
05/23/2006	1301	Dry			May	No Discharge
06/15/2006	1430	Dry			June	No Discharge
07/26/2006	1028	Dry			July	No Discharge
08/07/2006	1443	Dry			August	No Discharge
09/26/2006	1140	Dry			September	No Discharge
10/24/2006	1022	Dry			October	No Discharge
11/16/2006	1450	Dry			November	No Discharge
12/06/2006	1115	Dry			December	No Discharge
01/15/2007	1300	Dry			January 2007	No Discharge
02/02/2007	920	Dry			February	No Discharge
03/20/2007	1021	Dry			March	No Discharge
04/10/2007	1430	Dry			April	No Discharge
05/25/2007	854	Dry			May	No Discharge
06/10/2007	831	Dry			June	No Discharge
07/12/2007	920	Dry			July	No Discharge
08/03/2007	1206	Dry			August	No Discharge
09/21/2007	1346	Dry			September	No Discharge
10/17/2007	1302	Dry			October	No Discharge
11/18/2007	1000	Dry			November	No Discharge
12/05/2007	1145	Dry			December	No Discharge
01/04/2008	1045	Dry			January 2008	No Discharge
02/06/2008	1130	Dry			February	No Discharge
03/05/2008	1100	Dry			March	No Discharge
04/01/2008	1025	Dry			April	No Discharge
05/01/2008	930	Dry			May	No Discharge
06/02/2008	1040	Dry			June	No Discharge
07/01/2008	1325	Dry			July	No Discharge
08/05/2008	1025	Dry			August	No Discharge
09/02/2008	1430	Dry			September	No Discharge
10/02/2008	1040	Dry			October	No Discharge
11/06/2008	1415	Dry			November	No Discharge
12/02/2008	1500	Dry			December	No Discharge
01/06/2009	1500	Dry			January 2009	No Discharge
02/02/2009	1135	Dry			February	No Discharge
03/02/2009	1035	Dry			March	No Discharge
04/02/2009	1110	Dry			April	No Discharge
05/04/2009	1350	Dry			May	No Discharge
06/01/2009	1040	Dry			June	No Discharge
07/06/2009	1200	Dry			July	No Discharge
08/03/2009	1415	Dry			August	No Discharge
09/09/2009	1045	Dry			September	No Discharge
10/05/2009	1325	Dry			October	No Discharge
11/03/2009	1350	Dry			November	No Discharge
12/02/2009	1035	Dry			December	No Discharge

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITC

WILBERG MINE - GRIMES WASH
PERMIT # 0022896-001A
(WMDO1)
TMA Discharge to Cottonwood Canyon Creek
UPDES 001 Transferred to TMA - June 2001

Date	Time	GPM	Quality Temp. (°C)	Comments
01/12/2005	1106	9	10.7	
01/19/2005	930	14.6	9.7	State sampling
02/21/2005	1442	19	10.4	
03/21/2005	1600	14.6	10.1	
04/14/2005	1400	14.6	10.5	
05/16/2005	1610	23.7	10.7	
05/25/2005	927	14.6	13.3	State sampling
06/05/2005				No samples taken for June
07/22/2005	1130	14.6	12.9	
07/27/2005	1220	14.6	10.9	
08/09/2005	1220	14.4	10.5	
08/31/2005	927	14.6	10.4	State sampling
09/06/2005	945	14.7	11.5	
10/05/2005	947	4.3	9.9	
11/07/2005	1354	14.7	10.4	
11/30/2005	927	23.7	9.9	
12/14/2005	1500	14.7	10.2	
01/26/2006	1530	14.7	10.2	
02/08/2006	952	12.6	9.8	State sampling
03/30/2006	1415	14.6	10.6	
04/17/2006	1020	14.6	10.4	
05/08/2006	1340	14.6	10.5	
05/10/2006	921	12.6	8.5	State sampling
06/21/2006	944	12.6	10.4	
07/13/2006	1459	14.6	10.7	
08/10/2006	1054	14.6	10.8	
09/13/2006	900	14.6	10.2	
10/12/2006	1030	12.6	10.5	
11/01/2006	939	12.6	9.5	State sampling
12/05/2006	1430	12.6	10.4	
01/10/2007	1410	12.6	11.5	
02/06/2007	1455	25.6	11.5	
03/06/2007	1120	23.6	11.4	
03/28/2007	955	23.6	10.1	State sampling
04/04/2007	1140	26.1	11.5	
05/16/2007	1310	23.6	11.3	
06/05/2007	1400	26.1	11.6	
07/03/2007	1115	21.2	11.2	
08/13/2007	1340	21.2	11.6	
09/05/2007	1415	21.6	11.5	
09/18/2007	810	23.6	10.4	State sampling
10/02/2007	1400	16.7	11	
11/01/2007	1320	12.6	10.3	
12/04/2007	1120	31.3	12.3	
01/04/2008	1045	26.14	11.4	
02/06/2008	1130	31.37	13.3	
03/05/2008	1100	18.96	10.8	
04/01/2008	1025	21.26	10	
05/01/2008	930	1264	11	
06/02/2008	1040	23.66	11	
07/01/2008	1325	21.26	11	
08/05/2008	1025	23.66	12	
09/02/2008	1430	16.75	12	
10/02/2008	1040	23.66	11	
11/06/2008	1415	16.75	11	
12/02/2008	1500	23.66	11	
01/06/2009	1500	18.96	11	
02/02/2009	1135	12.64	11	
03/02/2009	1035	26.14	11	
04/02/2009	1110	16.75	11	
05/04/2009	1350	23.66	10	
06/01/2009	1040	26.14	12	
07/06/2009	1200	23.66	12	
08/03/2009	1415	26.14	11	
09/09/2009	1045	18.96	12	
10/05/2009	1325	12.64	11	
11/03/2009	1350	26.14	11	GPD and total gallons corrected
12/02/2009	1035	23.66	11	1/05 through 12/09

