Surface Land Ownership Within and Adjacent to the Permit Area

The following information describes the surface land ownership within and adjacent to the permit. Plate I-1 shows surface land ownership in and adjacent to the permit area.

Section 19 T22S, R6E

George E. & Patricia Olsen
15 E. Center
Orangeville, Utah 84537
(801) 748-2522

James Olsen
647 N. Main
Spanish Fork, Utah 84660
(801) 798-3322

United States of America (BLM)
Lease No. U-5287
Utah State Offices
440 West 200 South, Suite 500
Salt Lake City, Utah 84145-0155

Utah Power and Light
P.O. Box 899
Salt Lake City, Utah 84522
(801) 748-2570

Wynona P. Olsen (trustee)
3805 Highland Cove Lane
Apt #D18
Salt Lake City, Utah 84146

M. Christensen
Box 35
Emery, Utah 84522
(801) 286-2348

Young Investment LLC
c/o Walt Young
6590 W. Center St.
Mendon, UT 84325

Consolidation Coal Company
1800 Washington Road
Pittsburgh, Pennsylvania 15241
(412) 831-4000

Julian Bowman
P.O. Box 141
Huntington, UT 84528-0141

File in:
☐ Confidential
☐ Shelf
☒ Expandable
Refer to Record No 0023 Date 04302008
In C/015/015, 2008, Incoming
For additional information

Inserted 12/2007

Surface Land Ownership Within and Adjacent to the Permit Area

The following information describes the surface land ownership within and adjacent to the permit. Plate I-1 shows surface land ownership in and adjacent to the permit area.

Section 20 T22S, R6E

Gary Petty & Jolene
P.O. Box 44
Emery, Utah 84522

Glen R. Anderson
1462 W. 6235 S.
Murray, Utah 84107
(801) 266-4324

Emery County
Emery County Courthouse
Castle Dale, Utah 84513

Osburn Bret and Lori Lynn Carter
P.O. Box 24
Emery, Utah 84522

Kenneth L. & Earlene Christensen
P.O. Box 552
Emery, Utah 84522

Jeffery Christensen
P.O. Box 235
Cleveland, UT 84518

Osburn Bret Carter & J.R. Lawrence
P.O. Box 24
Emery, Utah 84522

Utah Power and Light
P.O. Box 899
Salt Lake City, Utah 84110
(801) 748-2570

Section 21 T22S, R6E

Wayne & Delise Staley
482 N. 2 W.
Emery, Utah 84522
(801) 286-2213

John & Vicki Byars
P.O. Box 575
Emery, Utah 84522

Consolidation Coal Company
1800 Washington Road
Pittsburgh, Pennsylvania 15241
(412) 831-4000

Osburn Bret and Lori Lynn Carter
P.O. Box 24
Emery, Utah 84522

L.D. & C.A. Jensen
179 W. 4 S.
Emery, Utah 84522
(801) 286-2297

Kent Alan Jorgensen et al
3663 Bountiful Blvd.
Bountiful, UT 84010-3313

Morris & Ronnie Sorensen
P.O. Box 104
Emery, UT 84522-0104

Surface Land Ownership Within and Adjacent to the Permit Area

The following information describes the surface land ownership within and adjacent to the permit. Plate I-1 shows surface land ownership in and adjacent to the permit area.

Section 22 T22S, R6E

Consolidation Coal Company
1800 Washington Road
Pittsburgh, Pennsylvania 15241
(412) 831-4000

John & Vicki Byars
P.O. Box 575
Emery, Utah 84522

Kenneth L. & Earlene Christiansen
P.O. Box 552
Emery, Utah 8452

D.U. Company, Inc.
53 West Angelo Avenue
Salt Lake City, Utah 84115

Section 27 T22S, R6E

Consolidation Coal Company
1800 Washington Road
Pittsburgh, Pennsylvania 15241
(412) 831-4000

Section 28 T22S, R6E

Wayne & Delise Staley
P.O. Box 83
Emery, Utah 84522
(801) 286-2213

Consolidation Coal Company
1800 Washington Road
Pittsburgh, Pennsylvania 15241
(412) 831-4000

Russell H. Odle
P.O. Box 23
Emery, UT 84522-0023

Section 29 T22S, R6E

Russell H. Odle
P.O. Box 23
Emery, UT 84522-0023

Emery County
Emery County Courthouse
Castle Dale, Utah 84513

Morgan Robertson
P.O. Box 65
Emery, Utah 84522
(Refer to Page 7b thru 7d for
Exploration & Surface Agreement)

Rainbow Glass
P.O. Box 340
Orangeville, UT 84537

Consolidation Coal Company
1800 Washington Road
Pittsburgh, Pennsylvania 15241
(412) 831-4000

Osburn Bret Carter & J.R. Lawrence
P.O. Box 24
Emery, Utah 84522

Inserted 12/2007

Surface Land Ownership Within and Adjacent to the Permit Area

The following information describes the surface land ownership within and adjacent to the permit. Plate I-1 shows surface land ownership in and adjacent to the permit area.

Section 30 T22S, R6E

George E. & Patricia L. Olsen
15 E. Center
Orangeville, Utah 84537
(801) 748-2522

Josiah K. Eardley
2433 South Highway 10
Price, Utah 84501

Consolidation Coal Company
1800 Washington Road
Pittsburgh, Pennsylvania 15241
(412) 831-4000

Emery County
Emery County Courthouse
Castle Dale, Utah 84513

Morgan C. Robertson
P.O. Box 65
Emery, Utah 84522
(Right of Entry - Road &Monitoring Facilities, right-of-way & easement grant executed 10-3-88, filed & recorded 10-6-88, Utah, Emery County Book 174, Page 600-601)

Wynona P. Olsen (trustee)
3805 Highland Cove Lane
Apt #D18
Salt Lake City, Utah 84146

Young Investment LLC
c/o Walt Young
6590 W. Center St.
Mendon, UT 84325

Clara V. Albrechtsen
893 N 800 E
Bountiful, UT 84010-2848

M. Christensen
Box 35
Emery, Utah 84522
(801) 286-2348

Section 31 T22S, R6E

Consolidation Coal Company
1800 Washington Road
Pittsburgh, Pennsylvania 15241
(412) 831-4000

Morgan Robertson
P.O. Box 65
Emery, Utah 84522

Josiah K. & Etta Marie Eardley
2433 South Highway 10
Price, Utah 84501

Osburn Bret Carter et al
P.O. Box 24
Emery, Utah 84522

Section 32 T22S, R6E

Consolidation Coal Company
1800 Washington Road
Pittsburgh, Pennsylvania 15241
(412) 831-4000

Osburn Bret Carter
P.O. Box 24
Emery, Utah 84522

Inserted 12/2007

Surface Land Ownership Within and Adjacent to the Permit Area

The following information describes the surface land ownership within and adjacent to the permit. Plate I-1 shows surface land ownership in and adjacent to the permit area.

Section 33 T22S, R6E

Consolidation Coal Company
1800 Washington Road
Pittsburgh, Pennsylvania 15241
(412) 831-4000

Section 34 T22S, R6E

Consolidation Coal Company
1800 Washington Road
Pittsburgh, Pennsylvania 15241
(412) 831-4000

United States of America (BLM)

Section 25 T22S, R5E

Rex Addley
Emery, Utah 84522
(801) 286-2250

George Lewis
75 E. 3rd South
Salt Lake City, Utah 84111
Phone Unknown

Robert Lewis
107 W. 2 S.
Emery, Utah 84522
(801) 286-2424

United States of America (BLM)
Not Leased

Section 36 T22S, R5E

Consolidation Coal Company
1800 Washington Road
Pittsburgh, Pennsylvania 15241
(412) 831-4000

M. Robertson
P.O. Box 65
Emery, UT 84522-0065

Section 6 T23S, R6E

Consolidation Coal Company
1800 Washington Road
Pittsburgh, Pennsylvania 15241
(412) 831-4000

United States of America (BLM)
Not Leased

Osburn Bret Carter
P.O. Box 24
Emery, Utah 84522

Section 5 T23S, R6E

Osburn Bret Carter
P.O. Box 24
Emery, Utah 84522

United States of America (BLM)
Not Leased

Inserted 12/2007

Surface Land Ownership Within and Adjacent to the Permit Area

The following information describes the surface land ownership within and adjacent to the permit. Plate I-1 shows surface land ownership in and adjacent to the permit area.

Section 4 T23S, R6E

United States of America (BLM)
Not Leased

Section 1, T23S, R5E

United States of America (BLM)
Not Leased

Inserted 12/2007

Coal Ownership Within and Adjacent to the Permit Area

All the holdings described below that are shown as controlled by P&M or Consol were subject to a 50/50 lease agreement between Consol and P&M (through Gulf Oil Company's acquisition of Kemmerer Coal Company) dated August 23, 1966 and amended 9/1/72 and 2/27/75 . Any reference, below, to Kemmerer should be read as P&M. This agreement was terminated by an agreement made effective 3/31/93 giving Consolidation Coal Company sole control of the Emery Coal Mine and all real property associated with it. A copy of this latest agreement is provided at the end of this appendix. The documents and lands listed below pertain only to coal ownership. Plate I-1 shows coal ownership in and adjacent to the permit area.

Township 22 South, Range 6 East (SLM)

Section 19	NE¼SW¼ NW¼SE¼ E½SE¼ S½NE¼	Lease from USA (BLM) to Kemmerer and Consol dated 7/1/70 (#U-527) Utah State Offices University Club Building Salt Lake City, Utah (801) 524-5330

Re-numbered 07/2007

APPENDIX V-3

1980 Pre-subsidence Survey

Information in this appendix may have been superceded by the pre-subsidence survey contained in subsequent Appendicies. Please consult Chapter V index page for references to revised pre-subsidence survey data.

Revised 5/07
Revised 12/07

CHAPTER V

GEOLOGY AND SUBSIDENCE

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Revised 5/07
Revised 3/08

GEOCHEMICAL TESTING
Environmental and Energy Analysis

2005 N Center Ave
Somerset PA 15501

814/443-1671
814/445-6666
FAX: 814/445-6729

Wednesday, July 11, 2007

TIM WALTER
CONSOL - EMERY MINE
CONSOLIDATION COAL COMPANY
1800 WASHINGTON ROAD
PITTSBURGH, PA 15241

TEL:
FAX:

RE:

Order No.: G0706408

Dear TIM WALTER:

Geochemical Testing received 2 sample(s) on 6/18/2007 for the analyses presented in the following report.

There were no problems with the analyses and all QC data met NELAC, EPA, and laboratory specifications except where noted in the Case Narrative.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

David M. Glessner
Laboratory Manager

Geochemical Testing

Date: *11-Jul-07*

CLIENT: CONSOL - EMERY MINE
Project:
Lab Order: G0706408

CASE NARRATIVE

No problems were encountered during analysis of this work order number, except as noted.

The reported analytes are not NELAC parameters.

The available boron and soluble selenium are reported on both the extract and solid basis.

The Acid-Base Accounting results are also reported in a tabular format on Page 5 of this Work Order.

REVISED REPORT: 07/11/2007
Sample descriptions revised per client request.

Qualifiers:

ND - Not Detected at the Reporting Limit

J - Indicates an estimated value.

U - The analyte was not detected at or above the listed concentration, which is below the laboratory quantitation limit.

B - Analyte detected in the associated Method Blank

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

E - Value above quantitation range

* - Value exceeds Action Limit

H - Method Hold Time Exceeded

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA
DEP

Laboratory Results

Geochemical Testing

Date: *11-Jul-07*

CLIENT:	CONSOL - EMERY MINE	**Client Sample ID:**	Roof Sample
Lab Order:	G0706408		1st North Section
Project:		**Sampled By:**	Client
Lab ID:	G0706408-001	**Collection Date:**	6/15/2007
Matrix:	SOLID	**Received Date:**	6/18/2007

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ACID BASE ACCOUNTING		**ACID BASE ACCNT**				Analyst: **GAK**
Total Sulfur	2.69	0.01		%	1	6/19/2007
Sulfate + Sulfide	2.36	0.01		%	1	6/19/2007
Max Potential Acidity	73.8	0		TN CaCO3/1000 T	1	6/19/2007
Fizz Rating	0	0			1	6/19/2007
Neutralization Potential (CaCO3)	3.9	0		TN CaCO3/1000 T	1	6/19/2007
Deficiency or Excess	-69.9	0		TN CaCO3/1000 T	1	6/19/2007
CO2		**ASTM D1756/D5373**				Analyst: **GAL**
Total Organic Carbon	20.1	0.20		%	1	6/19/2007
FORMS OF SULFUR		**OVERBURDEN**				Analyst: **RLL**
Organic Sulfur	0.32	0.01		%	1	6/19/2007
Pyritic Sulfur	2.18	0.01		%	1	6/19/2007
Sulfate Sulfur	0.18	0.01		%	1	6/19/2007
Total Sulfur	2.69	0.01		%	1	6/19/2007
OVERBURDEN METALS		**D 3987/EPA 200.7**				Analyst: **NPT**
Available Boron - Extract Basis	0.02	0.01		mg/L	1	6/22/2007
Available Boron - Solid Basis	0.94	0.20		mg/Kg	1	6/22/2007
Soluble Selenium - Extract Basis	< 0.01	0.01		mg/L	1	6/22/2007
Soluble Selenium - Solid Basis	< 0.20	0.20		mg/Kg	1	6/22/2007
ASTM EXTRACTION		**ASTM D 3987**				Analyst: **DAN**
% Moisture	0.38	0.01		%	1	6/19/2007
Final pH	6.4	1.0		%	1	6/19/2007
Solids, gram/gram	1.0	0.10		%	1	6/19/2007

ACCREDITED IN ACCORDANCE WITH nelac
I.D. 56-00306 PA DEP

Inserted 12/07

Laboratory Results

Geochemical Testing

Date: *11-Jul-07*

CLIENT:	CONSOL - EMERY MINE	**Client Sample ID:**	Floor Sample
Lab Order:	G0706408		X-Cut #5, Zero North
Project:		**Sampled By:**	Client
Lab ID:	G0706408-002	**Collection Date:**	6/15/2007
Matrix:	SOLID	**Received Date:**	6/18/2007

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
ACID BASE ACCOUNTING		**ACID BASE ACCNT**				Analyst: **GAK**
Total Sulfur	0.21	0.01		%	1	6/19/2007
Sulfate + Sulfide	0.08	0.01		%	1	6/19/2007
Max Potential Acidity	2.5	0		TN CaCO3/1000 T	1	6/19/2007
Fizz Rating	0	0			1	6/19/2007
Neutralization Potential (CaCO3)	4.8	0		TN CaCO3/1000 T	1	6/19/2007
Deficiency or Excess	2.3	0		TN CaCO3/1000 T	1	6/19/2007
CO2		**ASTM D1756/D5373**				Analyst: **GAL**
Total Organic Carbon	8.49	0.20		%	1	6/19/2007
FORMS OF SULFUR		**OVERBURDEN**				Analyst: **RLL**
Organic Sulfur	0.14	0.01		%	1	6/19/2007
Pyritic Sulfur	0.05	0.01		%	1	6/19/2007
Sulfate Sulfur	0.03	0.01		%	1	6/19/2007
Total Sulfur	0.21	0.01		%	1	6/19/2007
OVERBURDEN METALS		**D 3987/EPA 200.7**				Analyst: **NPT**
Available Boron - Extract Basis	0.18	0.01		mg/L	1	6/22/2007
Available Boron - Solid Basis	3.50	0.20		mg/Kg	1	6/22/2007
Soluble Selenium - Extract Basis	< 0.01	0.01		mg/L	1	6/22/2007
Soluble Selenium - Solid Basis	< 0.20	0.20		mg/Kg	1	6/22/2007
ASTM EXTRACTION		**ASTM D 3987**				Analyst: **DAN**
% Moisture	1.86	0.01		%	1	6/19/2007
Final pH	6.9	1.0		%	1	6/19/2007
Solids, gram/gram	0.98	0.10		%	1	6/19/2007

Acid Base Accounting Report

Client CONSOL - EMERY MINE
Sampled By Client
Sampled Collected 6/15/2007

Work Order	Lab No	Description	Soil pH	Total Sulfur %	Sulfate S plus Sulfide S%	Maximum Potential Acidity (1)	Fizz Rating (3)	Neutralization Potential (1)	Deficiency or Excess (1,2)
G0706408	001	Roof Sample-1st North Section		2.69	2.36	73.8	0	3.9	-69.9
G0706408	002	Floor Sample-X-Cut #5 Zero North		0.21	0.08	2.5	0	4.8	2.3

Notes: (1) Tons CaCO3/1000 tons overburden.
(2) Negative Number indicates deficiency.
(3) Legend 0=None 1=Slight 2=Moderate 3=Strong

Sample Preparation and Testing Techniques

All preparation and testing procedures are performed according to the "Overburden Sampling and Testing Manual" as prepared for the Pennsylvania Department of Envitonmental Resources by Energy Center, Inc., T. Bergstresser, D. Noll, J Woodcock.

The maximum potential acidity is calculated from the sulfate plus sulfide sulfurs. Whenever the forms of sulfur are not determined, the total sulfur value is used to calculate the maximum potential acidity.

APPENDIX V-5

2007 PRE-SUBSIDENCE SURVEY
OF THE ZERO NORTH PANEL

PRE-SUBSIDENCE SURVEY
PRIOR TO FULL EXTRACTION AT THE
ZERO NORTH, 4th EAST MAINS, AND 6th WEST PANELS

Prepared for

CONSOLIDATION COAL COMPANY
Emery Mine
Emery County, Utah

October 2007

Prepared by

EARTHFAX ENGINEERING, INC.
Engineers/Scientists
Midvale, Utah
www.earthfax.com

EarthFax

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2.2 INDIVIDUAL FEATURE DESCRIPTIONS 2

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Attachments

TABLE 1. PRE-SUBSIDENCE SURVEY POINTS

FIGURE 1. PRE-SUBSIDENCE SURVEY UPDATE 4th EAST MAINS PANEL 6 WEST AND ZERO NORTH

SITE PHOTOGRAPHS

SECTION 1

INTRODUCTION

The purpose of this report is to present baseline surface conditions prior to full extraction operations at the Zero North, 4th East Mains, and 6th West Panel in the Consolidation Coal Company (CONSOL) Emery Mine, Emery County, Utah. It is intended to be part of a Subsidence Control Plan as required in Section R645-301-525.100 of the Utah Administrative Code. Recording initial surface conditions will facilitate locating and mitigating any areas determined to be adversely affected by future subsidence. As part of the pre-subsidence survey, the locations and conditions of the following features were recorded:

- Structures (e.g. buildings, corrals, roads)
- Fences
- Utilities (e.g. power, telephone, gas, and water lines, water wells)
- Surface drainages (e.g. natural channels, irrigation ditches)

This report references the original Pre-subsidence Survey performed prior to mining operations in 1980 (Valley Engineering, 1980). The feature numbers given in this document correspond to those described in the 1980 report. These features were surveyed in the field in October 2007, and any differences and/or changes from the conditions noted during the 1980 survey are noted both in the text and figures of this document. This report supercedes the Valley Engineering survey where conflicts exist.

CHAPTER 2
SURVEY AREA OBSERVATIONS

2.1 GENERAL AREA DESCRIPTION

This pre-subsidence survey covers approximately 142 acres, consisting of mostly undeveloped rangeland. Approximately 9.1 acres of the surveyed area are irrigated crop land. There are no structures located above the Zero North, 4th East Mains, or the 6th West Panel, but a small shed and corral is located nearby. Both of these structures are in dilapidated condition. There are several fences in the area in various states of repair. Most of the fences consist of barbed wire strung between posts made from natural rough cut tree limbs. Some fences use finished lumber fence posts or metal tee-stakes. A paved road which serves as the access road for the 4th East Portal traverses roughly west to east across the southeastern corner of the 4th East Mains. Unimproved roads stem from the paved road to the irrigated croplands in the survey area. There are one perennial drainage and several ephemeral drainages in the survey area. The perennial drainage is named Christiansen Wash. An overhead electrical power line traverses through the western portions of both the 4th East Mains and 6th West Panel. All of the features (structures, fences, roads, drainages, utilities, etc.) located during the pre-subsidence survey are shown on Figure 1. CONSOL has signed a County Road Repair Agreement with Emery County to mitigate any subsidence damage to roads within the full extraction area. Similarly, CONSOL has entered into a Power Line Repair Agreement with Pacificorp to mitigate subsidence damage to power lines within the full extraction area.

2.2 INDIVIDUAL FEATURE DESCRIPTIONS

Each numbered feature on Figure 1 is described below. The numbers for each feature are identical to those used in the 1980 Pre-Subsidence Survey. Refer to Section 6 for photographs.

Feature 85. Dirt Road and Fences. This feature is essentially unchanged from how it is described in the Valley Engineering (1980) report, which states the following: "The road is a two-track, single lane, dirt road. The road surface consists of the natural sand and clay that is in the area, and has been compacted by vehicles that travel the road. The fences in the area are barbed wire with either natural rough cut wood posts or steel posts." The fences are in fair to good condition.

Feature 86. Barbed Wire Fence. This feature has been updated from the Valley Engineering (1980) report. The fence, which is constructed with rough cut timber posts, is in dilapidated condition. Several of the posts are missing, and many of the barbed wire strands are loose and partially buried under the ground surface.

Feature 87. Small Creek and Fence. The description of this feature has been updated from the Valley Engineering (1980) report. The fence is constructed of rough cut timber posts and barbed wire and is in good condition. The "small creek" was incorrectly identified in the 1980 survey. The survey area is relatively flat, dry, and contains no established stream channels. The 1980 survey shows several irrigation ditches overlying the Zero North Panel which drain toward this "stream channel," which was actually an irrigation outflow ditch. During the 2007 survey, it was evident that many of the irrigation ditches had been allowed to fill in, including the "stream channel" identified in the 1980 survey.

Feature 88. Small Fenced Area. The description of this feature has been updated from the Valley Engineering (1980) report. It has fallen into disrepair since it was surveyed in 1980. The fenced area measures approximately 25 feet by 25 feet. Many of the fence posts are no longer straight, and the barbed wire sags. The area in the vicinity of the fence is overgrown with vegetation.

Feature 89. Quarter Section Marker. This feature remains the same as described in the Valley Engineering (1980) report, which states the following: "This quarter section corner marker is in Range 6 East Township 22 South. It divides sections 22 and 27. The marker is a metal cap on a short steel pipe."

Feature 90. Ponds. The description of this feature has been updated from the Valley Engineering (1980) report. The ponds were empty during the October 2007 survey, but four earth berms were present that appeared capable of impounding water. The berms are approximately 3 feet tall. Three of the berms are clustered together in a north to south alignment, and one berm is located a few hundred feet to the northeast. A dry irrigation ditch located west of the three clustered ponds appears to serve as a water source. A dilapidated wooden corral and small shed is located just north of the three clustered ponds.

Feature 91. Sixteenth Section Corner Marker. This feature remains the same as described in the Valley Engineering (1980) report, which states the following: "The marker is located in Range 6 East Township 22 South and divides the south boundary of the southwest quarter of Section 22 between sections 22 and 27. The marker is a short steel pipe, about a foot in height, with a metal cap at the top."

Feature 92. Fence and Dirt Road. The description of this feature has been updated from the Valley Engineering (1980) report. This feature is in fair to poor condition. The road is rutted and overgrown with vegetation, especially where irrigation runoff discharges from the center of the field located to the north. The fence, which is constructed from rough cut timber and barbed wire, is also overgrown by grasses. Many of the fence posts are no longer plumb, and many of the barbed wire strands sag.

Feature 93. Irrigation Ditches and Farmland. The description of this feature has been updated from the Valley Engineering (1980) report. The portion of this feature that overlies the

6th West Panel (it does not exist above the 4th East Mains) contains two irrigated fields with a total of 9.1 acres of cultivated land. The northwestern field drains to the south/southeast and receives irrigation water from a ditch running along its eastern edge. The southeastern field drains to the south and receives irrigation water from a ditch that enters the field from the north.

Feature 96. Cattle Guard. The description of this feature has been updated from the Valley Engineering (1980) report. The cattle guard was not present during the October 2007 survey.

Feature 97. Dirt Road, Utility Power Line, and Fence. The description of this feature has been updated from the Valley Engineering (1980) report. The dirt road is approximately 24 feet wide with a surface constructed from imported, compacted gravel. The road is in very good condition. The utility power line hangs from 30 to 40 foot tall wooden poles, and is in very good condition. The poles appear relatively plumb. The barbed wire fence is located on the west side of the road and has posts constructed from rough cut timbers and metal tee-stakes. The fence is in good to excellent condition.

Feature 98. Small Creek. The description of this feature has been updated from the Valley Engineering (1980) report. The creek is called Christiansen Wash. During the October 2007 survey, flow in the creekbed was approximately 3 feet wide. The creek flows to the southwest and discharges into Quitchupah Creek. The creek flows under the paved access road for the 4th East Portal via a 60-inch diameter coated corrugated steel pipe that is in very good condition.

Feature 103. Farm Land, Corrals, Ponds, and Fences. The description of this feature has been updated from the Valley Engineering (1980) report. Most of this feature lies just outside the boundaries of the 4th East Mains and 6th West Panel. However, a fenced and gated hay storage area is located just to the northwest of the 6th West Panel. The fence and gate are in good

condition. An unimproved dirt road (good condition) leads from the gravel road up to the hay storage area.

Feature 122. Irrigation Ditch. This feature was mapped but not enumerated in the Valley Engineering (1980) report. It consists of an irrigation ditch that conveys water from north to south along the west side of the road described in Feature 97, and then along the northwest edge of an irrigated field adjacent to the road. The ditch is approximately six inches deep and is in fair to good condition. Survey coordinates associated with this ditch are provided in Table 1.

Feature 123. Remnant Irrigation Ditch Segment. This feature was mapped but not enumerated in the Valley Engineering (1980) report. It consists of a segment of an irrigation ditch that has been allowed to fall into disrepair. The ditch contains a section of irrigation piping, and both the ditch and the piping have mostly filled in with sediment. Both the inflow and outflow to and from this ditch segment are completely filled in. Survey coordinates associated with this ditch are provided in Table 1.

SECTION 3
CONCLUSIONS

This report summarizes pre-subsidence surface conditions for the Zero North, 4th East Mains, and 6th West Panel at the Consolidation Coal Emery Mine, Emery County, Utah. Surface features were inspected and surveyed in October 2007 prior to full extraction. Although the damage due to subsidence is generally expected to be limited, the greatest potential for adverse effects would likely be disturbances to surface drainages, roads, and utilities. By detailing pre-subsidence conditions in this report, it will be easier to both identify and mitigate negative impacts caused by future subsidence.

SECTION 4

REFERENCES

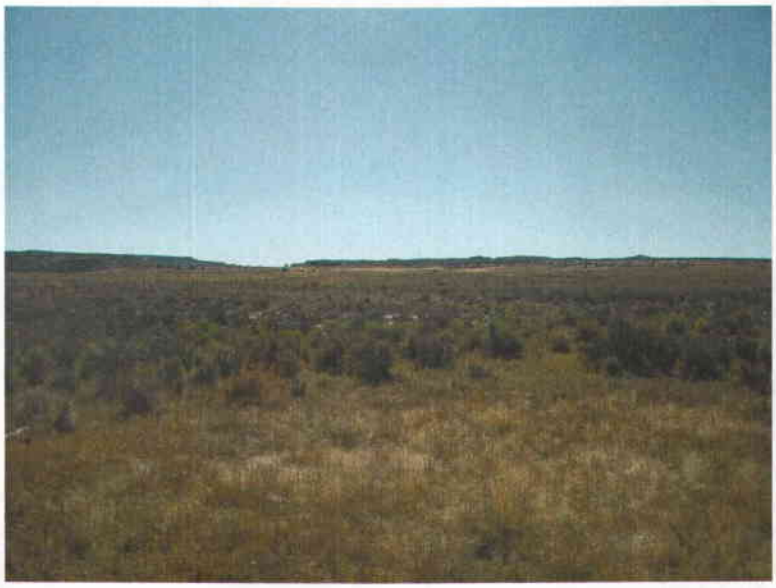
Consolidation Coal Company, 1990. Emery Mine Permit Act 015/015 Renewal. Chapter VI Volume 1 Section VI.A.3. Submitted to Division of Oil, Gas, and Mining September 9, 1990.

Valley Engineering, Inc., 1980. Consolidation Coal Company, Emery Mine, Presubsidence Survey, Structure and Renewable Resources Descriptions. Division of Oil, Gas, and Mining, Emery Permit 015/015. Chapter V, Vol. 2 of 3.

FIGURE 1

SITE PHOTOGRAPHS

Corners of Sections 22, 23, 26, and 27. Looking west at the ground surface above the Zero North Panel. USGS bench marker is visible where fences intersect. Note that the fence is constructed of unfinished timbers and is in fair condition.



View looking south near the center of the Zero North Panel. The ground surface is relatively flat, and is not currently used for crop production.

Feature 85. Dirt Road and Fences. Looking east. Fence is constructed from rough cut timbers and is in good condition. The road is an unsurfaced two track road and is in good condition.

Feature 86. Barbed Wire Fence. Looking west at the fence that extends to the north from the point labeled Feature 86 on Appendix V-5 Figure 1. The fence is missing several of its rough cut timber posts, and is in poor condition.

Feature 86. Barbed Wire Fence. Looking south along the fence that extends to the north from the point labeled Feature 86 on Appendix V-5 Figure 1.

Features 86, 87. Barbed Wire Fence, Small Creek and Fence. Looking southwest. Fence is constructed from rough cut timbers and is in good condition. The small creek identified in the 1980 survey was not present in 2007.

Paved Access Road to 4th East Portal. Looking southeast along road. The 4th East Portal is visible in the distance.

4th East Mains South of Paved Access Road. Looking South. Note Christiansen Wash on far right of photo. The land surface is undeveloped.

Feature 88. Small Fenced Area. Looking east.

Feature 89. Quarter Section Corner Marker.

Feature 90. Ponds. Looking southeast at southern pond.

Feature 90. Ponds. Looking southeast at central pond.

Feature 90. Ponds. Looking southeast at northern pond.

Feature 90. Ponds. Looking southeast at northeastern pond.

Feature 90. Ponds. Looking north at a nearby dilapidated corral and small Shed.

Feature 90. Ponds. Looking west at a nearby small Shed.

Feature 92. Fence and Dirt Road. Looking east. Note that road and fence are overgrown and in fair to poor condition.

Feature 93. Irrigation Ditches and Farmland. Looking south at the northern field.

Feature 93. Irrigation Ditches and Farmland. Looking south at the southern field.

Feature 97. Dirt Road, Utility Power Line, and Fence. Looking north from a point just north of where the dirt road crosses Christiansen Wash.

Feature 97. Dirt Road, Utility Power Line, and Fence. Looking north. Note that Feature 103 is visible in the distance.

Feature 97. Dirt Road, Utility Power Line, and Fence. Looking west at fence and power line.

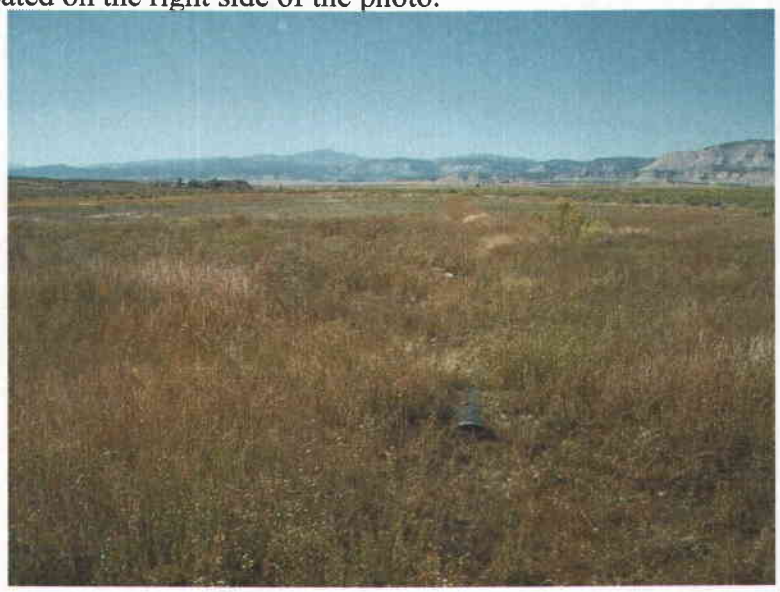
Feature 97. Dirt Road, Utility Power Line, and Fence. Looking south from road junction in Panel 6W. The 4th East Portal is visible in the distance.

Feature 98. Small Creek. Looking south from where the creek intersects the graded gravel road. Note the embankment for the paved access road for the 4th East Portal along the horizon. This small creek is called Christiansen Wash. During the October 2007 survey, the stream was flowing about 3 feet across.

Feature 98. Small Creek. Looking south at the 60-inch diameter coated corrugated metal pipe that conveys Christiansen Wash under the paved access road for the 4th East Portal.

Feature 103. Farm Land, Corrals, Ponds, and Fences. Looking west at a hay storage area.

Feature 122. Irrigation Ditch. Looking southwest where the ditch curves from running along the gravel road toward the irrigated field located west of the road. Vegetation is growing in the ditch, which is located on the right side of the photo.



Feature 123. Remnant Irrigation Ditch Segment. Looking southwest from the northeast portion of Zero North Panel. Note the partially buried piping in the foreground. It is in dilapidated condition.

V.B SUBSIDENCE

This part of Chapter V covers all of the issues associated with subsidence. Other chapters refer to this part when information concerning subsidence is required.

A comprehensive presubsidence survey of the permit area was done by Valley Engineering, Inc. and is appended to this part. Subsequent updated pre-subsidence surveys will be completed for all future panels where full extraction (planned subsidence) is contemplated. The reports will be submitted to DOGM six months prior to initiating full extraction.

V.B.1 Subsidence Control, Monitoring and Mitigation

UMC 783.24 (d), (e). (h)

Plates V-1, V-2, and V-3, of Appendix V-3 (Presubsidence Survey) show the manmade features within and adjacent to the permit area, which are not associated with the mining operation. Each feature or structure is coded on the maps and described in the narrative. Plates II-I, II-2, IV-3, and IV-18, show the manmade structures associated with the mining operation. Each structure is coded on the maps and described in the narrative of Chapter II. The designs for the various structures are detailed in Chapters IV and VI.

UMC 784.16 (a)(I)(iv)

Past underground mining has taken place beneath three structures in this category. They are Pond #I (mine discharge sedimentation pond), Pond #4 (reverse osmosis discharge collection pond), and Pond #5 (preparation plant area sedimentation pond). A small amount of subsidence would not have a significant effect on these ponds.

Pond #1, the largest, is an incised structure with heavily rip-rapped berms and concrete inlet/outlet structures*

Pond #I is the only impoundment containing an appreciable amount of water and it is a large distance from any public or private structure. Any discharge would be to an unnamed tributary of Quitchupah Creek. All three impoundments overlie mains and submains entries with relatively shallow overburden depths (less than 200 ft) and thus subsidence is not likely. The potential for downstream material damage due to subsidence is very low.

UMC 784.20

Appendix V-3 contains a presubsidence survey, performed by Valley Engineering, Inc. in 1980. Since that time, no structures have been added or removed. This document is therefore still used as baseline information.

Since the presubsidence survey shows that subsidence could cause material damage to structures and renewable resource lands, the following information is included for Parts (a),(b),(c), and (d) of this regulation.

UMC 817.121

The room and pillar mining method used at Emery is a commonly used practice in the mining industry. While unplanned subsidence is possible and has occurred in the past, the subsidence control plan is being and will be followed as prepared pursuant to UMC 784.20.

UMC 817.122

Consol shall submit written notice to surface property owners at least six months prior to mining under or adjacent to their property. Such notice shall include:

1. Identification of the specific areas in which mining will occur with the estimated dates of underground operations.

2. Measures to prevent, minimize or control subsidence.

The following property owners shall be notified by certified mail six months prior to mining under or adjacent to their property:

Please refer to Chapter I, Appendix 1-2 for a complete list of surface owners that will be notified.

Consol sent re-notification letters to landowners on 2/16/07. This was done due to the change in surface control in several areas. Refer to DOGM inspection #1443, dated 10/23/07 for inspector verification of the letters. Copies of the notifications were forwarded to the Division.

Revised 8-31-95
Revised 8/05
Revised 3/08

3. The effects of mitigation work on non-renewable resources -The best example of this situation is the case where it is necessary to regrade an area to mitigate the effects of subsidence. If it is necessary to remove the topsoil prior to regrading, it would be better to walt until all probable subsidence had occurred than to risk topsoil contamination through repeated removal and respreading of the topsoil should subsidence continue for several years. However in this case, it may be necessary to perform lesser or temporary mitigative work to minimize the effects of pending water on the soil resources or hazardous conditions for people, wildlife or livestock.

   As discussed above, we do not believe it is possible to commit to a specific timetable for performing subsidence mitigation. However, when subsidence mitigation is required by applicable laws and regulations, mitigation will be performed as soon as practical taking into consideration the above items.

UMC 817.126

As described in the subsidence control plan, under UMC 784.20, the two (2) perennial streams in the permit area will be protected by buffer zones (Refer to Plate V-5). There are no impoundments of 20 acre-feet or more in the permit area.

Underground water rights described in Chapter VI, under UMC 784.14, show that the Town of Emery maintains two (2) wells developed in different aquifers within the Ferron Sandstone formation. These wells are used as a backup water source to the town's present water supply system which relies on surface water from Muddy Creek. Emery Town Well No. 1 is developed in the Lower Ferron aquifer, which lies well below current mining activities. Well No. 2 is developed in the Middle and Upper Ferron aquifers which are directly below and above the seam being mined. No adverse impacts to either well are anticipated since the wells are located about 3 to 4 miles from the mine and are up gradient within the regional ground water flow pattern. If it is proven that mining activities adversely impact the Emery Town Wells and the towns surface water system becomes inoperable, Consol commits to providing an alternative source of water, per R645-301-731-530. If the town of Emery surface water system becomes inoperable and the backup wells are needed, Consol will replace the water that was adversely impacted by mining. Consol will commit to hauling water to the Emery treatment facility until the towns surface system becomes operable, an alternative source is secured, or the aquifer recharges as outlined in the hydrologic model. Static water level readings taken from wells maintained as part of the mine's ground water monitoring program also indicate that no disruption of the aquifers in the vicinity of the town's wells has occurred.

Underground operations at the Emery Mine are not conducted beneath or in close proximity to any public buildings, including churches, schools, hospitals, court houses, and government offices.

APPENDIX V-6

SUBSIDENCE MITIGATION AGREEMENTS

COUNTY ROAD REPAIR AGREEMENT

THIS COUNTY ROAD REPAIR AGREEMENT ("**Agreement**") is entered into this 3rd day of ~~June~~ July, 2007, by and between EMERY COUNTY, a political subdivision of the State of Utah, whose address is P.O. Box 629, Castle Dale, Utah 84513 (the "**County**"); and CONSOLIDATION COAL COMPANY, a Delaware corporation, whose mailing address is 1800 Washington Road, Pittsburgh, PA 15241 ("**Consol**")(collectively the "**Parties**").

RECITALS

WHEREAS, a section of Emery County roads 906, 909, 910, 915 and 916 (collectively the "**Roads**"), traverse a portion of Sections 20, 21, 22, 27, 28 and 29, Township 22 South, Range 6 East, SLB&M (the "**Premises**") and are designated as public county roads;

WHEREAS, Consol is the owner of record or lessee of the mineral estate underlying the Premises and owns or controls coal leases, the surface estate and/or the mineral estate in the lands in the vicinity of the Premises and is presently conducting coal mining operations on a portion of those lands;

WHEREAS, Consol will be conducting full extraction mining of the coal within the Premises and below the Roads, which mining operations may result in ground surface subsidence (hereinafter "**Subsidence Events**") and possible damage to the Roads; and

WHEREAS, Consol and the County have reached an agreement regarding notice to the County of the commencement of full extraction mining operations beneath the Roads, repair of the Roads following initial Subsidence Events, final restoration of the Roads to a condition functionally equivalent to the condition of the Roads prior to the Subsidence Events, and reimbursement for repair to the Roads.

AGREEMENT

NOW THEREFORE, in consideration of the above and the mutual covenants, terms, conditions, and restrictions contained herein, and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties hereby agree as follows:

1. Term. The term of this Agreement shall be for a period of Ten (10) years following the effective date ("**Term**").

2. Consideration. Upon execution of this Agreement, Consol shall pay a one-time lump sum payment of Five Hundred and 00/100 Dollars ($500.00) to the County as further consideration for this Agreement.

3. Notice of Mining Operations. Consol shall notify the County at least thirty (30) days prior to the commencement of full extraction mining beneath the Roads, and provide additional notifications as warranted throughout the mining process.

4. Notice of Subsidence. Prior to commencing full extraction mining beneath the Roads, Consol shall provide the County with a schedule outlining the anticipated timing (based on Consol's best estimate) of the Subsidence Events (the "**Subsidence Period**") so as to allow the County to post the Roads with reduced speed limits or detours, or take any further actions deemed appropriate or necessary by the County to maintain public safety.

5. Road Inspection. During the Subsidence Period, Consol will conduct daily inspections to identify material damage to the Roads resulting from Subsidence Events, and immediately notify the County of any material damage that would threaten public safety.

6. Interim Repairs. If the Roads remain open for public traffic after the occurrence of the initial Subsidence Events and during the Subsidence Period, the County will perform interim repairs as deemed necessary to maintain the Roads in a safe and operational condition.

7. Final Repairs. After the Subsidence Events have ceased (as determined by the Parties) and it is mutually agreed by the Parties that the completion of final repairs are appropriate, the County shall provide Consol with a plan outlining the necessary repairs to restore the Roads to a condition functionally comparable to the pre-subsidence condition (including surface treatment), and an estimate of the cost of restoration. Consol shall have the option to allow the County to complete the final repairs to the Roads, or to contract the work to a qualified third party, which party would perform the work in a manner consistent with applicable County regulations and design specifications, and subject to County review and approval.

8. Reimbursement. Consol shall reimburse the County for all costs and expenses incurred by the County in repairing damage to the Roads resulting from Subsidence Events. County labor shall be reimbursed by Consol at a rate of Twenty-eight Dollars and Sixty-eight cents ($28.68) per hour. Equipment use shall be reimbursed in accordance with Schedule "A" attached herewith.

9. Indemnity. Consol will defend, indemnify and hold harmless the County against all claims or demands, of any kind or nature, against the County as a result of any accident, death and/or injury directly resulting from damage to the Roads from Subsidence Events.

10. Assignment. Consol may assign or transfer this Agreement, and all related rights and obligations, to another individual or entity, so long as said individual or entity agrees to perform all obligations under this Agreement.

11. Recording. The Parties agree to execute a Memorandum of this Agreement in a form substantially similar to that attached as Exhibit A, for recording in the county containing the Premises. This Agreement will not be placed of record. Upon the expiration or termination of this Agreement, Consol agrees to execute a release of this Agreement for recording, in a form reasonably acceptable to the County.