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

Sediment Pond Analysis

Deer Creek
Permit # 0023604-001

Date	Time	GPM	Temp. (°C)	Weather	Comments
01/12/2005	1500	80	5	sunny30's	
01/19/2005	825	91	3	sunny30's	State sampling
02/21/2005	1528	79	5	cloudy30's	
03/21/2005	1500	11	6	sunny40's	
04/14/2005	1510	7	7	sunny50's	
05/16/2005	1432	54	11	cloudy60's	
05/25/2005	825	45	11	clear60's	
07/21/2005	1428	15	17	sunny80's	No samples taken in June
07/27/2005	1105	15	16	sunny70's	
08/302005	1320	20	13	sunny70's	
08/31/2005	823	20	11	sunny70's	State sampling
09/06/2005	1030	20	12	ptcloudy70's	
10/05/2005	839	13	8	clear40's	State sampling
11/07/2005	1130	38	5	cloudy40's	
11/30/2005	826	38	4	ptcloudy30's	State sampling
12/13/2006		no flow			
01/26/2006	1424	31	2	cloudy30's	
02/08/2006	837	34	2	clear20's	State sampling
03/30/2006		no flow			
04/18/2006	950	97	7	ptcloudy40's	
05/08/2006	1340	15	11	sunny60's	
05/10/2006	820	54	9	clear60's	State sampling
06/21/2006	820	54	12	sunny60's	
07/13/2006	1547	25	14	sunny80's	
07/20/2006	1526	34	14	sunny80's	State sampling
08/10/2006	900	54	14	sunny70's	
09/13/2006	800	42	11	clear50's	State sampling
10/12/2006	1250	166	8	sunny50's	
11/01/2006	831	54	3	ptcloudy30's	State sampling
12/05/2006	1520	79	4	clear30's	
01/10/2007	1040	20	5	clear20's	
02/06/2007	1345	42	5.5	ptcloudy30's	
03/06/2007	930	54	5.3	ptcloudy60's	
03/28/2007	850	54	5.9	clear40's	State sampling
04/04/2007	950	54	7.0	cloudy40's	
05/16/2007		no discharge		clear60's	Cleaning pond
06/05/2007		no discharge		clear70's	Not up to discharge level, since pond cleaning.
07/03/2007	1025	34	14.5	cloudy80's	
08/13/2007	1100	45	17.1	cloudy60's	
09/05/2007	1125	22	15.8	clear60's	
09/18/2007	900	25	10.8	clear60's	State sampling
10/02/2007	1135	25	8.0	clear50's	
11/01/2007	1510	31	5.0	ptcloudy50's	
11/20/2007	750			cloudy50's	Tss only
11/24/2007	730			clear40's	Tss only
12/04/2007	1025	20	5.8	cloudy30's	
01/04/2008	950	54	3.9		
02/06/2008	1000	38	4.0		
03/05/2008	950	17	4.3	clear10's	
04/01/2008	850	11	4.6	ptcloudy20's	
05/01/2008	1055	31	7.1	clear20's	
06/02/2008	1430	69	11.2	clear70's	
07/01/2008	915	dry		clear80's	
08/05/2008	915	45	15.7	clear80's	
09/02/2008	1340	59	12.7	ptcloudy70's	
10/02/2008	1000	dry		ptcloudy60's	
11/06/2008	1105	dry		ptcloudy70's	
12/02/2008	1410	42	5.3	ptcloudy40's	
01/06/2009	1420	no discharge		cloudy 20's	
02/02/2009	1015	41.5	4.3	clear 30's	
03/02/2009	945	34.2	3.2	clear 40's	
04/02/2009	955	53.9	11.5	clear 40's	
05/04/2009	1050	37.7	13.5	ptcloudy 50's	
06/01/2009	910	no discharge		clear 65	
07/05/2009	1110	38	15	clear 75	
08/03/2009	1025	no discharge		clear 80's	
09/09/2009	945	25	13		
10/05/2009	950	118	7	clear 40's	
11/03/2009	900	no discharge		clear 40's	cleaning pond
12/02/2009	940	no discharge		clear 20's	pond filling from clean work completed in Novemb

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC
DEER CREEK MINE / DISCHARGE

PERMIT # 0023604-002
(DCD)
Quality

Date	Time	GPM	Temp. (°C)	Comments
01/12/2005	1430	76	13.2	
01/19/2005	842	683	12.03	State sampling
02/23/2005	1409	674	13	
03/22/2005	1004	669	13.6	
04/14/2005	1456	658.3	14.4	
05/16/2005	1500	60	13.7	
05/25/2005	825	63	12.9	State sampling
06/05/2005				No samples taken for June
07/25/2005	1444	738	14.8	
07/27/2005	1120	476	13.9	
08/09/2005	1415	620	13.5	
08/31/2005	833	75	12.8	State sampling
09/06/2005	1045	30	13.7	
10/06/2005	1530	530	13.1	
11/07/2005	1110	50	13.1	
12/13/2005	1415	587	13.3	
01/26/2006	1445	75	13	
02/08/2006	851	183	12.56	
03/30/2006	1500	75	13.1	
04/25/2006	1000	75	13.1	
05/08/2006	1505	163	13.2	
05/10/2006		no discharge		Filling high pressure water tank.
06/21/2006	832	75	12.12	
07/14/2006	906	160	13.4	
08/10/2006	1440	257	13.6	
09/14/2006	1355	232	10.7	
10/12/2006	1235	404	13.4	
11/01/2006	843	393	11.8	
12/05/2006	1547	392	13.1	
01/10/2007	1100	264	13.5	
02/06/2007	1400	290	14.2	
03/06/2007	950	291	13.6	
04/04/2007	1010	287	14.1	
05/16/2007	1040	248	14.3	
06/05/2007	1000	361	14.9	
07/03/2007	1000	240	14.2	
08/13/2007	1035	653	15.1	
09/05/2007	1045	272	14.7	
09/18/2007	920	119	12.7	State sampling
10/01/2007	1350	230	14.4	
11/01/2007	1450	1780	12.5	
12/04/2007	1010	1350	15.2	
01/04/2008	930	1790	11.9	
02/06/2008	1020	205	11.2	
03/05/2008	925	630	12	
04/01/2008	830	1830	14	
05/01/2008	1030	151	14	
06/02/2008	1410	441	15	
07/01/2008	840	438	14	
08/05/2008	845	848	15	
09/02/2008	1315	833	14	

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC
DEER CREEK MINE / DISCHARGE

PERMIT # 0023604-002
(DCD)
Quality

Date	Time	GPM	Temp. (^{o}C)	Comments
10/02/2008	940	82	13	
11/06/2008	1050	323	13	
12/02/2008	1350	706	14	
01/06/2009	1405	490	13	
02/02/2009	1035	346	12	
03/02/2009	925	602	11	
04/02/2009	955	328	12	
05/04/2009	1050	150	14	
06/01/2009	910	685	14	
07/06/2009	1045	361	14	
08/03/2009	1025	110	15	
09/09/2009	945	339	15	
10/05/2009	950	566	14	
11/03/2009	900	333	13	
12/02/2009	940	544	11	

DEER CREEK MINE DISCHARGE
2009 Calendar Year

	Total Gallons	DEER CREEK MINE DISCHARGE GPD	DEER CREEK MINE DISCHARGE ACRE FT.	DEER CREEK DRAINAGE ACRE FT.	HUNTINGTON POWER PLANT ACRE FT.
Jan 2009	23,287,765	751,218	71.47	71.47	0.00
Feb	33,027,968	1,179,570	101.37	101.37	1.09
Mar	45,610,525	1,471,307	139.99	139.99	0.89
Apr	31,695,232	1,056,508	97.28	97.28	0.07
May	28,609,964	922,902	87.81	87.81	0.15
Jun	38,921,085	1,297,370	119.45	119.45	4.61
Jul	39,312,630	1,268,149	120.66	120.66	1.71
Aug	46,288,527	1,493,178	142.07	142.07	0.98
Sep	58,021,588	1,934,053	178.08	178.08	0.05
Oct	54,116,300	1,745,687	166.09	166.09	1.25
Nov	47,064,208	1,568,807	144.44	144.44	1.12
Dec 2009	49,382,565	1,592,986	151.56	151.56	0.55
TOTAL	495,338,357	1,357,091	1520.26	1520.26	12.47

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

Sediment Pond Analysis

Trail Mountain Mine
Permit # UTG040003-001

Date	Time	GPM	Temp. (°C)	Weather	Comments
Jan-Dec.2001		No Discharge			
Jan-Dec.2002		No Discharge			
Jan-Dec.2003		No Discharge			
Jan-Dec.2004		No Discharge			
Jan-Dec.2005		No Discharge			
Jan-Dec.2006		No Discharge			
Jan-Dec.2007		No Discharge			
Jan-Dec.2008		No Discharge			
Jan-Dec.2009		No Discharge			

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

TRAIL MOUNTAIN MINE - COTTONWOOD CANYON
PERMIT # UTG040003-002
(TRAIL MOUNTAIN MINE DISCHARGE to COTTONWOOD CANYON CREEK)

		Quality				Quantity
Date	Time	GPM	Temp. (^{O}C)	Comments	Month	Gallons/day
02/22/2001	1040	400	10.7			
02/26/2001	1005	520	7.9			
03/20/2001	1415	300	11.6			
04/04/2001	1045	360	8.7			
04/17/2001	850	500	8.3			
05/08/2001	940	340	10.4			
June-Dec-01		0		NO DISCHARGE MINE SEALED		
2002		0		NO DISCHARGE MINE SEALED		
2003		0		NO DISCHARGE MINE SEALED		
2004		0		NO DISCHARGE MINE SEALED		
2005		0		NO DISCHARGE MINE SEALED		
2006		0		NO DISCHARGE MINE SEALED		
2007		0		NO DISCHARGE MINE SEALED		
2008		0		NO DISCHARGE MINE SEALED		
2009		0		NO DISCHARGE MINE SEALED		

PACIFICORP
TECHNICAL SERVICES - HYDROLOGIC MONITORING

DEER CREEK IN-MINE QUALTIY & LONG TERM FLOW

QUALITY					LONG TERM FLOW (GPM)		
Date	Location	Time	Temp. (°C)	GPM	Date	Site #1	Site #2
03/30/2005	TW-10	930	7.1	1.8			
03/30/2005	MAIN N.-MAIN E	945	2.4	0.2			
06/22/2005	TW-10	1305	7.1	3.74			
06/02/2005	MAIN N.-MAIN E	1325	7.4	0.23			
10/05/2005	TW-10	1035	7.1	6.7			
10/05/2005	MAIN N.-MAIN E	1055	6.7	0.38			
12/20/2005	TW-10	1045	7.1	4.22			
12/20/2005	MAIN N.-MAIN E	1100	2.3	0.42			
03/22/2006	TW-10	940	8.1	3.16			
03/22/2006	MAIN N.-MAIN E	1000	3.5	0.41			
06/20/2006	TW-10	935	7.8	5			
06/20/2006	MAIN N.-MAIN E	915	7.7	0.21			
10/27/2006	TW-10	1215	7.6	5.08			
10/27/2006	MAIN N.-MAIN E	1230	6.8	0.24			
12/20/2006	TW-10	950	6.9	3.7			
12/20/2006	MAIN N.-MAIN E	1005	2.2	0.23			
03/27/2007	TW-10	910	6.9	2.97			
03/27/2007	MAIN N.-MAIN E	930	3.6	0.23			
06/26/2007	TW-10	1203	7.1	2.7			
06/26/2007	MAIN N.-MAIN E	1220	7.1	0.47			
09/20/2007	TW-10	1140	7.2	2.8			
09/20/2007	MAIN N.-MAIN E	1215	7.6	0.19			
12/13/2007	TW-10	1000	7.4	2.45			
12/13/2007	MAIN N.-MAIN E	1030	2.1	0.42			
06/18/2008	TW-10	1056	6.7	2.22			
06/18/2008	MAIN N.-MAIN E	1028	6.3	0.2			
09/23/2008	TW-10	1157	?	3.53			
09/23/2008	MAIN N.-MAIN E	1121	7	0.18			
12/15/2008	TW-10	1355	6.9	2.3			
12/15/2008	MAIN N.-MAIN E	1315	1.7	0.17			
03/31/2009	TW-10	1000	6.9	2.3			
03/31/2009	MAIN N.-MAIN E	930	1.9	0.21			
06/18/2009	TW-10	1226	7.2	2.22			
06/18/2009	MAIN N.-MAIN E	1153	7.1	0.23			
09/23/2009	TW-10	1210	7.6	2.4			
09/23/2009	MAIN N.-MAIN E	1245	6.9	0.2			
12/14/2009	TW-10	1050	6.9	2.22			
12/14/2009	MAIN N.-MAIN E	1020	1.4	0.18			

Site #1 Main North-Main East
Site #2 3rd North XC-65 2R, TW-10

PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
DEER CREEK, WILBERG/COTTONWOOD, DES-BEE-DOVE and TRAIL MOUNTAIN MINES

I. MONITORING LOCATIONS

A. Surface Water Hydrology (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1, Deer Creek Volume 12 R645-301-700: Hydrologic Monitoring Map MFS1851D Mill Fork Lease for East Mountain locations listed below / Trail Mountain Mine: Volume 3 Plate 7-1 and Plate 7-2 for Trail Mountain locations listed below)

1. Cottonwood Creek Drainage System

a. ***Cottonwood Canyon Creek*** (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1 or Trail Mountain Mine Permit Volume 3 Plate 7-1)

(1) SW-1 - Above Trail Mtn. Mine
(Approximately 5000 feet upstream from the inlet culvert for the disturbed area.) 2150 feet South, 2000 feet East of the Northwest corner of Section 24, Township 17 South, Range 6 East.

(2) SW-2 - Below Trail Mtn. Mine
(Approximately 200 feet downstream from the outlet culvert for the disturbed area.) 1300 feet South, 1750 feet West of the Northeast corner of Section 25, Township 17 South, Range 6 East.

(3) CCC01 - USGS Flume:
(Approximately 7800 feet downstream from the outlet culvert for the disturbed area.)1500 feet North, 200 feet East of the Southwest corner of Section 31, Township 17 South, Range 7 East.

(4) SW-3 - Below Trail Mtn. Mine
(Approximately 3800 feet above confluence with Straight Canyon) 2400 feet South, 2400 feet East of the Northeast corner of Section 6, Township 18 South, Range 6 East.

INCORPORATED
OCT 2 3 2006
Div. of Oil, Gas & Mining

b. ***Unnamed Drainage off Straight Canyon*** (refer to Trail Mountain Mine Permit Volume 3 Plate 7-1)

(1) T-19
(Approximately 200 feet upstream from the from confluence with Straight Canyon) 2500 feet South, 1100 feet East of the Northeast corner of Section 3, Township 18 South, Range 6 East.

c. ***Grimes Wash*** (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1)

(1) GWR01 - Right Fork:
(Approximately 1500 feet upstream from the inlet culvert for the disturbed area.) 550 feet North, 1500 feet West of the Southwest corner of Section 22, Township 17 South, Range 7 East.

(2) GWR02 - Left Fork:
(Approximately 50 feet upstream from the inlet culvert for the disturbed area.) 200 feet South, 2350 feet East of the Northwest corner of Section 27, Township 17 South, Range 7 East.

(3) GWR03 - Below the mine:
(Approximately 500 feet downstream from the outlet culvert below the disturbed area.) 1770 feet South, 1820 feet West of the Northeast corner of Section 27, Township 17 South, Range 7 East.

d. ***Indian Creek*** (refer to Deer Creek Volume 12 R645-301-700: Hydrologic Monitoring Map MFS1851D)

(1) ICA - Indian Creek Above
(Approximately 2500 feet northwest of the Mill Fork permit boundary) 400 feet North, 2350 feet West of the Southwest corner of Section 3, Township 16 South, Range 6 East.

(2) ICF - Indian Creek Flume
(Approximately 2100 feet west of the Mill Fork permit boundary) 300 feet North, 3400 feet West of the Southwest corner of Section 10, Township 16 South, Range 6 East.

INCORPORATED
OCT 2 3 2006
Div. of Oil, Gas & Mining

(3) ICD - Indian Creek Ditch
(Approximately 1600 feet west of the Mill Fork permit boundary, irrigation ditch for Upper Joes Valley) 240 feet North, 2850 feet West of the Southwest corner of Section 15, Township 16 South, Range 6 East.

(4) ICB - Indian Creek Below
(Approximately 3700 feet west of the Mill Fork permit boundary, junction of Indian Creek and FDR040) 70 feet North, 120 feet West of the Southwest corner of Section 16, Township 16 South, Range 6 East.