12. General Provisions.

a. Successors and Assigns. The terms of this Agreement shall be binding upon and benefit the Parties, and their respective successors and assigns.

b. Notices. All communications, consents, and other notices provided for in this Agreement shall be in writing and shall be effective on the date hand delivered, sent by facsimile, or mailed by registered or certified mail, return receipt requested, postage prepaid, and addressed as follows:

(a) If to the County, to:

Emery County Commission
P.O. Box 629
Castle Dale, UT 84513

or to such other address as the County may designate to Consol, in writing.

(b) If to Consol, to:

Consolidation Coal Company
Attn: Rod Ford – Land Dept.
1800 Washington Road
Pittsburgh, PA 15241-1405

or to such other address as Consol may designate to the County, in writing.

c. Entire Agreement. This Agreement contains the entire agreement between the Parties, and may be modified only in writing signed by the Parties or their respective successors or assigns. The express covenants and provisions in this Agreement constitute the sole obligations of the Parties, and no other or further covenants or obligations shall be implied, either in fact or in law.

d. Costs. Except as otherwise provided in this Agreement, the Parties each shall pay their own costs and expenses incurred in preparation and performance under this Agreement.

e. Authority and Title. Each party represents to the other party that such party has the right, legal capacity, power and authority to enter into and to perform its obligations under this Agreement.

f. Interpretation. The laws of the State of Utah shall govern this Agreement.

g. Counterparts. This Agreement may be signed simultaneously by facsimile or other form of electronic transmission, and in one or more counterparts, each of which shall be accepted as an original and all of which shall be one and the same agreement.

h. Costs and Attorney's Fees. In the event of any action or proceeding brought by any party against any other party under this Agreement, the prevailing party shall be entitled to recover the reasonable attorneys' fees, and any costs incurred, including experts' fees and costs of appeal, if any.

i. No Waiver. Acceptance by either party of any performance less than required shall not be deemed to be a waiver of the rights of such party to enforce all of the terms and conditions of this Agreement.

j. Severability. If any portion of this Agreement is held invalid or unenforceable the balance shall continue in full force and effect.

IN WITNESS WHEREOF, the Parties, intending to be legally bound, have signed this Agreement as of the effective date.

EMERY COUNTY:

By: Drew Sitterud

Its: Chairman

CONSOLIDATION COAL COMPANY:

By: ROBERT P. KING

Its: VICE PRESIDENT

POWERLINE REPAIR AGREEMENT

THIS POWERLINE REPAIR AGREEMENT ("**Agreement**") is entered into this 23rd day of August, 2007, by and between PACIFICORP, an Oregon corporation doing business as Rocky Mountain Power, whose mailing address is 201 South Main, Suite 2300, Salt Lake City, UT 84111 ("**RMP**"); and CONSOLIDATION COAL COMPANY, a Delaware corporation, whose mailing address is 1800 Washington Road, Pittsburgh, PA 15241 ("**Consol**")(collectively the "**Parties**").

RECITALS

WHEREAS, a section of RMP's 12470 kV powerline (the "**Powerline**") running from Emery Town, UT to Interstate 70 Fremont Junction, UT traverses Sections 20, 21, 22, 28 and 29, Township 22 South, Range 6 East, SLB&M (the "**Premises**").

WHEREAS, Consol is the owner of record or lessee of the coal estate underlying the Premises and owns or controls coal leases, the surface estate and/or the mineral estate in the lands in the vicinity of the Premises, and is presently conducting coal mining operations on a portion of those lands;

WHEREAS, Consol will be conducting full extraction mining of the coal within the Premises and below the Powerline, which mining operations may result in ground surface subsidence (hereinafter "**Subsidence Events**") and possible damage to the Powerline; and

WHEREAS, Consol and RMP have reached an agreement regarding notice to RMP of the commencement of full extraction mining operations beneath the Powerline, inspection of the Powerline, and reimbursement for repair of any damage to the Powerline resulting from the Subsidence Events to a condition functionally equivalent to the condition of the Powerline prior to the Subsidence Events.

AGREEMENT

NOW THEREFORE, in consideration of the above and the mutual covenants, terms, conditions, and restrictions contained herein, and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties hereby agree as follows:

1. Term. The term of this Agreement shall be for a period of Ten (10) years following the effective date ("**Term**").

2. Consideration. Upon execution of this Agreement, Consol shall pay a one-time lump sum payment of Five Hundred and 00/100 Dollars ($500.00) to RMP as further consideration for this Agreement.

3. Notice of Mining Operations. Consol shall notify RMP, in writing, at least thirty (30) days prior to the commencement of full extraction mining beneath the

Powerline, and provide additional notifications as warranted throughout the mining process.

4. Notice of Subsidence Period. Prior to commencing full extraction mining beneath the Powerline, Consol shall provide RMP, at least thirty (30) days prior to the commencement of full extraction mining, with a schedule outlining the anticipated timing (based on Consol's best estimate) of the Subsidence Events (the "**Subsidence Period**") so as to allow RMP to take any actions deemed appropriate or necessary to mitigate damage to the Powerline and protect public safety.

5. Pre-Subsidence Survey. Prior to commencing full extraction mining beneath the Powerline, Consol will conduct a pre-subsidence survey of the Premises to determine the pre-subsidence baseline. As part of this survey, Consol will survey the Powerline to determine its pre-subsidence condition. This survey will include, but not be limited to, a measurement of the vertical alignment of each Powerline pole within the Premises. Consol shall notify RMP, in writing, at least thirty (30) days prior to the beginning of the survey and RMP may, at its sole discretion, send an observer on all survey activities. At the conclusion of the survey, Consol shall provide a copy of all baseline survey information for the Powerline to RMP.

6. Powerline Inspection. During the Subsidence Period, Consol will conduct daily inspections of the Powerline to identify material damage to the Powerline resulting from Subsidence Events and immediately notify RMP of any material damage that may impair operation of the Powerline or threaten public safety.

7. Interim Repairs. If the Powerline remains in operation after the occurrence of the initial Subsidence Events and during the Subsidence Period, RMP will perform interim repairs as deemed necessary to maintain the Powerline in a safe and operational condition.

8. Final Repairs. After the Subsidence Events have ceased (as determined by the Parties) and it is mutually agreed by the Parties that completion of final Powerline repairs are appropriate, RMP shall complete the final repairs to restore the Powerline to the latest RMP construction standards, or contract the work to a qualified third party, which party would perform the work in a manner consistent with applicable regulations and design specifications.

9. Reimbursement. Consol shall reimburse RMP for all costs and expenses incurred by RMP in repairing damage to the Powerline resulting from Subsidence Events. RMP labor and materials shall be reimbursed by Consol based on the actual costs incurred.

10. Assignment. Consol may assign or transfer this Agreement, and all related rights and obligations, to another individual or entity, so long as said individual or entity agrees to perform all obligations under this Agreement; provided, however, that prior to any such transfer or assignment, Consol shall first obtain RMP's written consent

of such transfer or assignment, which consent shall not be unreasonably conditioned or withheld.

11. Recording. The Parties agree to execute a Memorandum of this Agreement in a form substantially similar to that attached as Exhibit A, for recording in the county containing the Premises. This Agreement will not be placed of record. Upon the expiration or termination of this Agreement, Consol agrees to execute a release of this Agreement for recording, in a form reasonably acceptable to RMP.

12. General Provisions.

a. Successors and Assigns. The terms of this Agreement shall be binding upon and benefit the Parties, and their respective successors and assigns.

b. Notices. All communications, consents, and other notices provided for in this Agreement shall be in writing and shall be effective on the date hand delivered, sent by facsimile, or mailed by registered or certified mail, return receipt requested, postage prepaid, and addressed as follows:

(a) If to RMP, to:

Rocky Mountain Power
Attn: Contract Administrator
Customer and Regulatory Liaison
825 NE Multnomah, Suite 800
Portland, OR 97232

with a copy to:

Rocky Mountain Power
General Council
201 South Main Street, Suite 2300
Salt Lake City, UT 84111

or to such other address as RMP may designate to the Consol, in writing.

(b) If to Consol, to:

Consolidation Coal Company
Attn: Rod Ford – Land Dept.
1800 Washington Road
Pittsburgh, PA 15241-1405

or to such other address as the Consol may designate to RMP, in writing.

c. Entire Agreement. This Agreement contains the entire agreement between the Parties with respect to any repair of the Powerline resulting from Subsidence Events, and may be modified only in writing signed by the Parties or their respective successors or assigns. The express covenants and provisions in this Agreement constitute the sole obligations of the Parties, and no other or further covenants or obligations shall

be implied, either in fact or in law.

d. Costs. Except as otherwise provided in this Agreement, the Parties each shall pay their own costs and expenses incurred in preparation and performance under this Agreement.

e. Authority and Title. Each party represents to the other party that such party has the right, legal capacity, power and authority to enter into and to perform its obligations under this Agreement.

f. Interpretation. The laws of the State of Utah shall govern this Agreement.

g. Counterparts. This Agreement may be signed simultaneously by facsimile or other form of electronic transmission, and in one or more counterparts, each of which shall be accepted as an original and all of which shall be one and the same agreement.

h. Costs and Attorney's Fees. In the event of any action or proceeding brought by any party against any other party under this Agreement, the prevailing party shall be entitled to recover the reasonable attorneys' fees, and any costs incurred, including experts' fees and costs of appeal, if any.

i. No Waiver. Acceptance by either party of any performance less than required shall not be deemed to be a waiver of the rights of such party to enforce all of the terms and conditions of this Agreement.

j. Severability. If any portion of this Agreement is held invalid or unenforceable the balance shall continue in full force and effect.

[Signatures on Following Page]

IN WITNESS WHEREOF, the Parties, intending to be legally bound, have signed this Agreement as of the effective date.

PACIFICORP,
d/b/a, ROCKY MOUNTAIN POWER:

By: Jody Berger

Its: So. Utah Field Operations Director

CONSOLIDATION COAL COMPANY:

By: ROBERT P. KING

Its: VICE PRESIDENT

Exhibit A

Memorandum of Powerline Repair Agreement

Date: 24-SEP-2007 11:19AM
Fee: $19.00 Check
Filed By: DKS
DIXIE SWASEY, Recorder
EMERY COUNTY CORPORATION
For: CNX LAND RESOURCES INC

WHEN RECORDED: MAIL TO:

Richard R. Hall, Esq.
Stoel Rives LLP
201 S. Main St., Suite 1100
Salt Lake City, UT 84111

MEMORANDUM OF POWERLINE REPAIR AGREEMENT

THIS MEMORANDUM OF POWERLINE REPAIR AGREEMENT is entered into this 23rd day of August, 2007, by and between PACIFICORP, an Oregon corporation doing business as Rocky Mountain Power, whose mailing address is 201 South Main, Suite 2300, Salt Lake City, Utah 84111 ("**RMP**"); and CONSOLIDATION COAL COMPANY, a Delaware corporation, whose mailing address is 1800 Washington Road, Pittsburgh, PA 15241 ("**Consol**")(collectively the "**Parties**"). Capitalized terms used herein without definition shall have the respective meanings given to them in the Agreement.

W I T N E S S E T H:

The Parties hereto agree:

1. Upon the terms and conditions set forth in that certain Powerline Repair Agreement (the "**Agreement**"), effective of even date herewith, all of which are hereby incorporated herein as if set forth in full, the Parties agree to comply with those duties and obligations as set forth in the Agreement and relating to those certain lands situated in Emery County, State of Utah, more particularly described as follows:

Township 22 South, Range 6 East, SLB&M

Sections 20, 21, 22, 28 and 29

(referred to herein as the "**Premises**")

2. The term of this Agreement shall be for a period of ten (10) years following the effective date.

[Signatures on Following Page]

IN WITNESS WHEREOF, the Parties hereto have caused this Memorandum of Powerline Repair Agreement to be signed effective as of the day and year first above written.

PACIFICORP,
d/b/a, ROCKY MOUNTAIN POWER:

By: Jody Berger

Its: So. Utah Field Operations Director

CONSOLIDATION COAL COMPANY:

By: ROBERT P. KING

Its: VICE PRESIDENT

STATE OF Utah)
: ss.
COUNTY OF Utah)

On the 23rd day of August, 2007, personally appeared before me Jody Berger, personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Sr. Utah Field operations Director of PACIFICORP doing business as Rocky Mountain Power, and that said document is signed by him/her on behalf of said company by authority of its bylaws, and said Jody Berger acknowledged to me that said corporation executed the same.

DILLON FOOTE
Notary Public
State of Utah
My Commission Expires May 10, 2010
207 E Main Street, American Fork, UT 84003

Notary Public
Residing at: 207 E Main St. American Fork, UT

My commission expires:

05/2010

COMMONWEALTH OF PENNSYLVANIA)
)ss.
COUNTY OF ALLEGHENY)

On the 5 day of SEPTEMBER, 2007, personally appeared before me ROBERT P. KING, personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the VICE PRESIDENT of CONSOLIDATION COAL COMPANY, a Delaware corporation, and that said document is signed by him/her on behalf of said corporation by authority of its bylaws, and said VICE PRESIDENT acknowledged to me that said corporation executed the same.

Notary Public
Residing at: 375 FIFTH AVE
PITTSBURGH, PA 15106

My commission expires:

06-20-2009

COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Jane M. Young, Notary Public
Upper St. Clair Twp., Allegheny County
My Commission Expires June 20, 2009
Member, Pennsylvania Association of Notaries

CHAPTER VI

HYDROLOGY

Consolidation Coal Company
Emery Mine
Emery, Utah

Utah Permit Number ACT015/015

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CHAPTER VI
HYDROLOGY

VI.1 INTRODUCTION

VI.1.1 General Requirements

This chapter presents a description of:

- Existing hydrologic resources within the permit and adjacent areas;
- Mine operations and the potential impacts of these operations to the hydrologic balance;
- Methods of complying with design criteria;
- Applicable hydrologic performance standards; and
- Hydrologic reclamation plans for the Emery Mine.

VI.1.2 Certification

All maps, plans, and cross sections presented in this chapter have been certified by a qualified, registered professional engineer.

VI.1.3 Inspection

Impoundments associated with the mining and reclamation operations will be inspected as described in Section 5.1.4.3 of this MRP.

VI.2 ENVIRONMENTAL DESCRIPTION

VI.2.1 General Requirements

This section presents a description of hydrologic resources within the permit and adjacent areas that may be affected or impacted by the coal mining and reclamation operations at the Emery Mine.

VI.2.2 Cross Sections and Maps

VI.2.2.1 Location and Extent of Subsurface Water

A generalized hydrostratigraphic cross section of the permit and adjacent areas is presented in Figure VI-1. Thin deposits of Quaternary alluvium overlie some of the areas but are not shown on Figure VI-1 due to the scale. Estimates of recharge and discharge noted on this figure are from Lines and Morrissey (1983) based on data collected and groundwater modeling conducted in the late 1970s and early 1980s. Actual rates are probably different now than when those earlier estimates were developed.

The Ferron Sandstone Member of the Mancos Shale (in which the coal occurs that is extracted from the Emery Mine) is overlain by the Blue Gate and underlain by the Tununk Members of the Mancos Shale. Both the Blue Gate and the Tununk are relatively impermeable shales that bound the more permeable Ferron Sandstone. For the purpose of this MRP, the portion of the Ferron Sandstone including the "I" coal zone and above is called the upper Ferron Sandstone and is designated by the symbol Kmf(u). The portion laying stratigraphically between the base of the "I" zone and the base of the "A" coal zone is referred to herein as the

middle Ferron Sandstone and designated by the symbol Kmf(m). The remaining portion of the Ferron Sandstone lying below the base of the "A" zone is called the lower Ferron Sandstone and designated by the symbol Kmf(l). This partitioning of the Ferron Sandstone is consistent with that of Lines and Morrissey (1983).

The uppermost continuous aquifer beneath the permit and adjacent areas occurs within the Ferron Sandstone. Potentiometric surface maps of this aquifer are presented in Plates VI-1 and VI-2 for the upper and lower Ferron Sandstone, respectively. Plate VI-1 presents data for 1979 while Plate VI-2 portrays conditions in 1985 (the earliest periods of relatively complete data in each zone).

Water rights associated with groundwater within 1 mile of the permit boundary are shown on Plate VI-3. Information concerning these water rights is contained in Appendix VI-4 and summarized in Table VI-1. Seasonal variations in water levels are discussed in Section VI.2.4.1. These fluctuations are not sufficient to result in substantial changes to the potentiometric surface maps (Plates VI-1 and VI-2) or the hydrostratigraphic cross section (Figure VI-1).

VI.2.2.2 Location of Surface Water Bodies

The location of surface water bodies for which water rights have been obtained within the permit and adjacent areas is provided on Plate VI-3. Information concerning these rights is provided in Appendix VI-4 and summarized in Table VI-1. Other water bodies in the area are noted on the base map that comprises Plate VI-3.

VI.2.2.3 Locations of Monitoring Stations

Surface water and groundwater monitoring stations associated with the Emery Mine are shown on Plate VI-4. Approximate surface elevations of the monitoring stations are indicated by the topographic lines on Plate VI-4.

VI.2.2.4 Location and Depth of Water Wells

Water-supply wells and groundwater monitoring wells in the permit and adjacent areas are shown on Plate VI-4. Depths of these wells and other completion details are summarized in Table VI-2.

VI.2.2.5 Surface Topography

Surface topographic features in the permit and adjacent areas are shown on the base maps used for many of the plates in this submittal.

VI.2.3 Sampling and Analysis

All water samples collected under this MRP have been analyzed according to methods in either the "Standard Methods for the Examination of Water and Wastewater" or 40 CFR parts 136 and 434. Where feasible, these same references have been used as the basis for sample collection.

VI.2.4 Baseline Information

Surface and groundwater resource information is presented in this section to assist in understanding hydrologic conditions in the mine area. This information provides a basis for determining if mining operations have had, or can be expected to have, a significant impact on the hydrologic balance of the area.

VI.2.4.1 Groundwater Information

This section presents a discussion of baseline groundwater conditions in the permit and adjacent areas. The locations of wells and springs in the area are presented on Plates VI-3 and VI-4. Lithologic and completion logs for monitoring wells in the permit and adjacent areas are provided in Appendix VI-2.

Geologic conditions in the permit and adjacent areas are described in Volume V of this MRP. Groundwater in the permit and adjacent areas occurs predominantly in the Ferron Sandstone. However, perched aquifers of limited areal extent are present in overlying materials. Hydrogeologic conditions within the permit and adjacent areas are summarized below.

Quaternary Deposits (Qal)

Discontinuous, shallow perched zones are contained within Quaternary alluvial, mud and slope wash, and pediment deposits scattered throughout the Emery area (see Plate VI-5). These Quaternary deposits are generally less than 50 feet thick, with boundaries defined by the contact with the underlying Blue Gate Member of the Mancos Shale.

Recharge to Quaternary *alluvial deposits* in the area occurs primarily by streamflow seepage along adjacent water courses. During the spring and summer months, much of this water consists of irrigation return flow. Groundwater discharges from these Quaternary alluvial deposits primarily via evapotranspiration and horizontal, subsurface outflow to topographically lower areas. Given the relatively impermeable nature of the underlying Blue Gate Member, it is assumed that only minor quantities of alluvial groundwater discharge to the adjacent bedrock.

Most recharge to the Quaternary *mud and slope wash and pediment deposits* occurs via seepage of irrigation water applied to adjacent land. This water, which in the Emery area is diverted predominantly from Muddy Creek, is either evapotranspired or moves horizontally through these deposits and then discharges to the surface at the underlying contact with the relatively impervious Blue Gate Member. Several seepage points representing irrigation return flow from this subsurface mud and slope wash/pediment water are noted on Plate VI-5 (specifically SP-1 through SP-14). Water flowing from some of these seeps becomes trapped in swales which, coupled with the high salinity of the Blue Gate, creates areas of salt accumulation.

Consol conducted an inventory of seepage points within one mile of the permit area on October 24, 1979, and again on June 11, 1980. Each point was evaluated in the field for its geologic setting, and field data were collected to define the temperature, pH, specific conductance, dissolved oxygen, and discharge (where possible) of the seepage.

Within the study area, 16 seepage points were identified in 1979-1980. Locations and field measurements for each of the points are exhibited on Plate VI-5 and Table VI-3, respectively. All but two of the seepage points were observed to be issuing from pediment

gravels overlying the Bluegate Shale. This seepage originates from infiltrating irrigation water used for farming south of Emery on the weathered pediment gravels. The remaining two springs (SP-15 and SP-16, located east of the permit area) issue from the Ferron Sandstone and are discussed in a subsequent section of this document.

The specific conductance of the seepage water ranged from 658 to 2015 and averaged 1155 umhos/cm at 25°C. The pH ranged from 6.3 to 8.3 with an average of 7.6. Although discharge at most of the seepage sites could not be measured because of the diffuse nature of the discharge and/or vegetative overgrowth, flows were typically less than 10 gpm. The dissolved oxygen of the seepage water is more indicative of a near-surface source and is much higher than would be expected for a natural groundwater source. This observation, coupled with the fact that all seepage appeared to be issuing from the pediment gravels adjacent to irrigated fields, indicates that none of these seepage points would likely exist if not for the adjacent irrigation (i.e., all are considered to have an anthropomorphic source).

Ten monitoring wells were completed in Quaternary deposits in 1982. Wells RDA 1 through 6 were drilled in the Quitchupah Creek drainage and wells SM1-1 through 4 were drilled in the Christiansen Wash drainage. Water-level measurements collected from these wells are summarized in Figure VI-2 and presented in their entirety in Appendix VI-10. No consistent seasonal or long-term variations in water levels are evident in the alluvial monitoring wells. Given the relatively thin nature of the Quaternary deposits in the area, differences in water-level elevations between wells are primarily a function of the ground elevation at the well locations.

A summary of water quality data collected from the Quaternary monitoring wells, together with a limited number of samples from springs, is provided in Table VI-4, with individual sample results presented in Appendix VI-1. The pH of this water tends to be moderately alkaline, averaging 7.3 to 7.7 (field and laboratory measurements, respectively). Total dissolved solids ("TDS") concentrations averaged about 16,600 mg/l and varied by approximately two orders of magnitude (from 940 to nearly 93,000 mg/l) during the period of record (1982 through the present).

TDS concentrations in Quaternary deposits tend to be highest at monitoring wells RDA-5, RDA-6, SM1-1, and SM1-3, being approximately an order of magnitude higher at these wells than the other "RDA" and "SM1" wells. Figure VI-3 indicates that no consistent trends in TDS concentrations are apparent between these high-TDS wells. These trends can also not be correlated with nearby mining activities. Trends at the "RDA" wells (generally decreasing at RDA-5 and generally increasing at RDA-6) suggest wide variations over relatively short distances, especially considering the lower TDS concentrations in the other nearby "RDA" wells. The cause of these variations is uncertain. Wells SM1-1 and SM1-3 are completed in areas where subsurface irrigation seepage accumulates, concentrating salts from the overlying soil and the underlying Blue Gate Member, suggesting a source for the elevated TDS concentrations relative to the other "SM1" wells. However, it is uncertain why TDS concentrations show no consistent trend between wells SM1-1 and SM1-3.

Groundwater in Quaternary deposits is generally categorized as a sodium sulfate type. This characterization exhibits the influence of the underlying gypsiferous Blue Gate Member of the Mancos Shale. Dissolved iron and manganese concentrations in the Quaternary deposits have averaged approximately 3.6 and 0.9 mg/l, respectively, during the period of record.

Blue Gate Member of the Mancos Shale (Kmb)

In the vicinity of the Emery Mine, the Blue Gate consists of massive gray shales with minor intercalated, fine-grained sandstones and thin carbonaceous layers. Several monitoring wells, installed by Consol and the USGS, are completed totally or partially in this zone.

Water-level data collected from the Blue Gate monitoring wells are provided in Appendix VI-10 and summarized in Figure VI-4. No consistent seasonal variations in water levels occur in this unit. Long-term water-level declines are apparent in the Blue Gate at monitoring wells I, R2, and (to a lesser degree) AA. A comparison of Figure VI-4 with information presented on Plate VI-6 indicates that the timing of water-level declines at these wells is not related to mining in nearby areas. The fact that declines are not consistent over the entire area suggests that they are also not climate related. Thus, water-level declines at wells AA, I, and R2 are presumably the result of local changes in irrigation patterns.

Historically, water-quality data have been collected from only one monitoring well completed in the Blue Gate Member within the permit area (well T1-BG – see Table VI-5 and Appendix VI-1). These data indicate that groundwater in the Blue Gate Member has a near-neutral pH with a high salinity (TDS concentrations in the general range of 15,000 to 24,000 mg/L). Dissolved iron and manganese concentrations in the Blue Gate are typically less than 1 mg/l.

The predominant ions in groundwater within the Blue Gate Member are sodium and sulfate, which is indicative of the gypsiferous nature of the formation. The generally saline nature of the Blue Gate Member is also evident from alkali deposits that occur throughout the Emery area.

Ferron Sandstone Member of the Mancos Shale (Kmf)

Groundwater within the Emery Mine permit and adjacent areas occurs primarily in the Ferron Sandstone Member of the Mancos Shale, the unit that also contains the coal that is extracted from the Emery Mine. The Ferron Sandstone is bounded above by the Blue Gate Member and below by the Tununk Member of the Mancos Shale.

Aquifer Characteristics:

Aquifer pumping tests have been conducted in the Ferron Sandstone in the permit and adjacent areas by the U.S. Geological Survey (see Lines and Morrissey, 1983) and Consol (see Appendix VI-3). The results of these pumping tests are summarized in Table VI-6. As indicated, the average transmissivity of the Ferron Sandstone in the permit and adjacent areas is 230 ft^2/day, varying by more than two orders of magnitude from 5 to 800 ft^2/day. The limited amount of data summarized in Table VI-6 suggests that the transmissivity of the upper Ferron Sandstone is about one-tenth that of the lower Ferron Sandstone (averages of 60 ft^2/day vs. 540 ft^2/day, respectively). However, insufficient data exist to draw definitive conclusions from these numbers.

White et al. (2005) concluded, from calibration of a regional groundwater model, that the permeability of aquifers in the Colorado Plateau of Utah is about four orders of magnitude higher than that of aquicludes in the region. Assuming an approximate thickness of 400 feet for the entire Ferron Sandstone (based on a review of Plate V-20), the average hydraulic conductivity of the Ferron Sandstone as a whole in the Emery area would be approximately 0.5

ft/day (230 ft^2/daty divided by 400 ft). This would suggest that the hydraulic conductivity of the overlying Blue Gate and underlying Tununk Members in the area is about $5x10^{-5}$ ft/day, based on the calibration results of White et al. (2005).

Lines and Morrissey (1983) indicate that the transmissivity of the Ferron Sandstone generally increases to the northwest as the unit thickens. According to Table VI-6, the average storage coefficient of the Ferron Sandstone in the area is $1.3x10^{-3}$, varying by about one order of magnitude across the area.

Groundwater Recharge, Flow, and Fluctuations:

According to Lines and Morrissey (1983), recharge to groundwater in the Ferron Sandstone within the permit and adjacent areas occurs primarily along the Joe's Valley-Paradise fault zone, with this water originating as precipitation at higher-elevations along the Wasatch Plateau to the west. Lines and Morrissey (1983) estimated that recharge to the Ferron Sandstone aquifer is about 2.4 cfs along the Joe's Valley-Paradise fault zone east of the Emery Mine. Direct recharge from precipitation and from overlying and underlying formations is considered minimal, given the relatively impermeable nature of the Blue Gate and Tununk Members and the limited precipitation that falls on the valley floor (see Figure VI-1).

Potentiometric surface maps of the upper and lower Ferron Sandstone are provided in Plates VI-1 and VI-2 for 1979 and 1985, respectively (the earliest years with relatively complete data sets). A comparison of these maps with data provided by Doelling (2004) indicates that groundwater moves generally updip and in a southeast direction through the permit area. Throughout most of the region, groundwater in the Ferron Sandstone west of the mine has historically been under sufficient artesian pressure to flow at the ground surface.

Plates VI-7 and VI-8 present the potentiometric surface of the upper and lower Ferron Sandstone, respectively, in 2006. With coal being extracted from the upper Ferron Sandstone, Plate VI-7 shows the effects of discharging water that is encountered during mining operations. Mining has not affected the potentiometric surface of the lower Ferron Sandstone to the same degree as the upper Ferron Sandstone.

Figures VI-5 through VI-7 present hydrographs of water-level data collected from the upper, middle, and lower Ferron Sandstone, respectively. As indicated in Figure VI-5, several wells completed in the upper Ferron Sandstone have exhibited substantial water-level declines due to mining activities. For instance, the Bryant and Lewis wells experienced approximately 250 to 300 feet of drawdown beginning in the late 1970s/early 1980s. Water levels have remained relatively constant at these locations since that time. Although these wells are located a mile or more upgradient from areas where mining was occurring at the time, dewatering of the mine is the presumed cause of this drawdown. Consol has furnished and installed pumps and ancillary facilities at these private wells to augment water that formerly flowed at the surface.

Approximately 300 feet of drawdown occurred at well R2 in the upper Ferron Sandstone through the 1980s, after which the water level at this location has remained relatively constant. Similarly, well TP experienced approximately 300 feet of drawdown in the upper Ferron Sandstone during the 1980s and early 1990s, with relatively constant water levels since that time (see Figure VI-5). These declines all occurred presumably as a result of nearby mining activities. Water levels at well T2 declined by 200 to 300 feet in the upper Ferron Sandstone during the 1980s, with wide fluctuations of 100 to 200 feet (both positive and negative) at this

location since 2004. Although additional mining near this location may have caused some of these fluctuations, the relative stability of water levels at the adjacent well TP during this period of time imply that data collection errors may have been the source of some of the recent apparent fluctuations.

According to Figure VI-5, wells AA, Muddy #2, and USGS1-2 in the upper Ferron Sandstone experienced approximately 50 feet of drawdown in the late 1970s and early 1980s, presumably as a result of mining in nearby areas (see well locations on Plate VI-4). Water levels in these wells have remained relatively constant since then, even though (in the case of Muddy #2 and USGS1-2) additional mining occurred beneath these locations 10 to 20 years later.

Water levels in the upper Ferron Sandstone have remained relatively constant at wells H, I2, and Muddy #1 throughout the period of record (see Figure VI-5). These wells are located at similar or closer distances to mined areas than other wells where water-level declines have occurred. The reason for the lack of anticipated water-level response at these locations is unknown.

Selected wells completed in the middle Ferron Sandstone have also shown water level declines through the period of record (see Figure VI-6). Wells AA and I experienced about 80 to 100 feet of drawdown in the 1980s. Water levels in the middle Ferron Sandstone have remained relatively unchanged at well AA since that time, but declined an additional 150 feet at well I in the fourth quarter of 2005 after a several-year period of relative stability. Well AA is located near an area where mining occurred in the late 1970s and early 1980s, suggesting that this mining activity resulted in the drawdown noted in this well. Well I is located near an area where mining occurred in the early to mid 1980s, with additional mining occurring directly beneath this well in 2004 and 2005. The response of water levels in the middle Ferron Sandstone at well I is indicative of the two phases of mining in the area.

At well R2, the middle Ferron Sandstone experienced a decline of approximately 500 feet in the late 1980s (see Figure VI-6). This decline likely occurred from mining in the immediate area during that time frame (see Plate VI-6).

Water levels in well H monitoring the middle Ferron Sandstone dropped over 300 feet in the late 1980s. The reason for this response is unknown, since similar declines did not occur at well H in the upper Ferron Sandstone (compare Figures VI-5 and VI-6). Underground observations near the area of this well did not indicate any unusual water inflow into the mine nor do discharge records from the mine dewatering system substantiate any sustained increase in water volume entering the mine as would be expected to affect such a sharp decline in water levels. It is possible that the integrity of well H in the middle Ferron Sandstone has been compromised. Field investigations with a water level probe indicate that this well is at least partially blocked above its completion zones. Except at well H, responses of nested wells completed in the upper and middle Ferron Sandstone were essentially similar, suggesting a hydraulic connection between these two intervals.

Water level records of wells AA, I, WW1, and ZZ completed in the lower Ferron Sandstone show no apparent declines during the period of record. Each of these wells is located in the south or east (i.e., downgradient) portion of the permit area. These data suggest hydraulic separation of the upper/middle and lower Ferron Sandstone in the areas of these wells. However, water-level declines have occurred at the Kemmerer well and wells H and R1 completed in the lower Ferron Sandstone (all located in the north or west portion of the permit

and adjacent areas). A decline of about 170 feet occurred at well R1 in the late 1980s/early 1990s when mining was active immediately east of that location. Water levels since that time have been relatively stable at well R1. Declines at the Kemmerer well and well H have been more gradual, with a decrease in head of about 40 feet at the Kemmerer well throughout the period of record, and about 70 feet of decline at well H throughout the 1980s and 1990s. These latter two wells are more remote from mining activities than well R1. These data indicate that the potentiometric surface of the lower Ferron Sandstone in upgradient areas is more affected by mining activities than in downgradient areas.

Groundwater Discharge:

The USGS used a three-dimensional finite-difference computer model of the Ferron Sandstone to simulate groundwater flow in the vicinity of the Emery Mine (Lines and Morrissey, 1983). The model was calibrated in a steady-state simulation using water levels and discharges from the aquifer that were measured during 1979. Discharge estimates resulting from that calibration effort are noted on Figure VI-1. The precise recharge and discharge rates noted on Figure VI-1 have probably changed since the work of Lines and Morrissey (1983).

Based on estimates provided in Figure VI-1, the most significant discharges from the Ferron sandstone aquifer in the permit and adjacent areas have historically been leakage to the Blue Gate Member, discharge from the Emery Mine, leakage to streams, and extractions from wells. The largest man-made discharge from the Ferron Sandstone is discharge from the mine.

In a study of the Emery Mine area, Lines (1987) found that "prior to mining, the vertical component of flow was upward from the Ferron into the Blue Gate Member. As mining progressed, ground-water flow was directed toward the mine workings, and much of the aquifer and other rocks above the mined coal bed were dewatered. The steady-state pattern of [predominantly horizontal] flow . . . probably would not develop unless mining ceased and dewatering of the mine continued for several years." These conditions are depicted in Figure VI-8. With this in mind, the declines in water levels in the upper Ferron Sandstone suggest that upward leakage from the Ferron Sandstone to the Blue Gate Member is probably minimal over areas where mining has occurred.

Groundwater from the Ferron Sandstone flows into the mine and is discharged via pumps to holding ponds and thence to Quitchupah Creek. These discharges are regulated under permits issued by the Utah Division of Water Quality through the Utah Pollutant Elimination Discharge System ("UPDES"). The average discharge from the Emery Mine during the period of 1979 through 2005 is shown in Figure VI-9 and Table VI-7. The data contained in Table VI-7 are summarized in three periods: a period of active mining from 1979 through 1990, a period of temporary shutdown from 1991 through 2001, and an additional period of active mining since 2001. As indicated, the average discharge from the mine during the period of 1979 through 1990 was 0.93 cfs. During the temporary shutdown from 1991 through 2001, Consol pumped water from the mine at an average rate of 1.03 cfs to maintain accessible conditions. Following the restart of mining in 2002, discharge from the mine has averaged 0.63 cfs. Since 2002, additional mining equipment has been added to the operation. Thus, the difference in discharge between the period of temporary shut down and the period since 2002 is likely attributable to increased in-mine water usage.

Discharge to alluvium is presumed to occur from the Ferron Sandstone at various locations within the general mine area. Lines and Morrissey (1983) simulated groundwater discharge to alluvium along Muddy Creek, Ivie Creek, Christiansen Wash, and Quitchupah

Creek within the permit and adjacent areas. They estimated from this simulation that groundwater discharges at a rate of about 0.4 cfs from the Ferron Sandstone to alluvium. As indicated above, discharges from the Emery Mine have averaged 50 to 150% higher than this value, with this water all eventually discharging to Quitchupah Creek. Thus, although discharge in permit-area streams may be locally affected, the net effect of mine-water discharges is an increase in groundwater discharge to local streams above that experienced historically.

Within the general mine area, well discharges from the Ferron sandstone aquifer include the Emery municipal well (approximately 90 gpm) and the Bryant and Lewis wells (approximately 30 gpm each). The Bryant and Lewis wells have been affected by underground mining in that they no longer flow at the land surface. Consol has furnished and installed pumps and surface ancillary facilities in order to replace these water supplies. No further effect to these wells is anticipated from present mining operations, given the relative stability of water levels at these locations noted in Figure VI-5 and the fact that future mining is not currently anticipated in the western portion of the permit area near these wells. Given the distance of the Emery municipal well from the permit area, no impacts are anticipated from mining activities on this well.

Two springs are known to discharge from the Ferron Sandstone within the general mine area (see Plate VI-5). Spring SP-15 appears to discharge from the upper Ferron Sandstone and is appropriated for 0.1 cfs by Consol for stock watering purposes. Spring SP-16 appears to discharge from the lower Ferron sandstone and is unappropriated. The USGS measured the discharge of this spring in 1979 and found it to be issuing at 5 gpm.

Groundwater Quality:

A summary of water-quality analyses for groundwater samples (wells, springs and mine inflow) collected from the Ferron Sandstone in the permit and adjacent areas is presented in Table VI-8. Individual sample results are presented in Appendix VI-1. Groundwater-quality samples have historically been collected in the permit and adjacent areas from four wells completed in the upper Ferron Sandstone (the Bryant well, the Lewis well, and monitoring wells TP and USGS1-2), one spring issuing from the upper Ferron Sandstone (SP-15), two wells completed in the lower Ferron Sandstone (the Kemmerer well and monitoring well ZZ), and one well completed in both the upper and middle Ferron Sandstone (EMRIA2). The locations of these wells are noted on Plate VI-4.

The pH of groundwater in the Ferron Sandstone tends to be moderately alkaline, averaging 7.9 in the upper Ferron and 8.2 in the lower Ferron. Although only two groundwater samples from the Ferron Sandstone have been analyzed for acidity, several have been analyzed for alkalinity. These data indicate that the alkalinity of groundwater in the Ferron Sandstone exceeds the acidity by a factor of more than 5. Coupled with the alkaline pH, these data indicate that no substantial risk exists for acidic groundwater to be discharged from the Emery Mine.

The TDS concentration of water in the upper Ferron Sandstone is substantially lower than that of the overlying Quaternary deposits and Blue Gate Member, averaging approximately 1,600 mg/l in the upper Ferron and 690 mg/l in the lower Ferron. In the upper Ferron Sandstone, TDS concentrations tend to increase in the downgradient direction (from west to east), thus indicating the influence of recharging by fresher water from the Wasatch Plateau and natural leaching of salts as groundwater flows downgradient within the Ferron. Lines and Morrissey (1983) indicate that similar spatial variations in TDS concentrations occur in the lower Ferron Sandstone.

Temporal variations in TDS concentrations in the upper Ferron Sandstone are portrayed in Figure VI-10. The increase in TDS concentration at well USGS1-2 in mid 1989 occurred coincident with nearby mining activities (see Plate VI-6). Mine-related fractures in the overlying rock may have increased the hydraulic connection between the Ferron Sandstone and the more saline Blue Gate Member at this location, thereby locally increasing the TDS concentration of the upper Ferron Sandstone. However, similar changes are not evident at well TP, below which mining occurred in 1986. Hence, the effects of mining on TDS concentrations are likely localized.

Groundwater in the upper Ferron Sandstone tends to be a sodium sulfate type, while that in the lower Ferron is a sodium sulfate/bicarbonate type. The indicated differences in TDS concentrations and general chemistry, coupled with differences in water-level responses to mining (as discussed above), suggest at least some hydraulic separation between the upper and lower Ferron Sandstone.

VI.2.4.2 Surface Water Information

Streamflow

The Emery Mine is situated at the confluence of Quitchupah Creek and its tributary, Christiansen Wash. Quitchupah Creek is tributary to Ivie Creek which in turn is a tributary of Muddy Creek. Muddy Creek empties into the Dirty Devil River which flows into the upper Colorado River.

Quitchupah Creek is a perennial stream whose headwaters in the eastern flank of the Wasatch Plateau are primarily sustained by snowmelt. Christiansen Wash, also a perennial stream, originates at lower elevation in the Wasatch Plateau north-northwest of the permit area. Given its lower elevation, Christiansen Wash receives less influence from snowmelt than Quitchupah Creek.

Both Quitchupah Creek and Christiansen Wash receive additional flow in the vicinity of the mine from several sources unrelated to the Emery Mine, including:

- Direct irrigation return flow consisting of water whose source is primarily Muddy Creek;
- Irrigation-induced seepage from Quaternary pediment deposits;
- Groundwater discharging from the Ferron Sandstone;
- Water discharged from the Emery Mine; and
- Localized overland flow from storm events.

Quitchupah Creek also receives mine-water discharged from the SUFCO Mine at a point approximately 10 mile northeast (upstream) from the Emery Mine permit area. This discharge represents a substantial quantity of relatively high-quality water.

The assortment of influences affecting both Quitchupah Creek and Christiansen Wash creates considerable fluctuations in both streamflow and water quality. Streamflow data have been collected at least occasionally from the permit and adjacent areas at multiple locations as indicated on Plate VI-9. The U.S. Geological Survey maintained a stream gaging station on Quitchupah Creek, immediately above its confluence with Christiansen Wash (site S-24 on Plate VI-9) from July 1978 through September 1981 (see Appendix VI-11). Average monthly flow at this location during the period of record varied from 2.6 cubic feet per second ("cfs") in August and October to 17 cfs in May. Approximately half of this flow occurred in the months of

March through June, presumably as a result of snowmelt runoff. A substantial amount of flow also occurred, on average, in September, probably from thunderstorm activity.

The USGS also maintained a stream gaging station on Christiansen Wash, immediately above its confluence with Quitchupah Creek (site S-14 on Plate VI-9), from August 1978 through September 1984 (see Appendix VI-3). Average monthly flow at this location during the period of record varied from 1.2 cubic feet per second ("cfs") in December to 6.9 cfs in June and July. Most runoff occurred in the period April through September, presumably as a result of snowmelt runoff and thunderstorm activity.

Daily streamflow data collected by the USGS from Quitchupah Creek and Christiansen Wash are presented in Figure VI-11. From these records, it is apparent that both streams experience a wide seasonal variation in flow as well as occasional flood events. Considerable fluctuation in streamflow is evident from day to day during the spring and summer months. This can be explained in the spring by fluctuations in temperature as it affects melting of the mountain snow pack. In the summer and fall, thunderstorms and man-induced irrigation influences are the most likely cause of daily variations in streamflow. In contrast, daily fluctuations are much less substantial during the winter months, when irrigation has stopped and snow is accumulating. Although the period of record on Quitchupah Creek and Christiansen Wash is too short to draw many definitive conclusions, daily variations in streamflow appear to be less extreme than in Christiansen Wash, probably as a result of the discharge of mine water to Quitchupah Creek.