2. Huntington Creek Drainage System

a. ***Huntington Creek*** (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1)

(1) HCC01 - Above Deer Creek Confluence:
1400 feet north, 2200 feet west of the southeast corner of Section 36, Township 16 South, Range 7 East.

(2) HCC02 - Below Deer Creek Confluence:
300 feet north, 300 feet west of the southwest corner of Section 31, Township 16 South, Range 8 East.

(3) HCC03 - Below Huntington Power Plant:
2500 feet north, 1500 feet east of the southeast corner of Section 6, Township 17 South, Range 8 East.

(4) HCC04 - @ Research Farm*
800 feet north, 200 feet east of the southwest corner of Section 5, Township 17 South, Range 8 East.
*Not listed on map due to scale.

b. ***Deer Creek*** (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1)

(1) DCR01 - Above the mine:
(Approximately 600 feet upstream from the mine facility.)
200 feet North, 800 feet West of the Southeast corner of Section 10, Township 17 South, Range 7 East.

INCORPORATED
OCT 2 3 2006
Div. of Oil, Gas & Mining

(2) DCR04 - Near C1/C2 Belt Intersection: (Approximately 5,000 feet downstream from the mine facility.) 300 feet North, 2000 feet East of the Southeast corner of Section 2, Township 17 South, Range 7 East.

(3) DCR06 - @ Huntington Creek Confluence: (Approximately 15,000 feet downstream from the facility) 1400 feet north, 1100 feet east of the southeast corner of Section 36, Township 16 South, Range 7 East.

c. ***Meetinghouse Canyon - South Fork*** (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1) (Approximately 200 feet upstream from the north and south convergence.) 800 feet North, 1500 feet East of the Southwest corner of Section 35, Township 16 South, Range 7 East.

d. ***Rilda Canyon*** (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1)

(1) RCF-1 - Rilda Canyon - Right Fork: (Approximately 4000 feet upstream from the Right and Left fork convergence.) 400 feet South, 200 feet West of the Northeast corner of Section 30, Township 16 South, Range 7 East.

(2) RCLF1 - Rilda Canyon - Left Fork, below Rilda Canyon Portals: (Approximately 200 feet upstream from the Right and Left fork convergence.) 2400 feet North, 2100 feet West of the Southeast corner of Section 29, Township 16 South, Range 7 East.

(3) RCLF2 - Rilda Canyon - Left Fork, above Rilda Canyon Portals: (Approximately 1600 feet upstream from the Right and Left fork convergence.) 1600 feet North, 2300 feet West of the Southwest corner of Section 29, Township 16 South, Range 7 East.

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

INCORPORATED
OCT 1 8 2006
Div. of Oil, Gas & Mining

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

(6) RCW4 - Rilda Canyon: (Approximately 1000 feet upstream from the confluence with Huntington Creek.) 850 feet North, 1900 feet West of the Southeast corner of Section 26, Township 16 South, Range 7 East.

e. ***Mill Fork Canyon*** (refer to Deer Creek Volume 12 R645-301-700: Hydrologic Monitoring Map MFS1851D)

(1) MFA01 - Mill Fork Canyon - Above Old Mine: (Approximately 2000 feet above old mine portals @ end of USFS development road.) 100 feet North, 1500 feet West of the Southeast corner of Section 17, Township 16 South, Range 7 East.

(2) MFB02 - Mill Fork Canyon - Above Huntington Creek Confluence: (Approximately 200 feet above confluence with Huntington Creek @ culvert outfall.) 100 feet South, 1900 feet East of the Northwest corner of Section 22, Township 16 South, Range 7 East.

(3) MFU03 - Mill Fork Canyon - Above Mill Fork Fault Crossing: (Approximately 700 feet upstream of projected Mill Fork Fault crossing) 1150 feet North, 1700 feet East of the Southwest corner of Section 17, Township 16 South, Range 7 East.

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

INCORPORATED
OCT 2 9 2006
Div. of Oil, Gas & Mining

PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
DEER CREEK, WILBERG/COTTONWOOD, DES-BEE-DOVE and TRAIL MOUNTAIN MINES

B. Groundwater Hydrology

1. **East Mountain Springs** (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine Permit : Volume 9 maps HM-4 and HM-5)

Burnt Tree *	80-41
Elk Spring *	80-43
Sheba Springs *	80-44*
Ted's Tub	80-46*
79-2	80-47
79-10 *	80-48
79-15	80-50
79-23 *	82-51
79-24	82-52*
79-26 *	84-56*
79-28 (Flag Lake)	89-60(Alpine Spring)
79-29 *	89-61
79-32	89-65
79-34	89-66
79-35 *	89-67
79-38	89-68
79-40	Rilda Canyon-(Meters 2&3)

* Recession Study Springs (Flow August & September)

2. **Trail Mountain Springs** (refer to Trail Mountain Mine Permit Volume 3 Plate 7-1)

T-6	T-14
T-8	T-15
T-9	T-16
T-10	T-18 (Oliphant Mine Discharge)

INCORPORATED
OCT 1 0 2006
Div. of Oil, Gas & Mining

PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
DEER CREEK, WILBERG/COTTONWOOD, DES-BEE-DOVE and TRAIL MOUNTAIN MINES

3. **East Mountain Springs - Mill Fork Area** (refer to Deer Creek Permit Volume 12 R645-301-700: Hydrologic Monitoring Map MFS1851D)

EM-216	MFR-30
JV-9	RR-5
JV-34	RR-15
MF-7	RR-23A
MF-10	SP1-26
MF-19B	SP1-29
MF-213	UJV-101
MF-219	UJV-206
MFR-10	UJV-213
EMPOND	Grants Spring
Little Bear Spring	

3. **Piezometric Data**
   a. Surface
      (1) Rilda Canyon (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1)
         P1
         P5
         P6
         P7
         EM-47
      (2) Cottonwood Canyon Creek
         East Mountain (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1)
         EM-31
         CCCW-1A
         CCCW-1S
         CCCW-2A
         CCCW-3A
         CCCW-3S U
         CCCW-3S L

INCORPORATED
OCT 2 9 2006
Div. of Oil, Gas & Mining

Trail Mountain (refer to Trail Mountain Mine Permit Volume 3 Plate 7-1)
TM-1B
TM-3

b. Underground: In-Mine
(1) Deer Creek Mine (Refer to Annual Hydrologic Reports for Locations : Map HM-2)

4. **In-Mine Water Locations**
a. Deer Creek Mine (Refer to Annual Hydrologic Reports for Locations : Map HM-2)
b. Wilberg/Cottonwood Mines (Refer to Annual Hydrologic Reports for Locations : Map HM-3)
c. Trail Mountain Mine (Refer to Annual Hydrologic Reports for Locations : PLATE 7-3)

5. **Waste Rock Wells** (refer to Deer Creek, Wilberg/Cottonwood, Des-Bee-Dove Mine: Volume 9 Map HM-1)
a. Deer Creek
b. Cottonwood

C. UPDES Monitoring Locations

a. ***Deer Creek Mine***
UPDES UT0023604
001- Sediment Pond
002- Mine Discharge

b. ***Des-Bee-Dove Mines***
UPDES UTG040022
001- Sediment Pond

INCORPORATED
OCT 23 2006
Div. of Oil, Gas & Mining

PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
DEER CREEK, WILBERG/COTTONWOOD, DES-BEE-DOVE and TRAIL MOUNTAIN MINES

c. ***Wilberg/Cottonwood Mines***
UPDES UT0022896
001- Mine Discharge @ Cottonwood Canyon (TMA)
002- Sediment Pond Discharge @ Cottonwood Canyon
003- Sediment Pond @ Mine Facilities
004- Mine Discharge @ Miller Canyon
005- Sediiment Pond Discharge @ Waste Rock Site

d. ***Trail Mountain Mine***
UPDES UT0023728
001- Sediment Pond
002- Mine Discharge

INCORPORATED
OCT 1 3 2006
Div. of Oil, Gas & Mining

PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
DEER CREEK, WILBERG/COTTONWOOD, DES-BEE-DOVE and TRAIL MOUNTAIN MINES

II. MONITORING SCHEDULE (see enclosed monitoring table)

A. Field Measurements

Field Measurements collected during quality sampling: Listed below are the sites which will be monitored by PacifiCorp - Energy West in accordance with the guidelines established by DOGM; i.e.,

- Date and Time
- Flow
- pH
- Temperature
- Conductivity
- Dissolved oxygen (perennial streams only)

Surface Monitoring

Surface monitoring locations will be field monitored quarterly for all field parameters, except Indian Creek - monitoring to be conducted during baseflow only.

1. **Cottonwood Canyon Creek**
   - a. Cottonwood Canyon Creek
     - (1) SW-1
     - (2) SW-2
     - (3) Cottonwood Canyon Creek - USGS Flume
     - (4) SW-3
   - b. Grimes Wash
     - (1) GWR01
     - (2) GWR02
     - (3) GWR03
   - c. Indian Creek
     - (1) ICA
     - (2) ICF
     - (3) ICD
     - (4) ICB
   - d. Straight Canyon
     - (1) T-19 (Unnamed Side Drainage)

INCORPORATED

SEP 1 9 2006

Div. of Oil, Gas & Mining

2. Huntington Canyon Drainage

a. Deer Creek
   (1) DCR01
   (2) DCR04
   (3) DCR06

b. Huntington Creek
   (1) HCC01
   (2) HCC02
   (3) HCC04

   Flow in Huntington Creek is measured only at HCC01 by Utah Power, and will be reported in the Annual Hydrologic Report.

c. Meetinghouse Canyon - South Fork: MCH01

d. Rilda Canyon
   (1) RCF1*
   (2) RCLF 1
   (3) RCLF 2
   (4) RCF2
   (5) RCF3
   (6) RCW4

   * Baseline flow will be measured adjacent to EM-163

e. Mill Fork Canyon
   (1) MFA01
   (2) MFB02
   (3) MFU03

Groundwater Monitoring

1. East Mountain Springs (see monitoring location list)
2. Trail Mountain Springs (see monitoring location list)
3. East Mountain Springs - Mill Fork Area (see monitoring location list)

   East/Trail Mountain Springs will be field monitored during the months of July and October. In addition, the East Mountain Recession Study Springs (denoted by asterisks in the Monitoring Location section) and Trail Mountain Springs will be field monitored for flow only from July through October. T-18: Oliphant Mine Discharge, will be collected and analyzed

INCORPORATED
2006
Div. of Oil, Gas & Mining

quarterly. Rilda Canyon Springs - NEWUA (meters 2 & 3) will be field monitored monthly depending upon access.

3. In-Mine
   a. Deer Creek
   b. Wilberg/Cottonwood
   c. Trail Mountain

   In-mine locations will be field monitored quarterly for all field parameters except pH, conductivity, and dissolved oxygen.

4. Piezometric Wells
   a. Surface

   Piezometric surface wells will be field monitored for level only on a monthly basis depending upon access.

   (1) Rilda Canyon (see Map HM-1 for locations)
      P1
      P5
      P6
      P7
      EM-47

   (2) Cottonwood Canyon Creek (see Map HM-1 for locations)
      EM-31
      CCCW-1A
      CCCW-1S
      CCCW-2A
      CCCW-3A
      CCCW-3S U
      CCCW-3S L
      TM-1B
      TM-3

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

INCORPORATED
Div. of Oil, Gas & Mining

PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
DEER CREEK, WILBERG/COTTONWOOD, DES-BEE-DOVE and TRAIL MOUNTAIN MINES

UPDES Monitoring

1. Deer Creek
2. Des-Bee-Dove
3. Wilberg/Cottonwood
4. Trail Mountain

UPDES sites will be monitored as speicfied in the individual permits.

Reclamation Monitoring

Surface Water Resources: (see enclosed monitoring table)
Surface monitoring locations will be field monitored monthly for flow and all field parameters quarterly until bond release.

Ground Water Resources: (see enclosed monitoring table)

Springs: East/Trail Mountain Springs will be field monitored during the months of July and October.
Rilda Canyon Springs NEWUA (meters 2 & 3) will be field monitored monthly for flow depending upon access. East/Trail Mountain Springs (including Rilda Springs and T-18 [Oliphant Mine]) monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.

Wells: Piezometric surface wells (Rilda Canyon and Cottonwood Canyon including TM-3 in Straight Canyon): will be field monitored for level only on a monthly basis depending upon access. Piezometric surface well monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.
Waste Rock Wells and TM-1B: will be field monitored for level only on a quarterly basis. Monitoring will be conducted until sealing during Phase I reclamation.

UPDES: Sites will be monitored as specified in the individual permits

INCORPORATED

PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM
DEER CREEK, WILBERG/COTTONWOOD, DES-BEE-DOVE and TRAIL MOUNTAIN MINES

B. Quality Sampling (Laboratory Measurements)

1. **Surface Water Hydrology:** Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter, except for Indian Creek - quality samples will be collected during baseflow only. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Quality (see Table #1). Quarterly sampling was initiated during March 1988 and will continue throughout the year; i.e., June, September, and December. Baseline analysis was performed in 2001 and will be repeated every five years thereafter.

   a. **Cottonwood Creek Drainage**
      - (1)Cottonwood Canyon Creek
        - (a) SW-1
        - (b) SW-2
        - (c) SW-3
      - (2)Grimes Wash
        - (a)GWR01
        - (b)GWR02
        - (c)GWR03
      - (3) Indian Creek
        - (a) ICA
        - (b) ICD
        - (c) ICB
      - (4) Straight Canyon
        - (a) T-19

   b. **Huntington Creek Drainage**
      - (1) Deer Creek
        - (a) DCR01
        - (b) DCR04
        - (c) DCR06
      - (2) Huntington Creek
        - (a) HCC01
        - (b) HCC02
        - (c) HCC04
      - (3) Meetinghouse Canyon - South Fork: MCH01

INCORPORATED
Div. of Oil, Gas & Mining

(4) Rilda Canyon
  (a) RCF1
  (b) RCF3
  (c) RCW4
(5) Mill Fork Canyon
  (a) MFA01
  (b) MFB02
  (c) MFU03

Reclamation Monitoring - Surface Water Hydrology: Water samples will be collected and analyzed quarterly (one sample at low flow and high flow) during the first or second week of the quarter. Parameters analyzed are those listed in the DOGM Guidelines for Surface Water Quality (see Table #1). Sampling will be conducted on a quarterly basis until bond release. Baseline analysis will be performed on the 5th and 9th years following reclamation. In no case will baseline sampling time frame exceed 5 years converting from operational to reclamation monitoring.

2. Groundwater Hydrology

a. East/Trail Mountain Springs: Water samples will be collected and analyzed during the months of July and October. Rilda Canyon Springs (NEWUA: Meters 2 & 3) and T-18 (Oliphant Mine Discharge) will be monitored for quarterly for quality. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).
b. In-Mine: Two water samples will be collected and analyzed per mine quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).
c. Wells: TM-1B will be sampled quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).
d. Waste Rock Wells: One water sample will be collected and analyzed per location quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).