The USGS has also maintained stream gaging stations on Ivie Creek and Muddy Creek for various periods of record at the locations noted on Figure VI-12. A summary of the data collected from these stations is provided in Appendix VI-11. Annual flow data collected by the USGS from these locations, as well as the Quitchupah Creek and Christiansen Wash stations, are summarized in Figure VI-13. As indicated, streamflow varies widely in the region on an annual basis. These annual variations are likely less extreme in Quitchupah Creek than in the surrounding streams, given the consistent discharge of mine water to Quitchupah Creek.

Muddy Creek serves as the main source of irrigation water in the region. This water is diverted primarily from a point approximately 20 miles northwest of the permit area. Additional points of diversion are located about 6 miles north and 4 miles northeast of the permit area. A comparison of flow measurements at up and downstream gaging stations on Muddy Creek indicates that this stream loses approximately 60 percent of its flow between the USGS gaging stations. This dramatic loss in flow is primarily due to the above-noted irrigation diversions.

Between October 1977 and July 1978, Conoco conducted a seasonal streamflow and water quality study along Quitchupah Creek and Christiansen Wash in order to determine seepage and water quality trends within the permit area. Stream gaging data from this investigation are presented in Table VI-9 and gaging sites are indicated on Figure VI-14.

These data indicate that increases in flow generally increased in the downstream direction on both streams. Substantial increases in flow generally occurred between sites "C" and "D" on Christiansen Wash where seepage from irrigation water enters from a tributary. Flow also generally increased between sites "G" and "H" on Quitchupah Creek, where a tributary carrying irrigation return flow and seepage enters. Less consistent fluctuations in flow, including both gains and losses, were measured between the other sites on both streams. These gains and losses may reflect various contributions from groundwater and irrigation return flows, as well as seepage losses to the alluvium. In addition, man-induced and natural

streamflow fluctuations during the time period between stream gaging at the various sites may account for some of the apparent gains and losses.

The USGS has also conducted seepage studies along Quitchupah Creek and Christiansen Wash. Available data are given in Table VI-10, with data collected from the locations noted in Figure VI-15. Within the vicinity of the Emery Mine, these data validated the results drawn from the Conoco study, indicating a general downstream increase in flow on both streams.

Due to the complexity of the surface water hydrology of both Christiansen Wash and Quitchupah Creek, it is difficult to determine the individual contributions to streamflow of irrigation return flows and seepage, natural discharge from the Ferron Sandstone, overland flow, and losses to seepage into alluvium. Only the discharges from the mine are practical to measure separately. These data were presented previously in Figure VI-9.

Several small impoundments have been constructed in the permit and adjacent areas to capture water for livestock use. No water rights have been filed on these impoundments. The impoundments capture water from surface runoff local to each pond.

The Emery Mine has eight discharge monitoring points that are regulated under permit number UT0022616 of the Utah Pollutant Discharge Elimination System ("UPDES"). These points are described in Table VI-11 and located as shown on Plate VI-4. Data collected from these points are contained in Appendix VI-12. Consistent discharges have occurred only at UPDES points 001 and 003, where water is discharged from the underground workings. Average flow rates associated with these discharge points were presented in Figure VI-9. Eight discharge events, ranging from 100 to 630 gallons per minute, have occurred since 1991 at UPDES point 004. Discharge at this point also represents mine water which is used by a local farmer for irrigation. Discharge has occurred at UPDES point 007 on two occasions since 1994. This pond was constructed in an area initially intended to be the site of a coal preparation plant. The preparation plant was not constructed and no disturbed area drains to the pond, other than that associated with the pond itself. No discharges have occurred from any of the other UPDES points since monitoring began.

Surface Water Quality

Surface water-quality data have been collected from several locations within the permit and adjacent areas, including those locations identified on Plates VI-4 and VI-9. The U.S. Geological Survey conducted a water-quality study on Quitchupah Creek from July 1975 through September 1976, collecting samples at site S-18 (See Plate VI-9) where State Highway 10 crosses Quitchupah Creek and at site S-29 on Quitchupah Creek where it joins Ivie Creek. Water-quality analyses for these sites are summarized in Appendix VI-13. Increases in concentration are typical between these two sampling sites, with pH increasing slightly from an average of 8.1 to an average of 8.3; TDS increasing from an average of 939 to an average of 2406 mg/l, and the sodium adsorption ratio ("SAR") increasing from an average of 2.2 to an average of 5.5. The water also changed from a mixed type at S-18 (with Ca, Mg, and Na, being the dominant cations and sulfate and bicarbonate being the dominant anions) to a strongly sodium sulfate type at S-29. At site S-18, the specific conductivity of 1346 umhos/cm at 25°C and SAR of 2.2 classify the water as high salinity, low sodium water which may be used for irrigation of plants with good salt tolerance grown in well drained soils (U.S. Department of Agriculture, 1954). At site S-29, the specific conductivity of 3078 umhos/cm at 25°C and SAR

of 5.5 classify the water as very high salinity, medium sodium water which is not suitable for irrigation under ordinary conditions.

Data collected by the USGS on Muddy Creek and its tributaries in the 1970s are also presented in Appendix VI-13. At sample location S-1 located about 6 miles north of the permit are (see Plate VI-9), the quality of water in Muddy Creek was found to be very good, with an average TDS concentration of 212 mg/l. Calcium and magnesium were the dominant cations, while bicarbonate was the dominant anion. The SAR of 0.23 and a mean lab specific conductivity of 417 umhos/cm at 25°C classify this water as medium-salinity, low sodium water suitable for irrigation of plants with moderate salt tolerance. Downstream at site S-5 before its confluence with Ivie Creek, Muddy Creek's water is noticeably more saline, with a mean TDS concentration of 3065 (see Appendix VI-13). Sodium has become the dominant cation and sulfate the dominant anion. The mean lab conductivity of 3584 umhos/cm at 25°C and a SAR of 6.6 classify the water as very high salinity, medium-sodium water which is not suitable for irrigation under ordinary conditions. At site S-6, Ivie Creek dilutes Muddy Creek's waters slightly such that the mean TDS concentration decreases to 2306 mg/l. The water remains a sodium sulfate type, similar to the downstream end of Muddy Creek.

Site S-7 represents water collected from a canal carrying water from Muddy Creek. The quality of this water is very similar to that of Muddy Creek at site S-1. This canal and its associated laterals service the entire Emery area, diverting water from a location near S-1. Thus, the chemical quality of waters sampled at S-1 and S-7 are probably very representative of all irrigation waters in the Emery area.

On three occasions in the late 1970s, Consol conducted water-quality studies on Quitchupah Creek and Christiansen Wash to determine trends along these streams. Grab samples were collected at 19 of the sites indicated on Plate VI-9, with the resulting data contained in Appendix VI-13. These studies indicated that TDS concentrations in Quitchupah Creek increased in the downstream direction, largely as a result of irrigation return flows, seepage from the tributary sampled at site S-20, and mine-water discharges. At this time, the Emery Mine discharged its water into this tributary below site S-20. Notably, Quitchupah Creek after its confluence with Christiansen Wash contained a considerably smaller ionic concentration than that measured in either stream just upstream from the confluence. This decrease in concentrations was probably due to dilution via groundwater inflow from the Ferron Sandstone.

Concentrations of dissolved constituents were also found to increase in the downstream direction in Christiansen Wash above site S-12 as a result of runoff and irrigation return flow south of Emery. Below site S-12, which represents groundwater seepage from the Ferron Sandstone, water quality in Christiansen Wash improves towards its confluence with Quitchupah Creek due to dilution from the groundwater inflow.

Between October 1977 and July 1978, Conoco collected grab samples in conjunction with a stream gaging program along Christiansen Wash and Quitchupah Creek. These data, which are presented in Appendix VI-13, are consistent with the findings of the previously-cited water-quality studies. These investigations also found that total suspended solids concentrations in both Quitchupah Creek and Christiansen Wash are inversely related to streamflow, being generally less than 200 mg/l except during the spring and early summer months when flows are high.

Routine surface water monitoring in the permit and adjacent areas began at several locations in 1979, with the monitoring network being expanded in later years as needed. Data collected from these stations (Plate VI-4), together with statistical analysis of the data, are provided in Appendix VI-5 and summarized in Table VI-12. These data confirm the conclusions drawn from the previously cited short-term studies on water quality types and trends for both Quitchupah Creek and Christiansen Wash.

Routine monitoring data show that Quitchupah Creek can generally be characterized as a sodium sulfate water, becoming more saline in the downstream direction. At Surface Water Monitoring Site ("SWMS") 1A, the average TDS concentration during the period of record has been 908 mg/l (near the upstream edge of the permit boundary). This concentration increases to an average of 1259 at SWMS-1, an average of 1386 mg/l at SWMS-4, and an average of 1445 at SWMS-3 (near the downstream edge of the permit boundary.

Based on the average flows and average TDS concentrations for these sampling sites (see Appendices VI-12 and VI-5), the salt load of Quitchupah Creek has increased an average of 11.2 tons per day ("TPD") between SWMS-1A and SWMS-1 during the period of record (see Table VI-12). Mine water is discharged to Quitchupah Creek between these sampling sites, with the salt load from this mine-water discharge outfall averaging 4.1 TPD during the period of 2000 through 2006 (see data for UPDES discharge point 003). The remaining increase in salt load in this reach of Quitchupah Creek (averaging 7.1 TPD) is attributed to irrigation return flows and natural leaching of saline bedrock and colluvium, particularly that associated with the Blue Gate Member.

The average salt load of Quitchupah Creek also increases (by 8.1 TPD) between SWMS-1 and SWMS-4. A tributary enters Quitchupah Creek between these sites, carrying irrigation return flows (sampled at SWMS-8, contributing 1.4 TPD) and water discharged from the mine (sampled at SWMS-6 [UPDES outfall 001], contributing 2.0 TPD [see Appendix VI-12]). Again, the remaining increase in salt load (4.9 TPD) is attributed to irrigation return flow and natural leaching of saline deposits. The salt load of Quitchupah Creek increases substantially at SWMS-3, primarily due to inflow from Christiansen Wash (see data at SWMS-2 and SWMS-5), which is not impacted by mine-water discharges. Thus it is evident that, while mine-water discharges increase the salt load of Quitchupah Creek, the majority of the salt-load increase in this stream occurs from irrigation return flows and leaching of naturally-saline deposits.

TDS concentrations are generally highest in local streams during periods of low flow, when dilution is at a minimum. Total suspended solids concentrations, on the other had, tend to be highest in stream during periods of high flow, when streamflow energy is greatest. Mine water concentrations of dissolved and suspended solids show no seasonal variations.

The pH of surface water in the permit and adjacent areas is moderately alkaline. Total iron and manganese concentrations tend to correlate positively with suspended sediment concentrations, as would be expected. All streams included in the routine monitoring network (Quitchupah Creek, Christiansen Wash, and Ivie Creek) can be classified as magnesium-sodium sulfate type at the upstream-most station and strongly sodium sulfate type at downstream stations.

VI.2.4.3 Geologic Information

Geologic information related to the permit and adjacent areas is presented in Chapter V of this MRP. This information is also briefly discussed in this chapter as an aid in understanding hydrologic conditions in the permit and adjacent areas.

VI.2.4.4 Climatological Information

Climatological information is presented in Chapter X, Part B of this MRP.

VI.2.4.5 Supplemental Information

No supplemental information is required at this time.

VI.2.4.6 Survey of Renewable Resource Lands

The existence and recharge of aquifers in the permit and adjacent areas is discussed in Section VI.2.4.1 of this MRP. A description of the probable hydrologic consequences of subsidence on these aquifers and their recharge areas is provided in Section VI.2.8 of this MRP.

VI.2.4.7 Alluvial Valley Floor Requirements

Information regarding the presence or absence of alluvial valley floors in the permit and adjacent areas is presented in Chapter XI of this MRP.

VI.2.5 Baseline Cumulative Impact Area Information

The hydrologic and geologic information required for the Division to develop a Cumulative Hydrologic Impact Assessment is presented in Chapters V and VI of this MRP. Required information not available in these chapters is available from the Utah Division of Water Rights, the Utah Division of Water Resources, the U.S. Geological Survey, and the U.S. Bureau of Land Management.

VI.2.6 Modeling

Numerical groundwater modeling was conducted to assist in determining the probable hydrologic consequences of mining in the permit area. A discussion of this modeling effort is presented in section VI.2.8 of this MRP.

VI.2.7 Alternative Water Source Information

No surface coal mining has been or will be conducted in the permit and adjacent areas. Therefore, this section does not apply to the Emery Mine.

VI.2.8 Probable Hydrologic Consequences

This section addresses the probable hydrologic consequences of coal mining and reclamation operations in the mine permit and adjacent areas. Mitigating measures are discussed generally in this section and in detail in subsequent sections of this MRP.

VI.2.8.1 Potential Impacts to Surface and Groundwater

The following potential impacts of coal mining on the quality and quantity of surface and groundwater flow within and adjacent to the Emery Mine permit area were evaluated:

- Contamination from acid- or toxic-forming materials;
- Increased sediment yield from disturbed areas;
- Impacts to groundwater availability;
- Impacts to surface water availability;
- Increased total dissolved solids concentrations in surface and groundwater;
- Flooding or streamflow alteration;
- Hydrocarbon contamination from above ground storage tanks or from the use of hydrocarbons in the permit area; and
- Contamination of surface water from coal spillage due to hauling operations.

These potential impacts are addressed in the following sections of this MRP.

VI.2.8.2 Baseline Hydrologic and Geologic Information

Baseline geologic information is presented in Chapter V of this MRP. Baseline hydrologic information is presented in Sections VI.2.4 of this MRP.

VI.2.8.3 PHC Determination

Potential impacts to the hydrologic balance are addressed below.

Contamination from Acid- or Toxic-Forming Materials. Information concerning acid- and toxic-forming materials in rock at the Emery Mine is presented in Sections V.A.4 through V.A.6 of the MRP. As noted, the pH of roof and floor materials ranges from 5.0 to 9.1, with the acid-base potential indicating a net base potential. The alkaline nature of the system is further indicated by the fact that the pH of groundwater in the area is typically alkaline (see Section VI.2.4.1).

Except near outcrops, the electrical conductivity of the rock is generally low. However, naturally-occurring sodium adsorption ratios and exchangeable sodium percentages of the rock are moderately high. As a result, sodium adsorption ratios calculated from the data presented in Appendix VI-1 suggest that groundwater discharged from the mine may have a low to medium sodium hazard if that water is used for irrigation without further treatment. Analyses of rock samples presented in Section V.A.4 indicate that concentrations of trace elements are generally sufficiently low that the rock can be considered non toxic-forming. Thus, with the exception of moderate sodium concentrations in some samples, analytical data obtained from the local rock and mine-water discharges indicate that no significant potential exists for the contamination of surface and groundwater in the permit and adjacent areas by acid- or toxic-forming materials.

Increased Sediment Yield from Disturbed Areas. Mining and reclamation at the Emery Mine has the potential to increase sediment concentrations in the surface waters downstream from disturbed areas. However, sediment-control measures such as sedimentation ponds, diversions, etc. have been installed to minimize this impact. These facilities have been designed to meet applicable regulatory requirements and are regularly inspected and maintained to ensure that they continue to meet those standards (see Sections VI.3 and VI-4).

No discharges have occurred from the Emery Mine sedimentation ponds during their period of operation, other than two incidences of discharge from pond 5 (UPDES outfall 007). This pond was constructed in an area initially intended to be the site of a coal preparation plant. The preparation plant was not constructed and no disturbed area drains to the pond, other than that associated with the pond itself. Thus, the sediment-control measures at the mine are effective at minimizing sediment yields to adjacent streams.

Impacts to Groundwater Availability. As noted previously in this chapter, coal at the Emery Mine occurs in the Ferron Sandstone Member of the Mancos Shale. In the upper Ferron, sandstones are lenticular, channel-shaped bodies that are generally less than 40 feet thick. These channel sandstones are characterized by unidirectional cross-stratification, fining-upward cycles, and lateral interfingering with mudstones. The middle and lower Ferron consists of thin-bedded sandstone and shale at the base that grade upward to thick, cliff-forming sandstones.

The Ferron Sandstone outcrops in a series of prominent cliffs along the eastern edge of the Emery coal field and dips 2 to 10° to the northwest beneath the ground surface. The continuity of the Ferron is broken in the subsurface by the Paradise Valley-Joes Valley fault zone, which exists immediately northwest of the permit area. This fault zone extends for about 60 miles northeast and 20 miles southwest of the mine area (Hintze, 1980). A comparison of Plates VI-1 and VI-7 with Plates V-19 through V-22 indicates that the Emery Mine has historically operated within the saturated zone, except along the outcrop to the east and where water levels have been locally altered due to mining activities.

Morrissey et al. (1980) indicate that recharge to the Ferron Sandstone originates in the Wasatch Plateau west of the Emery Mine and discharges to the southeast along the Paradise Valley-Joes Valley fault zone. Hence, this fault zone effectively acts as a linear source of groundwater recharge to the Ferron Sandstone. Groundwater has the potential to enter the Emery Mine through both the floor and roof from permeable, saturated sandstones. Hydrographs of water-level data collected from monitoring wells at the mine (Figures VI-4 through VI-7) show that water level declines have been experienced in all three sections of the Ferron Sandstone and also in the Blue Gate Member. However, data presented in Plates VI-7 and VI-8 indicate that water levels in the upper Ferron Sandstone have been affected to a greater degree than the lower Ferron Sandstone. Significant upward leakage from the middle and lower Ferron is impeded by shales that constitute the floor of the mine. In-mine observations have verified that most inflow to the mine occurs from the roof rather than the floor.

As water flows into the mine, the flow pattern within the Ferron Sandstone is altered. These conditions in turn induce groundwater level declines in the area. Since the principal avenue of inflow to the mine is through the roof of the workings, the upper portion of the Ferron Sandstone is most subject to water level declines.

Average discharge from the Emery Mine during the period of 1979 through 2005 is shown in Figure VI-9 (see also Table VI-7). No data are available for the years prior to 1979. Discharge from the mine continued through a period of temporary shutdown (1991 through 2001) when Consol pumped water to maintain the mine in an accessible condition. Since pillars were pulled prior to the 1991 temporary shutdown, the mine-water discharge during this period is anticipated to be predictive of full-extraction, post-subsidence conditions.

The long-term effect of mining on groundwater availability in the permit and adjacent areas was determined using a mass balance calculations and groundwater modeling. The mass balance approach relied on the following water balance equation:

Outflow = Inflow + Change in storage

Direct recharge from precipitation to the Ferron Sandstone is limited in the mine area, given the low amount of precipitation (averaging about 8 inches annually) and the presence of the relatively impermeable Blue Gate Member covering the Ferron Sandstone throughout most of the permit area. As a result, subsurface inflow to the permit area occurs predominantly from groundwater that flows from the Paradise Valley-Joes Valley fault zone into the Ferron Sandstone and then toward the mine. Outflow occurs when groundwater is either pumped from the mine or used underground for various purposes (i.e., dust suppression, equipment cooling, etc.) and then removed from the mine as moisture in the coal or in the mine air.

Groundwater inflow to the mine occurs either horizontally (due to the mine being within the flow path) or vertically (due to gravity drainage from the overlying sandstone into the mine void). These conditions are depicted on Figure VI-8 and described in Section VI.2.4.1.

For the mass-balance analysis, it was assumed that the steady state condition identified in Figure VI-8(c) was reached during the several-year shutdown period of 1991 through 2001. Under this condition and assuming no substantial change in underground water storage in the mine during the shutdown, water discharged from the mine during this period would equal the amount of predominantly horizontal inflow to the mine. Data contained in Table VI-7 indicate that discharge from (and therefore horizontal inflow to) the mine during the shutdown period averaged 1.03 cfs. Since groundwater flows horizontally out of the Paradise Valley-Joes Valley fault zone toward the mine, the amount of water flowing into the mine would be a function of the length of mine workings parallel (i.e., exposed) to the fault zone. During the temporary shutdown, this length was 2.17 miles (see Plate VI-6), resulting in a ratio of *horizontal inflow* per unit length of mine exposed to the groundwater flow path of 0.47 cfs/mi. This value was used to predict future quantities of horizontal inflow to the mine as the mine expands.

Following the restart of mining in 2002, some groundwater encountered in the mine was used underground by the mining equipment. The quantity of water used underground was assumed to equal the difference between the mine-water discharge during the period of inactivity (1.03 cfs) and the mine-water discharge following the restart of mining (averaging 0.63 cfs from 2002 through 2005 – see Table VI-7). Since full extraction was not occurring during this period, the difference would be indicative of in-mine usage only (i.e., not influenced by increased inflows due to mine subsidence). Hence, in-mine water usage averaged 0.40 cfs from 2002 through 2005. With an average annual mined area of 18.1 acres from 2002 to 2005 (see Plate VI-6), *in-mine water usage* is estimated to be 0.022 cfs/acre under current operational conditions. This value was used to predict future quantities of in-mine water usage as the mine expands.

Although vertical inflow to the mine is likely limited in areas that were mined prior to 1991 (due to the development of steady-state conditions noted in Figure VI-8(c)), a condition more like Figure VI-8(b) has probably existed in areas mined since 2002 (i.e., components of both vertical and horizontal inflow as the mine expands unto areas where the groundwater has not yet reached static equilibrium). Under these conditions, it was necessary to estimate the vertical component of inflow to the mine. This was accomplished using two analytical methods,

assuming full-extraction conditions, and then comparing the results to pre-1991 conditions to determine the method that most accurately predicts conditions at the mine site.

Each method is limited in its application to simplified flow situations, assuming that the aquifer is of infinite areal extent with uniform thickness. The first method used to estimate vertical mine-water inflow was the tunnel inflow equation presented by Freeze and Cherry (1979). This method assumes that the mine acts as an infinitely long tunnel in a homogeneous, isotropic porous medium. Under this assumption, the rate of ground water inflow Q_o per unit length of mine can be calculated using the following equation:

$$Q_o = \frac{2\pi K H_o}{2.3\log(2H_o / r)}$$

where r is the mine radius, H_o is the depth from the potentiometric surface to the center of the mine, and K is the hydraulic conductivity, with all units being compatible.

The second method used to estimate vertical mine-water inflow was the Hantush equation presented by Singh and Atkins (1985). This equation, which assumes that the aquifer is homogeneous, isotropic, and pumped at a constant rate, is applied to large underground openings as illustrated in Figure VI-16. Inflow to the mine is calculated by:

$$Q = 2\pi TDG(\lambda, r/B)$$

$$\lambda = Tt / r^2 S$$

$$r/B = r(K'/KLL')^{\frac{1}{2}}$$

where B is the leakage factor; D is drawdown to a level H from the original head H_o; $G(\lambda,r/B)$ is the Hantush well function; K is the aquifer hydraulic conductivity; K' is the aquitard hydraulic conductivity; L is the thickness of the formation being dewatered; L' is the aquitard thickness, Q is the quantity of inflow; r is the radius at which drawdown occurs; and t is elapsed time, with all units being compatible.

Vertical inflow to the mine was estimated using the two methods described above for the period of 1980 through 1990 when Figure VI-8(b) was again assumed to represent mine hydrologic conditions (i.e., prior to attaining steady-state conditions during the temporary shutdown). Assuming no change in water storage in the mine (i.e., discharge is equal to inflow), and accounting for lateral groundwater inflow and in-mine water usage as outlined above, these calculations were then compared with measured discharge rates during the same period. Based on these calculations, the best approach for estimating future conditions was selected.

Preliminary calculations using the two methods indicated that the Hantush equation was a much better predictor of *vertical mine-water inflow* than was the tunnel inflow equation. To more accurately predict inflow, the average post-subsidence hydraulic conductivity of the aquifer was therefore derived by calibration using the Hantush equation, attempting to mimic measured discharge rates as closely as possible. The average hydraulic conductivity of the Ferron Sandstone overlying the coal seam was thereby determined to be 0.20 ft/day. This value compares well with aquifer data presented previously in this chapter and independent data presented by Lines et al. (1983). Assuming an aquifer thickness of 400 feet (based on a review of Plate V-20), the transmissivity data presented in Table VI-6 convert to hydraulic

conductivities ranging from 0.01 to 2.0 ft/day and averaging 0.6 ft/day. Laboratory hydraulic conductivity data provided by Lines et al. (1983) ranged from $2.6x10^{-6}$ to 0.77 ft/day, averaging 0.11 ft/day in the horizontal direction and 0.076 ft/day in the vertical direction. Hydraulic conductivities derived from field tests summarized by Lines et al. (1983) ranged from 0.025 to 2.0 ft/day, averaging 0.55 ft/day (again assuming an aquifer thickness of 400 feet).

Results of the mine-water inflow/discharge calculations for the period of 1980 through 1990, using the Hantush and tunnel inflow equations, are summarized in Table VI-13 and detailed in Appendix VI-14. Each set of calculations accounted for lateral groundwater inflow and in-mine water usage, and assumed that no change in underground water storage occurred during the period of interest (i.e., that discharge was equal to inflow). The equations were able to account for varying inflow as the mine expanded since vertical inflow was assumed to enter the mine only in the area of current mining. As indicated in Table VI-13 and Figure VI-17, the Hantush equation provides a reasonable estimate of mine water discharge. Hence, this equation was used to predict future mine-water discharge rates under the mass-balance approach, again assuming post-subsidence conditions.

Predicted mine-water discharge rates through 2013 (the mine plan period at the time of the calculation) are summarized in Table VI-14, based on the Hantush equation and accounting for mine-water inflow and usage as described above. These calculations again assume that no substantial change in underground water storage will occur during the period of evaluation (i.e., discharge is equal to inflow). Spreadsheets detailing these calculations are provided in Appendix VI-14. Based on these calculations, discharge rates are expected to average 1.50 cfs, ranging from about 1.3 to 2.0 cfs during the calculation period. Variations in discharge rates are anticipated depending on the depth of mining below the potentiometric surface and the area over which mining will occur. These estimates are based on the assumed hydraulic conductivity of 0.20 ft/day (i.e., the calibrated value arrived at in the comparison with measured historic discharge rates). Since pillars had been pulled prior to the 1991 temporary shutdown, this hydraulic conductivity is assumed to be indicative of average post-subsidence conditions. Hence, the estimates presented in Table VI-14 are considered adequate predictors of full extraction conditions.

Inflow of water to and discharge of water from the mine will continue to influence the shape of the potentiometric surface in the vicinity of the mine. As a result, it is anticipated that the cone of depression noted on Plate VI-7 will change as mining continues. To predict the impact of mining on groundwater levels in the permit and adjacent areas, Consol modeled groundwater conditions in the permit and adjacent areas using the software package MODFLOW. A description of the groundwater modeling effort is presented in Appendix VI-15.

Groundwater in the permit and adjacent areas was modeled using three layers: 1) the Blue Gate Member (where present), 2) the upper Ferron Sandstone, and 3) the "I" coal seam horizon. Geologic structure data were imported into the model to simulate strike, dip, and thickness of the various units. Figure 2 in Appendix VI-15 shows the model in plan view and Figure 3 in Appendix VI-15 shows the model in cross section. Groundwater conditions within the coal seam were simulated using extremely high hydraulic conductivity values for the mine works and low conductivity values for the solid coal surrounding the mine. The initially assumed hydraulic properties of the Blue Gate Member and the Ferron Sandstone were estimated from aquifer tests performed in monitoring wells in the vicinity of Emery Mine. These values were adjusted during calibration to approximate actual mine inflow rates. The initial head values used in the model were based on 2007 groundwater levels in both the Blue Gate Member and the upper Ferron Sandstone. Mine inflow and potentiometric surface changes were predicted from

the period of June 2007 through December 2016 (the projected life of mine at the time of modeling).

Three scenarios were run with MODFLOW to approximate a range of future conditions. To simulate worst-case inflow, it was assumed that groundwater levels in the upper Ferron Sandstone do not change in the future (i.e., that the vertical head over the mine remains unchanged beyond 2007). The conservative nature of this set of assumptions is evidenced by the fact that water levels in the upper Ferron Sandstone *have* declined in the vicinity of the mine as mining has progressed, thereby decreasing the head above the mine and the transmissivity of the aquifer.

As a worst case drawdown evaluation, it was assumed that groundwater levels in the upper Ferron Sandstone are allowed to decline as mining progresses. Since water-level declines will likely continue as mining progresses, this scenario is considered more realistic than the worst case inflow scenario discussed above.

As an independent check to the modeled inflows, a relatively simple calculation of predicted inflow based on unit-area inflows measured in the 1st and 2nd South pillared area was used and applied to the remaining areas to be mined. However, since the 1st and 2nd South areas of the mine are near the outcrop, this unit-area approximation may not be representative of the deeper portions of the mine.

The results of the MODFLOW evaluation are summarized in Table VI-15. Predicted mine-water inflow rates under the worst-case drawdown scenario agree reasonably well with the mass balance estimates presented in Table VI-14. These inflow estimates are also considered most realistic since drawdown is expected to continue to occur in the future, based on past observations.

Figure VI-18 shows the predicted potentiometric surface under the worst-case drawdown scenario for the upper Ferron Sandstone at the end of the year 2016 (when all planned mining has been completed). As indicated, it is anticipated that the trough of depression created by mine dewatering will expand to the northeast as the mine expands in that direction. It is not predicted, however, that the maximum magnitude of drawdown in the area will increase above that currently being experienced, since the elevation of the mine floor will rise as mining proceeds updip.

A comparison of Plates VI-1 (1979 data) and VI-7 (2006 data) indicate that the potentiometric surface of the upper Ferron Sandstone has been affected by past mining. As would be expected, declines in this groundwater surface have been most pronounced within the permit area, with decreasing effects away from the mine workings. Whereas Plate VI-1 indicates that groundwater in the upper Ferron Sandstone flowed generally southeastward through the permit area prior to significant mining, the trough of depression caused by mine dewatering causes groundwater to flow toward the center of the permit area under current conditions (see Plate VI-7). This trough of depression currently extends throughout the permit and much of the adjacent areas. The groundwater modeling results indicate that the area of impact to groundwater levels will likely continue to extend throughout the permit and immediately adjacent areas into the future as long as mine dewatering continues.

The effect of mining on groundwater levels in the lower Ferron Sandstone is much less pronounced than in the upper Ferron Sandstone. Although groundwater levels at individual wells in the middle and lower Ferron Sandstone have dropped over 100 feet since mining

began (see Section VI.2.4.1), a comparison of Plates VI-2 (1985 data) and VI-8 (2006 data) indicates that the general shape and elevations of the potentiometric surface in the lower Ferron Sandstone have remained quite similar between 1985 and 2006. These observations, together with the results of the groundwater modeling effort, suggest that the effects of mining on the potentiometric surfaces within the Ferron Sandstone will decrease in the following order: upper Ferron>middle Ferron>lower Ferron.

Data presented in Appendix VI-15 indicate that the potentiometric surface of the upper Ferron Sandstone will gradually return to pre-mining conditions once pumping ceases. Whereas maximum drawdowns of 350 to 400 feet have occurred in the upper Ferron Sandstone in the center of the permit area during the mining period (compare Plates VI-1 and VI-7), it is predicted that groundwater levels will recover to within 50 to 60 feet of pre-mining conditions approximately 10 years after cessation of pumping from the mine (compare Plate VI-1 with Figure 5 in Appendix VI-15). It is further predicted that groundwater levels in the upper Ferron Sandstone will recover to within about 30 feet of pre-mining conditions throughout most of the permit area within 20 years following cessation of pumping operations (compare Plate VI-1 with Figure 6 in Appendix VI-15).

Artesian conditions in the western portion of the permit area were such that some wells flowed at the surface prior to mining. It is doubtful that these conditions will return within 20 years after mining. Specifically, the modeling results indicate that the Bryant and Lewis wells will likely not flow at the surface, as they did prior to mining, within 20 years of ceasing pumping operations. Consol has furnished and installed pumps and ancillary facilities at these locations to compensate the well owners for the decline in water levels (see Section VI.2.4.1).

As groundwater levels return to an approximate pre-mining condition, pre-mining groundwater flow directions will also be re-established. This situation is seen in a comparison of Plate VI-1 with Figure 6 of Appendix VI-15, which indicates that groundwater flow directions in the upper Ferron Sandstone will gradually return to approximate pre-mining conditions following the cessation of pumping.

As noted in Table VI-1, the town of Emery has water rights at two wells located adjacent to each other about 14,500 feet north of the mine permit boundary. A review of data on file with the Utah Division of Water Rights indicates that Emery town Well #1 is completed in the lower Ferron Sandstone while Emery town Well #2 (located about 50 feet to the east) is completed in the middle and upper Ferron Sandstone. These wells were constructed to supply water on a backup basis to the town's distribution system. The pump in Well #1 is functional but there is no means to measure water levels in this well. The pump in Well #2 is not functional, but an air line exists by which water levels can be measured. Hence, water quality samples can be collected from Well #1 and water-level measurements can be collected from Well #2.

Several years ago, the town suggested that water levels at the wells had declined significantly since the beginning of operations at the Emery Mine. However, the town indicated in a meeting between Consol and the town in November 1988 that the apparent water-level declines may have been caused by their own pumping operations. As indicated above, Well #2 is completed in the middle and upper Ferron Sandstone (i.e., that section of the formation where water levels are most impacted by dewatering operations at the Emery Mine). The driller's log for Well #2 indicates that the static water level was 91 feet below ground surface in October 1979 when the well was completed. A water-level measurement collected from Well #2 in November 2007 indicated a depth to water of 85 feet. Hence, mining has apparently not impacted water levels at the Emery town wells.

To better assess conditions at the Emery wells, the model output was evaluated to determine the potential effects of mining on the potentiometric surface at the location of these wells. As noted in Figure 2 of Appendix VI-15, the northern boundary of the MODFLOW model was approximately 8,800 feet south of the Emery wells. At this northern model boundary, the model results indicate that groundwater levels in the Upper Ferron sandstone will drop 1.6 feet from 2007 to 2016, the period when active mining is planned to cease. From 2016 to 2026, groundwater levels at the northern model boundary are predicted to increase to approximately 5.4 feet above 2007 levels. Twenty years after mining ceases (2036), the model predicts that the head at the northern model boundary will be approximately 12.7 feet above 2007 levels. The predicted heads in 2026 and 2036 are calculated to be higher than 2007 levels primarily because of the high transmissivity and lateral recharge in the vicinity of the Joe's Valley-Paradise fault zone.

Although the MODFLOW evaluation concentrated on the upper Ferron Sandstone, observations discussed earlier in this section indicate that potentiometric-surface impacts to the middle and lower Ferron Sandstone will be less than those in the upper Ferron Sandstone. Given the distance of the Emery town wells from the modeled area and their completion zones, the effects of mining on water levels at the Emery town wells are predicted to be much less than those predicted to occur in the upper Ferron Sandstone at the model boundary (i.e., these impacts will be minimal at the town wells, if at all).

Two springs have historically issued from the Ferron Sandstone adjacent to the permit area (SP-15 from the upper Ferron Sandstone and SP-16 from the lower Ferron Sandstone). Both of these springs are located near the formation outcrop, making model predictions less precise. However, the model results indicate that the potentiometric surface will decline approximately 24.1 feet at the location of SP-15 from 2007 to 2016 (the period of active mining and dewatering) and subsequently recover to approximately 4.1 feet below 2007 levels by 2036. Data contained in Appendix VI-1 indicate that no flow has occurred at SP-15 since June 2000. The model data imply that this condition will continue for some time in the future.

Quantitative predictions of potentiometric surface impacts at SP-16 are not possible since modeling concentrated on the upper Ferron Sandstone and since SP-16 is located near the formation outcrop just east of the model boundary. This spring is not currently used for beneficial purposes. Given the generally lesser mining-related impacts on the lower as compared to the upper Ferron Sandstone and the fact that this spring is located updip of the upper Ferron Sandstone outcrop, impacts to the potentiometric surface at this location should be less than those predicted for SP-15.

Several seepage points representing irrigation return flow are noted on Plate VI-5 (specifically SP-1 through SP-14). Recharge to these seeps is primarily a function of surface irrigation practices. Since this recharge is not connected to the regional groundwater system contained in the Ferron Sandstone, no impacts to these seeps are anticipated as a result of mine-dewatering activities.

The Emery Mine hydrologic monitoring program has been designed to assess the impacts of mining on groundwater resources in the area. Data collected from this program will provide a much more accurate picture of mining impacts than the current model will provide.

Impacts to Surface Water Availability. Water removed from the mine will be discharged to Quitchupah Creek in the future as it has in the past, increasing the flow of this receiving stream.

As noted previously, only limited continuous streamflow data are available for Quitchupah Creek, with the U.S. Geological Survey maintaining a gaging station near the mine office from July 1978 through September 1981. The average annual flow of Quitchupah Creek at this location for the three complete water years of record was 8.43 cfs, ranging from 6.73 to 10.8 cfs (see Appendix VI-11). Mine-water discharge rates are predicted in Tables VI-14 and VI-15 to range from 1.35 cfs to 3.20 cfs through the end of mining. These values represent a 16 to 38% increase in the above-noted average annual flow of Quitchupah Creek.

As noted above, no water has been observed to discharge from the Emery Mine sedimentation ponds. Hence, a small quantity of runoff is precluded from reaching Quitchupah Creek and Christiansen Wash that would discharge to this stream if the mine surface facilities were not present. Given the small amount of precipitation in the area and the relatively small area of the surface facilities, this reduction in the streamflow of Quitchupah Creek and Christiansen Wash is likely minimal. Thus, the net effect of mining on the availability of surface water in the immediate area is an increase in the flow of Quitchupah Creek and downstream waters.

According to Section VI.2.4.2, streamflow in Christiansen Wash and Quitchupah Creek in the permit and adjacent areas is influenced by several factors, including direct irrigation return flow of water that originated in Muddy Creek, groundwater discharge from the Ferron Sandstone, discharge from the Emery Mine, and overland flow from precipitation runoff. Although it is assumed that interception of water in the mine will locally decrease base flow in Christiansen Wash and Quitchupah Creek, the magnitude of this impact cannot be accurately predicted given the multiple factors affecting streamflow in the area.

It should be noted that the discharge of mine water to Quitchupah Creek probably results only in a local increase in flow and not a basin-wide increase. As discussed above, the coal being mined at this location occurs in the Ferron Sandstone Member of the Mancos Shale, which is underlain by the Tununk Shale member of the same formation. The shales of this formation have a low permeability (Waddell et al., 1981), thus forcing groundwater to the surface as streamflow. As a result, although the discharge of water from the mine results in a local loss of groundwater and gain in surface water, this discharge does not disrupt the hydrologic balance of the larger basin.

Given this condition, the only actual loss of groundwater from the hydrologic balance is that water which is contained in the coal and leaves the basin upon mining or is discharged from the mine in the ventilation air. These quantities are estimated in Section II.C, subsection UMC 817.97 of this MRP.

As indicated on Plate V-5, buffer zones have been established to preclude full-extraction mining in the future beneath Christiansen Wash and Quitchupah Creek. Hence, direct impacts to the streambed of these two surface waters are not anticipated. However, subsidence may influence irrigation ditches and stock-watering ponds in areas overlying full-extraction panels. Impacts to irrigation ditches may include the development depressions that cause ponding in areas that would otherwise be free draining. Cracks may also develop in ditch and pond embankments, resulting in seepage outside of the embankments to adjacent ground.

Two conditions make it doubtful that substantial water will be diverted from an irrigation ditch or stock-water pond to the mine as a result of subsidence. First, the Blue Gate member of the Mancos Shale, which exists between the surface and the coal zone throughout the area, contains bentonitic clays (U.S. Geological Survey, 2007). As a result, subsurface cracks will swell

and seal when water enters the crack. Second, irrigation ditches and ponds in the area typically contain water only ephemerally, minimizing the time that surface water may come into contact with a crack. Monitoring and mitigation of subsidence impacts, if they occur, will be in accordance with the plan presented in Section V.B.1 of the approved MRP.

Increased Total Dissolved Solids Concentrations in Surface and Groundwater. Data summarized in Table VI-16 indicate that the average TDS concentration of water entering the mine (as measured in roof samples) is 1025 mg/l. Assuming that the equivalent-weight bicarbonate concentration can be calculated by balancing the anions and cations in that table, the roof inflow is a sodium-bicarbonate water with an average sulfate concentration of 264 mg/l. The average TDS concentration of water discharging from the mine to Quitchupah Creek (as measured at Ponds 1 and 6 [UPDES outfalls 001 and 003, respectively] and reported in Table VI-16) is 3110 mg/l. This is a sodium-sulfate water with an average sulfate concentration of 1510 mg/l.

These data indicate that the TDS concentration of water flowing through the mine increases by a factor of approximately 3.0. The sulfate concentration of this water increases by a factor of about 5.7. Furthermore, the ratio of calcium to sodium increases as the water flows through the mine. This increase in calcium concentration suggests that the observed changes in TDS and sulfate concentrations are probably the result of dissolution of gypsum rock dust used in the mine.

Consol operates under a UPDES discharge permit issued by the Utah Division of Water Quality and controls discharges from the mine to be consistent with that permit. As noted in Section VI.2.4.2, although mine-water discharges increase the salt load of Quitchupah Creek, the majority of the salt-load increase in this stream occurs from irrigation return flows and leaching of naturally-saline deposits. Furthermore, except where overlain by a thin veneer of alluvial deposits, surface water in Quitchupah Creek flows across the Tununk Member of the Mancos Shale immediately downstream from the mine permit area. Since this member is a gypsiferous formation, sulfate and TDS concentrations increase naturally in surface water that flows across areas underlain by this unit. Thus, the additional input of these constituents from the mine waters to local streams is considered minor compared with contributions from natural sources and irrigation return flows.

A TMDL study of the Muddy Creek watershed (of which Quitchupah Creek is a tributary) indicated that Muddy Creek and its major tributaries (including Quitchupah Creek) would not support an agricultural beneficial use classification (MFG, 2004). This lack of beneficial-use support occurs at the location where these streams cross State Highway 10 (i.e., upstream from the mine water discharge point). The study concluded that elevated TDS concentrations in areas downstream from Highway 10 are caused predominantly by changes in surficial geology (i.e., outcropping of the saline Mancos Shale) and irrigated agriculture (i.e., return flows), thereby agreeing with the above conclusions.

According to the U.S. Bureau of Reclamation (2003), the salt load from the Muddy Creek watershed averages 86,000 tons/yr. The Emery Mine UPDES permit currently allows a maximum salt load of 12 tons/day to be discharged from the mine. Assuming that this load is discharged constantly throughout the year, the annual salt load from the mine to the Muddy Creek watershed would be 4380 tons/yr (about 5% of the basin-wide salt load). The UPDES permit anticipates that the salt-load limit will change in the future to 3839 tons/yr (rather than 12 tons/day) following EPA approval of the TMDL loading limit. Once this new limit is adopted, the salt load from the Emery mine will represent about 4.5% of the annual salt load of the Muddy Creek watershed.

No surface-water rights exist on Quitchupah Creek downstream from the mine-water discharge point, nor do they exist on Ivie Creek between the confluence of Quitchupah Creek and Muddy Creek. Hence, no substantial water-quality impact to downstream water users is anticipated.