INCORPORATED
Div. of Oil

Baseline analysis was performed in 2001 and will be repeated every five years thereafter.

Reclamation Monitoring - Groundwater Hydrology:

a. East/Trail Mountain Springs: Water samples will be collected and analyzed during the months of July and October. Rilda Canyon Springs (NEWUA: Meters 2 & 3) will be monitored quarterly for quality. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2). East/Trail Mountain Springs (including Rilda Springs and T-18 [Oliphant Mine Discharge]) monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.

b. In-Mine: Two water samples will be collected and analyzed per mine quarterly until the mine is sealed or the sites become inaccessible. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).

c. Wells: Well TM-1B will be sealed during Phase I reclamation. Quarterly sampling will continue until sealing. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).

d. Waste Rock Wells: Waste rock wells will be sealed during Phase I reclamation. One water sample will be collected and analyzed per location quarterly until well sealing. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2).

e. Post Reclamation Monitoring: PacifiCorp commits to conduct annual surveys to identify new discharge locations within and below sealed portals. If discharge occurs, one water sample will be collected and analyzed per location quarterly. Parameters analyzed are those listed in the DOGM Guidelines for Groundwater Water Quality (see Table #2). Baseline analysis will be performed on the 5th and 9th year.

INCORPORATED

Div. of Oil

3. **UPDES Monitoring Sites**
   a. Deer Creek Mine
   b. Des-Bee-Dove Mines
   c. Wilberg/Cottonwood Mines
   d. Trail Mountain Mine

   UPDES sites will be monitored as speicfied in the individual permits.

III. ANNUAL REPORTS

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

J:\Environmental\Hydrology\volume9\MONSITESSeptember2006.wpd

INCORPORATED
OCT
Div. of Oil, Ga

PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM

TABLE 1
SURFACE WATER (UPDES Monitoring) BASELINE, OPERATIONAL, POSTMINING WATER QUALITY PARAMETER LIST

Field Measurements:

*	-	Water Level or Flow
*	-	pH
*	-	Specific Conductivity (umhos/cm)
*	-	Dissolved Oxygen (ppm) (Perennial Streams Only)
*	-	Temperature

Laboratory Measurements: (mg/l)

#	*	-	Total Settleable Solids (UPDES Only)
#	*	-	Total Suspended Solids
	*	-	Total Dissolved Solids
	*	-	Total Hardness ($CaCO_3$)
		-	Acidity ($CaCO_3$)
		-	Aluminum (Al) - Dissolved
		-	Arsenic (As) - Dissolved
		-	Boron (B) - Dissolved (Waste Rock Sites Only)
	*	-	Carbonate ($CaCO_3$)
	*	-	Total Alkalinity/Bicarbonate ($CaCO_3$)
		-	Cadmium (Cd) - Dissolved
	*	-	Calcium (Ca) - Dissolved
	*	-	Chloride (Cl^-)
		-	Copper (Cu) - Dissolved
	*	-	Iron (Fe) - Total & Dissolved
		-	Lead (Pb) - Dissolved
	*	-	Magnesium (Mg) - Dissolved
	*	-	Manganese (Mn) - Total & Dissolved
		-	Molybdenum (Mo) - Dissolved
		-	Nitrogen: Ammonia (NH_3) - reported as N
		-	Nitrite (NO_2) - reported as N
		-	Nitrate (NO_3^-) - reported as N
	*	-	Potassium (K) - Dissolved
	*	-	Oil & Grease (UPDES & Above & Below Mine Sites Only)
		-	Ortho Phosphate (PO_4^{-3}) - reported as P
		-	Selenium (Se) - Dissolved (Waste Rock Sites Only)
	*	-	Sodium (Na) - Dissolved
	*	-	Sulfate (SO_4^{-2})
		-	Zinc (Zn) - Dissolved
	*	-	Cation-Anion Balance

Construction * Operational - Baseline

INCORPORATED
MAR 3 1 2005
DIV OF OIL GAS & MINING

PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM

TABLE 2
GROUND WATER BASELINE, OPERATIONAL, POSTMINING WATER QUALITY PARAMETER LIST

Field Measurements:

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

Laboratory Measurements: (mg/l)

*	-	Total Dissolved Solids
*	-	Total Hardness ($CaCO_3$)
	-	Acidity ($CaCO_3$)
	-	Aluminum (Al) - Dissolved
	-	Arsenic (As) - Dissolved
	-	Boron (B) - Dissolved (Waste Rock Sites Only)
*	-	Carbonate (CO_3^{-2})
*	-	Total Alkalinity/Bicarbonate ($CaCO_3$)
	-	Cadmium (Cd) - Dissolved
*	-	Calcium (Ca) - Dissolved
*	-	Chloride (Cl^-)
	-	Copper (Cu) - Dissolved
*	-	Iron (Fe) - Total & Dissolved
	-	Lead (Pb) - Dissolved
*	-	Magnesium (Mg) - Dissolved
*	-	Manganese (Mn) - Total & Dissolved
	-	Molybdenum (Mo) - Dissolved
	-	Nitrogen: Ammonia (NH_3) - reported as N
	-	Nitrite (NO_2) - reported as N
	-	Nitrate (NO_3^-) - reported as N
*	-	Potassium (K) - Dissolved
	-	Ortho Phosphate (PO_4^{-3}) reported as P
	-	Selenium (Se) - Dissolved (Waste Rock Sites Only)
*	-	Sodium (Na) - Dissolved
*	-	Sulfate (SO_4^{-2})
	-	Zinc (Zn) - Dissolved
*	-	Cation-Anion Balance

* Operational - Baseline

INCORPORATED
MAR 3 1 2005
DIV OF OIL GAS & MINING

PACIFICORP
ENERGY WEST
HYDROLOGIC MONITORING PROGRAM

WATER SAMPLE DOCUMENTATION

The following information will be included on the lab sheets:

1. Sample time and date
2. Individual taking sample
3. Field parameters (except in-mine)
   - Temperature
   - Flow
   - pH (units)
   - Conductivity (umhos/cm)
   - Dissolved Oxygen (PPM), depending on location
4. Precipitation date if applicable
5. Date and time each parameter is analyzed at the lab