In the post-mining situation, there is a potential for water-quality degradation within the upper Ferron Sandstone as groundwater flows through previously mined areas and then into adjacent un-mined rock. However, it is expected that this condition will be tempered by the diluting effect of better-quality recharge water entering the area from the west. As far as the middle and lower Ferron Sandstones are concerned, a fairly uniform shale floor impedes downward seepage of mine water to lower zones. Thus, groundwater quality in these lower sections of the Ferron should not be substantially affected either during or after mining.

Flooding or Streamflow Alteration. Runoff from all disturbed areas flows through sedimentation ponds or other sediment-control devices prior to discharge to adjacent undisturbed drainages. Three factors indicate that these sediment-control devices minimize or preclude flooding impacts to downstream areas as a result of mining operations:

1. The sediment-control facilities have been designed and constructed to be geotechnically stable. Thus, no substantial potential exists for breaches of the sediment-control devices to occur that could cause downstream flooding.
2. These sediment-control devices are sized sufficiently that no discharges have been recorded. This precludes flooding impacts to downstream areas.
3. By retaining sediment on site in the sediment-control devices, the bottom elevations of stream channels downstream from the disturbed areas are not artificially raised. Thus, the hydraulic capacity of the streams channels is not altered and flooding potential is further precluded.

Following reclamation, stream channels will be returned to a stable state. The reclamation channels have been designed in accordance with the requirements of the Division. Thus, flooding in the reclaimed areas will be precluded. Interim sediment-control measures and maintenance of the reclaimed areas during the post-mining period will preclude deposition of significant amounts of sediment in downstream channels following reclamation, thus maintaining the hydraulic capacity of the channels and further precluding adverse flooding impacts.

The mine has been designed to preclude subsidence in areas occupied by perennial streams (see Plate V-5). Thus, no alteration of perennial streamflow is anticipated.

Subsidence will occur in areas occupied by ephemeral stream channels. Although surface cracks that result from subsidence in the permit area are expected to heal with time in areas overlain by unconsolidated deposits and the Bluegate Member of the Mancos Shale, ephemeral stream flows may be partially intercepted prior to completion of the healing process. In addition, the broad depressions created by subsidence may locally retain runoff that would normally discharge from an area. However, the following factors indicate that the impact of subsidence on ephemeral streamflow will be minimal:

1. Ephemeral streamflow in the area is sporadic, allowing significant periods of time for surface cracks to heal between flow events.

2. Ephemeral streamflow typically carries a high sediment load. This sediment will fill remaining cracks. As the cracks heal, the potential for interception of streamflow is minimized.
3. The depressions created by subsidence are sufficiently broad that changes in slope are not typically of an ample magnitude to cause ponding in anything other than local areas.

Potential Hydrocarbon Contamination. Diesel fuel, oils, greases, and other hydrocarbon products are stored and used at the site for a variety of purposes. Diesel and oil stored in above-ground tanks at the mine surface facilities may spill onto the ground during filling of the storage tank, leakage of the storage tank, or filling of the vehicle tank. Similarly, greases and other oils may be spilled during use in surface and underground operations.

The probable future extent of the contamination caused by diesel and oil spillage is expected to be small for three reasons. First, because the tanks are located above ground, leakage from the tanks can be readily detected and repaired. Second, spillage during filling of the storage or vehicle tanks is minimized to avoid loss of an economically valuable product. Finally, the mine has a Spill Prevention Control and Countermeasure Plan that provides inspection, training, and operation measures to minimize the extent of contamination resulting from the use of hydrocarbons at the site.

Coal Spillage During Hauling. Coal is hauled over County roads from the mine to State Highway 10 and future destinations. Past experience has indicated that no substantial quantities of coal have been spilled during transport. If coal is spilled, it may wash into local streams during a runoff event prior to cleanup. Possible impacts to the surface water include increases in total suspended solids and turbidity from the fine coal particulates. The probability of a spill occurring in an area sufficiently close to a stream channel to introduce coal to the stream bed is extremely small.

VI.2.9 Cumulative Hydrologic Impact Assessment (CHIA)

A Cumulative Hydrologic Impact Assessment to include the permit and adjacent areas has been prepared by the Division.

VI.3 OPERATION PLAN

VI.3.1 General Requirements

This permit application includes an operation plan which addresses the following:

- Groundwater and surface water protection and monitoring plans;
- Design criteria and plans;
- Performance standards; and
- A reclamation plan.

VI.3.1.1 Hydrologic-Balance Protection

Groundwater Protection. To protect the hydrologic balance, coal mining and reclamation operations will be conducted to handle earth materials and runoff in a manner that minimizes acidic, toxic, or other harmful infiltration to the groundwater system. Additionally, the mine will manage excavations and disturbances to prevent or control discharges of pollutants to the groundwater.

Surface Water Protection. To protect the hydrologic balance, coal mining and reclamation operations will be conducted to handle earth materials and runoff in a manner that minimizes acidic or toxic drainage, prevents, to the extent possible, additional contributions of suspended solids to streamflow outside the permit area, and otherwise prevents water pollution. Additionally, Consol will maintain adequate runoff- and sediment-control facilities to protect local surface waters.

VI.3.1.2 Water Monitoring

Groundwater Monitoring. Groundwater monitoring is conducted in the permit and adjacent areas according to the water monitoring plans presented in Table VI-17. The locations of the monitoring points are presented on Plate VI-4. The monitoring plans were developed based on information presented in the PHC determination, the baseline hydrologic data, and the geology chapter of this document.

The monitoring programs provide data that are reviewed and compared to the baseline data. Any significant changes are evaluated to determine their impact on the hydrologic balance. Results of these evaluations are submitted periodically to the Division.

Sampling for the Emery Mine area is accomplished in accordance with the schedule outlined in Table VI-17. Monitoring at locations that are inaccessible during winter months are sampled three times per year. All other sites are monitored quarterly. Groundwater monitoring data are submitted to the Division by the end of the quarter following sampling. Monitoring data are submitted in an annual summary by March 31 of the subsequent year.

Groundwater monitoring will continue through the mining and post-mining periods until bond release. The monitoring requirements, including the analytical parameters and the sampling frequency may be modified in the future in consultation with the Division if the data demonstrate that such a modification is justified.

Equipment, structures and other devices used in conjunction with monitoring the quality and quantity of groundwater in the permit and adjacent areas have been installed, maintained, and operated in accordance with accepted procedures. Where feasible, this equipment will be removed or properly abandoned by Consol when no longer needed.

Surface Water Monitoring. Surface water monitoring is conducted in the permit and adjacent areas based upon the monitoring plans contained in Table VI-17. Surface water monitoring locations are identified on Plate VI-4. The parameters monitored meet the requirements of R614-301-731.222.1, 40 CFR 122 and 123, R614-301-751, and the applicable UPDES permits.

Surface water monitoring data are submitted to the Division by the end of the quarter following sampling. Monitoring data are submitted in an annual summary by March 31 of the subsequent year. UPDES reporting requirements will be met for the UPDES discharge sites at the mine.

Surface water monitoring will continue through the mining and post-mining periods until bond release. The monitoring requirements (except those required by UPDES) may be modified in the future in consultation with the Division if the data demonstrate that such a modification is justified.

Equipment, structures, and other devices used in conjunction with monitoring the quality and quantity of the surface water in the permit and adjacent areas have been installed, maintained, and operated in accordance with accepted procedures. This equipment will be removed by Consol when no longer needed.

VI.3.1.3 Acid- and Toxic-Forming Materials

Information presented in Section VI.2.8.3 indicates that acid- and toxic-forming materials are not a significant concern at the Emery Mine. In the event that acid- or toxic-forming materials are identified in the future, they will be disposed of as outlined in Chapter II, Section II.C.

VI.3.1.4 Transfer of Wells

Before final release of bond, exploration or monitoring wells will be sealed in a safe and environmentally sound manner in accordance with R614-301-631, R614-301-738, and R614-301-765. Ownership of wells will be transferred only with prior approval of the Division. The conditions of such a transfer will comply with State and local laws. Consol will remain responsible for the management of such wells until bond release in accordance with R614-301-529, R614-301-551, R614-301-631, R614-301-738, and R614-301-765.

VI.3.1.5 Discharges

The Emery Mine has eight discharge monitoring points that are regulated under the Utah Pollutant Discharge Elimination System (permit number UT0022616). These points are described in Table VI-11. The primary discharge from the mine consists of water from the underground workings that is diverted into mined-out areas now used as sumps. These sumps are used to settle fines before the water is discharged to the surface. This water is discharged in accordance with the requirements of R614-301-731.100 through R614-301-731.522 and R614-301-731.800.

Water from the underground workings is pumped to the surface and discharged at Pond 1 (UPDES discharge point 001) and Pond 6 (UPDES discharge point 003). Additional settlement of sediment occurs in these ponds before the water is discharged to Quitchupah Creek. Occasionally, water is discharged from the mine to a location known as the "Farmer's Pond" (UPDES discharge point 004 – see Plate VI-4) where the water is diverted for irrigation use. All discharge water is monitored for compliance with UPDES permit standards.

Water from disturbed surface areas associated with the mine is collected and conveyed to sedimentation ponds. The mine maintains UPDES permits that allow the discharge of this water if it meets appropriate standards. No discharges have occurred from the sedimentation ponds during their period of operation, other than two incidences of discharge from pond 5 (UPDES outfall 007). This pond was constructed in an area initially intended to be the site of a coal preparation plant. The preparation plant was not constructed and no disturbed area drains to the pond, other than that associated with the pond itself. If discharges occur from sedimentation ponds in the future, the discharge water will be monitored for compliance with the UPDES permit standards prior to release from the ponds.

No discharges of surface water are being made to underground mines and none are planned in the future.

VI.3.1.6 Stream Buffer Zones

All perennial and intermittent streams in the mine area are protected by 100 foot stream buffer zones on either side of these streams. Coal mining and reclamation operations will not cause or contribute to the violation of applicable Utah or federal water standards and will not adversely affect the water quantity and quality or other environmental resources of the stream.

Stream Channel Diversions. Temporary or permanent stream channel diversions comply with R614-301-742.300.

Buffer Zone Designation. Areas surrounding the streams that are not to be disturbed are designated as buffer zones, and Consol has marked these areas as specified in R614-301-521.260.

VI.3.1.7 Cross Sections and Maps

The locations of surface and groundwater rights for current users of water within the permit and adjacent areas are provided on Plate VI-3. Discharges associated with the permit and adjacent areas occur at locations shown on Plate VI-4.

The location of each water diversion, collection, conveyance, treatment, storage, and discharge facility associated with the Emery Mine is presented on Plate VI-10. Locations and elevations of each station used for water monitoring during coal mining and reclamation operations are presented on Plate VI-4. Existing plans and profiles for the mine-water discharge and sedimentation ponds are shown on Plates VI-14 through VI-20 as well as in Appendix VI-7.

Other relevant cross sections or maps required by Division regulations are presented and discussed in other sections of this chapter, in Chapter V, and other chapters of this MRP.

VI.3.1.8 Water Rights and Replacement

This section applies to surface mining only. Therefore, this section does not apply to the Emery Mine where surface mining does not occur.

VI.3.2 Sediment Control Measures

The existing sediment control measures within the permit area have been designed, constructed, and maintained to prevent additional contributions of sediment to streamflow or to runoff outside the permit area. In addition, they have been designed to meet applicable effluent limitations, and minimize erosion to the extent possible.

The structures to be used for the runoff-control plan for the permit area include disturbed and undisturbed area diversion channels and culverts, sedimentation ponds, containment berms, and silt fences.

VI.3.2.1 Siltation Structures

The siltation structures within the permit area consist of the sedimentation ponds described in Section VI.3.2.2.

VI.3.2.2 Sedimentation Ponds

Five sedimentation ponds operate at the mine facility, not including the three mine-water discharge ponds. Three of these sedimentation ponds are located in the area of the mine office, where the mine portals formerly existed. Another sedimentation pond is located at the 4th East portal facility, the active portal for the mine. The fifth sedimentation pond is located north of the mine office in an area that was formerly under consideration for construction of a preparation plant. The preparation plant was not constructed, and no disturbance exists in this area, outside of that associated with the pond. An additional sedimentation pond (Pond 7) has been designed to provide sediment control in the area of a proposed coarse refuse disposal area (see Plate VI-10). Neither this refuse disposal area nor the associated pond has been constructed. Yet an additional sedimentation pond (Pond 4) was initially constructed immediately northwest of Pond 5, with Pond 4 designed to serve as an evaporation pond for a planned reverse-osmosis unit. The reverse-osmosis unit was never built, and Pond 4 was subsequently removed from service. Design information concerning this pond is included in Plate VI-16 to serve as background information for future final reclamation of the site where the pond was constructed. Details regarding the design of the mine-water discharge and sedimentation ponds are discussed in Section VI.4.2.2.

Each sedimentation pond was designed to provide treatment or full containment of the total runoff volume from a 10-year, 24-hour precipitation event. Treatment of the design runoff volume is provided by maintaining pool volumes within the pond equal to or greater than the design inflow volume into the pond. The sedimentation ponds were also constructed with a dewatering system consisting of slide gates that remain closed except when dewatering. Dewatering of these ponds will proceed only after a minimum of 24 hours of storm water detention is provided to achieve effluent limitations. These dewatering systems are sufficiently sized to remove the storm water from the ponds once deposition has occurred in a reasonable time, not to exceed 10 days.

The spillways on the sedimentation ponds were designed to safely discharge the peak runoff from a 25-year, 24-hour precipitation event. A minimum of 1.0 foot of freeboard is provided above the peak water surface to the crest of the pond embankment. The discharge from the sedimentation ponds will be controlled by riprap or other methods, as necessary, to reduce erosion and minimize disturbance.

The sedimentation pond embankments were designed and constructed to maintain a combined upstream and downstream slope of not less than 1v:5h, with neither slope steeper than 1v:2h. The minimum top width of the embankment was designed to be greater than the quotient of (H+35)/5, where H is the embankment height measured from the upstream toe, in feet. Construction of the pond embankments was performed using prudent engineering practices to ensure a stable structure.

All sedimentation ponds at the Emery Mine were certified after construction by a registered professional engineer with as-built drawings submitted and approved by the Division. All ponds are inspected in accordance with applicable regulations.

Compliance Requirements. All sedimentation ponds will be maintained until removed in accordance with the approved reclamation plan (see Chapter III of this MRP). When a pond is removed, the land will be revegetated in accordance with the reclamation plan defined in Chapter III.

The sedimentation ponds were designed to contain the volume of sediment equal to 5 years of accumulated sediment inflow, based on the Universal Soil Loss Equation. Sediment removal will be conducted once the volume of sediment accumulates to 60% of the total pond volume designated for sediment storage volume. In addition, the sedimentation ponds will fully contain the runoff from the 10-year, 24-hour storm event. The spillways for the sedimentation ponds will adequately pass the peak flow from the 25-year, 6-hour precipitation event.

Additional design standards for all ponds are presented in Section VI.4.2.

MSHA Requirements. MSHA requirements defined in 30 CFR 77.216 are not applicable since the existing sedimentation ponds do not impound water or sediment to an elevation of 20 feet or more above the upstream toe of the structure. The ponds also store a volume less than 20 acre-feet.

VI.3.2.3 Diversions

The objective of the run-off control plan is to isolate, to the extent possible, run-off from disturbed areas from that of undisturbed areas. This is accomplished by:

- Diverting as much upstream run-off around disturbed areas via a network of ditches, culverts, and other diversions.
- Routing of run-off from undisturbed areas which enters the disturbed area into the sediment control system.

The location of each diversion is presented on Plate VI-10. A brief list of each diversion structure is provided in Table VI-18. Drawings containing plans, profiles, and cross sections of the development waste disposal site diversion, the preparation plant diversion, and the 4th East portal stream diversion are presented in Plates VI-11, VI-13, and VI-21, respectively. Typical cross sections for these and the other diversions, together with additional design information, are found in Appendix VI-6.

All diversion ditches are maintained with adequate erosion protection in those sections where flow velocities are great enough that a ditch lining is necessary. Adequate ditch capacities are maintained in all ditch sections. Culvert inlets are kept free of debris. Detailed diversion design information is presented in Section VI.4.2.

VI.3.2.4 Road Drainage

Public roads in the permit and adjacent areas are owned and maintained by Emery County. Drainage associated with these roads is the responsibility of the County. Drainage from all routes within disturbed areas that are the responsibility of Consol is controlled via sedimentation ponds or alternate sediment-control methods. Drainage associated with these roads is addressed in Appendix IV-7 of this MRP.

VI.3.3 Impoundments

VI.3.3.1 General Plans

Five sedimentation ponds and three mine-water discharge ponds operate at the mine. These ponds are located as shown in Figure VI-20 and Plate VI-10. Design information concerning each of these ponds is provided in Appendix VI-7.

Certification. All maps and cross sections associated with the sedimentation and mine-water discharge ponds have been prepared by or under the direction of and certified by a qualified, registered, professional engineer.

Maps and Cross Sections. Plans and cross sections associated with the mine-water discharge and sedimentation ponds are provided on Plates VI-14 through VI-20, Plate VI-20A, and Appendix VI-7 of this MRP.

Narrative. A description of each sedimentation pond is presented in Sections VI.3.1.5, VI.3.2.2, and VI.4.2 of this MRP.

Subsidence Survey Results. No future subsidence is planned beneath the existing mine-water discharge and sedimentation ponds in the permit area.

Hydrologic Impact. The preliminary hydrologic and geologic information required to asses the hydrologic impacts of the impoundments can be found in Section VI.2.4 and Chapter V, respectively.

Design Plans and Construction Schedule. There are no additional structures proposed for the mining operation at this time. Designs of all existing structures have been described within this MRP.

VI.3.3.2 Permanent and Temporary Impoundments

Requirements. All impoundments have been designed and constructed using current, prudent, engineering practices. Specific design criteria for each impoundment are presented in Section VI.4.3. All impoundments will be inspected at least quarterly.

Permanent Impoundments. There are no permanent impoundment structures associated with the mine facilities.

Temporary Impoundments. The Division authorized the construction of the temporary impoundments at the mine as part of coal mining and reclamation operations.

Hazard Notifications. The sedimentation ponds will be examined for structural weakness and erosion at least four times per year. A report of these findings will be submitted to the Division in accordance with permit requirements.

VI.3.4 Discharge Structures

The discharge structures associated the Emery Mine include spillways on the sedimentation ponds and outlets on the mine-water discharge ponds. These discharge structures are defined in Section VI.4.4.

VI.3.5 Disposal of Excess Spoil

There is no excess spoil generated at the mine.

VI.3.6 Coal Mine Waste

Areas designated for the disposal of coal mine waste and coal mine waste structures are constructed and maintained as described in Chapter II of this MRP.

VI.3.7 Noncoal Mine Waste

Noncoal mine waste is stored and disposed of as described in Chapter II.

VI.3.8 Temporary Casing and Sealing of Wells

Each groundwater monitoring well identified on Plate VI-4 will be operated and maintained as described in Section VI.4.8.

VI.4 DESIGN CRITERIA AND PLANS

VI.4.1 General Requirements

This MRP includes site-specific plans that incorporate minimum design criteria for the control of drainage from disturbed and undisturbed areas.

VI.4.2 Sediment Control Measures

VI.4.2.1 General Requirements

Design. Existing sediment control measures have been designed, constructed, and maintained to accomplish the following:

- Prevent additional contributions of sediment to stream flow or to runoff outside the permit area;
- Meet the effluent limitations defined in Section VI.5.1; and
- Minimize erosion to the extent possible.

Measures and Methods. The sediment control measures at the mine include practices carried out within and adjacent to the disturbed area. Sediment control methods include:

- Retention of sediment within the disturbed area;
- Diversion of runoff away from the disturbed area;
- Diversion of runoff using channels or culverts through disturbed areas to prevent additional erosion;
- Provision of riprap, silt fences, site revegetation, ponds and other measures that reduce overland flow velocities, reduce runoff volumes, or trap sediment; and
- Treatment of mine drainage in underground sumps before being discharged to the surface.

VI.4.2.2 Siltation Structures

General Requirements. Additional contributions of suspended solids and sediment to stream flow or runoff outside the permit area is being prevented to the extent possible using various siltation structures. These structures were designed and constructed in accordance with applicable State and Federal regulations. Each structure has been certified by a qualified

registered professional engineer. All siltation structures which impound water have been designed, constructed and maintained as described in Chapter III and Sections VI.3.3 and VI.4.3.

Siltation structures are also provided at the mine-water discharges points. Water is presently being discharged from the mine at UPDES discharge points 001 and 003. Water discharges from these outfalls to Quitchupah Creek.

Sedimentation Ponds. There are five sedimentation ponds operating within the permit area. These ponds are located in the areas noted in Figure VI-20 and Plate VI-10 and are described in Table VI-11. An additional sedimentation pond (Pond 7) has been designed to provide sediment control in the area of a proposed coarse refuse disposal area (see Plate VI-19). Neither this refuse disposal area nor the associated pond has been constructed. Furthermore, Pond 4 (Plate VI-16) has been removed from service and partially reclaimed.

Each sedimentation pond is designed to work individually to manage the design sediment volume and safely convey the peak discharge rate from its drainage area. All sedimentation ponds are located as near as possible to the disturbed areas. None of the ponds are located within a perennial stream channel.

Sediment storage and cleanout quantities (volumes and elevations) are presented in Table VI-19 for each of the mine-water discharge and sedimentation ponds. Calculations used to generate these quantities are presented in Appendix VI-7. Each pond will be cleaned when its actual sediment storage equals 60% of the design volume.

An adequate detention time will be provided in each pond to allow the effluent to meet UPDES and 40 CFR Part 434 limitations. The decant water will be sampled and discharged from the pond in accordance with the above referenced effluent limitations.

Each mine-water discharge pond and sedimentation pond was designed to fully contain runoff resulting from the 10-year, 24-hour precipitation event. The sedimentation ponds were constructed with slide gates that remain closed except when dewatering. Dewatering of these ponds will proceed only after a minimum of 24 hours of storm water detention is provided to achieve effluent limitations. The ponds have been designed to minimize short circuiting. All mine-water discharge and sedimentation ponds within the permit area have spillway systems that will safely discharge the peak flow resulting from a 25-year, 24-hour precipitation event. Information relating to pond storage capacity and spillway hydraulics is presented in Table VI-20.

All of the ponds within the permit area have been operating for a period long enough to ensure that any settlement which may have occurred is now complete. Excessive settlement has not been observed at any of the mine-water discharge or sedimentation ponds.

During construction of the ponds, the embankment materials were free of sod, large roots, frozen soil, and acid- or toxic forming coal-processing waste. The embankments were compacted during placement of the materials.

MSHA Sedimentation Ponds. MSHA requirements defined in 30 CFR 77.216 are not applicable at this mine since the existing mine-water discharge and sedimentation ponds do not impound water or sediment to an elevation of 20 feet or more above the upstream toe of the structure. The ponds also store a volume less than 20 acre-feet.

Other Treatment Facilities. There are no other water treatment facilities within the mine permit area.

Exemptions. Alternative sediment control methods are provided by the following facilities for surface drainage which does not pass through a sedimentation pond. These alternative treatments provide sufficient sediment control for these areas to meet Division approval, before leaving the permit area. Additional details regarding the following alternative sediment control methods are provided in Appendix VI-8. Locations where alternative sediment control have been installed are listed in Table VI-21.

- Mine Office Catch Basin: The catch basin in the mine office area is located in a depression where the drainage berms cannot effectively direct disturbed area runoff from 0.6 acre to Pond No.2. This evaporative catch basin is sufficiently sized to fully contain the expected runoff from a 25-year, 24-hour storm event. The small amount of runoff entering the depression evaporates, effectively providing complete sediment control for these portions of the surface facilities area without discharging from the permit area. This catch basin is a Division approved treatment facility which has functioned effectively for several years.
- Runoff Collection Berms: Runoff collection berms have been constructed along the perimeter of the disturbed area in several locations to provide total containment of runoff.
- Rock Check Dams: A series of rock check dams have been placed in Ditch No. 6 along the downstream toe of the subsoil stockpile at the development waste disposal site. Runoff from the stockpile enters the ditch and flows to the rock check dams where the velocity is reduced, causing sediment deposition to occur. Design details for Ditch No. 6 are provided in Appendix VI-7.
- Silt Fences: Silt fences are used at several areas of minor disturbance for additional sediment control. These silt fences have been installed in general accordance with Figure VI-19.
- Vegetative Cover: Alternative sediment control for several areas of disturbance is provided by vegetative cover. Vegetation on these disturbed sites has proven to be equivalent to or exceed that of the undisturbed ground adjacent to the site. This comparison of disturbed versus undisturbed sites is the result of a vegetation count conducted February 9, 1994 by the Division's reclamation biologist. This vegetation count was conducted upon request by Consolidation Coal Company in order to resolve sediment control concerns for these relatively small, isolated disturbance areas. These primarily inactive sites have been in place a sufficient number of years to re-establish natural vegetative cover. Any further action to control sediment from these small areas would serve only to disturb additional acreages and destroy the vegetation already established. Based on the disturbance areas meeting or exceeding the vegetation provided on the natural, undisturbed adjacent sites, as verified from vegetation count data, no additional sediment control measures are anticipated. The vegetative cover on these existing disturbance sites provides an improved condition, as compared to the surrounding, undisturbed areas.

The current disturbed area associated with the Emery Mine is 66.7 acres (see Tables III-1 and III-2). The total area for alternate sediment controls is 12.47 acres (see Table VI-21). This represents about 19 percent of the total disturbed area at the mine site.

VI.4.2.3 Diversions

General Requirements. Diversions within the permit area consist of drainage ditches and culverts. All diversions within the permit area have been designed to minimize adverse impacts to the hydrologic balance, to prevent material damage outside the permit area and to assure the safety of the public. All diversions and diversion structures have been designed, located, constructed, maintained and used to:

- Be stable,
- Provide protection against flooding and resultant damage to life and property,
- Prevent, to the extent possible, additional contributions of suspended solids to stream flow outside the permit area, and
- Comply with all applicable local, State, and Federal laws and regulations

All diversions within the permit area are temporary and will be removed when no longer needed. The diversions will be reclaimed in accordance with the plan defined in Chapter III.

Peak discharge rates from the drainages flowing to the diversions were calculated based on design storms varying from the 10-year, 6-hour precipitation event to the 100-year, 24-hour precipitation event, depending on the diversion. Descriptions of the methods used and the resulting calculations required to determine the peak discharge rates are presented in Appendix VI-6. The disturbed and undisturbed drainage areas for the facilities area are presented on Plates VI-10 and VI-21.

All diversions are located as shown on Plate VI-10. The capacity and freeboard of each diversion were determined based on the minimum ditch slope, while the maximum velocity and the need for channel armoring were based on the maximum ditch slope. Slopes were measured either in the field or from the design topography. All diversion calculations are presented in Appendix VI-6.

Diversion of Perennial and Intermittent Streams. Consol constructed a crossing over Quitchupah Creek in the late 1970s using a multi-plate arch on a concrete foundation. This structure was constructed with concrete wingwalls and was equipped with a guardrail. The crossing was installed to allow access to the stockpile area south of Quitchupah Creek. It replaced two 3-foot-diameter culverts which were determined to be undersized for design flood conditions. Design information concerning this structure is provided in Appendices IV-7 and IV-8.

Diversion of Miscellaneous Flows. Diversion ditches and culverts have been utilized within the permit area to divert miscellaneous flows from ephemeral disturbed- and undisturbed-area drainages. Details regarding these diversions are presented in Appendix VI-6. A summary of these diversions is presented in Table VI-18.

VI.4.2.4 Road Drainage

The access road to the mine is a public road that is owned and maintained by Emery County. Drainage associated with this and other public roads in the permit and adjacent areas is the responsibility of the County. Drainage from all routes within disturbed areas that are the responsibility of Consol is controlled via sedimentation ponds or alternate sediment-control methods. Drainage associated with these roads is addressed in Appendix IV-7 of this MRP.

VI.4.3 Impoundments

Eight impoundments have been constructed within the permit area, five of which serve as sedimentation ponds and three of which serve as mine-water discharge ponds. These structures are located as indicated on Figure VI-20 and Plate VI-10. A ninth pond (Pond 7) has been designed to provide sediment control in the area of a proposed coarse refuse disposal area (see Plate VI-10). Neither this refuse disposal area nor the associated pond has been constructed. Pertinent information regarding these sedimentation ponds is presented in Sections VI.3.2.2 and VI.4.2.2. An additional impoundment (Pond 4) has been removed from service.

VI.4.4 Discharge Structures

Discharge structures within the permit area consist of spillways on each sedimentation pond and outlets on the mine-water discharge ponds. The spillways on all sedimentation ponds within the permit area will adequately pass the peak discharge from the 25-year, 6-hour precipitation event. Detailed information for each sedimentation pond is presented in Sections VI.3.2.2 and VI.4.2.2. The design calculations for the discharge structures are presented in Appendix VI-7. Detailed drawings of each discharge structure are presented on Plates VI-14 through VI-20.

VI.4.4.1 Erosion Protection

The outlets on each sedimentation pond and mine-water discharge pond associated with the Emery Mine are periodically inspected to assess the need for erosion protection. Conditions are currently adequate to reduce erosion, prevent deepening or enlargement of stream channels, and minimize disturbance of the hydrologic balance at the pond outlets.

VI.4.4.2 Design Standards

All discharge structures within the permit area were designed and constructed according to standard engineering design procedures.

VI.4.5 Disposal of Excess Spoil

There is no excess spoil generated within the permit area.

VI.4.6 Coal Mine Waste

VI.4.6.1 General Requirements

All coal mine waste is currently contained within the development waste disposal area. A coarse refuse disposal area has also been proposed, but not yet constructed. Information regarding these disposal areas is provided in Chapter IV. All coal mine waste will be placed in a controlled manner to minimize adverse effects of leachate and surface water runoff on surface and groundwater quality and quantity.

VI.4.6.2 Refuse Piles

Based on the size, configuration, and open graded structure of the coal-mine waste, no underdrains or rock core chimney drains were required. There are no springs or seeps within the fill areas that require special treatment. All surface precipitation falling on the disposal areas is

channeled to sedimentation ponds. All surface drainage from the areas above the sites is diverted around the disposal areas using diversion ditches. No permanent impoundments will exist on the completed refuse piles.

VI.4.6.3 Impounding Structures

There are no impounding structures within the permit area that are constructed of coal mine waste or are used to impound coal mine waste.

VI.4.6.4 Return of Coal Processing Waste to Underground Workings

Coal processing waste is not returned to abandoned underground workings at this mine.

VI.4.7 Disposal of Noncoal Mine Waste

Disposal of noncoal mine waste is discussed in Chapter II.

VI.4.8 Casing and Sealing of Wells

Each monitoring well or other borehole associated with the Emery Mine has been cased, sealed, or otherwise managed, as approved by the Division, to prevent acid or other toxic drainage from entering ground or surface water, to minimize disturbance to the hydrologic balance, and to ensure the safety of people, livestock, fish and wildlife, and machinery in the permit and adjacent area. The drill logs and completion diagrams for the water wells are contained in Appendix VI-2.

If a water well is exposed by coal mining and reclamation operations, it will be permanently closed unless otherwise managed in a manner approved by the Division.

VI.5 PERFORMANCE STANDARDS

All mining and reclamation operations will be conducted to minimize disturbance to the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area, and support approved post-mining land uses.

VI.5.1 Water Quality Standards and Effluent Limitations

Discharges of water from disturbed areas will be in compliance with all Utah and Federal water quality laws and regulations and with effluent limitations for coal mining contained in 40 CFR Part 434.

VI.5.2 Sediment Control Measures

All sediment control measures will be located, maintained, constructed and reclaimed according to plans and designs presented in Sections VI.3.2, VI.4.2, and VI.6.

VI.5.2.1 Siltation Structures and Diversions

Siltation structures and diversions will be located, maintained, constructed and reclaimed according to plans and designs presented in Sections VI.3.2, VI.4.2, and VI.6.3.

VI.5.2.2 Road Drainage

All roads that are the responsibility of Consol will be located, designed, constructed, reconstructed, used, maintained and reclaimed according to plans and designs presented in Sections VI.3.2.4, VI.4.2.4, and VI.6.2. Any roads that are the responsibility of Consol have been constructed to:

- Control or prevent erosion, siltation and the air pollution attendant to erosion by vegetating or otherwise stabilizing all exposed surfaces in accordance with current, prudent engineering practices;
- Control or prevent additional contributions of suspended solids to stream flow or runoff outside the permit area;
- Neither cause nor contribute to, directly or indirectly, the violation of effluent standards given under Section VI.5.1.
- Minimize the diminution to or degradation of the quality or quantity of surface- and ground-water systems; and
- Refrain from significantly altering the normal flow of water in streambeds or drainage channels.

VI.5.3 Impoundments and Discharge Structures

Impoundments and discharge structures will be located, maintained, constructed and reclaimed as described in Sections VI.3.3, VI.3.4, VI.4.3, VI.4.5, and VI.6.

VI.5.4 Disposal of Excess Spoil, Coal Mine Waste and Noncoal Mine Waste

Disposal areas for coal mine waste and noncoal mine waste will be located, maintained, constructed and reclaimed as described in Sections VI.3.6, VI.3.7, VI.4.6, VI.4.7, VI.6 and Chapter II.

VI.5.5 Casing and Sealing of Wells

All wells will be managed as described in Sections VI.4.8 and VI.6.5. Water monitoring wells will be managed on a temporary basis as described in Section VI.3.8.

VI.6 RECLAMATION

VI.6.1 General Requirements

A detailed reclamation plan for the mine is presented in Chapter III. In general, Consol will ensure that all temporary structures are removed and reclaimed. No permanent sedimentation ponds, diversions, impoundments, or treatment facilities are anticipated under the reclamation plan.

VI.6.2 Roads

A road not to be retained for use under an approved post-mining land use will be reclaimed immediately after it is no longer needed for coal mining and reclamation operations.

VI.6.2.1 Restoring the Natural Drainage Patterns

All natural drainage patterns will be restored during reclamation.

VI.6.2.2 Reshaping Cut and Fill Slopes

All cut and fill slopes will be reshaped to be compatible with the post-mining land use and to complement the drainage pattern of the surrounding terrain.

VI.6.3 Siltation Structures

VI.6.3.1 Maintenance of Siltation Structures

All siltation structures will be maintained until removed in accordance with the approved reclamation plan.

VI.6.3.2 Removal of Siltation Structures

When a siltation structure is removed, the land on which the siltation structure was located will be regraded and revegetated in accordance with the reclamation plan presented in Chapter III.

VI.6.4 Structure Removal

A timetable for the removal of each structure is presented in Section III.A.2 of this MRP.

VI.6.5 Permanent Casing and Sealing of Wells

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well, each monitoring well or borehole associated with the Emery Mine will be capped, sealed, backfilled, or otherwise properly managed, as required by the Division. Permanent closure measures will be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

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TABLE VI-1

Water Rights Near the Emery Mine

Water Right Number[a]	Owner	Source	Quantity	Use[b]	Status
94-2	Muddy Creek Irrigation Company	North Fork of Muddy Creek	51.3 AF	Dom, Irr, Stk	Claimed
94-30	Osburn Bret Carter and J.R. Lawrence	Three unnamed springs	0.45 cfs	Irr	Certificated
94-52	Consolidation Coal Company	Underground water well (Mine supply yard)	2400 AF	Ind, Irr	Approved
94-53	Consolidation Coal Company	Underground water well (Kemmerer well)	3.0 cfs	Ind	Approved
94-54	Consolidation Coal Company	Underground mine (Borehole #3) and two proposed wells	5.0 cfs	Ind, Irr, Stk	Approved
94-64	Consolidation Coal Company	Underground water well	5.0 cfs	Ind	Approved
94-65	Town of Emery	Underground water well	0.27 cfs	Dom, Mun	Claimed
94-81	Osburn Bret Carter and J.R. Lawrence	Underground water well	0.037 cfs	Irr, Stk	Claimed
94-92	Consolidation Coal Company	Christiansen spring	--	Stk	Claimed
94-285	Consolidation Coal Company	Underground mine (Borehole #1 and supplemental)	5.0 cfs	Ind, Min, Pwr	Approved
94-303	Town of Emery	Underground water well	0.45 cfs	Dom, Mun	Certificated
94-320	Morgan Robertson	Underground water well (Lewis well)	0.015 cfs	Dom, Irr, Stk	Claimed
94-732	U.S. Bureau of Land Management	Quitchupah Creek	--	Stk	Claimed
94-939	U.S. Bureau of Land Management	Intermittent stream	--	Stk	Claimed
94-1080	U.S. Bureau of Land Management	Intermittent stream	--	Stk	Claimed
94-1180	Morgan Robertson	Quitchupah Creek	--	Stk	Claimed
94-1189	Canyon Fuel Company	Quitchupah Creek	--	Stk	Claimed
94-1191	Osburn Bret Carter and J.R. Lawrence	Quitchupah Creek	5.25 cfs	Irr, Stk	Claimed
94-1193	Osburn Bret Carter and J.R. Lawrence	Unnamed springs	0.011 cfs	Stk	Claimed
94-1215	Castle Valley Ranches	Unnamed springs	0.015 cfs	Stk	Claimed
94-1216	Castle Valley Ranches	Quitchupah Creek	--	Stk	Claimed
94-1217	Castle Valley Ranches	Quitchupah Creek	--	Stk	Claimed
94-1285	Josiah K. and Etta Marie Eardley	Quitchupah Creek	--	Stk	Claimed
94-1315	Alonzo Olsen	Quitchupah Creek	--	Stk	Claimed

Water Right Number[a]	Owner	Source	Quantity	Use[b]	Status
94-1316	George E. Olsen	Quitchupah Creek	--	Stk	Claimed
94-1317	George E. Olsen	Quitchupah Creek	--	Stk	Claimed
94-1318	Josiah K. and Etta Marie Eardley	Quitchupah Creek	--	Stk	Claimed
94-1716	U.S. Bureau of Land Management	Miller Canyon	--	Stk, Wld	Claimed

[a] See Plate VI-3 for locations. See Appendix VI-4 for additional information.
[b] Dom = domestic, Ind = industrial, Irr = irrigation, Min = mining, Mun = municipal, Pwr = power, Stk = stockwatering, Wld = wildlife

TABLE VI-2

Monitoring Well Completion Information

Well Identification	Casing Diameter (in)	Depth Drilled (ft)	Well Depth (ft)	Perforated Interval (ft)
Quaternary Deposits				
RDA1	2	48	48	23-43
RDA2	2	44	44	19-39
RDA3	2	52	52	21-46
RDA4	2	54	54	19-49
RDA5	2	57	57	22-52
RDA6	2	40	40	15-35
SM1-1	2	21	21	14-17
SM1-2	2	14	14	4-9
SM1-3	2	26	24	10-18
SM1-4	2	30	18	8-18
Blue Gate Member				
AA	1	490	79	61-79
H	1	1140	808	755-775
I	1	728	335	60-315
R2	1	825	555	505-525, 545-555
T1	4.5	31	31	5-31
T2	4.5	345	342	31-342
USGS3-1	2	71	71	51-71
USGS4-1	2.5	30	30	10-30
Upper Ferron Sandstone				
AA		490	212	168-188
Bryant	6	466	466	360-466
H	1	1140	869	840-860
I2	1	728	475	440-460
Lewis	4	608	608	590-608
Muddy #1	2.5	162	162	122-162
Muddy #2	2.5	136	136	96-136
R2	1	825	620	600-620
T1	--	Unknown		
T2	2	425	418	338-418
TP	2	419	417	354-417
USGS1-2	2	150	150	Open below 75'
Middle Ferron Sandstone				
AA	1	490	396	336-356
H	1	1140	995	970-990
I	1	728	609	590-610
R2	1	825	820	800-820
Lower Ferron Sandstone				
AA	1	490	460	420-440
H	1	1140	1135	1115-1135
I	1	728	728	700-720
Kemmerer	8 and 12	1551	1543	1368-1543
R1	1	884	880	840-860
WW1	--	Unknown		
ZZ	4	390	390	310-330, 380-390

TABLE VI-3

Field Data from 1979/1980
Irrigation Return Flow Inventory

Location[a]	Date	pH (units)	Temperature (°C)	Diss. Oxygen (mg/l)	Sp. Cond. (umhos/cm)	Flow (gpm)[b]
SP-1	10/24/79	7.1	13.5	3.0	1196	NM
	06/11/80	7.9	26.4	8.6	1959	NM
SP-2	10/24/79	7.3	13.9	5.0	1613	NM
	06/11/80	7.8	21.1	6.8	1308	NM
SP-3	10/24/79	7.3	12.9	7.6	1307	NM
	06/11/80	7.8	18.3	9.4	1070	NM
SP-4	10/24/79	7.3	14.5	8.1	1295	NM
SP-5	10/24/79	8.1	9.2	10.9	2015	1
SP-6	10/24/79	7.8	15.9	9.2	1086	NM
SP-7	10/24/79	8.2	17.1	11.1	1023	NM
	06/11/80	7.6	18.4	8.4	1012	NM
SP-8	10/24/79	8.3	16.1	9.3	732	NM
	06/11/80	7.8	19.8	8.8	977	NM
SP-9	10/24/79	7.9	13.7	9.3	658	NM
	06/11/80	7.7	16.1	9.6	830	NM
SP-10	10/24/79	7.2	12.9	9.0	1043	NM
	06/11/80	7.5	12.3	9.9	1051	100
SP-11	10/24/79	7.5	13.8	9.2	800	NM
	06/11/80	7.7	14.3	9.2	1272	NM
SP-12	10/24/79	7.9	15.1	8.5	1338	NM
	06/11/80	7.9	22.7	8.1	1040	1
SP-13	10/24/79	7.5	14.3	8.0	1046	NM
	06/11/80	7.3	18.4	10.0	897	NM
SP-14	10/24/79	7.8	13.3	8.3	1022	7
	06/11/80	6.3	14.2	8.4	1280	3

[a] See Plate VI-5
[b] NM = not measured

TABLE VI-4

Groundwater Quality Summary –
Quaternary Deposit Wells

Parameter	Units	Maximum	Minimum	Mean
pH (lab)	units	11.8	6.7	7.7
Specific conductance (lab)	umhos/cm @25°C	51,100	2610	11,960
Total dissolved solids	mg/l	92,910	940	16,560
Calcium	mg/l	950	46	370
Magnesium	mg/l	5,250	30	900
Potassium	mg/l	780	2	32
Sodium	mg/l	19,300	231	4,180
Bicarbonate	mg/l	9,629	0	709
Carbonate	mg/l	301	0	5
Chloride	mg/l	2,998	11	620
Sulfate	mg/l	94,336	287	10,670
Iron (dissolved)	mg/l	130	0	3057
Manganese (dissolved)	mg/l	12.6	0	0.92
Acidity	mg/l	0	0	0
Total alkalinity	mg/l	7,893	168	681

TABLE VI-5

Groundwater Quality Summary –
Blue Gate Member Well

Parameter	Units	Maximum	Minimum	Mean
pH (field)	units	7.3	6.9	7.0
Specific conductance (field)	umhos/cm @25°C	17,920	3,530	8,860
Total dissolved solids	mg/l	24,232	4,531	16,490
Calcium	mg/l	622	193	391
Magnesium	mg/l	421	210	282
Potassium	mg/l	52	21	29
Sodium	mg/l	5,405	268	4,222
Bicarbonate	mg/l	727	304	465
Carbonate	mg/l	<5	<1	<5
Chloride	mg/l	450	29	141
Sulfate	mg/l	16,000	2,513	10,670
Iron (dissolved)	mg/l	2.2	0.02	0.63
Manganese (dissolved)	mg/l	1.13	0.20	0.44
Acidity	mg/l	--	--	--
Total alkalinity	mg/l	727	304	443

TABLE VI-6

Summary of Pumping Tests Conducted
in the Ferron Sandstone

Well Location[a]	Geologic Unit Tested	Type of Test	Transmissivity (ft^2/day)	Storage Coefficient	Testing Entity[b]
Bryant	Kmf(u)	Recovery	200	--	USGS
Emery Town	Kmf(l)	Drawdown	800	--	USGS
		Recovery	600	--	USGS
EMRIA #2	Kmf(u), Kmf(m)	Drawdown	100	$7x10^{-4}$	USGS
EMRIA #3	Kmf(u)	Drawdown	20	$2x10^{-3}$	USGS
		Recovery	10	--	USGS
Kemmerer	Kmf(l)	Drawdown	400	--	USGS
		Recovery	600	--	USGS
Mine Water Well	Kmf(l)	Drawdown	750	--	Consol
Muddy #3	Kmf(u)	Recovery	40	--	USGS
T1 (COW[U50])	Kmf(u)	Drawdown	5	$4x10^{-4}$	Consol
USGS1-1	Kmf(l)	Recovery	100	--	USGS
USGS1-2	Kmf(u)	Drawdown	100	$8x10^{-4}$	USGS
USGS1-4	Kmf(u)	Recovery	30	--	USGS
Walker Flat MW-PW	Kmf(u)	Drawdown	15[c]	--	Consol
Walker Flat MW-20	Kmf(u)	Drawdown	71[c]	$1.7x10^{-3}$	Consol
Walker Flat MW-50	Kmf(u)	Drawdown	110[c]	$2.2x10^{-3}$	Consol
Maximum	--	--	800	$2.2x10^{-3}$	--
Minimum	--	--	5	$4x10^{-4}$	--
Average	--	--	230	$1.3x10^{-3}$	--

[a] See Plate VI-4
[b] USGS data are reported by Lines and Morrissey (1983). Consol data are presented in Appendix VI-3.
[c] Average of test analyses, based on a saturated thickness of 115 feet at the test location.

TABLE VI-7

Emery Mine Average Annual Discharge Data

Year	Discharge (cfs)	Year	Discharge (cfs)	Year	Discharge (cfs)
Prior to temporary shutdown		During temporary shutdown		After temporary shutdown	
1979	0.70	1991	0.97	2002	0.54
1980	1.11	1992	1.10	2003	0.60
1981	0.68	1993	1.33	2004	0.77
1982	1.07	1994	0.88	2005	0.62
1983	1.20	1995	1.18		
1984	1.00	1996	0.67		
1985	0.80	1997	1.14		
1986	0.60	1998	1.09		
1987	1.00	1999	1.03		
1988	1.10	2000	1.03		
1989	0.90	2001	0.90		
1990	0.99				
Average	0.93	Average	1.03	Average	0.63

TABLE VI-8

Groundwater Quality Summary –
Ferron Sandstone Wells

Parameter	Units	Maximum	Minimum	Mean
Upper Ferron Sandstone				
pH (lab)	units	9.9	4.0	7.9
Specific conductance (lab)	umhos/cm @25°C	6,500	880	1,810
Total dissolved solids	mg/l	8,788	429	1,621
Calcium	mg/l	376	1	88
Magnesium	mg/l	474	1	68
Potassium	mg/l	17	1	4
Sodium	mg/l	2,030	90	427
Bicarbonate	mg/l	627	29	303
Carbonate	mg/l	490	0	138
Chloride	mg/l	209	8	45
Sulfate	mg/l	6,884	72	863
Iron (dissolved)	mg/l	24	0.02	1.55
Manganese (dissolved)	mg/l	0.67	0.008	0.22
Acidity	mg/l	0	0	0
Total alkalinity	mg/l	580	88	353
Lower Ferron Sandstone				
pH (lab)	units	10.0	7.3	8.2
Specific conductance (lab)	umhos/cm @25°C	2,200	580	1,090
Total dissolved solids	mg/l	1,320	526	685
Calcium	mg/l	17	1	4
Magnesium	mg/l	14.4	0.9	8.0
Potassium	mg/l	6	2	3
Sodium	mg/l	348	169	231
Bicarbonate	mg/l	654	80	290
Carbonate	mg/l	424	13	131
Chloride	mg/l	75	12	19
Sulfate	mg/l	660	1	203
Iron (dissolved)	mg/l	19	<0.01	2.0
Manganese (dissolved)	mg/l	0.02	0.001	0.008
Acidity	mg/l	--	--	--
Total alkalinity	mg/l	650	150	376

TABLE VI-9

Results of 1977-1978 Streamflow Study

Location[a]	Instantaneous Discharge (cfs) by Date			
	25-26 Oct 1977	8-9 Feb 1978	12-13 Apr 1978	26-27 Jul 1978
Christiansen Wash				
A	0.129	0.234	0.523	0.441
B	0.223	0.399	0.559	1.682
C	.0267	0.323	0.597	0.980
D	1.100	0.913	1.267	2.020
E	0.646	1.105	0.891	1.722
F	1.025	0.657	1.365	4.321
Quitchupah Creek				
G	0.000	1.071	3.833	0.000
H	0.501	4.274	17.87	0.800
I	0.898	7.018	22.00	0.650
J	0.690	3.902	13.38	0.699
K	0.951	2.650	15.78	2.140
L	1.123	3.869	14.84	2.450

[a] See Figure VI-14

TABLE VI-10

Results of USGS 1978 Seepage Study

Location[a]	Instantaneous Discharge (cfs) by Date			
	13 Aug 1978	9 Sep 1978	18 Nov 1978	19 Nov 1978
Christiansen Wash				
M	1.72	0.11	--	0.43
N	1.69	0.34	--	1.26
Quitchupah Creek				
O	--	0.67	0.34	--
P	0.91	0.69	0.18	--
Q	0.00	0.02	1.42	--
R	0.00	0.00	--	0.04
S	0.26	1.40	--	0.12
T	1.68	2.09	--	2.39

[a] See Figure VI-15

TABLE VI-11

UPDES Discharge Monitoring Point Descriptions[a]

Outfall Number	MRP Pond Number	Surface Water Monitoring Site	Source Description
Correlated by UPDES Outfall Number			
001	1	6	Underground mine pump No. 1 to surface discharge pond
002	2	7	Sedimentation pond east of mine office
003	6	12	Underground mine pump No. 3 to surface discharge pond
004	Farmer's Pond	13	Underground mine pump No. 3 (alternate discharge location)
005	3	14	Sedimentation pond southeast of mine office
006	8	--	Sedimentation pond south of mine office
007	5	11	Sedimentation pond at location of formerly proposed preparation plant
009	9	--	Sedimentation pond at 4th East portal facility

Correlated by Pond Number			Correlated by Surface Water Monitoring Site		
MRP Pond Number	Outfall Number	Surf. Water Mon. Site	Surf. Water Mon. Site	MRP Pond Number	Outfall Number
1	001	6	6	1	001
2	002	7	7	2	002
3	005	14	11	5	007
5	007	11	12	6	003
6	003	12	13	Farmer's	004
8	006	--	14	3	005
9	009	--	--	8	006
Farmer's	004	13	--	9	009

[a] All outfall numbers are associated with UPDES permit number UT0022616. Discharge locations are noted on Plate VI-4. Outfall number 008 was intended for a sedimentation pond that was not constructed. MRP pond numbers correspond to information contained in DOGM permit 015/015. Surface water monitoring site numbers correspond to sampling locations noted on Plate VI-4.

TABLE VI-12

Surface Water Quality Summary

Parameter	Average Concentration[(a)]								
	SWMS-1	SWMS-1A	SWMS-2	SWMS-3	SWMS-4	SWMS-5	SWMS-8	SWMS-9	SWMS-10
pH (field)	7.9	8.1	7.9	8.0	8.0	8.2	8.0	7.9	8.0
Sp. Cond. (field)	1570	1220	3240	1610	1620	2270	5800	3180	1940
Total Diss. Solids	1240	868	2860	1400	1340	1900	10060	2390	1970
Total Salt Load	12.2	23.4	20.5	48.6	31.7	22.0	1.4	--	--
Total Susp. Solids	543	272	789	680	700	567	674	508	238
Calcium	106	89	197	105	102	139	229	181	180
Magnesium	69	60	176	79	71	120	451	190	172
Potassium	4	4	7	4	4	5	15	8	6
Sodium	192	97	457	211	213	247	2880	322	191
Bicarbonate	333	300	377	326	328	336	456	283	283
Carbonate	9	9	15	14	14	15	43	17	17
Chloride	35	30	51	38	42	35	580	123	132
Sulfate	644	390	1650	735	705	1020	6550	1310	1020
Iron (diss.)	0.33	0.22	0.5	0.3	0.3	0.5	0.04	0.2	0.2
Iron (total)	7.1	4.0	7.3	5.2	5.2	4.6	8.4	5.8	1.5
Manganese (diss.)	<0.1	0.03	0.18	0.03	0.02	0.07	<0.05	0.06	0.06
Manganese (total)	0.18	0.09	0.37	0.19	0.18	0.24	0.23	0.23	0.13
Acidity	2.6	5	4.4	<5	<5	<5	<5	2	<5
Total Alkalinity	310	274	364	304	304	310	435	263	261

[(a)] All concentrations in mg/l except pH (units), specific conductance (umhos/cm @ 25°C), and total salt load (tons/day)

TABLE VI-13

Comparison of Mine-Water Discharge Rates
Using Two Analytical Methods
(Mass Balance Approach)

Year	Mine-Water Discharge Rate (cfs)		
	Measured discharge	Hantush inflow equation	Tunnel inflow equation
1980	1.11	1.05	11.38
1981	0.68	0.96	1.38
1982	1.07	1.04	7.42
1983	1.20	1.08	1.98
1984	1.00	0.98	2.13
1985	0.80	0.66	7.60
1986	0.60	0.79	1.67
1987	1.00	1.09	2.95
1988	1.10	1.03	7.13
1989	0.90	0.95	12.10
1990	0.99	1.07	2.47
Average	0.95	0.97	5.29

TABLE VI-14

Predicted Mine-Water Discharge Rates
(Mass Balance Approach)

Year	Predicted Discharge (cfs)
2006	1.29
2007	1.19
2008	1.33
2009	1.77
2010	1.28
2011	1.52
2012	1.63
2013	1.98
Average	1.50

TABLE VI-15

Predicted Mine-Water Inflow and Discharge Rates
(MODFLOW Approach)

Year	Predicted Inflow (cfs)		
	Worst-Case Drawdown Scenario	Unit-Area Inflow Estimate	Worst-Case Inflow Scenario
2007	1.37	1.57	1.63
2008	1.46	1.92	2.13
2009	1.51	2.17	2.51
2010	1.56	2.38	2.87
2011	1.69	2.70	3.43
2012	1.72	2.85	3.71
2013	1.99	3.22	4.27
2014	1.96	3.33	4.44
2015	2.14	3.76	5.29
2016	2.12	3.89	5.68
Average Inflow	1.75	2.78	3.60
Average Discharge[a]	1.35	2.38	3.20

[a] Based on in-mine water usage of 0.40 cfs (see discussion in text)

TABLE VI-16

Comparison of Average Water Quality Data Collected
From the Ferron Sandstone and the Emery Mine

Source	TDS (mg/l)	Anions (mg/l)			Cations (mg/l)			
		HCO_3	Cl	SO_4	Ca	K	Na	Mg
Upper Ferron SS[a]	1566	303	45	799	86	36	407	65
Lower Ferron SS[a]	685	290	19	203	4	3	231	8
Mine roof samples[b]	1025	--	31	264	9	--	322	22
Other mine samples[b]	4106	--	241	2298	146	--	680	168
Pond 1 mine water[c]	3812	384	140	1923	169	8	838	152
Pond 6 mine water[c]	2410	324	60	1094	38	4	463	32

[a] See Appendix VI-1
[b] Average of limited Consol sampling
[c] See Appendix VI-12

TABLE VI-17

Emery Mine Hydrologic Monitoring Program

Parameter	Surface Water Monitoring Stations	Sampled Wells	Other Wells	Springs/Seeps	UPDES Outfalls
Monitoring Site Names	SWMS-1A, SWMS-2, SWMS-3, SWMS-4, SWMS-5, SWMS-8, SWMS-9, SWMS-10	Bryant, Emery Town[a], I2, Lewis, Kemmerer, RDA-1, RDA-2, RDA-3, RDA-4, RDA-5, RDA-6, SM1-2, SM1-3, SM1-4, T1, TP, USGS1-2, USGS3-1, USGS4-1	AA, EMRIA #1, EMRIA #2, FC346WW, H, I, MUDDY #1, MUDDY #2, MUDDY #4, R-1, R-2, SM1-1, T2, WW1	SP-10, SP-11, SP-13, SP-14, SP-15	001, 002, 003, 004, 005, 006, 007, 009
Monitoring Frequency	Quarterly	Quarterly, except RDA wells (annual)	Quarterly	Quarterly flows. Samples in 2nd and 3rd quarters	Per permit
Field Measurements					
Flow	X			X	X
Water Level		X	X		
pH (field)	X	X		X	X
Sp. Cond. (field)	X	X		X	
Water Temp. (field)	X	X		X	
Laboratory Measurements					
Total Settleable Solids	X				
Total Suspended Solids	X				X
Total Dissolved Solids	X	X		X	X
Total Hardness (as $CaCO_3$)	X	X		X	
Oil and Grease	X				X
Acidity (as $CaCO_3$)	X				
Carbonate	X	X		X	
Bicarbonate	X	X		X	
Alkalinity (as $CaCO_3$)					
Calcium, Total	X				
Calcium, Dissolved	X	X		X	
Chloride	X	X		X	
Iron, Total	X				X
Iron, Dissolved		X		X	
Magnesium, Total	X				
Magnesium, Dissolved		X		X	
Manganese, Total	X				
Manganese, Dissolved		X		X	
Potassium, Total	X				
Potassium, Dissolved		X		X	
Sodium, Total	X				
Sodium, Dissolved		X		X	
Sulfate		X		X	

[a] Due to physical limitations in the Emery town wells (see text), water-quality samples will be collected from Well #1 and water-level data will be collected from Well #2. Consol will evaluate data collected from the Emery town wells, using hydrographs and other appropriate means, and submit a report of findings to DOGM on a semiannual basis.

TABLE VI-18

Summary of Operational Diversion Ditches and Culverts

Structure	Design Event	Ditch Features			Culvert Type
		Bottom Width (ft)	Side Slopes (H:V)	Design Flow Depth (ft)	
Waste Disposal Site Diversion	100-yr, 24-hr	14	3:1	2.1	NA
4th East Portal Stream Diversion	10-yr, 24-hr	6	2:1	1.7	NA
Prep. Plant Ditch and Culvert	10-yr, 24-hr	10	2:1	0.3-0.5	30" CMP
Ditch and Culvert No. 1	10-yr, 6-hr	0	4:1	0.7	18" CMP
Ditch No. 2	10-yr, 6-hr	0-2	2:1	0.3-1.0	NA
Ditch No. 2A	100-yr, 6-hr	0	2:1	1.0	NA
Ditch No. 3	10-yr, 24-hr	2	2:1	1.1	NA
Ditch No. 3A	10-yr, 24-hr	2	2:1	0.4	NA
Ditch No. 4	10-yr, 24-hr	2	2:1	0.4-0.6	18" CMP
Ditch No. 5	10-yr, 24-hr	2	2:1	0.8	NA
Ditch No. 6	10-yr, 24-hr	0	2:1	0.6	NA
Arch Culvert on Quitchupah Creek	25-yr, 24-hr	NA	NA	NA	15'x10' pipe arch

TABLE VI-19

Pond Sediment Storage and Cleanout Quantities

Pond No.	Design Quantities		Cleanout Quantities	
	Volume (AF)	Top Elevation (ft)	Volume (AF)	Cleanout Elevation (ft)
1	10.3	5937.7	6.2	5935.7
2	0.83	5905.3	0.50	5903.0
3	1.14	5906.5	0.68	5905.0
5	1.13	5944.6	0.68	5943.8
6	7.5	6014.8	4.5	6012.5
8	2.00	5910.0	1.35	5909.0
9	0.32	6052.5	0.18	6051.7

TABLE VI-20

Pond Storage and Spillway Capacity Data

Pond	Runoff Storage Capacity (AF)	Spillway Capacity	
		Design Storm	Peak Outflow (cfs)
1	0.44	25-yr, 24-hr	7.9
2	0.68	25-yr, 24-hr	1.0
3	0.37	100-yr, 6-hr	2.1
5	3.70	25-yr, 24-hr	4.0
6	9.18	25-yr, 24-hr	3.6
8	1.07	100-yr, 6-hr	1.8
9	0.22	25-yr, 24-hr	3.9

TABLE VI-21

Alternative Sediment Controls

Site	Area (ac)[a]	Alternative Sediment Control Method				
		Catch Basin	Berms	Rock Check Dams	Silt Fences	Vegetative Cover
Southeast mine office area	0.6	X				
4th East portal topsoil stockpile	1.0		X			X
4th East portal excavation stockpile	4.0		X			
4th East portal perimeter	0.4				X	
Topsoil stockpile T-3	1.38		X			X
Pond No. 6 topsoil and subsoil stockpiles	0.85		X			X
Waste disposal site – Ditch No. 6 and Subsoil stockpile S-2	1.88			X	X	X
Borehole pump No. 1	0.17					X
Borehole pump No. 2	0.92					X
Borehole pump No. 3	0.86		X		X	X
Revegetation test plot	0.34					X
Fire control area	0.07					X

[a] Total area included in alternative sediment controls = 12.47 ac

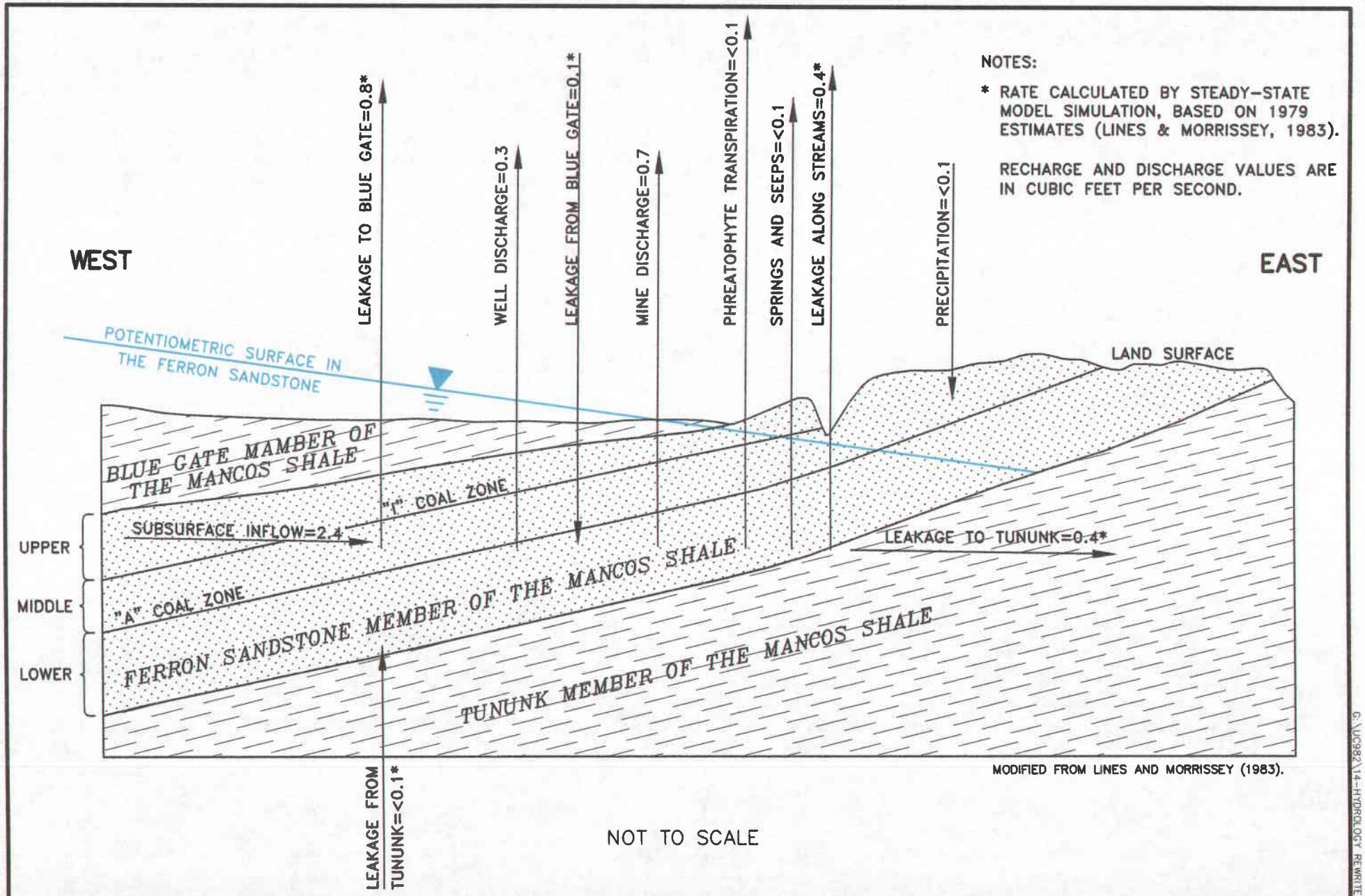

FIGURE VI-1. GENERALIZED HYDROSTRATIGRAPHIC CROSS SECTION OF THE PERMIT AND ADJACENT AREAS

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G:\UC982\14-HYDROLOGY REWRITE\FIG VI-1.DWG

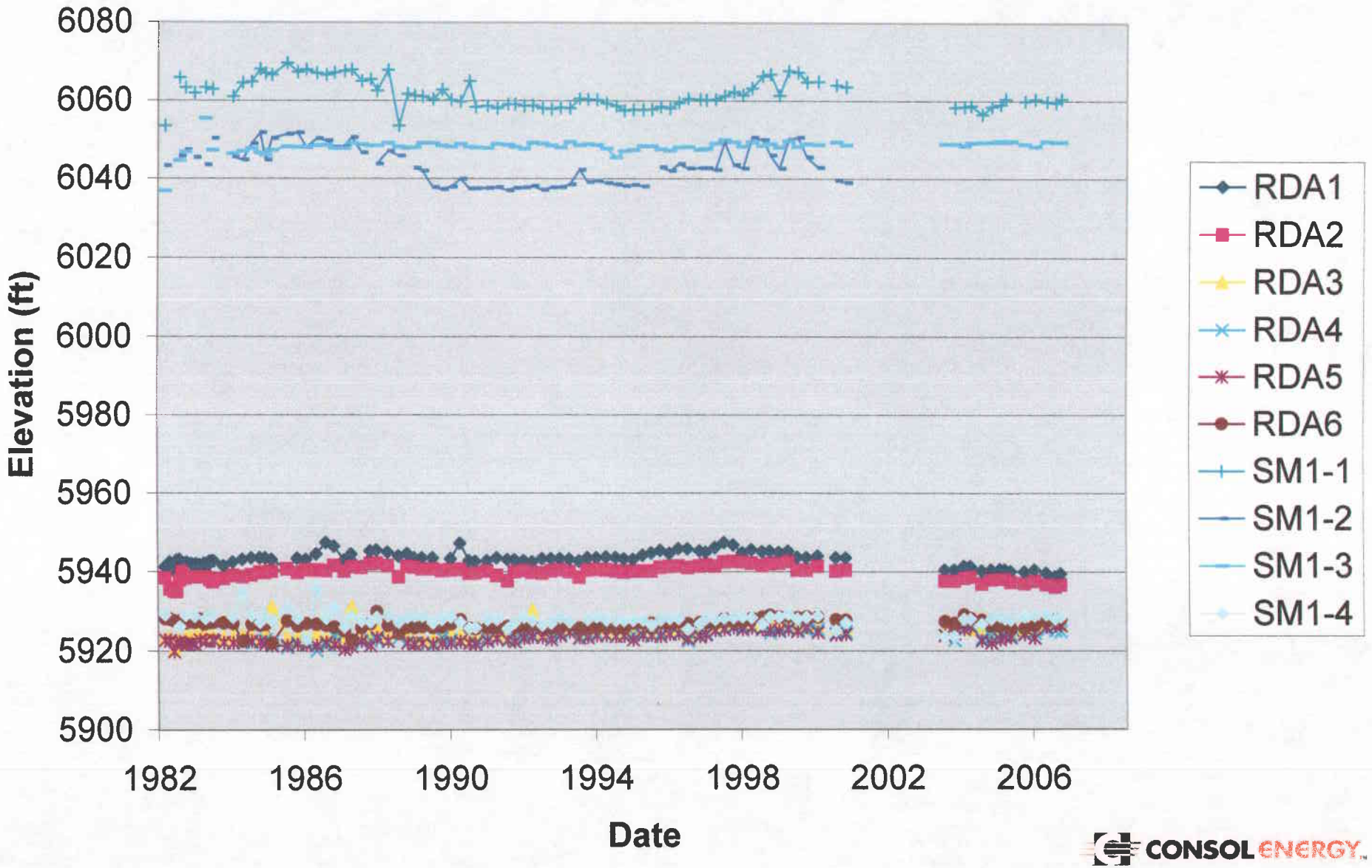


FIGURE VI-2. HYDROGRAPHS OF WELLS COMPLETED IN QUATERNARY DEPOSITS.

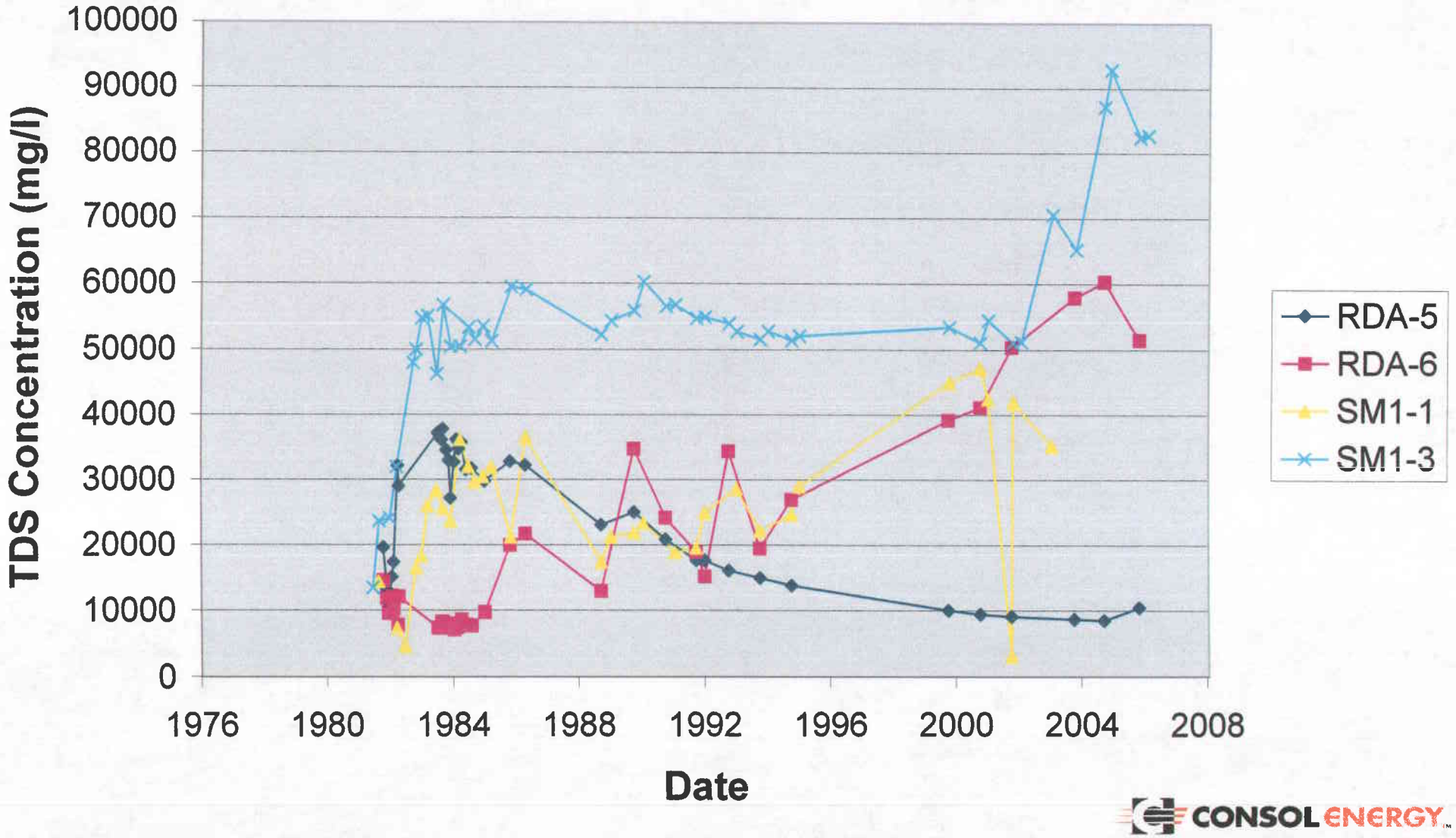


FIGURE VI-3. TDS CONCENTRATIONS OF SELECTED WELLS COMPLETED IN QUATERNARY DEPOSITS.

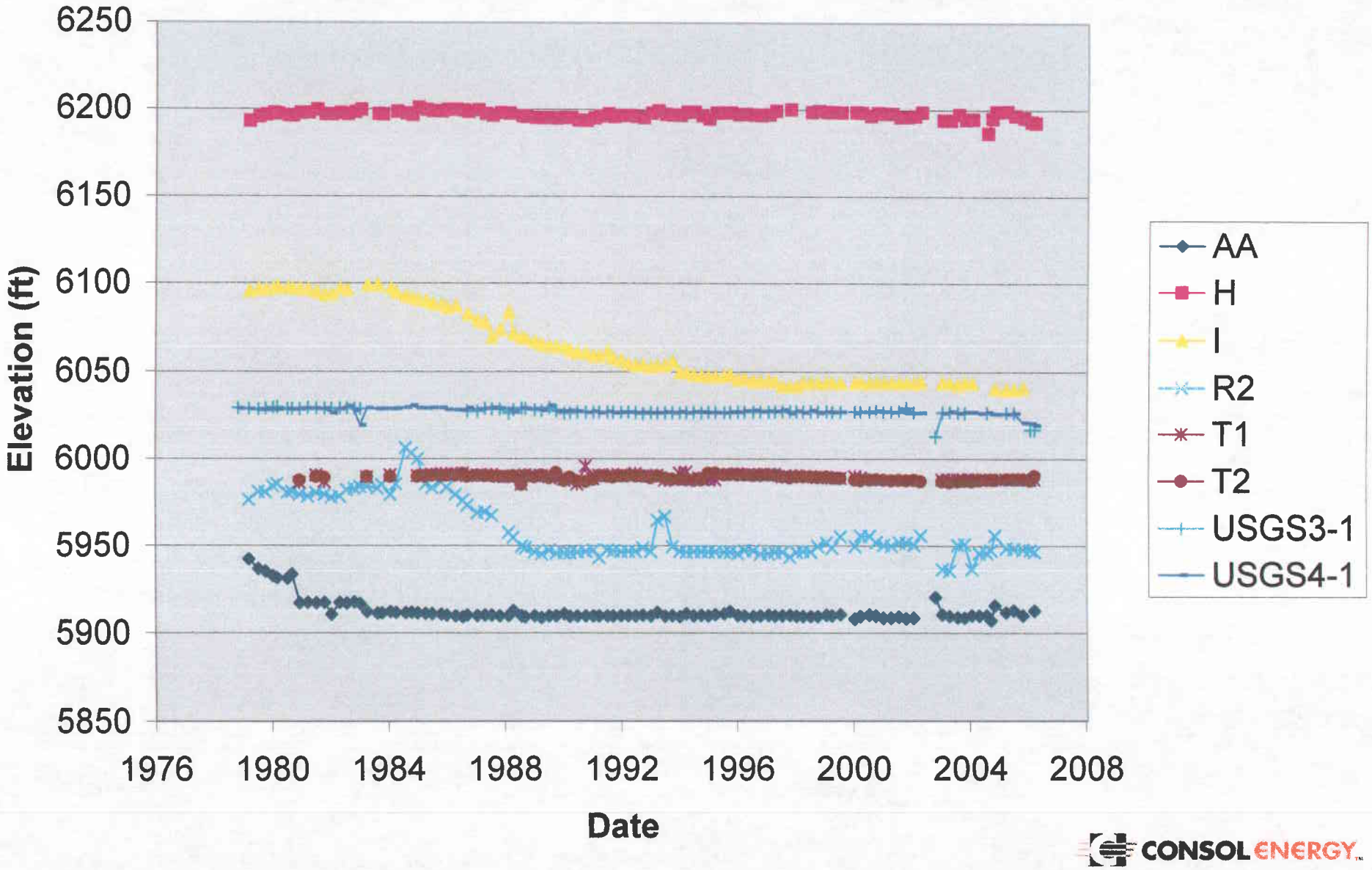


FIGURE VI-4. HYDROGRAPHS OF WELLS COMPLETED IN THE BLUE GATE MEMBER

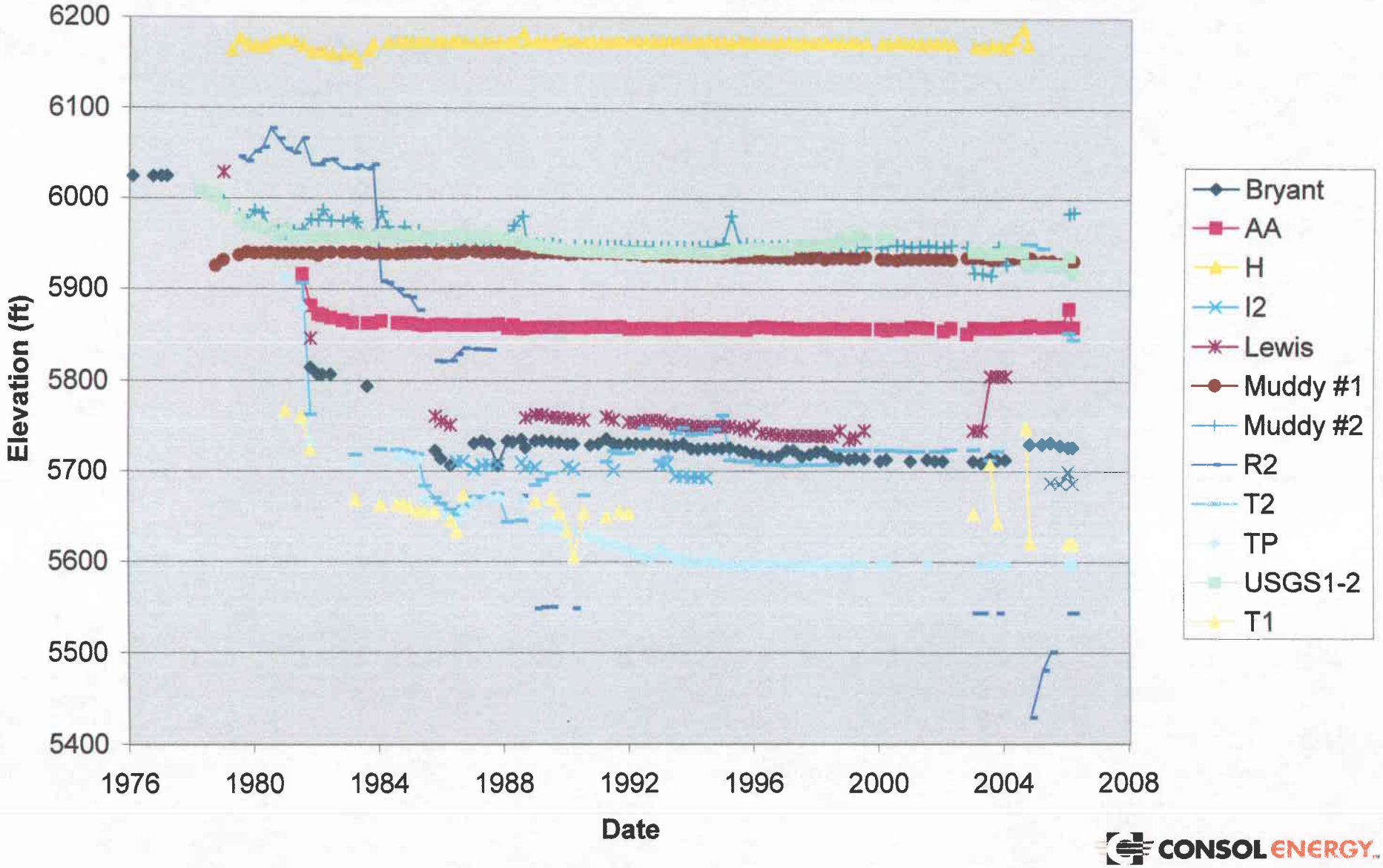


FIGURE VI-5. HYDROGRAPHS OF WELLS COMPLETED IN THE UPPER FERRON

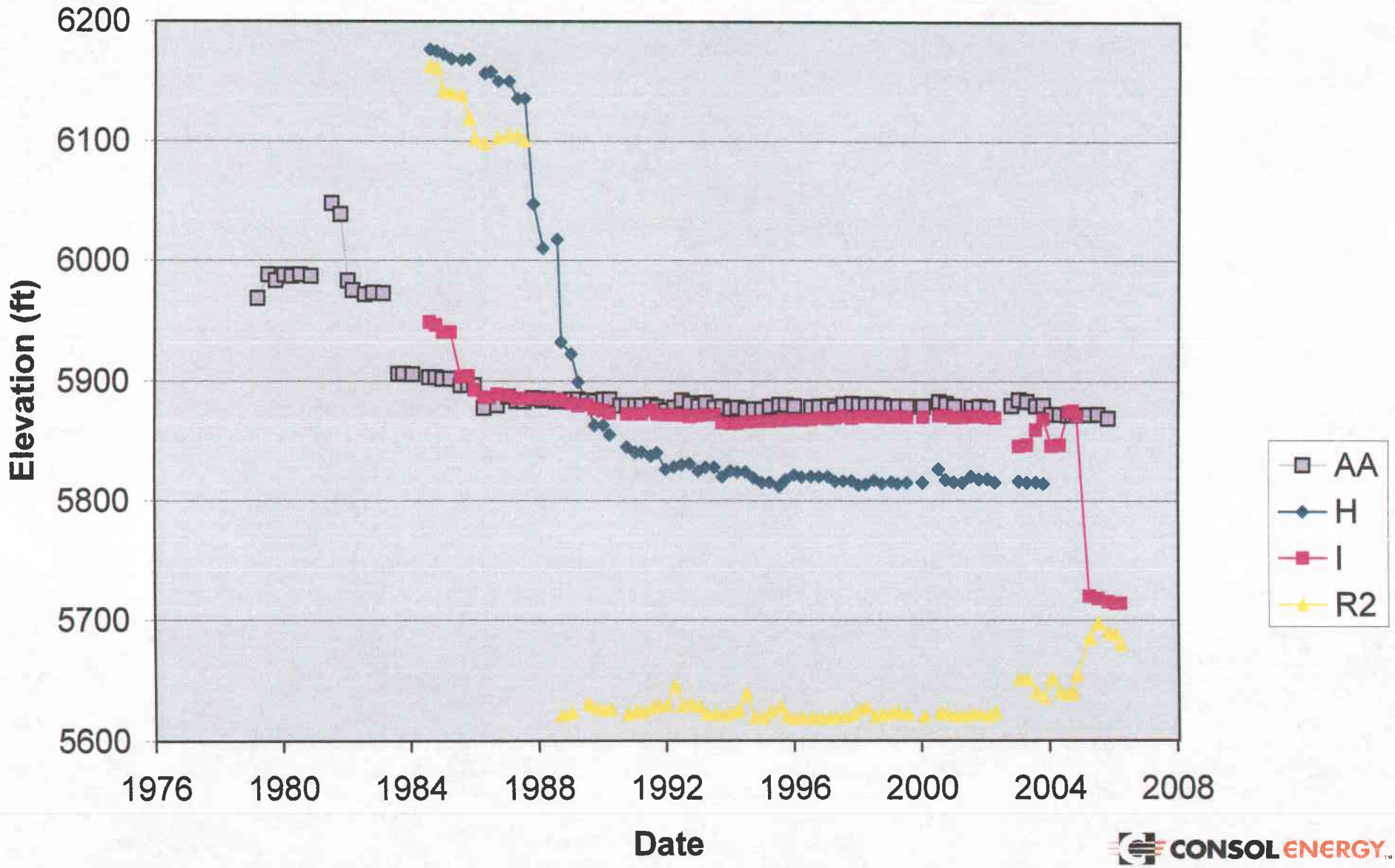


FIGURE VI-6. HYDROGRAPHS OF WELLS COMPLETED IN THE MIDDLE FERRON SANDSTONE.