ANALYTICAL METHOD AND DETECTION LIMIT

Parameter	MRL	UNITS	Method
Acidity	5	mg/l $CaCO_3$	D1067-92
Alkalinity, Bicarbonate	5	mg/l $CaCO_3$	SM 2320 B
Alkalinity, Carbonate	5	mg/l $CaCO_3$	SM 2320 B
Alkalinity, Total	5	mg/l $CaCO_3$	SM 2320 B
Aluminum	0.03	mg/l	EPA 200.7
Anions	----	meq/l	----------
Arsenic	.01	mg/l	EPA 200.7
Barium	0.02	mg/l	EPA 200.7
Boron	0.01	mg/l	EPA 200.7
Cadmium	0.001	mg/l	EPA 200.7
Calcium	0.03	mg/l	EPA 200.7
Cations	----	meq/l	----------
Chloride	1	mg/l	EPA 300.0
Chromium	0.001	mg/l	EPA 200.7
Conductivity	---	umhos/cm	SM2510-B
Copper, Drinking Water	0.01	mg/l	EPA 220.1
Copper, Waste Water	0.01	mg/l	EPA 200.7
Fluoride	0.05	mg/l	EPA 300.0
Hardness, Total	----	mg/l $CaCO_3$	SM2340-B
Iron	0.05	mg/l	EPA 200.7
Iron, Dissolved	0.03	mg/l	EPA 200.7
Lead, Drinking Water	0.001	mg/l	EPA 239.2
Lead, Waste Water	0.01	mg/l	EPA 200.7
Magnesium	0.01	mg/l	EPA 200.7
Manganese	0.002	mg/l	EPA 200.7
Mercury	.0002	mg/l	EPA 245.1
Molybdenum	0.005	mg/l	EPA 200.7
Nickel	0.001	mg/l	EPA 200.7
Nitrogen, Ammonia	0.1	mg/l	EPA 350.3
Nitrogen, Nitrate	0.05	mg/l	EPA 300.0
Nitrogen, Nitrite	0.05	mg/l	EPA 300.0
Oil & Grease	2	mg/l	EPA 413.1
Oxygen, Dissolved	----	mg/l	EPA 360.1
pH	----	Units	EPA 150.1
Phosphorus, Ortho	0.05	mg/l	EPA 300.0
Phosphorus, Total	0.05	mg/l	SM 4500P, B & E
Potassium	0.14	mg/l	EPA 200.7
Selenium	0.02	mg/l	EPA 200.7
Silver, Total	0.002	mg/l	EPA 200.7
Sodium	0.01	mg/l	EPA 200.7
Solids, Settleable	0.1	ml/l	EPA 160.5
Solids, Total Dissolved	30	mg/l	EPA 160.1
Solids, Total Suspended	5	mg/l	EPA 160.2
Sulfate	1	mg/l	EPA 300.0
Sulfide	1	mg/l	EPA 376.1
Turbidity	0.1	NTU	EPA 180.1
Zinc, Total	0.004	mg/l	EPA 200.7
Zinc, Dissolved	0.004	mg/l	EPA 200.7

INCORPORATED
MAR 3 1 2005
DIV OF OIL GAS & MIN.

PACIFICORP

ENERGY WEST MINING COMPANY

HYDROLOGIC MONITORING PROGRAM

DEER CREEK/COTTONWOOD-WILBERG/DES-BEE-DOVE/TRAIL MOUNTAIN MINES

SURFACE HYDROLOGY - OPERATIONAL SAMPLING (Table 1)

Drainage System	Drainage	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cottonwood Creek Drainage System	Cottonwood Canyon Creek	SW1	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		SW2	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		CCC01	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field
		SW3	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
	Grimes Wash	GWR01	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		GWR02	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		GWR03	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
	Joes Valley	ICA	Based Flow Monitoring Only (October or November)									Operational		
	Indian Creek	ICF	Based Flow Monitoring Only (October or November)									Field		
		ICD	Based Flow Monitoring Only (October or November)									Operational		
		ICB	Based Flow Monitoring Only (October or November)									Operational		
	Straight Canyon	T-19	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
Huntington Drainage System	Deer Creek	DCR01	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		DCR04	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		DCR06	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
	Huntington Creek	HCC01	Flow *	Flow *	Operational*	Flow *	Flow *	Operational*	Flow *	Flow *	Operational*	Flow *	Flow *	Operational*
		HCC02			Operational*			Operational*			Operational*			Operational*
		HCC04			Operational*			Operational*			Operational*			Operational*
			* Flow in Huntington Creek is measured @ HCC01 by Utah Power, and will be reported in the Annual Hydrologic Report											
	Meetinghouse Canyon	MCH01	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
	Rilda Canyon	RCF1*	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		RCLF1	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field
		RCLF2	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field
		RCF2	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field
		RCF3	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		RCW4	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
			* Baseline flow will be measured adjacent to EM-163											
	Mill Fork Canyon	MFA01	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		MFB02	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		MFU03	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational

INCORPORATED
MAY 3 1 2005
DIV OF OIL GAS & MINING

PACIFICORP

ENERGY WEST MINING COMPANY

HYDROLOGIC MONITORING PROGRAM

DEER CREEK/COTTONWOOD-WILBERG/DES-BEE-DOVE/TRAIL MOUNTAIN MINES

GROUNDWATER HYDROLOGY - OPERATIONAL SAMPLING (Table 2)

Groundwater Type			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Springs	*East Mountain*	*(Includes Mill Fork Springs)*							Operational	Flow *	Flow *	Operational		
										* Recession Springs				
	East Mountain-Rilda Canyon		Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
	Trail Mountain								Operational	Flow	Flow	Operational		
	Oliphant	T-18			Operational			Operational			Operational			Operational
In-Mine	*Cottonwood*				Operational			Operational			Operational			Operational
	Deer Creek				Operational			Operational			Operational			Operational
	Trail Mountain				Operational			Operational			Operational			Operational
Wells	*Cottonwood Waste Rock Well*				Operational			Operational			Operational			Operational
	Cottonwood Canyon Wells		Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
	(includes Straight Canyon TM-3)													
	Deer Creek Waste Rock Well				Operational			Operational			Operational			Operational
	Deer Creek In-Mine Well				Level			Level			Level			Level
	Rilda Canyon Wells		Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
	Trail Mountain (TM-1B)		Level	Level	Operational	Level	Level	Operational	Level	Level	Operational	Level	Level	Operational

UPDES SAMPLING - (Table 1)

			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mine Water Discharge	*Cottonwood*	TMA	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
		Miller	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Deer Creek	DCD	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Trail Mountain	TMD	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
Sediment Pond Discharge	*Cottonwood*	2 Outfalls	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Deer Creek	1 Outfall	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Des-Bee-Dove	1 Outfall	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Trail Mtn	1 Outfall	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational

INCORPORATED
MAR 3 1 2005
DIV OF OIL GAS & MIN

PACIFICORP

ENERGY WEST MINING COMPANY

HYDROLOGIC MONITORING PROGRAM

DEER CREEK/COTTONWOOD-WILBERG/DES-BEE-DOVE/TRAIL MOUNTAIN MINES

SURFACE HYDROLOGY - BASELINE SAMPLING (Table 1) - 2006

Drainage System	Drainage	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cottonwood Creek Drainage System	Cottonwood Canyon Creek	SW1	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		SW2	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		CCC01	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field
		SW3	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
	Grimes Wash	GWR01	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		GWR02	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		GWR03	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
	Joes Valley	ICA	Based Flow Monitoring Only (October or November)									Baseline		
	Indian Creek	ICF	Based Flow Monitoring Only (October or November)									Field		
		ICD	Based Flow Monitoring Only (October or November)									Baseline		
		ICB	Based Flow Monitoring Only (October or November)									Baseline		
	Straight Canyon	T-19	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
Huntington Drainage System	Deer Creek	DCR01	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		DCR04	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		DCR06	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
	Huntington Creek	HCC01	Flow *	Flow *	Baseline*	Flow *	Flow *	Baseline*	Flow *	Flow *	Baseline*	Flow *	Flow *	Baseline*
		HCC02			Baseline*			Baseline*			Baseline*			Baseline*
		HCC04			Baseline*			Baseline*			Baseline*			Baseline*
			* Flow in Huntington Creek is measured @ HCC01 by Utah Power, and will be reported in the Annual Hydrologic Report											
	Meetinghouse Canyon	MCH01	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
	Rilda Canyon	RCF1*	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		RCLF1	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field
		RCLF2	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field
		RCF2	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field	Flow	Flow	Field
		RCF3	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		RCW4	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
			* Baseline flow will be measured adjacent to EM-163											
	Mill Fork Canyon	MFA01	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		MFB02	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
		MFU03	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline