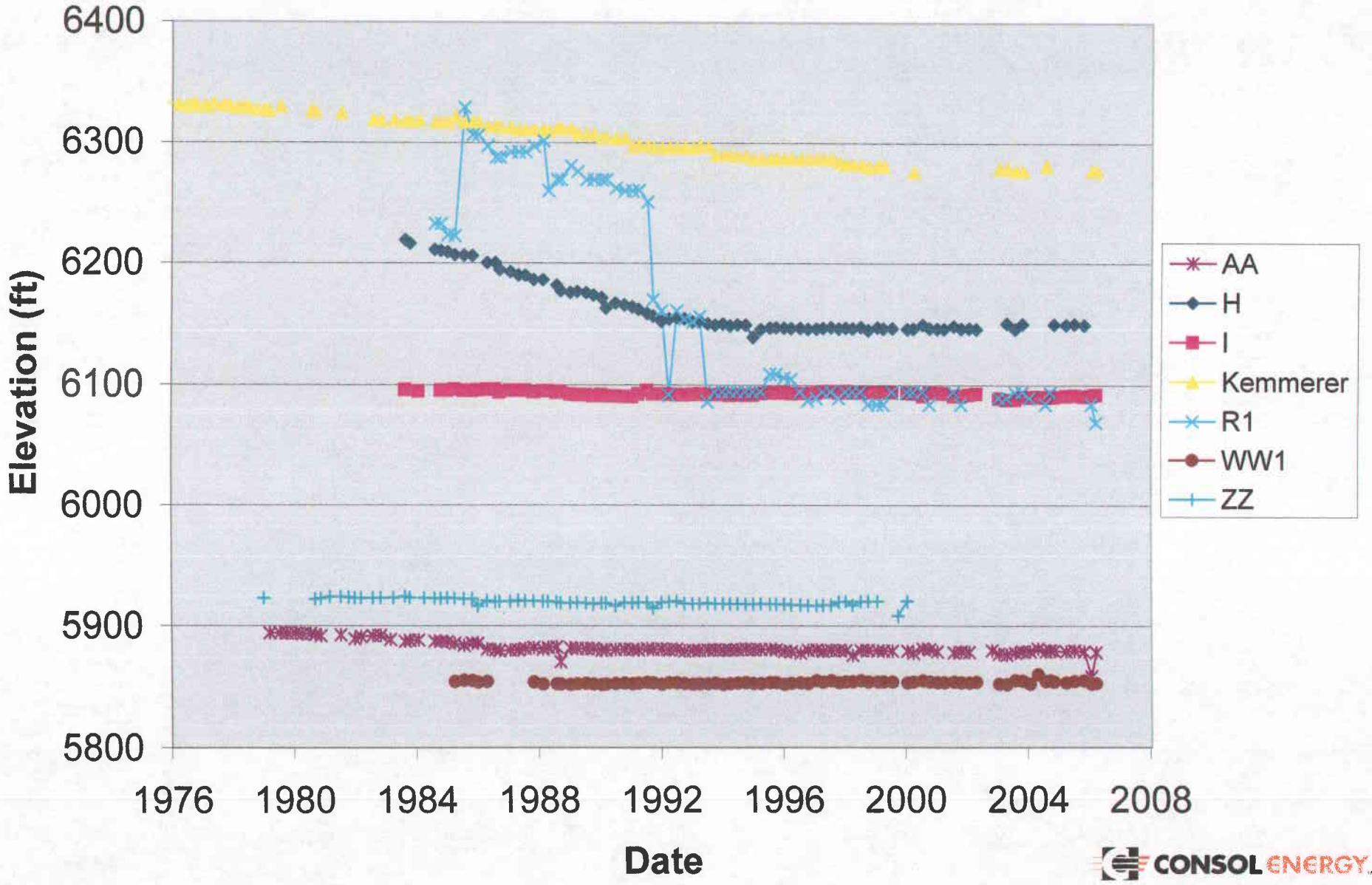
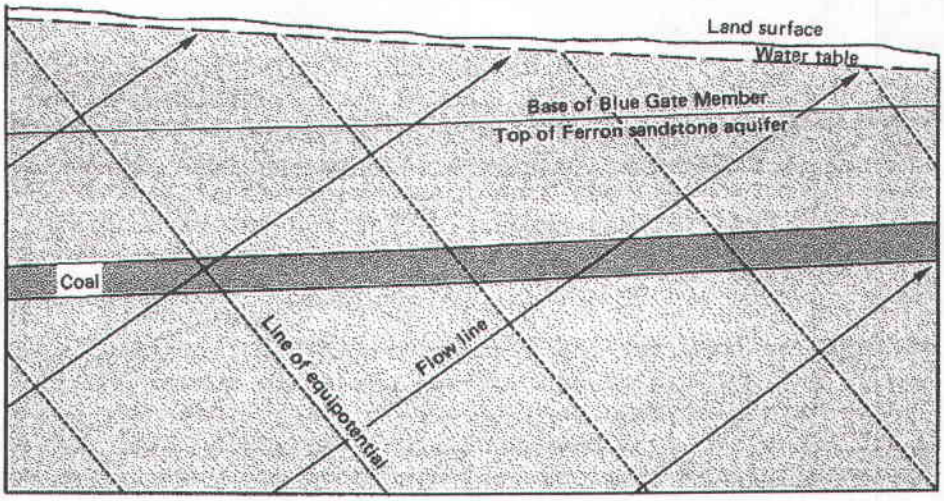
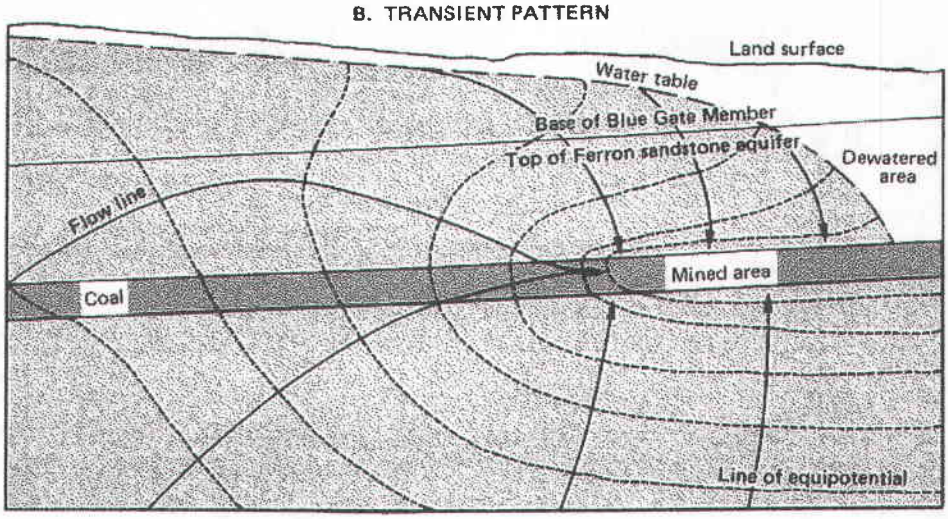


FIGURE VI-7. HYDROGRAPHS OF WELLS COMPLETED IN THE LOWER FERRON SANDSTONE.

A. PRE - MINING PATTERN



B. TRANSIENT PATTERN



C. STEADY - STATE PATTERN

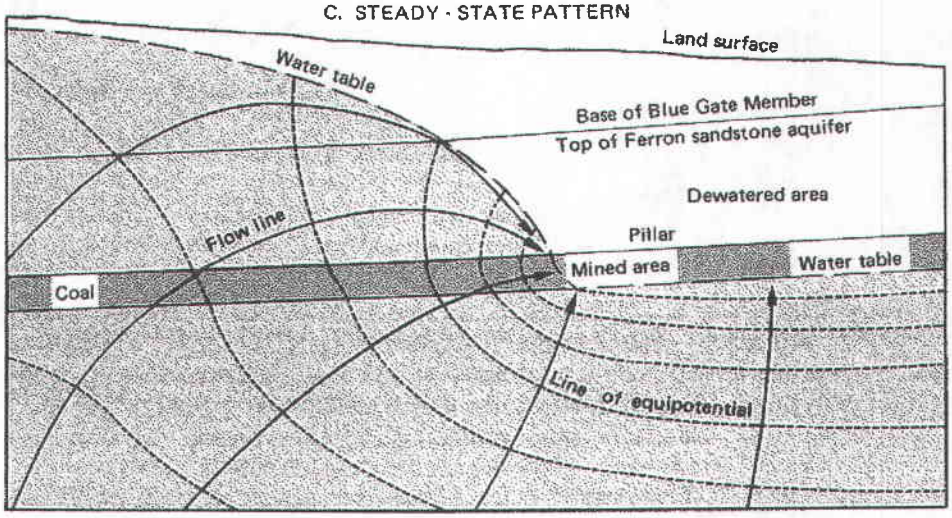


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FIGURE VI–8. APPROXIMATE PRE–MINING, TRANSIENT, AND STEADY–STATE GROUNDWATER FLOW AROUND THE EMERY MINE (FROM LINES, 1987).

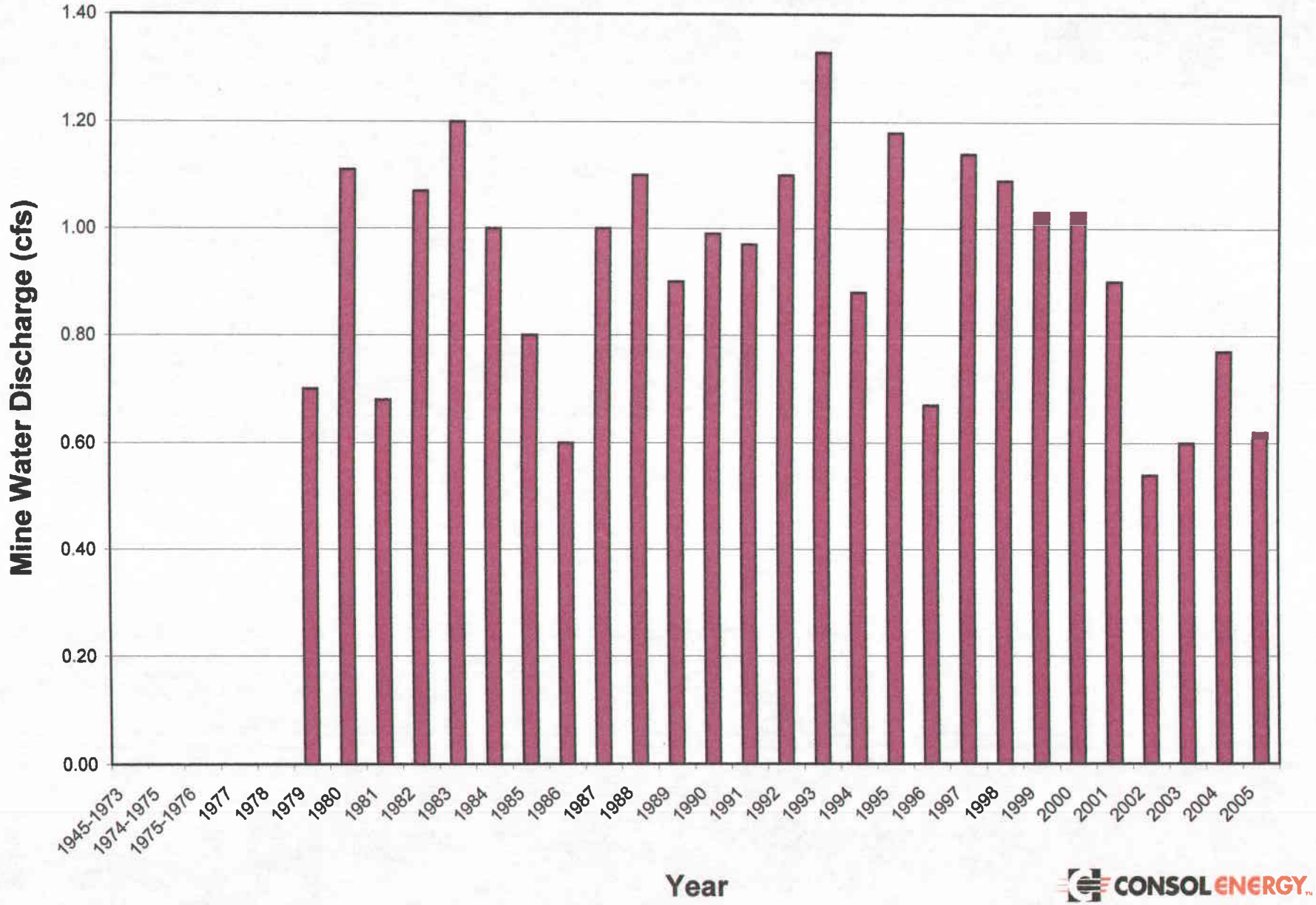


FIGURE VI-9. AVERAGE MINE WATER DISCHARGE BY YEAR.

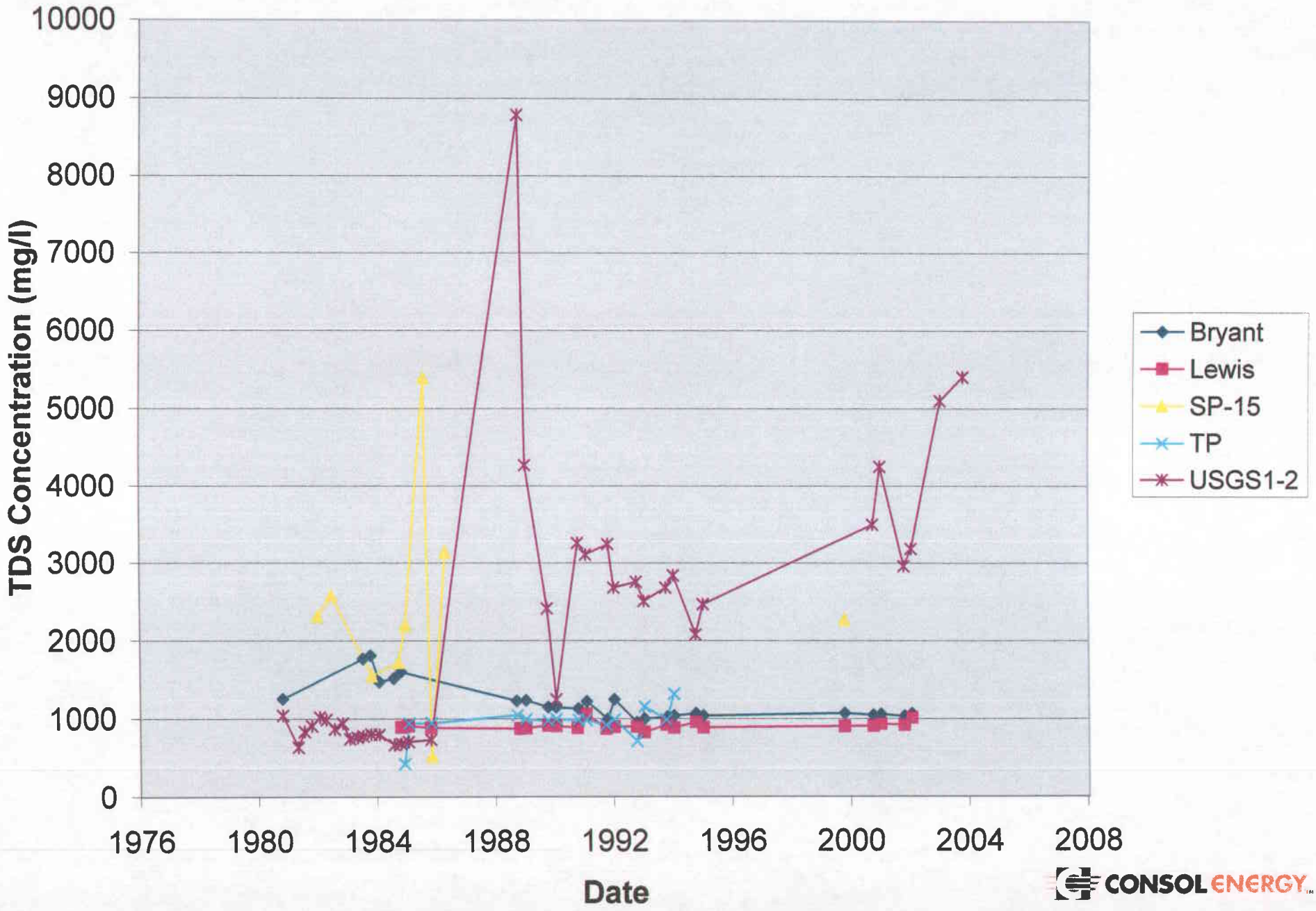
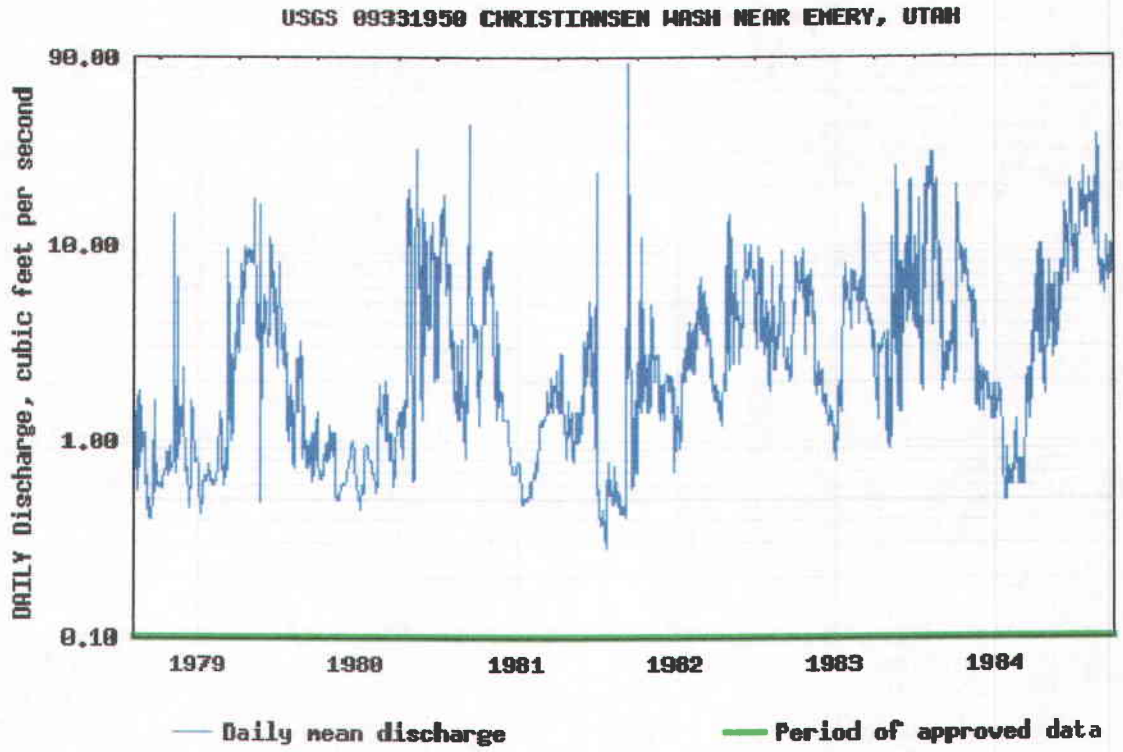


FIGURE VI-10. TDS CONCENTRATIONS OF WELLS COMPLETED IN THE UPPER FERRON SANDSTONE.



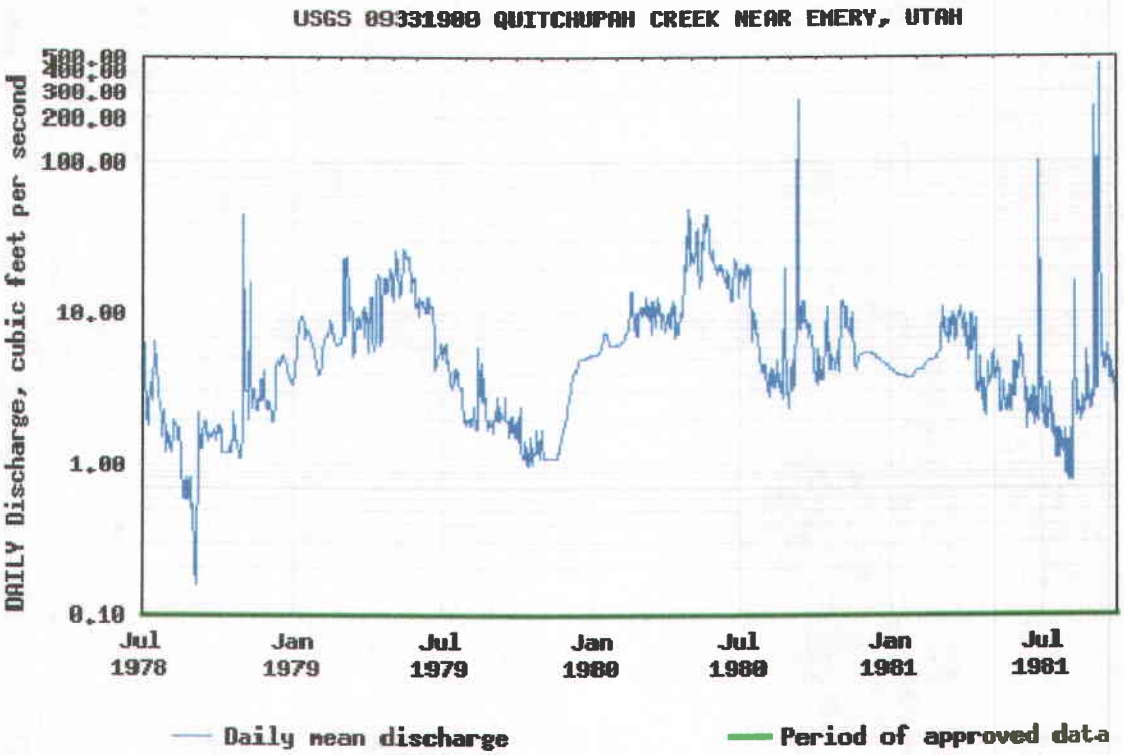


FIGURE VI-11. USGS DAILY DISCHARGE DATA.

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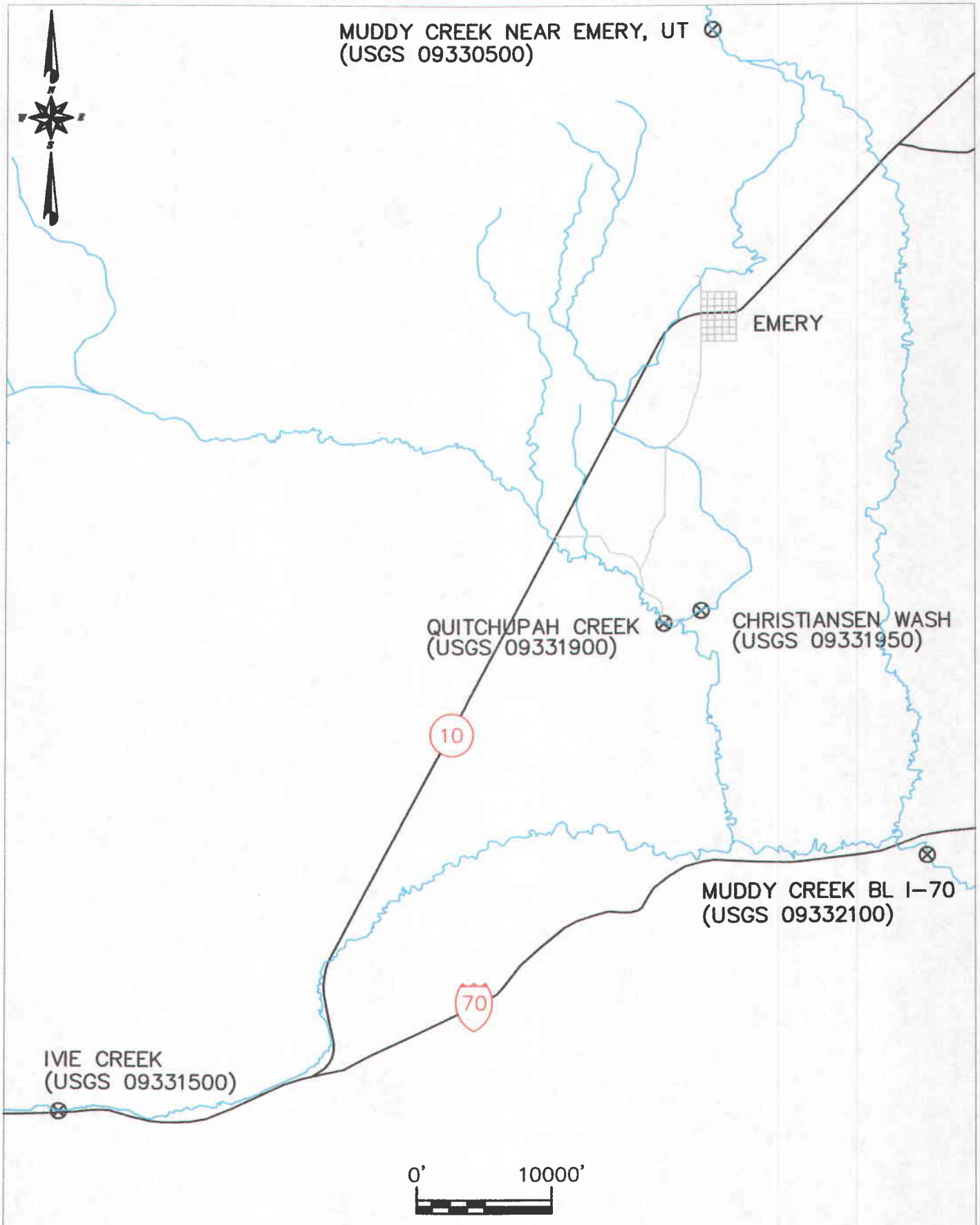

FIGURE VI-12. USGS STREAM GAGING STATIONS.

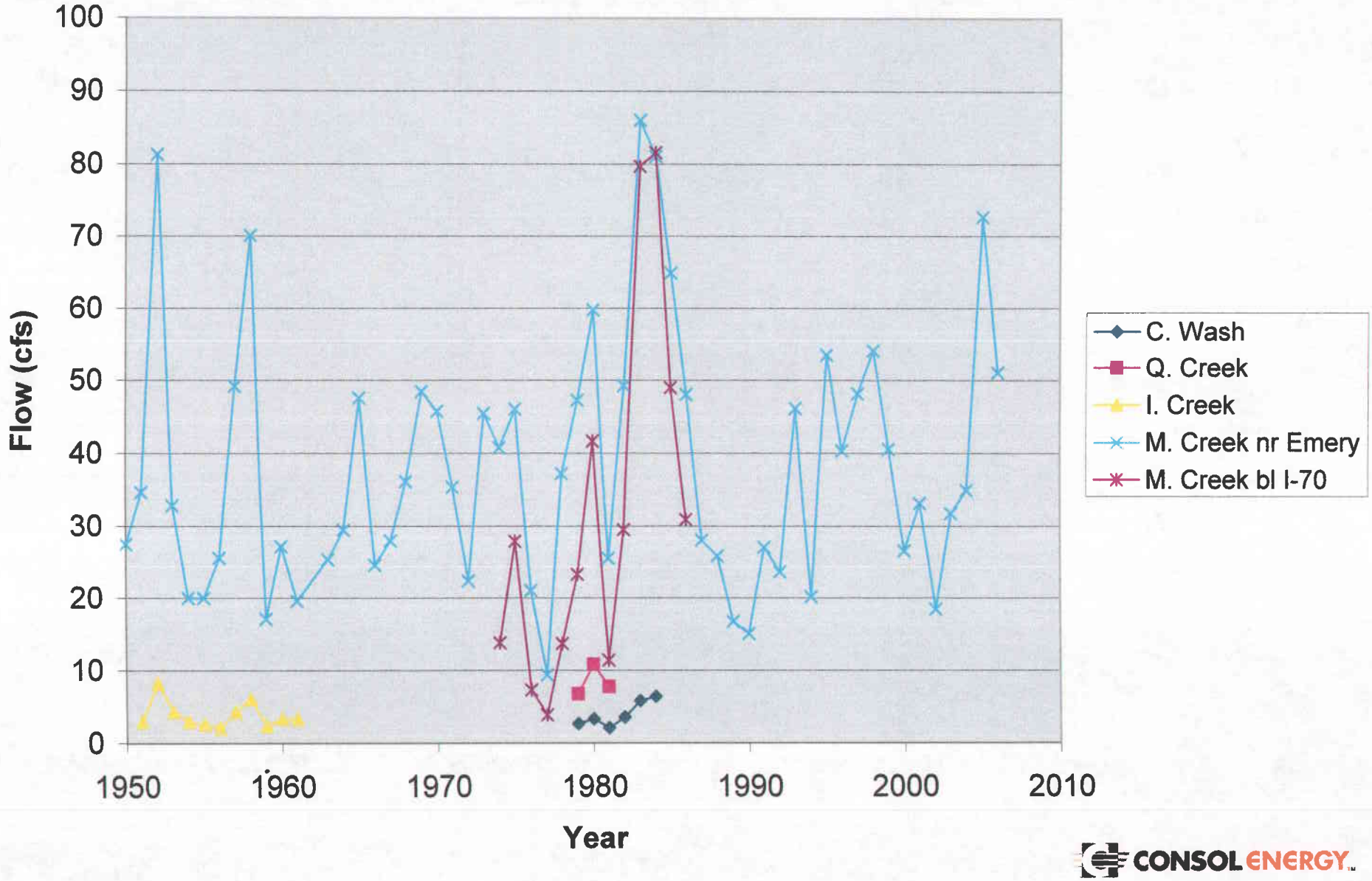

FIGURE VI-13. AVERAGE ANNUAL STREAMFLOW AT USGS GAGING STATIONS NEAR EMERY.

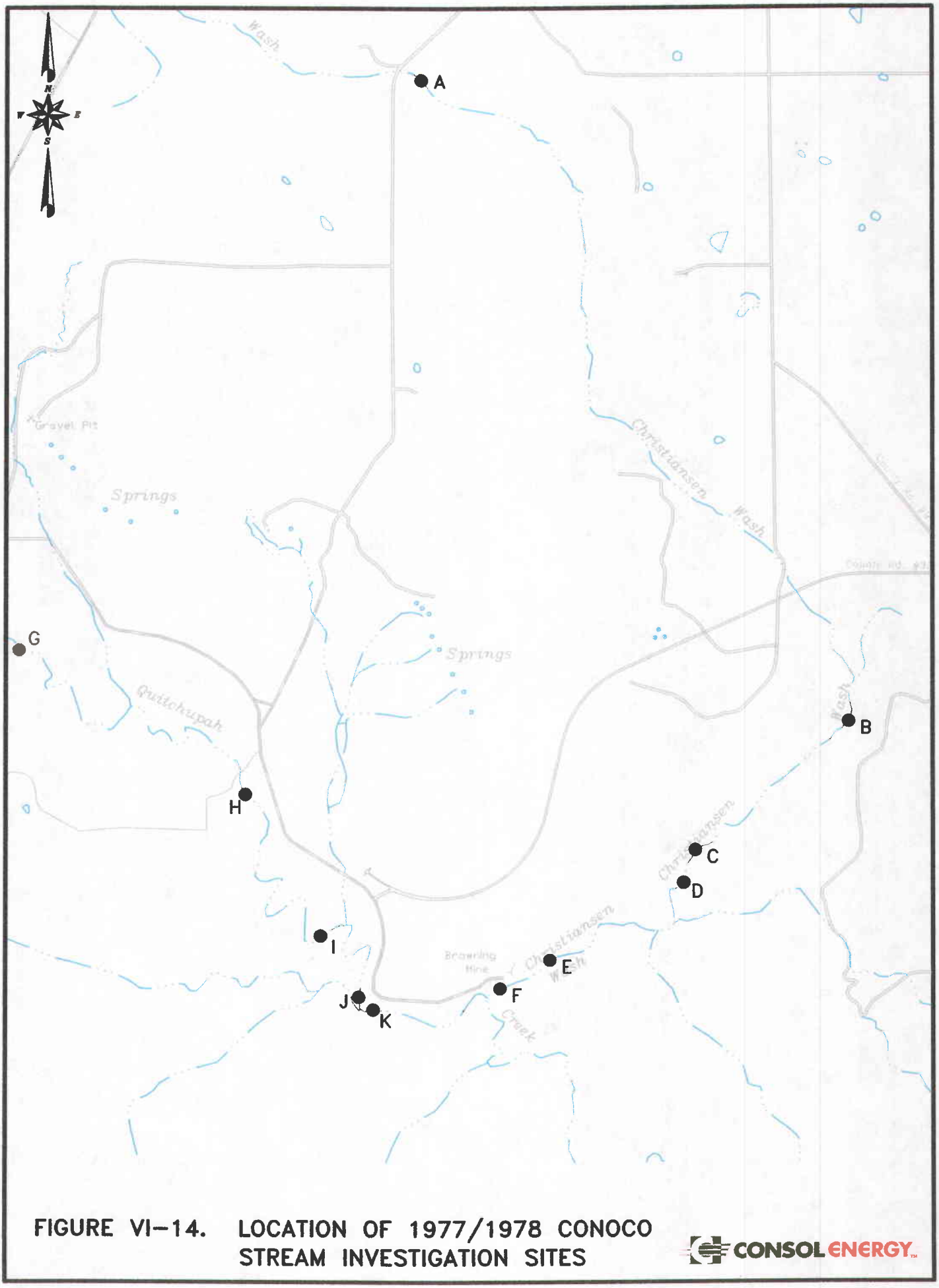

FIGURE VI–14. LOCATION OF 1977/1978 CONOCO STREAM INVESTIGATION SITES

CONSOL ENERGY

G:\UC982 - Hydrology rewrite\FIG-VI-14.dwg, 8/3/2007 12:18:19 PM

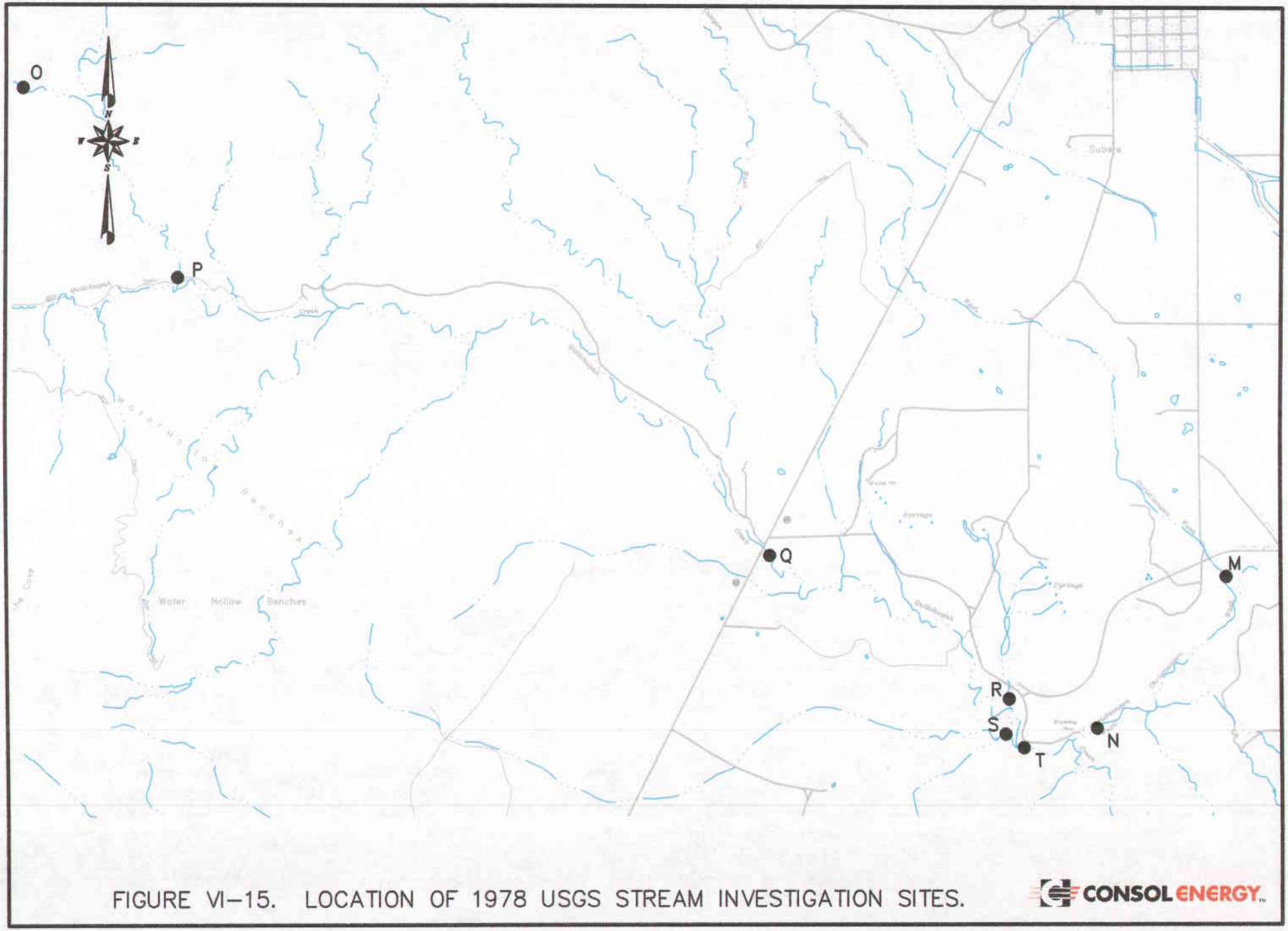

FIGURE VI–15. LOCATION OF 1978 USGS STREAM INVESTIGATION SITES.

CONSOL ENERGY

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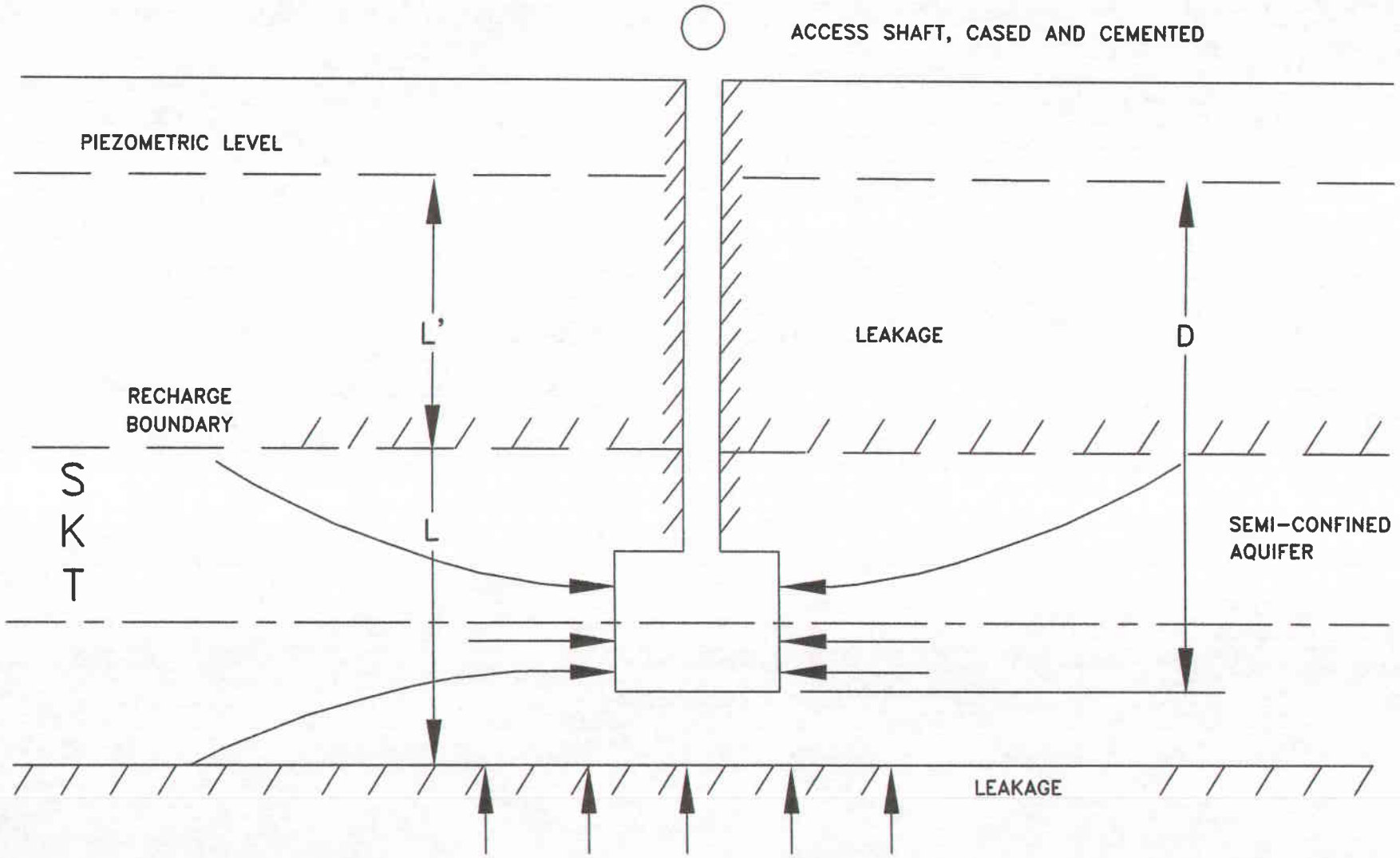

FIGURE VI-16. CONCEPTUAL HANTUSH FLOW MODEL (FROM SINGH AND ATKINS, 1985).