INCORPORATED
MAR 3 1 2005

PACIFICORP

ENERGY WEST MINING COMPANY

HYDROLOGIC MONITORING PROGRAM

DEER CREEK/COTTONWOOD-WILBERG/DES-BEE-DOVE/TRAIL MOUNTAIN MINES

GROUNDWATER HYDROLOGY - BASELINE SAMPLING (Table 2) - 2006

Groundwater Type			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Springs	*East Mountain*	*(Includes Mill Fork Springs)*							Baseline	Flow *	Flow *	Baseline		
										* Recession Springs				
	East Mountain-Rilda Canyon		Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline	Flow	Flow	Baseline
	Trail Mountain								Baseline	Flow	Flow	Baseline		
	Oliphant	T-18			Baseline			Baseline			Baseline			Baseline
In-Mine	*Cottonwood*				Baseline			Baseline			Baseline			Baseline
	Deer Creek				Baseline			Baseline			Baseline			Baseline
	Trail Mountain				Baseline			Baseline			Baseline			Baseline
Wells	*Cottonwood Waste Rock Well*				Baseline			Baseline			Baseline			Baseline
	Cottonwood Canyon Wells		Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
	(includes Straight Canyon TM-3)													
	Deer Creek Waste Rock Well				Baseline			Baseline			Baseline			Baseline
	Deer Creek In-Mine Well				Level			Level			Level			Level
	Rilda Canyon Wells		Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
	Trail Mountain (TM-1B)		Level	Level	Baseline	Level	Level	Baseline	Level	Level	Baseline	Level	Level	Baseline

UPDES SAMPLING - (Table 1)

			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mine Water Discharge	*Cottonwood*	TMA	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
		Miller	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Deer Creek	DCD	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Trail Mountain	TMD	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
Sediment Pond Discharge	*Cottonwood*	3 Outfalls	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Deer Creek	1 Outfall	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Des-Bee-Dove	1 Outfall	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational
	Trail Mtn	1 Outfall	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational	Operational

INCORPORATED
MAR 31 2005
DIV OF OIL GAS & MINING

PACIFICORP

ENERGY WEST MINING COMPANY

HYDROLOGIC MONITORING PROGRAM

DEER CREEK/COTTONWOOD-WILBERG/DES-BEE-DOVE/TRAIL MOUNTAIN MINES

SURFACE HYDROLOGY - RECLAMATION SAMPLING (Table 1)

Drainage System	Drainage	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
*Cottonwood Creek Drainage System**	*Cottonwood Canyon Creek*	SW1			Operational			Operational			Operational			Operational
		SW2			Operational			Operational			Operational			Operational
		CCC01			Field			Field			Field			Field
		SW3			Operational			Operational			Operational			Operational
	Grimes Wash	GWR01			Operational			Operational			Operational			Operational
		GWR02			Operational			Operational			Operational			Operational
		GWR03			Operational			Operational			Operational			Operational
	Joes Valley	ICA	Based Flow Monitoring Only (October or November)									Operational		
	Indian Creek	ICF	Based Flow Monitoring Only (October or November)									Field		
	Indian Creek	ICD	Based Flow Monitoring Only (October or November)									Operational		
		ICB	Based Flow Monitoring Only (October or November)									Operational		
	Straight Canyon	T-19			Operational			Operational			Operational			Operational
*Huntington Drainage System**	*Deer Creek*	DCR01			Operational			Operational			Operational			Operational
		DCR04			Operational			Operational			Operational			Operational
		DCR06			Operational			Operational			Operational			Operational
	Huntington Creek	HCC01			Operational**			Operational**			Operational**			Operational**
		HCC02			Operational**			Operational**			Operational**			Operational**
		HCC04			Operational**			Operational**			Operational**			Operational**
			** *Flow in Huntington Creek is measured @ HCC01 by Utah Power, and will be reported in the Annual Hydrologic Report*											
	Meetinghouse Canyon	MCH01			Operational			Operational			Operational			Operational
	Rilda Canyon	RCF1***			Operational			Operational			Operational			Operational
		RCLF1			Field			Field			Field			Field
		RCLF2			Field			Field			Field			Field
		RCF2			Field			Field			Field			Field
		RCF3			Operational			Operational			Operational			Operational
		RCW4			Operational			Operational			Operational			Operational
			*** *Baseline flow will be measured adjacent to EM-163*											
	Mill Fork Canyon	MFA01	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		MFB02	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
		MFU03	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational

** Analyzed for Baseline Parameters During the Fifth (5) and Ninth (9) Year After Final Reclamation*

INCORPORATED
MAR 3 1 2005
DIV OF OIL GAS & MINING

PACIFICORP

ENERGY WEST MINING COMPANY

HYDROLOGIC MONITORING PROGRAM

DEER CREEK/COTTONWOOD-WILBERG/DES-BEE-DOVE/TRAIL MOUNTAIN MINES

In no case will baseline sampling time frame exceed 5 years converting from operational to reclamation monitoring.

GROUNDWATER HYDROLOGY - RECLAMATION SAMPLING (Table 2)

Groundwater Type		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Springs	**East Mountain (Includes Mill Fork Springs)**							Operational			Operational		
	Spring monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.												
	East Mountain-Rilda Canyon	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational	Flow	Flow	Operational
	Rilda Spring monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.												
	Trail Mountain							Operational			Operational		
	Oliphant T-18			Operational			Operational			Operational			Operational
	Spring monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.												
In-Mine	**Deer Creek/Cottonwood/Trail Mtn. samples will be collected and analyzed quarterly until the mine is sealed or the sites become inaccessible**												
	Oliphant Mine discharge monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.												
Wells	**Cottonwood Waste Rock Well**			Operational			Operational			Operational			Operational
	Cottonwood Waste Rock Well will sealed during Phase I reclamation. One water sample will be collected and analyzed per location quarterly until well sealing												
	Cottonwood Canyon Wells*	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
	(Includes Straight Canyon TM-3)												
	Cottonwood Canyon well monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.												
	Deer Creek Waste Rock Well			Operational			Operational			Operational			Operational
	Deer Creek Waste Rock Well will sealed during Phase I reclamation. One water sample will be collected and analyzed per location quarterly until well sealing												
	Rilda Canyon Wells*	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level	Level
	Rilda Canyon well monitoring will be conducted until permit area reduction approval or unless otherwise approved by the Division.												
	Trail Mountain (TM-1B)	Level	Level	Operational	Level	Level	Operational	Level	Level	Operational	Level	Level	Operational
	TM-1B well will sealed during Phase I reclamation. One water sample will be collected and analyzed per location quarterly until well sealing												
	** Monitored monthly subject ot access*												

INCORPORATED
MAR 3 1 2005
DIV OF OIL GAS & MIN NG

UPDES SAMPLING - (Table 1)

			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
*Mine Water Discharge***	*Cottonwood*	TMA	As Needed Basis According to UPDES Permit Stipulations											
		Miller	As Needed Basis According to UPDES Permit Stipulations											
	Deer Creek	DCD	As Needed Basis According to UPDES Permit Stipulations											
	Trail Mountain	TMD	As Needed Basis According to UPDES Permit Stipulations											
	*** After Portal Sealing, PacifiCorp Will Monitor Down Dip For Development Of Groundwater Seeps/Springs Until Bond Release*													
Sediment Pond Discharge	*Cottonwood*	2 Outfalls	As Needed Basis According to UPDES Permit Stipulations											
	Deer Creek	1 Outfall	As Needed Basis According to UPDES Permit Stipulations											
	Des-Bee-Dove	1 Outfall	As Needed Basis According to UPDES Permit Stipulations											
	Trail Mtn	1 Outfall	As Needed Basis According to UPDES Permit Stipulations											