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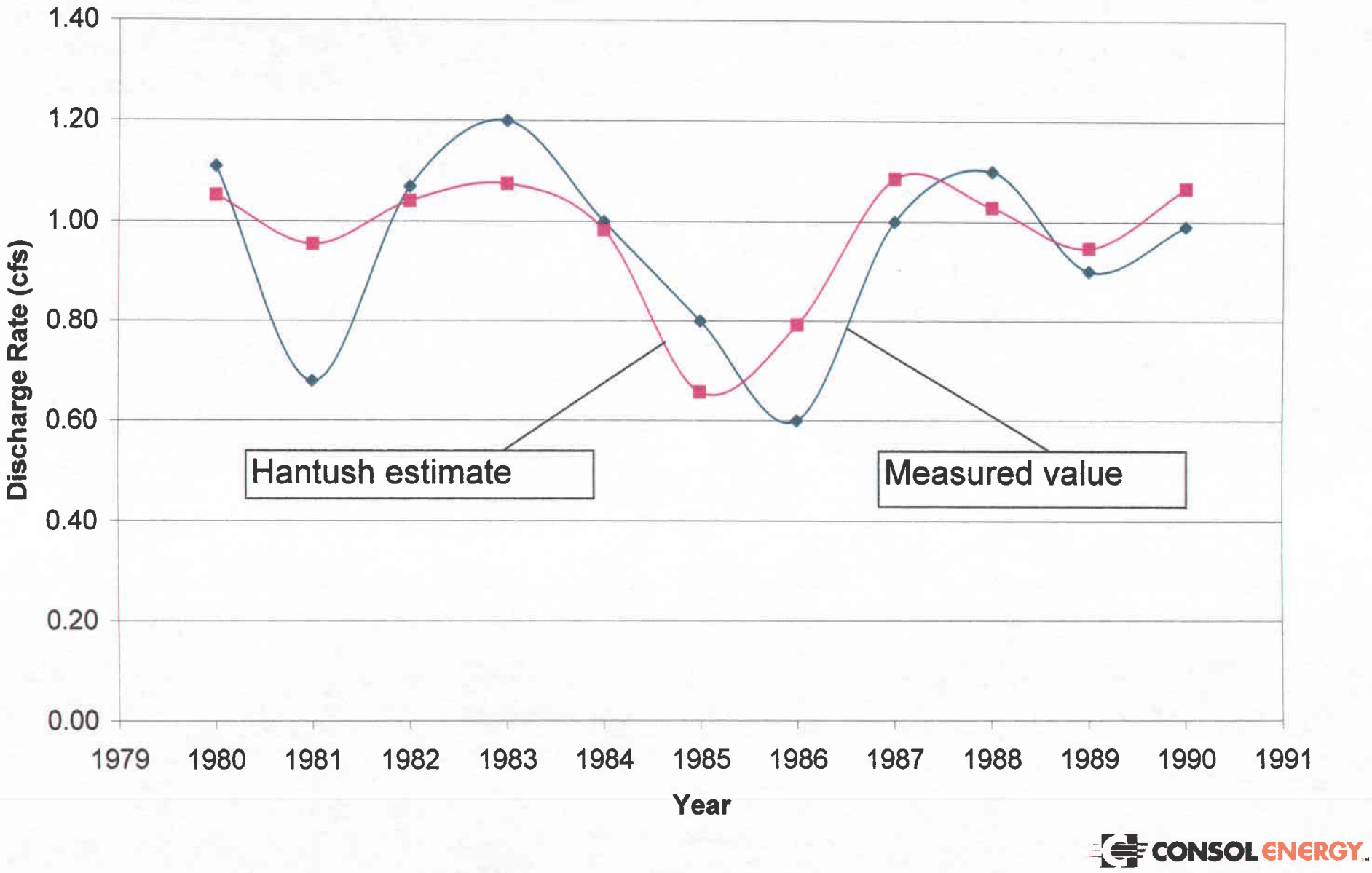
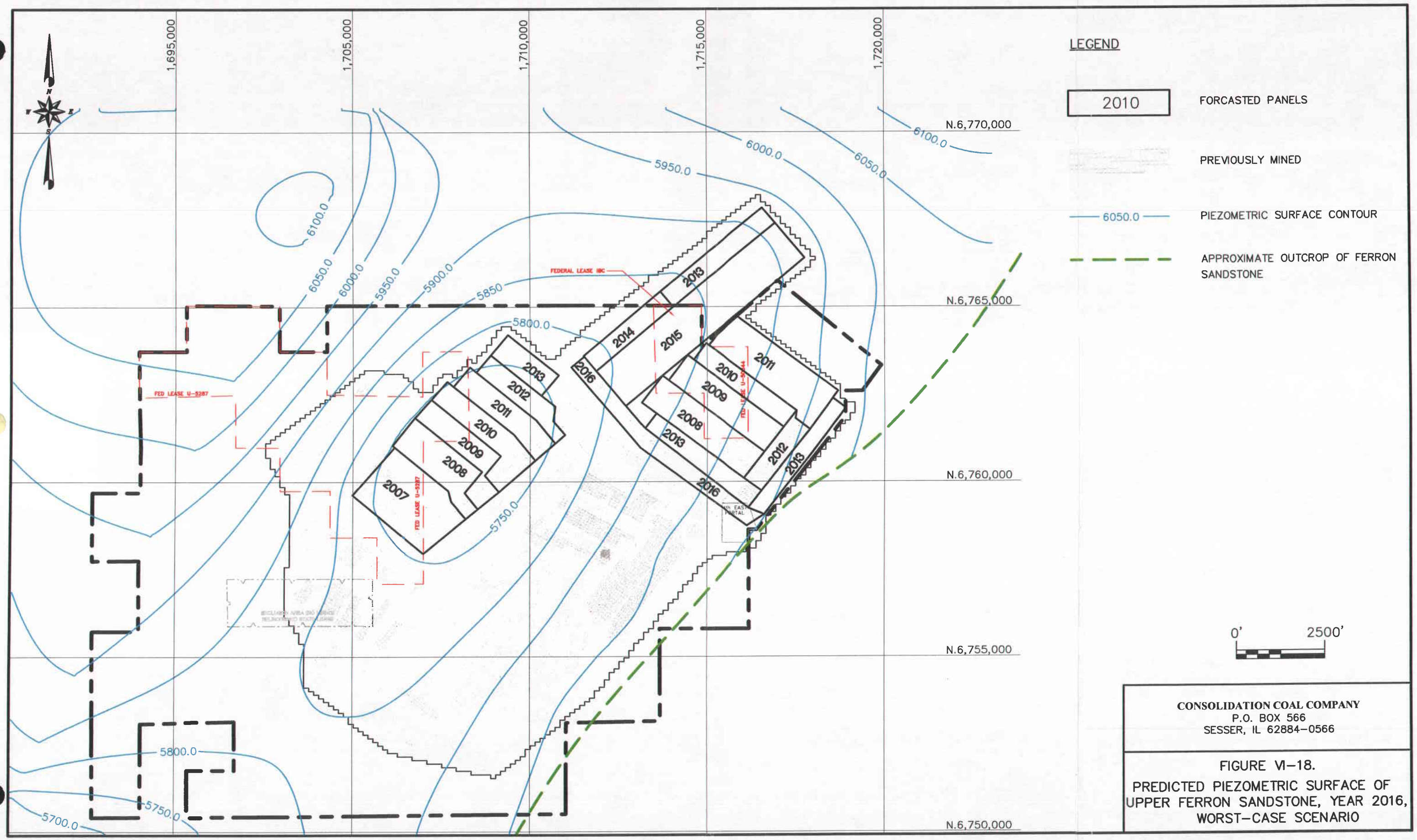


FIGURE VI-17. COMPARISON OF MEASURED AND CALCULATED MINE DISCHARGE DATA (HANTUSH EQUATION).



LEGEND

2010 — FORCASTED PANELS

PREVIOUSLY MINED

6050.0 — PIEZOMETRIC SURFACE CONTOUR

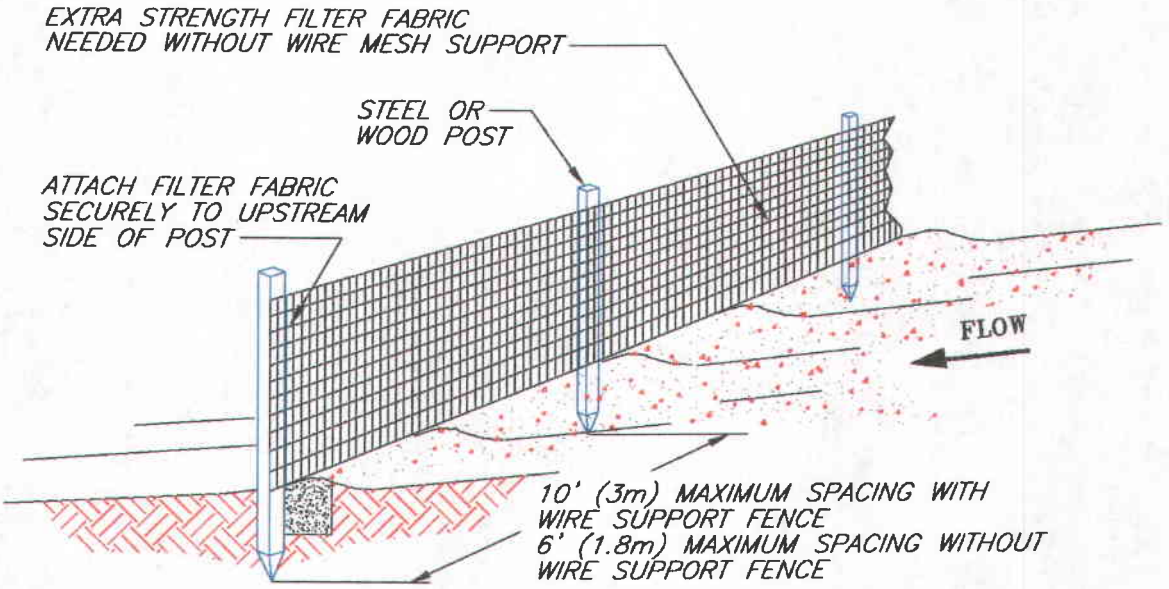
APPROXIMATE OUTCROP OF FERRON SANDSTONE

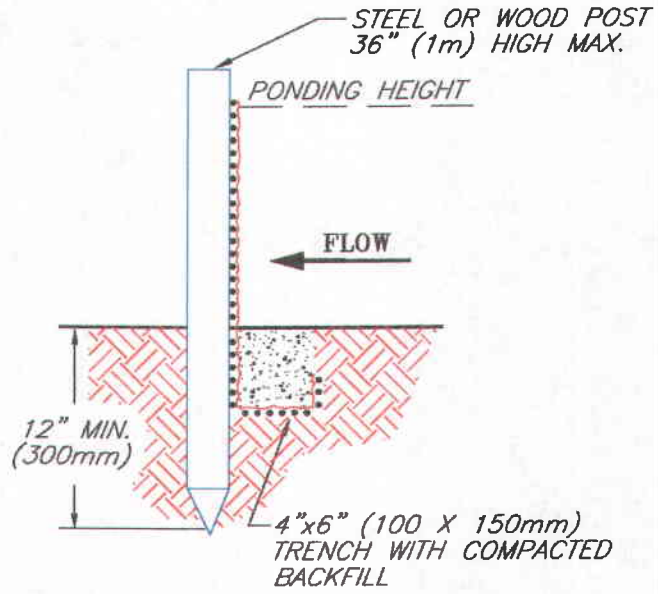
0' 2500'

CONSOLIDATION COAL COMPANY
P.O. BOX 566
SESSER, IL 62884-0566

FIGURE VI-18.

PREDICTED PIEZOMETRIC SURFACE OF UPPER FERRON SANDSTONE, YEAR 2016, WORST-CASE SCENARIO





TRENCH DETAIL

NOT TO SCALE

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FIGURE VI-19. SILT FENCE INSTALLATION DETAIL

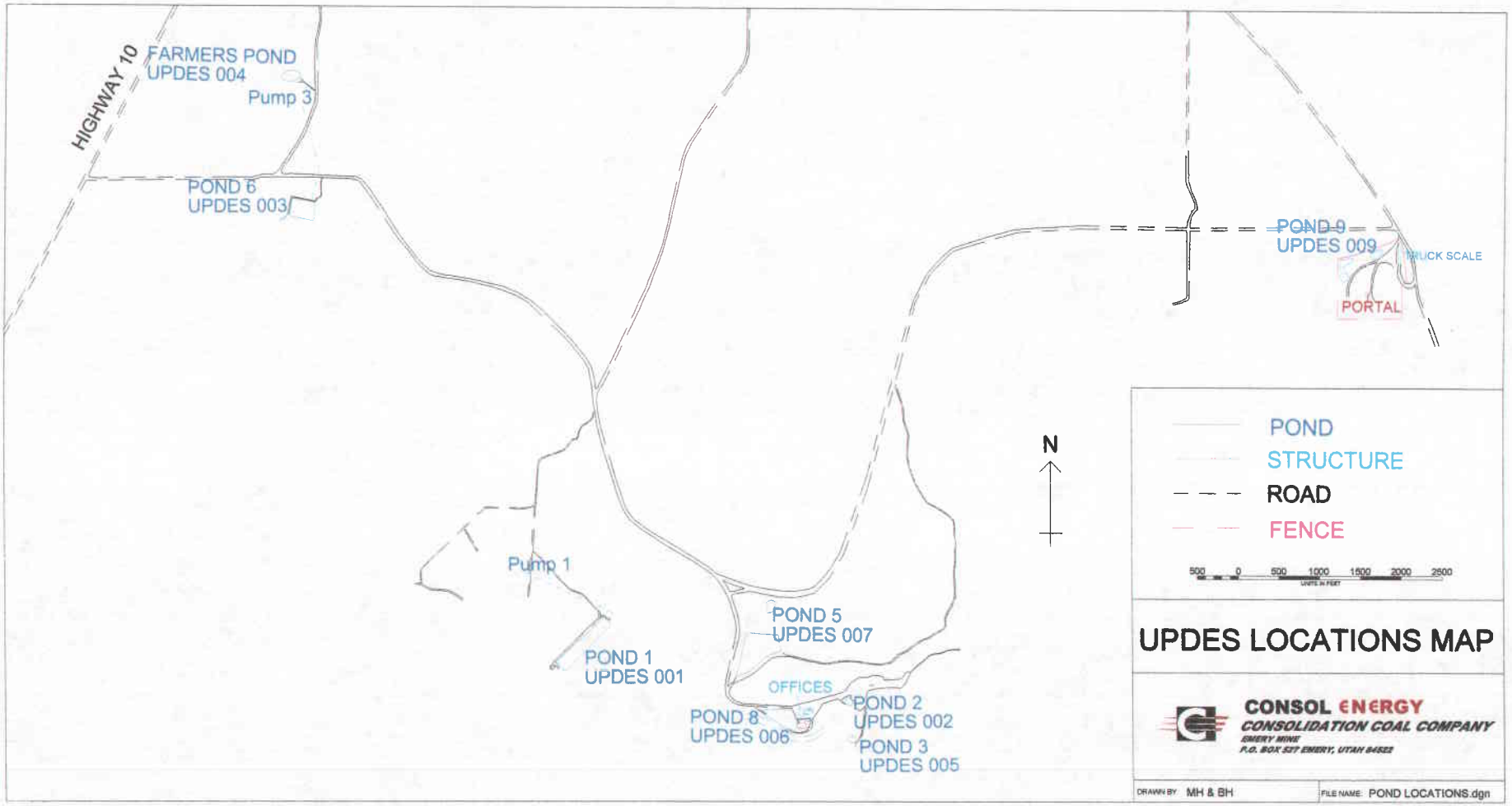

FIGURE VI-20. UPDES OUTFALL LOCATIONS

CHAPTER X

PART A: CULTURAL RESOURCES

Page

NARRATIVE FOR UMC 783.12(b), 783.24(i),(j)&(k), AND 784.17 1-3

APPENDICES

5.0 ARCHEOLOGICAL EVALUATION - AERC, 1980

5-1 ARCHEOLOGICAL EVALUATION - AERC, 1981

5-2 ARCHEOLOGICAL EVALUATION - M.S. BERRY, 1975

5-3 ARCHEOLOGICAL EVALUATION - AERC, 1988

5-4 ARCHEOLOGICAL SITE FORMS

5-5 ARCHEOLOGICAL EVALUATION - MONTGOMERY ARCHAEOLOGICAL CONSULTANTS, 4th EAST PORTAL SITE, MAY 2002

5-6 ARCHEOLOGICAL EVALUATION - MONTGOMERY ARCHAEOLOGICAL CONSULTANTS, 4th EAST POWERLINE, AUGUST 2002

5-7 ARCHEOLOGICAL EVALUATION - MONTGOMERY ARCHAEOLOGICAL CONSULTANTS, 4th EAST EXTENSION AREA, MARCH 2003

See: Chapter XII, Appendix XII-3, Cultural Resource Report (MOAC Report No. 05-177, May 23, 2005), for 1st North IBC Archeology

See: Chapter XIII, Apendix XIII-3, Class 3 Cultural Resource Report (MOAC Report 07-33, February 13, 2007) for First Federal Lease IBC Archeology.

5-8 ARCHEOLOGICAL EVALUATION- MONTGOMERY ARCHAEOLOGY CONSULTANTS, Zero North (MOAC 07-323) SEE CONFIDENTIAL BINDER

FIGURES

X-1 1st SOUTH FULL EXTRACTION ARCHEOLOGY SITES

PLATES

X.A-1 PERMIT AREA CULTURAL RESOURCES ..... MAP POCKET

Revised 10/2003
Revised 9/2005
Revised 5/2007
Revised 12/07

APPENDIX VI-1

Groundwater Monitoring –
Water Quality Data

Emery Water Quality Data - Qal

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-Sp. Cond. umhos/cm	Flow GPM	L-pH units	TSS mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	NO3 mg/l
Spring	SP-10	12/18/1995				0																					
Spring	SP-10	3/5/1997				0																					
Spring	SP-10	6/24/1997				30																					
Spring	SP-10	9/30/1997				44																					
Spring	SP-10	12/12/1997				0																					
Spring	SP-10	3/9/1998				0																					
Spring	SP-10	6/26/1998				30																					
Spring	SP-10	9/29/1998				65																					
Spring	SP-10	12/7/1998				0																					
Spring	SP-10	3/15/1999				0																					
Spring	SP-10	12/4/2000				0																					
Spring	SP-10	3/21/2001				0																					
Spring	SP-10	6/15/2001				7																					
Spring	SP-10	9/11/2001				3																					
Spring	SP-10	12/11/2001				0																					
Spring	SP-10	1/1/2002				0																					
Spring	SP-10	3/1/2002				0																					
Spring	SP-10	6/19/2002				0																					
Spring	SP-10	9/24/2002		7.5	1810																						
Spring	SP-10	6/30/2003				0																					
Spring	SP-10	9/18/2003				18																					
Spring	SP-10	12/26/2003				0																					
Spring	SP-10	3/29/2004				0																					
Spring	SP-10	6/22/2004				305																					
Spring	SP-10	9/25/2004				157																					
Spring	SP-10	12/28/2004				0																					
Spring	SP-10	3/31/2005				0																					
Spring	SP-10	5/23/2005				0																					
Spring	SP-10	7/19/2005				0																					
Spring	SP-10	11/22/2005				0																					
Spring	SP-10	3/9/2006				0																					
Spring	SP-10	6/27/2006				0																					
Spring	SP-10	9/29/2006				0																					
Spring	SP-10	11/28/2006				0																					
Spring	SP-11	12/18/1995				0																					
Spring	SP-11	3/5/1997				0																					
Spring	SP-11	6/24/1997				34																					
Spring	SP-11	9/30/1997				34																					
Spring	SP-11	12/12/1997				0																					
Spring	SP-11	3/9/1998				0																					
Spring	SP-11	6/26/1998				39																					
Spring	SP-11	9/29/1998				55																					
Spring	SP-11	12/7/1998				0																					
Spring	SP-11	3/21/2001				0.01																					
Spring	SP-11	6/15/2001				3.0																					
Spring	SP-11	9/11/2001				1.3																					
Spring	SP-11	12/11/2001				0																					
Spring	SP-11	1/1/2002				0																					
Spring	SP-11	3/1/2002				0																					
Spring	SP-11	6/19/2002				0																					
Spring	SP-11	6/30/2003				0																					
Spring	SP-11	9/18/2003				0																					
Spring	SP-11	12/26/2003				0																					
Spring	SP-11	3/29/2004				1.9																					
Spring	SP-11	6/22/2004				126																					
Spring	SP-11	9/25/2004				0																					
Spring	SP-11	12/28/2004				0																					
Spring	SP-11	3/31/2005				0																					
Spring	SP-11	5/23/2005				0																					
Spring	SP-11	7/19/2005				0																					
Spring	SP-11	11/22/2005				0																					
Spring	SP-11	3/9/2006				0																					
Spring	SP-11	6/27/2006				0																					
Spring	SP-11	9/29/2006				0																					
Spring	SP-11	11/28/2006				0																					
Spring	SP-13	12/18/1995				0																					
Spring	SP-13	3/5/1997				0																					

Emery Water Quality Data - Qal

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-Sp. Cond. umhos/cm	Flow GPM	L-pH units	TSS mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	NO3 mg/l
Spring	SP-13	6/24/1997				4.9																					
Spring	SP-13	9/30/1997				3.6																					
Spring	SP-13	12/12/1997				0																					
Spring	SP-13	3/9/1998				0																					
Spring	SP-13	6/26/1998				14																					
Spring	SP-13	9/29/1998				0.5																					
Spring	SP-13	12/7/1998				0																					
Spring	SP-13	3/21/2001				0																					
Spring	SP-13	6/15/2001				0.5																					
Spring	SP-13	9/11/2001				0																					
Spring	SP-13	12/11/2001				0																					
Spring	SP-13	1/1/2002				0																					
Spring	SP-13	3/1/2002				0																					
Spring	SP-13	6/19/2002				0																					
Spring	SP-13	6/30/2003				0																					
Spring	SP-13	9/18/2003				0																					
Spring	SP-13	12/26/2003				0																					
Spring	SP-13	3/29/2004				0																					
Spring	SP-13	6/22/2004				9																					
Spring	SP-13	9/20/2004				0																					
Spring	SP-13	12/28/2004				0																					
Spring	SP-13	3/31/2005				0																					
Spring	SP-13	5/23/2005				0																					
Spring	SP-13	7/19/2005				0																					
Spring	SP-13	11/22/2005				0																					
Spring	SP-13	3/9/2006				0																					
Spring	SP-13	6/27/2006				0																					
Spring	SP-13	9/29/2006				0																					
Spring	SP-13	11/28/2006				0																					
Spring	SP-14	12/18/1995				0																					
Spring	SP-14	3/5/1997				0																					
Spring	SP-14	6/24/1997				0.5																					
Spring	SP-14	9/30/1997				8.0																					
Spring	SP-14	12/12/1997				0																					
Spring	SP-14	3/9/1998				0																					
Spring	SP-14	6/26/1998				1.9																					
Spring	SP-14	9/29/1998				1.1																					
Spring	SP-14	12/7/1998				0																					
Spring	SP-14	3/21/2001				0																					
Spring	SP-14	6/15/2001				0.5																					
Spring	SP-14	9/11/2001				0																					
Spring	SP-14	12/11/2001				0																					
Spring	SP-14	1/1/2002				0																					
Spring	SP-14	3/1/2002				0																					
Spring	SP-14	6/19/2002				0																					
Spring	SP-14	6/30/2003				0																					
Spring	SP-14	9/18/2003				0																					
Spring	SP-14	12/26/2003				0																					
Spring	SP-14	3/29/2004				0																					
Spring	SP-14	6/22/2004				54																					
Spring	SP-14	9/20/2004				0																					
Spring	SP-14	12/28/2004				0																					
Spring	SP-14	3/31/2005				0																					
Spring	SP-14	5/23/2005				0																					
Spring	SP-14	7/19/2005				0																					
Spring	SP-14	11/22/2005				0																					
Spring	SP-14	3/9/2006				0																					
Spring	SP-14	6/27/2006				0																					
Spring	SP-14	9/29/2006				0																					
Spring	SP-14	11/28/2006				0																					
Well	RDA1	6/16/1982					7								0.5			0.57									
Well	RDA1	7/26/1982					7.2								0.46			0.53									
Well	RDA1	8/24/1982					7								0.5			0.6									
Well	RDA1	9/21/1982					7.1								0.63			0.57									
Well	RDA1	10/13/1982					7								0.6			0.53									
Well	RDA1	11/29/1982					7.1								0.57			0.49									
Well	RDA1	3/7/1984					7.2								<0.05			0.26									

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SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-Sp. Cond. umhos/cm	Flow GPM	L-pH units	TSS mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	NO3 mg/l
Well	RDA1	4/18/1984					7.1								0.07			0.35									
Well	RDA1	5/3/1984					7.2		<0.05						<0.05			0.2					581		<1.	139	0.09
Well	RDA1	6/12/1984					7.85										<50.	0.31									
Well	RDA1	7/12/1984					7.4								<0.05			0.15									
Well	RDA1	8/2/1984					7								<0.05			0.21									
Well	RDA1	9/11/1984					7								<0.05			0.14									
Well	RDA1	10/9/1984					7.8								<0.05			0.29									
Well	RDA1	11/5/1984					7.3								<0.05			<0.01									
Well	RDA1	12/6/1984					7.2								<0.05			0.58									
Well	RDA1	1/29/1985					7.5								<0.05			0.4									
Well	RDA1	4/3/1985					7.15								<0.05			0.23									
Well	RDA1	9/3/1985					7.1								<0.05			0.3									
Well	RDA1	12/16/1985					6.7								0.26			0.56									
Well	RDA1	6/25/1986					7.4		<0.05						<0.05			0.21					478		<1.	131	0.02
Well	RDA1	12/18/1986					7.27								<0.05			0.6									
Well	RDA1	5/19/1989											404		<0.02		228	0.39	12		754		522		0	198	
Well	RDA1	6/4/1990							0.15	0.008	0.53	<0.01	411	<0.01	0.03	0.03	168	0.34	10	<0.001	468	0.13	544		0	110	0.61
Well	RDA1	6/6/1991											378		0.44		164	3.04	9		443		526		0	106	
Well	RDA1	5/26/1992											337		<0.02		135	0.23	11		424		538		0	100	
Well	RDA1	9/2/1992											320		<0.02		137	0.13	10		409		562		0	109	
Well	RDA1	6/7/1993											434		0.52		168	1.86	14		517		470		0	103	
Well	RDA1	6/6/1994											405		0.24		160	0.62	13		481		566		0	118	
Well	RDA1	6/6/1995	12.9	7.9	3340								360		<0.1		140	0.4	11		410		710		<5.	96	
Well	RDA1	6/5/2000	13	7.2	3750								368		<0.1		143	0.3	10		364		668		<5.	80	
Well	RDA1	6/8/2001	12.2	7	3640								344		<0.1		132	0.2	10		354		641		<5.	78	
Well	RDA1	6/5/2002	12.4	7.2	4160								348		<0.1		149	0.22	10		422		645		<5.	81	
Well	RDA1	6/2/2004	11.4	7.3	3910								394		< .03		140	0.048	10.4		382		542		< 5.	86	
Well	RDA1	5/12/2005	12.6	7.4	3970								380		< .03		148	0.105	11.2		403					80	
Well	RDA1	6/28/2006	12.9	6.9	3780								370		< .03		145	0.561	9.77		346		493		< 5.	76	
Well	RDA2	6/16/1982					11.8								0.46												
Well	RDA2	7/28/1982					11.5								0.53			0.09									
Well	RDA2	8/24/1982					11.6								0.51			0.1									
Well	RDA2	9/21/1982					11								0.57			0.09									
Well	RDA2	10/13/1982					11.3								0.49			0.1									
Well	RDA2	11/29/1982													0.5			0.12									
Well	RDA2	12/9/1982					9.8								0.53			0.1									
Well	RDA2	3/7/1984					7.5								<0.05			0.08									
Well	RDA2	4/18/1984					7.4								0.06			0.02									
Well	RDA2	5/3/1984					7.3		<0.05						<0.05			<0.01					406		<1.	136	0.24
Well	RDA2	6/12/1984					8.1								<0.05			0.02									
Well	RDA2	7/12/1984					7.7								<0.05			0.03									
Well	RDA2	8/2/1984					7.5								<0.05			0.08									
Well	RDA2	9/11/1984					7.4								<0.05			0.05									
Well	RDA2	10/9/1984					7.75								<0.05			0.2									
Well	RDA2	11/5/1984					7.55								<0.05			0.04									
Well	RDA2	12/6/1984					7.45								<0.05			0.31									
Well	RDA2	1/29/1985					7.65								<0.05			0.06									
Well	RDA2	4/3/1985					7.5								<0.05			0.04									
Well	RDA2	9/3/1985					7.3								<0.05			0.17									
Well	RDA2	6/25/1986					7.4		<0.05						<0.05			0.02					412		<1.	152	0.03
Well	RDA2	12/18/1986					7.49								0.05			0.22									
Well	RDA2	5/19/1989											430		<0.02		175	<0.01	12		588		506		0	165	
Well	RDA2	6/4/1990							0.33	0.005	0.57	<0.01	454	<0.01	0.03	<0.02	179	<0.01	9	<0.001	576	<0.01	500		0	142	0.36
Well	RDA2	6/6/1991											498		10.2		193	2.03	10		554		516		0	140	
Well	RDA2	5/26/1992											383		<0.02		150	<0.01	10		700		522		0	118	
Well	RDA2	9/2/1992											384		<0.02		150	0.41	10		519		828		0	144	
Well	RDA2	6/7/1993											450		0.35		170	0.69	12		618		462		0	150	
Well	RDA2	6/6/1994											412		0.08		159	0.07	11		591		540		0	132	
Well	RDA2	6/6/1995	12.2	7.3	2820								340		<0.1		150	<0.1	9		530		770		<5.	128	
Well	RDA2	6/5/2000	13.4	7.4	5400								439		<0.1		180	<0.1	10		631		712		<5.	138	
Well	RDA2	6/8/2001	12.6	7.2	5600								421		<0.1		170	<0.1	10		649		691		<5.	147	
Well	RDA2	6/5/2002	11.8	6.9	4690								403		<0.1		166	<0.05	11		559		691		<5.	125	
Well	RDA2	6/2/2004	12.4	7.3	4820								445		< .03		166	0.011	11.4		570		554		< 5.	122	
Well	RDA2	5/13/2005	11.6	7.6	4850								446		< .03		176	0.017	11.4		622		556		< 5.	103	
Well	RDA2	6/28/2006	12.3	7.2	4610								428		< .03		170	0.042	10.8		517		542		< 5.	122	
Well	RDA3	6/15/1982					7.1								1.14			0.18									
Well	RDA3	7/26/1982					7.3								1.06			0.16									

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SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-Sp. Cond. umhos/cm	Flow GPM	L-pH units	TSS mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	NO3 mg/l
Well	RDA3	8/13/1982					6.9								1.1			0.19									
Well	RDA3	9/21/1982					7.6								1			0.2									
Well	RDA3	10/13/1982					7.1								1.96			0.17									
Well	RDA3	11/29/1982					7.6								1.62			0.15									
Well	RDA3	12/9/1982					7.9								1.6			0.17									
Well	RDA3	3/7/1984					7.3								<0.05			0.46									
Well	RDA3	4/18/1984					7.1								0.06			0.42									
Well	RDA3	5/3/1984					7		0.14						<0.05			0.45					585		<1.	94	0.03
Well	RDA3	6/12/1984					8								<0.05			0.28									
Well	RDA3	7/12/1984					7.5								<0.05			0.11									
Well	RDA3	8/2/1984					7.2								<0.05			0.34									
Well	RDA3	9/11/1984					7.5								<0.05			0.13									
Well	RDA3	10/9/1984					7.4								<0.05			0.32									
Well	RDA3	11/5/1984					7.5								0.07			0.03									
Well	RDA3	12/6/1984					7.4								0.06			0.48									
Well	RDA3	1/29/1985					7.65								<0.05			0.4									
Well	RDA3	4/3/1985					7.4								<0.05			0.25									
Well	RDA3	9/3/1985					7.2								<0.05			0.14									
Well	RDA3	6/25/1986					7.5		<0.05						<0.05								462		<1.	103	0.02
Well	RDA3	12/18/1986					7.32								<0.05			0.17									
Well	RDA3	5/19/1989											398		<0.02		1300	0.56	16		4474		980		0	1400	
Well	RDA3	6/4/1990							0.49	0.002	1.7	<0.01	493	<0.01	0.31	<0.02	554	0.51	7	<0.001	1410	<0.01	686		0	96	
Well	RDA3	6/5/1991											536		17.3		390	1.18	7		823		584		0	330	
Well	RDA3	5/26/1992											295		<0.02		211	0.41	6		620		518		0	77	
Well	RDA3	9/2/1992											362		0.16		260	0.35	6		438		644		0	93	
Well	RDA3	6/7/1993											515		16.6		276	1.03	6		376		866		0	88	
Well	RDA3	6/6/1994											295		0.49		254	0.2	6		486		615		0	707	
Well	RDA3	6/6/1995	13.1	7.1	7110								229		<0.1		1100	0.3	9		3800		1310		<5.	960	
Well	RDA3	6/5/2000	16	7.1	22700								376		<0.1		1588	0.2	11		5215		1567		<5.	1130	
Well	RDA3	6/8/2001	13.1	7.5	25200								374		<0.1		1605	0.3	10		5475		1481		<5.	1437	
Well	RDA3	6/5/2002	15.8	7	24200								350		<0.1		1539	0.56	10		5115		1637		<5.	1897	
Well	RDA3	6/2/2004	11.6	7.4	5620								359		0.08		352	0.251	5.42		683		620		< 5.	296	
Well	RDA3	5/13/2005	13.1	7.6	14250								398		< .03		694	0.892	9.29		1970					444	
Well	RDA3	6/28/2006	13.1	7.5	5250								387		< .03		336	0.665	7.25		532		710		< 5.	238	
Well	RDA4	6/15/1982					7.3								0.73			0.19									
Well	RDA4	7/26/1982					7.3								0.81			0.18									
Well	RDA4	8/13/1982					7.2								0.8			0.2									
Well	RDA4	9/21/1982					7.2								0.8			0.19									
Well	RDA4	10/13/1982					7.2								0.85			0.15									
Well	RDA4	11/29/1982					7.4								0.87			0.15									
Well	RDA4	12/9/1982					7.4								0.8			0.16									
Well	RDA4	3/7/1984					7.4								<0.05			0.31									
Well	RDA4	4/18/1984					7.2								0.07			0.24									
Well	RDA4	5/3/1984					7.3		0.11						0.05			0.26					695		<1.	295	5.42
Well	RDA4	6/12/1984					8.15								<0.05			0.23									
Well	RDA4	7/12/1984					7.6								0.05			0.06									
Well	RDA4	8/2/1984					7.4								<0.05			0.22									
Well	RDA4	9/11/1984					7.35								<0.05			0.06									
Well	RDA4	10/9/1984					7.45								0.05			0.32									
Well	RDA4	11/5/1984					7.7								<0.05			<0.01									
Well	RDA4	12/6/1984					7.6								0.09			0.24									
Well	RDA4	1/29/1985					7.85								0.07			0.39									
Well	RDA4	4/3/1985					7.6								0.07			0.4									
Well	RDA4	9/3/1985					7.3								0.05			0.06									
Well	RDA4	6/25/1986					7.7		0.1						<0.05			0.02					533		<1.	224	0.44
Well	RDA4	12/18/1986					7.33								0.05			0.15									
Well	RDA4	5/19/1989											436		<0.02		497	0.17	7		1420		560		0	300	
Well	RDA4	6/4/1990							0.29	0.006	1.4	<0.01	503	<0.01	0.09	<0.02	438	0.1	4	<0.001	1090	<0.01	562		0	270	
Well	RDA4	6/5/1991											470		56		356	1.02	6		813		558		0	290	
Well	RDA4	5/26/1992											304		<0.02		321	0.3	5		774		536		0	240	
Well	RDA4	9/2/1992											360		0.17		376	0.3	5		856		642		0	222	
Well	RDA4	6/7/1993											825		14.7		404	1.97	5		730		1220		0	192	
Well	RDA4	6/6/1994											354		0.78		383	0.26	7		946		634		12	238	
Well	RDA4	6/6/1995	14.5	7.5	5060								252		<0.1		310	0.2	5		690		800		<5.	130	
Well	RDA4	6/5/2000	14.3	7.3	4920								314		<0.1		277	0.1	5		573		1109		<5.	125	
Well	RDA4	6/8/2001	12.8	7.2	4780								319		<0.1		261	0.1	5		535		912		<5.	127	
Well	RDA4	6/5/2002	13.4	13.4	5520								320		<0.1		305	0.25	5		671		902		<5.	171	

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SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-Sp. Cond. umhos/cm	Flow GPM	L-pH units	TSS mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	NO3 mg/l
Well	RDA4	6/2/2004	11.6	7.3	4780								379		0.04		268	0.353	5.45		483		657		< 5.	130	
Well	RDA4	5/13/2005	11.9	7.4	5500								427		< .03		326	0.269	6.18		648					161	
Well	RDA4	6/28/2006	12.4	7.5	4790								401		0.07		296	0.366	5.99		487		704		< 5.	143	
Well	RDA5	6/15/1982					7.6								0.81												
Well	RDA5	7/26/1982					7.6								0.91			0.66									
Well	RDA5	8/13/1982					7.6								0.91			0.6									
Well	RDA5	9/21/1982					7.6								1			0.73									
Well	RDA5	10/13/1982					7.5								1.03			0.74									
Well	RDA5	11/29/1982					7.4								1.1			0.8									
Well	RDA5	12/9/1982					7.5								1.13			0.86									
Well	RDA5	3/7/1984					7.7								0.12			0.5									
Well	RDA5	4/18/1984					7.5								0.19			0.51									
Well	RDA5	5/3/1984					7.5		0.16						0.19			0.59					770		<1.	2910	0.07
Well	RDA5	6/13/1984					8.3								0.09			0.7									
Well	RDA5	7/12/1984					7.8								0.15			0.8									
Well	RDA5	8/2/1984					7.7								0.14			0.59									
Well	RDA5	9/11/1984					7.55								0.12			0.77									
Well	RDA5	10/9/1984					7.7								0.19			0.75									
Well	RDA5	11/5/1984					7.9								0.11			0.29									
Well	RDA5	12/6/1984					7.85								0.21			0.53									
Well	RDA5	1/28/1985					8.1								0.18			0.87									
Well	RDA5	4/3/1985					7.8								0.18			0.6									
Well	RDA5	9/3/1985					7.55								0.18			0.26									
Well	RDA5	6/25/1986					7.85		0.23						0.14			0.33					582		<1.	2160	0.22
Well	RDA5	12/18/1986					7.61	20800							0.17			0.46									
Well	RDA5	5/19/1989											361		<0.02		1100	0.17	7		6275		498		0	1150	
Well	RDA5	6/4/1990							0.36	<0.005	3.2	<0.1	663	<0.1	<0.2	<0.02	1280	0.35	<10.	<0.001	4845	<0.1	499		0	1060	
Well	RDA5	6/5/1991											450		18.9		1000	2.5	<5.		4290		460		0	880	
Well	RDA5	5/26/1992											371		<0.2		766	<0.1	<10.		3490		458		0	850	
Well	RDA5	9/2/1992											403		0.2		861	0.44	<10		4140		588		0	708	
Well	RDA5	6/7/1993											392		4.94		695	2.6	4		3215		0		88	633	
Well	RDA5	6/6/1994											355		0.5		625	0.08	<1		2941		456		20	478	
Well	RDA5	6/6/1995	13.8	7.1	20200								236		<0.1		570	<0.1	3		2900		570		<5.	350	
Well	RDA5	6/5/2000	13.6	7	10760								363		<0.1		438	<0.1	3		2202		518		<5.	186	
Well	RDA5	6/8/2001	12.6	7.1	10320								364		<0.1		408	<0.1	2		1928		514		<5.	213	
Well	RDA5	6/5/2002	12.8	7.1	10020								349		<0.1		397	<0.05	3		1788		519		<5.	181	
Well	RDA5	6/2/2004	11.7	7.6	9130								397		< .03		377	0.011	3.16		1700		425		< 5.	161	
Well	RDA5	5/13/2005	11.9	7.8	10140								415		< .03		391	< .002	2.56		1720					203	
Well	RDA5	6/28/2006	12.7	7.8	10880								406		< .03		470	0.033	3.38		1910		416		< 5.	285	
Well	RDA6	6/15/1982					8.3								0.46			0.12									
Well	RDA6	7/26/1982					8.2								0.44			0.11									
Well	RDA6	8/13/1982					8.2								0.41			0.09									
Well	RDA6	9/21/1982					7.9								0.5			0.07									
Well	RDA6	10/13/1982					7.8								0.53			0.09									
Well	RDA6	11/29/1982					7.6								0.66			0.1									
Well	RDA6	12/9/1982					7.6								0.6			0.1									
Well	RDA6	3/7/1984					8								<0.05			0.05									
Well	RDA6	4/18/1984					7.6								<0.05			0.11									
Well	RDA6	5/3/1984					7.6		0.12						<0.05			0.14					231		<1.	310	5.43
Well	RDA6	6/12/1984					8.3								<0.05			0.04									
Well	RDA6	7/12/1984					7.8								0.06			0.17									
Well	RDA6	8/2/1984					7.8								<0.05			0.15									
Well	RDA6	9/11/1984					7.7								0.05			0.15									
Well	RDA6	10/9/1984					7.8								<0.05			0.19									
Well	RDA6	11/5/1984					7.95								0.07			<0.01									
Well	RDA6	12/6/1984					7.8								0.08			0.18									
Well	RDA6	1/29/1985					8.1								<0.05			0.06									
Well	RDA6	4/3/1985					7.95								<0.05			0.04									
Well	RDA6	9/3/1985					7.7								0.05			0.04									
Well	RDA6	6/25/1986					7.8		0.06						0.08			0.04					495		<1.	1124	4.25
Well	RDA6	12/18/1986					7.62	14000							0.11			0.09									
Well	RDA6	5/19/1989											445		<0.02		690	<0.01	13		2940		400		0	550	
Well	RDA6	6/4/1990							0.45	0.016	1.7	<0.1	435	<0.1	1.6	0.04	1260	<0.1	20	0.3	5951	<0.1	728		0	1100	
Well	RDA6	6/5/1991											440		6		960	0.49	15		4303		588		0	920	
Well	RDA6	5/26/1992											393		<0.2		843	0.17	13		3620		518		24	900	
Well	RDA6	9/2/1992											419		<0.2		738	<0.1	11		3290		503		0	750	
Well	RDA6	6/7/1993											515		4.5		1520	0.7	20		7550		830		0	1280	

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SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-Sp. Cond. umhos/cm	Flow GPM	L-pH units	TSS mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	NO3 mg/l
Well	RDA6	6/6/1994											342		0.2		795	<0.01	10		3595		762		0	1010	
Well	RDA6	6/6/1995	13.3	7	9790								221		<0.1		1100	<0.1	13		5400		900		10	830	
Well	RDA6	6/5/2000	13.3	7	33400								349		<0.1		1593	0.1	19		9110		1289		<5	1217	
Well	RDA6	6/8/2001	14.1	7.2	35200								352		<0.1		1690	<0.1	18		9780		1317		<5	1545	
Well	RDA6	6/5/2002	13.1	6.9	42800								353		<0.1		2169	0.14	20		11840		1462		<5	1894	
Well	RDA6	6/2/2004	12.3	7.5	4560								446		< .03		2290	0.308	18.1		13100		1179		< 5	1943	
Well	RDA6	5/13/2005	12.2	7.7	48300								444		< .03		2650	0.387	22.3		15100					1719	
Well	RDA6	6/28/2006	12.7	7.7	36900								428		2.38		2090	0.36	35.4		12100		1062		< 5	1728	
Well	SM1-1	4/23/1982					8.4		1		0.3		46		0		95		45		2013	0.03	683	0	0	281	5.3
Well	SM1-1	11/17/1982					7.5				0.1		950		0.29		30		25		899	0.027	472	0	0	475	0.09
Well	SM1-1	2/15/1983					7.3		0.39		0.1		500		0.03		218		30		350	0.04	320	0	0	63	0.07
Well	SM1-1	6/28/1983					7.6		0.3		1.8	0.13	416	0.08	0.14		815	0.4	400		3350	0.16	559	0	0	540	59.3
Well	SM1-1	8/29/1983									0.78	0.08	396	0.03	0.07		452	0.05	31	0.02	4985	0.04	168	0	0	738	20.1
Well	SM1-1	11/7/1983									0.72	0.07	448	0.05	0.32		841		38	0.007	5655	0.18	508	0	0	775	23
Well	SM1-1	2/21/1984					7.9			0.002	0.97	0.16	396	0.05	0.17	0.84	1568	0.36	34	0.04	5700	0.16	676	0	0	950	0.25
Well	SM1-1	5/3/1984							0.17														1307		<1.	960	1.5
Well	SM1-1	8/2/1984							0.51														1129		<1.	1060	1.25
Well	SM1-1	11/19/1984							<0.05														1098		<1.	2600	0.15
Well	SM1-1	2/26/1985							0.11														1154		<1.	1220	0.14
Well	SM1-1	5/8/1985							<0.05														1174		<1.	1990	0.1
Well	SM1-1	8/14/1985							0.6														1311		<1.	1080	0.22
Well	SM1-1	11/21/1985							<0.05														1240		<1.	1800	1.01
Well	SM1-1	6/30/1986							0.17														895		<1.	760	4.07
Well	SM1-1	12/23/1986							<0.5														1354			1140	33.8
Well	SM1-1	5/18/1989											360		<0.02		652	0.27	48		3773		308		0	700	
Well	SM1-1	9/12/1989											449		0.02		1100	1.33	54		4900		800		0	650	
Well	SM1-1	6/4/1990							1.31	0.007	0.8	<0.1	685	<0.1	1.8	<0.02	1060	0.48		0.12	4550	0.01	687		0	1200	53.8
Well	SM1-1	9/19/1990											457		0.73		773	0.91	37		4670		936		0	750	
Well	SM1-1	9/24/1991											377		<0.4		685	0.03	35		4283		488		0	589	
Well	SM1-1	5/26/1992											400		130		408	12.6	6		4680		528		0	1000	
Well	SM1-1	9/2/1992											430		<0.2		752	<0.1	40		6600		2280		0	850	
Well	SM1-1	9/8/1993											460		2.9		1780	0.4	26		5870		1000		0	680	
Well	SM1-1	6/6/1994											260		0.5		1200	0.05	24		4280		840		0	505	
Well	SM1-1	6/6/1995	9	7.2	9090								241		<0.1		890	<0.1	33		5900		1100		10	720	
Well	SM1-1	9/6/1995	17	6.7	2410								398		<0.1		1086	<0.1	41		7200		975		<5.	632	
Well	SM1-1	6/13/2000	14.3	6.7	38600								332		<0.1		2695	<0.1	29		8520		1684		<5.	901	
Well	SM1-1	6/5/2001	11.2	6.7	38900								383		<0.1		3106	<0.1	34		8800		1751		<5.	1306	
Well	SM1-1	9/5/2001	16.6	7.1	33100								336		<0.1		2502	0.07	30		7750		1601		<5.	1052.7	
Well	SM1-1	6/5/2002	10.6	6.7	3690								236		<0.1		185	<0.05	5		400		519		<5.	58	
Well	SM1-1	6/24/2002	15.4	6.5	32900								410		<0.1		2510	0.28	34		7790		267		<5.	1122	
Well	SM1-1	9/17/2003	15.7	7.5	29900								439		5.5		2310	2.46	46.3		7510		9629		< 5.	979	
Well	SM1-2	4/28/1982					10.5		0.5		0.1		53				149		27		1033	0.01	408	0		210	3.3
Well	SM1-2	8/30/1982					7.1		2.1		0.3		210				137		15		233	0.04	550	0		56	0.7
Well	SM1-2	11/17/1982					7.1		2.0		0.32		450		0.6		130		17		400	0.04	547	0		76	0.7
Well	SM1-2	2/15/1983					7.3		1.95		0.21		220		0.6		140		14		250	0.04	500	0		57	0.7
Well	SM1-3	5/26/1983					7.2		0.11		0.29		180		5.9		207	1.4	13.3		470	0.03		0	0	86	0.36
Well	SM1-3	6/28/1983					7.6				1.6	0.01	196		0.8		197		110	0.004	520	0.05	640	0	0	79	1.7
Well	SM1-2	8/29/1983									0.9	0.01	130	0.05	0.2		125	0.8	9	0.05	346	0.016	593	0		44	1.9
Well	SM1-2	11/7/1983									0.46	0.008	236		0.33		326	1.7	13	0.004	440	0.04	612	0		60	0.29
Well	SM1-2	2/21/1984					7.2		0.23		0.73	0.05	416	0.03	0.5	0.36	890	2.3	15	0.02	872	0.097	671	0		163	0.25
Well	SM1-2	5/3/1984							0.17														782		<1.	154	0.19
Well	SM1-2	8/2/1984							0.23														359		<1.	51	0.08
Well	SM1-2	11/19/1984							<0.05														587		<1.	150	0.05
Well	SM1-2	2/26/1985							<0.05														643		<1.	160	0.04
Well	SM1-2	5/8/1985							<0.05														514		<1.	93	0.02
Well	SM1-2	8/14/1985							<0.05														611		<1.	120	0.02
Well	SM1-2	11/21/1985							<0.05														559		<1.	194	<0.01
Well	SM1-2	6/30/1986							0.09														538		<1.	72	0.15
Well	SM1-2	12/23/1986							<0.5														695		0	143	1.35
Well	SM1-2	4/2/1987							0.52	0.001	0.36	0.005	411	0.01	0.07	0.02	720	1.8	13	0.002	921	0.16	553	0		168	0.69
Well	SM1-2	6/1/1987							0.37	0.002	0.31	0.005	267	0.01		0.02	321	1.34	12	0.001	1042	0.02	524	0		170	1.01
Well	SM1-2	9/17/1987							0.4	0.001	0.58	0.005	498	0.01		0.02	890	5.4	21	0.002	977	0.05	704	0		159	1.07
Well	SM1-2	12/15/1987							0.06	0.001	0.19	0.005	143	0.01		0.02	182	2.24	10	0.002	580	0.14	350	0		74	0.94
Well	SM1-2	3/21/1988							1.96	0.001	0.57	0.005	505	0.01		0.02	1060	4.85	27	0.01	2470	0.05	719	0		297	21.94
Well	SM1-2	6/10/1988					7.8				0.39		113				182	1.35	13		802		443	0		68	3.88
Well	SM1-2	9/22/1988					7.4		3.81	0.004	0.61	0.005	460	0.01		0.02	920	3.16	18	0.001	984	0.05	718	0		138	6.37
Well	SM1-2	9/8/1993											105		0.04		94	0.03	11		319		370		0	46	

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SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-Sp. Cond. umhos/cm	Flow GPM	L-pH units	TSS mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	NO3 mg/l
Well	SM1-2	6/6/1994											90		0.1		144	0.1	95		410		2640		0	240	
Well	SM1-2	9/6/1995	21.1	7.8	1590								105		1.2		83	0.1	8		342		480		25	21	
Well	SM1-2	6/13/2000	18	6.9	2420								100		0.6		120	0.3	10		266		510		<5.	22	
Well	SM1-2	6/5/2001	17.3	7.1	2030								78		<0.1		95	<0.1	12		231		551		<5.	25	
Well	SM1-2	6/30/2003																									
Well	SM1-2	6/23/2004																									
Well	SM1-2	5/11/2005																									
Well	SM1-2	11/27/2006																									
Well	SM1-3	2/15/1982					8.3		7.2		0.3		570		3.1		200		59		3100	0.04	240	0	0	11	4.1
Well	SM1-3	4/30/1982					9.2		1.6		0.3		43				95	0.29	58		2139	0.02	840	0	301	840	2.2
Well	SM1-3	8/30/1982					8.3		9.9		0.3		562				233		60		3580	0.03	240	0	0	13	5.4
Well	SM1-3	11/17/1982					7.8		8.7		0.3		600		3		240		69		3650	0.03	402	0	0	1370	4.7
Well	SM1-2	5/26/1983					8.0		3.6		0.3	0.04	400		6.2		1702	0.59	59	0.01	12000	0.063		0		1137	32.6
Well	SM1-2	6/28/1983					8.0				0.95	0.29	436	0.14	0.27		1868		780		8650	0.17	605	0		1196	97
Well	SM1-3	8/29/1983									0.62	0.21	456	0.14	0.2		2142		47	0.013	7750	0.1	544	0	0	1480	39
Well	SM1-3	11/7/1983									0.38	0.14	492	0.14	0.3		907	0.69	63	0.006	11000	0.32	616	0	0	1300	11
Well	SM1-3	2/21/1984					8.0		0.4		0.5	0.3	440	0.1	0.32	1.4	1739		55	0.04	12000	0.32	596	0	0	1520	9.8
Well	SM1-3	5/3/1984							0.16	0.004	0.18	0.21	432	0.14	0.19	1.9	2290	0.36	106		13000	0.25	560	0	0	1610	27.5
Well	SM1-3	8/2/1984							0.19		0.56	0.07	452	0.08	0.08	0.6	2381	0.43	47	0.04	12000	0.126	620	0	0	1900	9.8
Well	SM1-3	11/19/1984									0.63	0.066	220		0.2	0.43	2440	0.74	45		13000	0.113	635	0	0	1550	11
Well	SM1-3	2/26/1985							0.13		0.52	0.13	440		0.21	0.55	2446	0.78	75		13000	0.086	617	0	0	1870	10.3
Well	SM1-3	5/3/1984							0.16														683		<1.	1610	27.5
Well	SM1-3	8/2/1984							0.19														620		<1.	1900	9.8
Well	SM1-3	11/19/1984							<0.05														635		<1.	1550	11
Well	SM1-3	2/26/1985							0.13														617		<1.	1870	10.3
Well	SM1-3	5/8/1985							<0.05														596		<1.	1836	10
Well	SM1-3	8/14/1985							0.13														667		<1.	1500	6.5
Well	SM1-3	11/21/1985							0.1														675		<1.	2870	3.25
Well	SM1-3	6/30/1986							0.23														679		<1.	1220	7.23
Well	SM1-3	12/23/1986							<0.5														720			1376	36.82
Well	SM1-3	5/18/1989											414		<0.02		2110	2.75	69		11650		690		0	1200	
Well	SM1-3	9/11/1989											505		0.02		2250	3.41	100		14200		680		0	980	
Well	SM1-3	6/4/1990							0.78	0.032	<2.	<1.	479	<1.	<2.	<0.02	2222	5	95	0.12	12380	<1.	712		0	168	133.99
Well	SM1-3	9/19/1990											863		<0.02		2130	4.03	74		13500		676		0	1200	
Well	SM1-3	6/10/1991											440		70		2370	4.7	90		13800		652		0	1200	
Well	SM1-3	9/24/1991											<1.		<0.4		2238	6.48	73		12918		634		0	1189	
Well	SM1-3	5/26/1992											442		<0.2		2140	5.51	61		14400		636		0	1160	
Well	SM1-3	9/2/1992											524		6.72		2240	6.64	77		12400		580		0	1368	
Well	SM1-3	6/7/1993											490		25.4		2350	6	70		13200		604		0	1400	
Well	SM1-3	9/8/1993											430		3.2		2130	6.3	72		12000		588		0	1366	
Well	SM1-3	6/6/1994											430		7.9		2100	5.14	60		12000		918		0	1200	
Well	SM1-3	9/7/1994	14.6	6.8	84500								460		0.86		2180	5.06	86		12300		560		0	1260	
Well	SM1-3	6/6/1995	9.3	7	52500								237		2.2		2000	1.8	61		12000		730		<5.	1120	
Well	SM1-3	9/6/1995	15.2	6.6	90200								412		22.5		2060	3.7	77		13500		675		<5.	1193	
Well	SM1-3	6/13/2000	14.2	6.7	44200								342		0.5		2077	0.8	59		11920		931		<5.	1260	
Well	SM1-3	6/5/2001	12.7	6.9	43300								413		22.2		1938	2.6	59		12100		824		<5.	1290	
Well	SM1-3	9/5/2001	17.5	7.2	43910								385		30.2		2021	3.1	62		12600		699		<5.	1292.3	
Well	SM1-3	6/24/2002	16.1	6.8	42400								406		10.4		2080	2.74	63		12100		1021		<5.	1266	
Well	SM1-3	9/24/2002	16.4	6.7	43100								402		11.6		2000	3.93	68		12020		780		<5.	1045	
Well	SM1-3	9/16/2003	18.4	6.7	55400								458		35.8		3500	10.2	92.2		16600		723		< 5.	1852	
Well	SM1-3	6/18/2004	12.5	6.7	52300								454		0.65		3040	0.088	68		14600		574		< 5.	1370	
Well	SM1-3	5/11/2005	9.9	7.1	61500								491		< .03		5250	8.6	87.5		19300					2998	
Well	SM1-3	7/20/2005	17.2	7	61500								505		2.51		4980	6.5	115		17600					2723	
Well	SM1-3	6/28/2006	16	7.1	58100								493		12.8		4620	7.94	96.7		16100		670		< 5.	2200	
Well	SM1-3	9/28/2006	21.1	8	57800								475		< .03		4313.8	8.209	72.56		17002		758		< 5.	1412	
Well	SM1-4	4/28/1982					8.5		4.3		0.2		58				84		17		847	0.02	1680	0	0	91	4.9
Well	SM1-4	8/30/1982					7.3		3.9		0.2		383				174		15		348	0.03	437	0	0	68	3.0
Well	SM1-4	11/29/1982					7.3		3.8		0.19		300		0.6		166		14		250	0.036	510	0	0	52.5	1.99
Well	SM1-4	2/15/1983					7.6		3.0		0.21		390		0.7		220		13		310	0.04	420	0	0	61	1.7
Well	SM1-4	6/28/1983					8.0				1.8	0.01	238		0.12		182		7		346	0.1	435	0	0	61	0.8
Well	SM1-4	8/29/1983									0.6	0.022	304	0.02	0.06		228		9	0.013	568	0.009	383	0	0	52	0.8
Well	SM1-4	11/7/1983									0.8	0.008	304		0.19		226	0.1	10	0.007	388	0.032	374	0	0	40	0.42
Well	SM1-4	2/21/1984					7.4		0.12		0.5	0.025	280		0.19	0.2	236		6	0.01	371	0.04	331	0	0	54	2.0
Well	SM1-4	8/2/1984							0.62														362		<1.	47	0.04
Well	SM1-4	11/19/1984							<0.05														332		<1.	42	0.04
Well	SM1-4	2/26/1985							<0.05														299		<1.	36	0.04
Well	SM1-4	5/8/1985							<0.05														310		<1.	43	0.02

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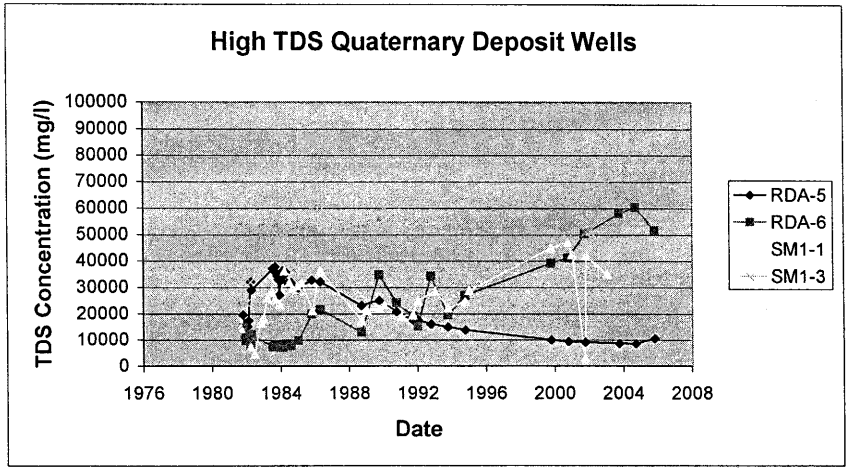
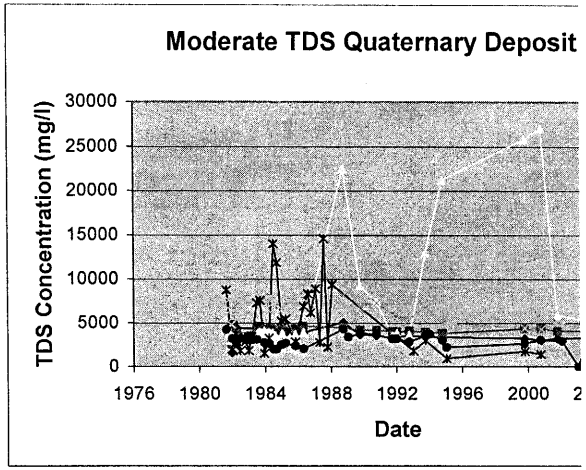
SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-Sp. Cond. umhos/cm	Flow GPM	L-pH units	TSS mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	NO3 mg/l
Well	SM1-4	8/14/1985							<0.05														349		<1.	40	0.05
Well	SM1-4	11/21/1985							<0.05														329		<1.	77	0.98
Well	SM1-4	6/30/1986							0.1														349		<1.	50	0.06
Well	SM1-4	12/23/1986							<0.5														326			36.5	0.16
Well	SM1-4	5/26/1989											247		0.02		203	0.04	13		748		284		0	63	
Well	SM1-4	9/11/1989											270		0.02		229	0.03	10		408		338		0	60	
Well	SM1-4	6/8/1990							0.16	0.005	0.28	<0.01	314	<0.01	0.18	<0.02	225	<0.01	5	0.028	466	<0.01	355		0	65	8.01
Well	SM1-4	6/10/1991											363		<0.02		214	0.37	5		433		344		0	60	
Well	SM1-4	5/26/1992											212		<0.02		173	<0.01	6		455		366		0	51	
Well	SM1-4	9/2/1992											296		<0.02		218	<0.01	6		483		758		0	54	
Well	SM1-4	6/7/1993											294		5.59		196	1.05	6		443		372		0	48	
Well	SM1-4	6/6/1994											259		0.2		219	<0.01	6		427		450		24	63	
Well	SM1-4	9/7/1994	18.2	7.4	4160								284		0.1		228	<0.01	7		562		412		0	69	
Well	SM1-4	6/6/1995	15.8	7.3	2820								178		<0.1		160	<0.1	5		380		510		20	60	
Well	SM1-4	9/6/1995	17.1	7.5	2690								149		0.7		168	0.2	7		814		455		<5.	30	
Well	SM1-4	6/5/2000	10.6	7.4	3100								207		<0.1		156	<0.1	5		328		568		<5.	30	
Well	SM1-4	6/4/2001	9.9	6.8	3620								234		<0.1		173	<0.1	5		388		495		<5.	50	
Well	SM1-4	9/23/2002	15.4	6.4	3600								206		<0.1		174	0.29	7		425		627		<5.	37	
Well	SM1-4	9/18/2003																									
Well	SM1-4	6/18/2004	11.7	7.7	4760								320		< .03		226	0.002	6.28		530		493		< 5.	55	
Well	SM1-4	9/25/2004																									
Well	SM1-4	5/23/2005	10.8	7.6	4680								324		< .03		244	0.035	5.29		472					59	
Well	SM1-4	7/20/2005	16.9	7.5	4340								272		< .03		208	< .002	6.36		447					57	
Well	SM1-4	6/28/2006	11.1	7.8	4200								311		0.05		247	0.031	5.6		441		563		< 5.	71	
Well	SM1-4	9/28/2006	19.4	7.9	3880								293		< .03		213.68	0.038	7.23		402		440		< 5.	81	
	Number of Observations:		78	79	79	126	158	2	61	16	52	27	193	19	178	16	194	262	188	25	194	45	230	44	107	241	95
	Maximum:		21.1	13.4	90200	305.2	11.8	20800	9.9	0.032	3.20	0.300	950	0.14	130.00	1.90	5250	12.60	780.0	0.30	19300	0.3	9629	0.0	301	2998	134.0
	Minimum:		9.0	6.4	1590	0.0	6.7	14000	0.1	0.001	0.10	0.005	43	0.01	0.00	0.02	30	0.00	2.0	0.00	231	0.0	0	0.0	0.0	11	0.02
	Mean:		13.8	7.3	19246	8.3	7.7	17400	1.2	0.006	0.64	0.077	372.4	0.06	3.57	0.40	901.0	0.92	32.0	0.03	4183	0.1	709.2	0.0	5.0	620	8.58
	Standard Deviation:		2.6	0.8	21527	33.9	0.8	4808	2.0	0.008	0.58	0.090	130.7	0.05	12.71	0.56	1002.2	1.78	67.0	0.06	4956	0.1	679.6	0.0	30.5	672	19.64
	Equivalent weights of means:												18.6				74.1		0.8		181.9		11.6			17.5	





Emery Water Quality Data - Qal

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
Spring	SP-10	12/18/1995																
Spring	SP-10	3/5/1997																
Spring	SP-10	6/24/1997																
Spring	SP-10	9/30/1997																
Spring	SP-10	12/12/1997																
Spring	SP-10	3/9/1998																
Spring	SP-10	6/26/1998																
Spring	SP-10	9/29/1998																
Spring	SP-10	12/7/1998																
Spring	SP-10	3/15/1999																
Spring	SP-10	12/4/2000																
Spring	SP-10	3/21/2001																
Spring	SP-10	6/15/2001																
Spring	SP-10	9/11/2001																
Spring	SP-10	12/11/2001																
Spring	SP-10	1/1/2002																
Spring	SP-10	3/1/2002																
Spring	SP-10	6/19/2002																
Spring	SP-10	9/24/2002																
Spring	SP-10	6/30/2003																
Spring	SP-10	9/18/2003																
Spring	SP-10	12/26/2003																frozen
Spring	SP-10	3/29/2004																
Spring	SP-10	6/22/2004																some irrigation water
Spring	SP-10	9/25/2004																
Spring	SP-10	12/28/2004																Site was dry
Spring	SP-10	3/31/2005																
Spring	SP-10	5/23/2005																Irrigation water flowing from above springs
Spring	SP-10	7/19/2005																Irrigation water only
Spring	SP-10	11/22/2005																
Spring	SP-10	3/9/2006																No Flow in 1st. Quarter.
Spring	SP-10	6/27/2006																
Spring	SP-10	9/29/2006																
Spring	SP-10	11/28/2006																
Spring	SP-11	12/18/1995																
Spring	SP-11	3/5/1997																
Spring	SP-11	6/24/1997																
Spring	SP-11	9/30/1997																
Spring	SP-11	12/12/1997																
Spring	SP-11	3/9/1998																
Spring	SP-11	6/26/1998																
Spring	SP-11	9/29/1998																
Spring	SP-11	12/7/1998																
Spring	SP-11	3/21/2001																
Spring	SP-11	6/15/2001																
Spring	SP-11	9/11/2001																
Spring	SP-11	12/11/2001																
Spring	SP-11	1/1/2002																
Spring	SP-11	3/1/2002																
Spring	SP-11	6/19/2002																
Spring	SP-11	6/30/2003																
Spring	SP-11	9/18/2003																dry
Spring	SP-11	12/26/2003																frozen
Spring	SP-11	3/29/2004																
Spring	SP-11	6/22/2004																
Spring	SP-11	9/25/2004																Site was dry
Spring	SP-11	12/28/2004																Site was dry
Spring	SP-11	3/31/2005																
Spring	SP-11	5/23/2005																Irrigation water flowing from above springs
Spring	SP-11	7/19/2005																Irrigation water only
Spring	SP-11	11/22/2005																
Spring	SP-11	3/9/2006																No Flow in 1st. Quarter.
Spring	SP-11	6/27/2006																
Spring	SP-11	9/29/2006																
Spring	SP-11	11/28/2006																
Spring	SP-13	12/18/1995																
Spring	SP-13	3/5/1997																

Emery Water Quality Data - Qal

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
Spring	SP-13	6/24/1997																
Spring	SP-13	9/30/1997																
Spring	SP-13	12/12/1997																
Spring	SP-13	3/9/1998																
Spring	SP-13	6/26/1998																
Spring	SP-13	9/29/1998																
Spring	SP-13	12/7/1998																
Spring	SP-13	3/21/2001																
Spring	SP-13	6/15/2001																
Spring	SP-13	9/11/2001																
Spring	SP-13	12/11/2001																
Spring	SP-13	1/1/2002																
Spring	SP-13	3/1/2002																
Spring	SP-13	6/19/2002																
Spring	SP-13	6/30/2003																
Spring	SP-13	9/18/2003																dry
Spring	SP-13	12/26/2003																frozen
Spring	SP-13	3/29/2004																damp
Spring	SP-13	6/22/2004																
Spring	SP-13	9/20/2004																Site was dry
Spring	SP-13	12/28/2004																Site was dry
Spring	SP-13	3/31/2005																
Spring	SP-13	5/23/2005																Irrigation water flowing from above springs
Spring	SP-13	7/19/2005																Irrigation water only
Spring	SP-13	11/22/2005																
Spring	SP-13	3/9/2006																No Flow in 1st. Quarter.
Spring	SP-13	6/27/2006																
Spring	SP-13	9/29/2006																
Spring	SP-13	11/28/2006																
Spring	SP-14	12/18/1995																
Spring	SP-14	3/5/1997																
Spring	SP-14	6/24/1997																
Spring	SP-14	9/30/1997																
Spring	SP-14	12/12/1997																
Spring	SP-14	3/9/1998																
Spring	SP-14	6/26/1998																
Spring	SP-14	9/29/1998																
Spring	SP-14	12/7/1998																
Spring	SP-14	3/21/2001																
Spring	SP-14	6/15/2001																
Spring	SP-14	9/11/2001																
Spring	SP-14	12/11/2001																
Spring	SP-14	1/1/2002																
Spring	SP-14	3/1/2002																
Spring	SP-14	6/19/2002																
Spring	SP-14	6/30/2003																
Spring	SP-14	9/18/2003																dry
Spring	SP-14	12/26/2003																frozen
Spring	SP-14	3/29/2004																damp
Spring	SP-14	6/22/2004																
Spring	SP-14	9/20/2004																Site was dry
Spring	SP-14	12/28/2004																Site was dry
Spring	SP-14	3/31/2005																
Spring	SP-14	5/23/2005																Irrigation water flowing from above springs
Spring	SP-14	7/19/2005																Irrigation water only
Spring	SP-14	11/22/2005																
Spring	SP-14	3/9/2006																No Flow in 1st. Quarter.
Spring	SP-14	6/27/2006																
Spring	SP-14	9/29/2006																
Spring	SP-14	11/28/2006																
Well	RDA1	6/16/1982			2753				5200	4101								
Well	RDA1	7/26/1982			2893				5800	4665								
Well	RDA1	8/24/1982			860				2700	1590								
Well	RDA1	9/21/1982			2100				5800	3450								
Well	RDA1	10/13/1982			2000				5100	3488								
Well	RDA1	11/29/1982			2100				5900	4392								
Well	RDA1	3/7/1984			2250				4800	4318								

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SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
Well	RDA1	4/18/1984			2400				4900	4300								
Well	RDA1	5/3/1984			2400			1980	4800	4312			64.18	63.43			190	
Well	RDA1	6/12/1984			2500				4650	4250								
Well	RDA1	7/12/1984			2500				4950	3860								
Well	RDA1	8/2/1984			2450				4700	4262								
Well	RDA1	9/11/1984			2250				4500	4024								
Well	RDA1	10/9/1984			2250				4500	4104								
Well	RDA1	11/5/1984			2350				4300	3972								
Well	RDA1	12/6/1984			2150				4300	4040								
Well	RDA1	1/29/1985			2250				4425	3896								
Well	RDA1	4/3/1985			2200				4500	3533								
Well	RDA1	9/3/1985			2600				4500	3736								
Well	RDA1	12/16/1985			2500				4525	4000								
Well	RDA1	6/25/1986			2200			1702	4550	3788			59.66	59.06			163	
Well	RDA1	12/18/1986			2160				4600	3900								
Well	RDA1	5/19/1989			2996		522	1945		5052			72.38	78.9			228	
Well	RDA1	6/4/1990	<0.01	<0.005	2083		544	1716		3668	<0.05	<0.05	55.18	57.7				
Well	RDA1	6/6/1991			1900		526	1617		3554			52.07	53.39				
Well	RDA1	5/26/1992			1836		538			3282			46.86	52.12				
Well	RDA1	9/2/1992			1704		562	1362		3400			45.49	50.08				
Well	RDA1	6/7/1993			1935		470	1774		3516			58.59	52.92				
Well	RDA1	6/6/1994			2058		566	1669		3425			54.87	57.84				
Well	RDA1	6/6/1995			2000		590	1480		3370			47.3	56				
Well	RDA1	6/5/2000			1809		547	1508		3237								
Well	RDA1	6/8/2001			1761		525	1403		3028								
Well	RDA1	6/5/2002			1814		529	1483		3245								
Well	RDA1	6/2/2004			1886		542	1560		3282								
Well	RDA1	5/12/2005			2007		521	1558		3213								
Well	RDA1	6/28/2006			1682		493	1521		3139								
Well	RDA2	6/16/1982			1605				4900	3901						0.09		
Well	RDA2	7/28/1982			1610				4800	3821								
Well	RDA2	8/24/1982			1900				4400	2520								
Well	RDA2	9/21/1982			2900				7000	4800								
Well	RDA2	10/13/1982			2200				5000	2790								
Well	RDA2	11/29/1982		10.3	2400				6300	3658								
Well	RDA2	12/9/1982			2000				6100	3728								
Well	RDA2	3/7/1984			2250				4650	4170								
Well	RDA2	4/18/1984			2475				4900	4564								
Well	RDA2	5/3/1984			2500			1930	4800	4168			62.93	62.55			185	
Well	RDA2	6/12/1984			2480				4400	4002								
Well	RDA2	7/12/1984			2450				4700	3660								
Well	RDA2	8/2/1984			2450				4425	4162								
Well	RDA2	9/11/1984			2550				4500	4026								
Well	RDA2	10/9/1984			2230				4450	4164								
Well	RDA2	11/5/1984			2500				4450	4198								
Well	RDA2	12/6/1984			2500				4500	4326								
Well	RDA2	1/29/1985			2250				4500	4178								
Well	RDA2	4/3/1985			2250				4800	3843								
Well	RDA2	9/3/1985			3000				4990	4294								
Well	RDA2	6/25/1986			2600			1910	5020	4293			66.27	66.67			187	
Well	RDA2	12/18/1986			2800				5100	4636								
Well	RDA2	5/19/1989			2535		506	1793		4424			62.03	67.98			183	
Well	RDA2	6/4/1990	<0.01	0.066	2440		500	1869		4172	<0.05	<0.05	62.96	65.22				
Well	RDA2	6/6/1991			2486		516	2036		4154			65.36	66.45				
Well	RDA2	5/26/1992			2354		522			4028			62.51	63.18				
Well	RDA2	9/2/1992			1688		828	1575		3960			54.6	56.04				
Well	RDA2	6/7/1993			2511		462	1822		4072			63.94	66.17				
Well	RDA2	6/6/1994			2264		540	1682		3960			59.93	62.04				
Well	RDA2	6/6/1995			2300		630	1470		3810			52.4	64				
Well	RDA2	6/5/2000			2493		584	1837		4327								
Well	RDA2	6/8/2001			2690		567	1751		4352								
Well	RDA2	6/5/2002			2206		567	1690		4071								
Well	RDA2	6/2/2004			2520		554	1795		4074								
Well	RDA2	5/13/2005			2339		556	1838		4126								
Well	RDA2	6/28/2006			2205		542	1769		3973								
Well	RDA3	6/15/1982			1988				5000	3841								
Well	RDA3	7/26/1982			2498				5500	3861								

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SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
Well	RDA3	8/13/1982			2520				4390	3000								
Well	RDA3	9/21/1982			2400				4800	3230								
Well	RDA3	10/13/1982			1900				4040	3226								
Well	RDA3	11/29/1982			1900				4310	3385								
Well	RDA3	12/9/1982			1720				4230	2632								
Well	RDA3	3/7/1984			2050				4300	3800								
Well	RDA3	4/18/1984			2150				4400	3948								
Well	RDA3	5/3/1984			2250			2110	4300	3884			60.01	59.11			289	
Well	RDA3	6/12/1984			2480				4200	3886								
Well	RDA3	7/12/1984			2400				4500	3555								
Well	RDA3	8/2/1984			2200				4275	4088								
Well	RDA3	9/11/1984			2100				4200	3542								
Well	RDA3	10/9/1984			2100				4200	3856								
Well	RDA3	11/5/1984			2480				4150	3888								
Well	RDA3	12/6/1984			2100				4050	3848								
Well	RDA3	1/29/1985			2150				4150	3848								
Well	RDA3	4/3/1985			2000				4300	3531								
Well	RDA3	9/3/1985			2650				4300	3780								
Well	RDA3	6/25/1986			2250			1870	4300	3665			58.82	58.99		0.03	250	
Well	RDA3	12/18/1986			2400				4500	3900								
Well	RDA3	5/19/1989			14118		980	6325		22488			323.77	355.28			1644	
Well	RDA3	6/4/1990			5808		686	3504		9250	0.58	<0.05	132.3	138.38				
Well	RDA3	6/5/1991			3560		584	2939		7454			95.17	95.68				
Well	RDA3	5/26/1992			2231		518			3514			59.49	59.37				
Well	RDA3	9/2/1992			2132		644	1971		3822			58.85	60.26				
Well	RDA3	6/7/1993			2066		866	2419		3634								
Well	RDA3	6/6/1994			7985		615	1779		12900			57.12	199.78				
Well	RDA3	6/6/1995			13000		1080	5100		21210			267.2	319.2				
Well	RDA3	6/5/2000			94336		1284	7478		25818								
Well	RDA3	6/8/2001			18981		1214	7543		27058								
Well	RDA3	6/5/2002			14975		1342	7212		5899								
Well	RDA3	6/2/2004			2996		620	2346		5141								
Well	RDA3	5/13/2005			6423		929	3852		11023								
Well	RDA3	6/28/2006			2609		710	2350		4929								
Well	RDA4	6/15/1982			4761				9810	7641								
Well	RDA4	7/26/1982			4893				8900	6486								
Well	RDA4	8/13/1982			4800				8100	4790								
Well	RDA4	9/21/1982			3900				7800	5730								
Well	RDA4	10/13/1982			3800				7900	6144								
Well	RDA4	11/29/1982			3950				9000	6925								
Well	RDA4	12/9/1982			3200				8900	7066								
Well	RDA4	3/7/1984			5000				8750	7496								
Well	RDA4	4/18/1984			5000				8000	7800								
Well	RDA4	5/3/1984			5250			3000	8500	7812			109.55	129.04			481	
Well	RDA4	6/12/1984			5000				8000	7892								
Well	RDA4	7/12/1984			5000				8800	7216								
Well	RDA4	8/2/1984			5000				8000	7940								
Well	RDA4	9/11/1984			5000				8000	6580								
Well	RDA4	10/9/1984			4500				7500	6624								
Well	RDA4	11/5/1984			5500				8000	7732								
Well	RDA4	12/6/1984			5000				7950	7564								
Well	RDA4	1/29/1985			5500				9000	7984								
Well	RDA4	4/3/1985			5250				8750	6782								
Well	RDA4	9/3/1985			6000				8100	6528								
Well	RDA4	6/25/1986			4100			2712	8000	6594			103.33	102.34			411	
Well	RDA4	12/18/1986			6000				8900	7752								
Well	RDA4	5/19/1989			5186		560	3128		8186			125.22	128.51			497	
Well	RDA4	6/4/1990			4565		562	3053		6960	0.11	<0.05	109.13	114.66				
Well	RDA4	6/5/1991			3322		558	2635		7314			88.62	89.04				
Well	RDA4	5/26/1992			3161		536			6020			75.71	83.82				
Well	RDA4	9/2/1992			3272		642	2442		5866			86.63	87.77				
Well	RDA4	6/7/1993			3374		1220	3719		5420								
Well	RDA4	6/6/1994			4322		646	2455		6854			90.91	110.35				
Well	RDA4	6/6/1995			2400		660	1910		4930			68.1	66.7				
Well	RDA4	6/5/2000			2608		909	1925		4447								
Well	RDA4	6/8/2001			2693		748	1871		4238								
Well	RDA4	6/5/2002			2884		740	2055		5055								

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SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
Well	RDA4	6/2/2004			2600		657	2050		4220								
Well	RDA4	5/13/2005			2875		713	2409		5026								
Well	RDA4	6/28/2006			2395		704	2220		4483								
Well	RDA5	6/15/1982			11983				25500	19634						0.65		
Well	RDA5	7/26/1982			11485				23900	13157								
Well	RDA5	8/13/1982			9490				14200	11010								
Well	RDA5	9/21/1982			8000				19000	15120								
Well	RDA5	10/13/1982			8900				27500	17360								
Well	RDA5	11/29/1982			4700				40900	32175								
Well	RDA5	12/9/1982			4000				37000	29040								
Well	RDA5	3/7/1984			21250				35000	37176								
Well	RDA5	4/18/1984			24000				35000	36158								
Well	RDA5	5/3/1984			21500			10380	33500	37812			534.08	542.34			2276	
Well	RDA5	6/13/1984			22500				29000	34576								
Well	RDA5	7/12/1984			23000				33100	33000								
Well	RDA5	8/2/1984			19500				29000	27200								
Well	RDA5	9/11/1984			20500				29000	32728								
Well	RDA5	10/9/1984			20000				30000	36192								
Well	RDA5	11/5/1984			24500				26500	34768								
Well	RDA5	12/6/1984			22000				23750	35752								
Well	RDA5	1/28/1985			20000				32000	31528								
Well	RDA5	4/3/1985			19000				32500	31780								
Well	RDA5	9/3/1985			24500				31500	29820								
Well	RDA5	6/25/1986			20500			9010	51100	32792			502.62	499.39			1923	
Well	RDA5	12/18/1986							36500	32240								
Well	RDA5	5/19/1989			15270		498	5413		23108			384.53	362.83			1277	
Well	RDA5	6/4/1990			15624		499	6906		25040	<0.5	<0.5	351.03	367.76				
Well	RDA5	6/5/1991			11895		460	5225		20838			293.13	283.64				
Well	RDA5	5/26/1992			10553		458			17664			234.66	254.57				
Well	RDA5	9/2/1992			10743		588	4538		17648			272.65	257.19				
Well	RDA5	6/7/1993			10866		416	3830		16092								
Well	RDA5	6/6/1994			10084		476	3450		14992			198.38	234.67				
Well	RDA5	6/6/1995			8700		470	2940		13820			184.8	200.3				
Well	RDA5	6/5/2000			5641		425	2710		10059								
Well	RDA5	6/8/2001			7026		422	2589		9471								
Well	RDA5	6/5/2002			6126		426	2506		9122								
Well	RDA5	6/2/2004			6239		425	2544		8725								
Well	RDA5	5/13/2005			5430		453	2646		8528								
Well	RDA5	6/28/2006			6444		416	2949		10476								
Well	RDA6	6/15/1982			9230				18300	14570								
Well	RDA6	7/26/1982			8436				15000	11843								
Well	RDA6	8/13/1982			9330				17100	9610								
Well	RDA6	9/21/1982			9000				15800	12200								
Well	RDA6	10/13/1982			8000				14100	10380								
Well	RDA6	11/29/1982			6900				10000	7828								
Well	RDA6	12/9/1982			5200				15100	12064								
Well	RDA6	3/7/1984			4750				8400	7372								
Well	RDA6	4/18/1984			5500				8750	8272								
Well	RDA6	5/3/1984			5500			2400	9000	8280			110.5	127.04			335	
Well	RDA6	6/12/1984			5000				8000	7432								
Well	RDA6	7/12/1984			5000				9000	7380								
Well	RDA6	8/2/1984			5250				8250	7984								
Well	RDA6	9/11/1984			5250				8000	7108								
Well	RDA6	10/9/1984			5000				8300	7388								
Well	RDA6	11/5/1984			5500				8000	7620								
Well	RDA6	12/6/1984			6250				8950	8604								
Well	RDA6	1/29/1985			5250				8790	7812								
Well	RDA6	4/3/1985			5500				10000	7700								
Well	RDA6	9/3/1985			8250				11900	9732								
Well	RDA6	6/25/1986			12500			4950	30100	19920			299.2	301.86			924	
Well	RDA6	12/18/1986							21850	21676								
Well	RDA6	5/19/1989			8067		400	3942		12936			208.53	192.81			690	
Well	RDA6	6/4/1990			17009		728	6254		34732	0.3	<0.5	387.43	402.55				
Well	RDA6	6/5/1991			11689		588	5036		24152			290.44	282.99				
Well	RDA6	5/26/1992			11319		542			18924			248.39	273.74				
Well	RDA6	9/2/1992			9940		503	4073		15184			226.51	239.8				
Well	RDA6	6/7/1993			22350		830	7520		34330			483.11	521.79				

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SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
Well	RDA6	6/6/1994			12471		782	4115		19424			240.73	305.81				
Well	RDA6	6/6/1995			16000		760	5080		26890			336.4	371.6				
Well	RDA6	6/5/2000			26271		1056	7431		39107								
Well	RDA6	6/8/2001			30577		1079	7838		41100								
Well	RDA6	6/5/2002			33030		1198	9813		50358								
Well	RDA6	6/2/2004			39550		1179	10544		57940								
Well	RDA6	5/13/2005			37550		1354	12021		60314								
Well	RDA6	6/28/2006			32646		1062	9675		51489								
Well	SM1-1	4/23/1982	0	0	9604	0.08	683	508	18100	14400	0.2							
Well	SM1-1	11/17/1982	0	0	4000	0	472	3607	13200	7394	0.05							
Well	SM1-1	2/15/1983	0	0	2610	0	320	2146		4600								
Well	SM1-1	6/28/1983	0.7	0	12200	0.12	559	4390	18000	16492	1.35							
Well	SM1-1	8/29/1983	0.4	0	11500	0.25	168	2850	22000	18280	0.12	0.6						
Well	SM1-1	11/7/1983	17	0	16000	0.07	508	4580		25988		0.26						
Well	SM1-1	2/21/1984	5	0	17000	0.19	676	7440	27000	28344		0.2						
Well	SM1-1	5/3/1984	0.18		16600			8310		25600			394.4	394.16	0.17	0.78	1785	
Well	SM1-1	8/2/1984	0.5		17000			8140		23628			372.05	406.46	0.06	0.55	1756	
Well	SM1-1	11/19/1984	0.6		20000			9692		36192			510.51	511.73	0.19	1.12	2233	
Well	SM1-1	2/26/1985	0.54		21000			9800		32000			498.02	494.77	0.19	1.26	2145	
Well	SM1-1	5/8/1985	0.5		20000			9634		29616			496.6	496.05	0.07	1.11	2100	
Well	SM1-1	8/14/1985	0.28		20000			9440		30471			457.11	471.72	0.24	1.2	2038	
Well	SM1-1	11/21/1985	0.11		19500			9450		31860			481.31	481.61	0.27	0.9	2043	
Well	SM1-1	6/30/1986	0.93		15000			7620		21143			362.45	351.64	0.16	1	1573	
Well	SM1-1	12/23/1986	0.2		24000			11170		36488			551.64	558.98	0.45	1.12	2444	
Well	SM1-1	5/18/1989			10660		308	3573		17358			238.72	249.62			683	
Well	SM1-1	9/12/1989			13007		800	5633		21194			329.65	307.35			1650	
Well	SM1-1	6/4/1990	2.2	0.097	13500		687	6059		21840	5.4	0.11	322.15	330.84				
Well	SM1-1	9/19/1990			13525		936	4312		23336			292.68	323.74				
Well	SM1-1	9/24/1991			11887		488	3751		18844			264.38	275.88				
Well	SM1-1	5/26/1992			10413		528			19524			259.53	257.23				
Well	SM1-1	9/2/1992			15312		2280	4158		24922			374.6	390.95				
Well	SM1-1	9/8/1993			19880		1000	8448		28600			427.92	456.52				
Well	SM1-1	6/6/1994			15312		840	5570		22098			300.34	352.49				
Well	SM1-1	6/6/1995			14000		920	4270		24640			341.9	330.2				
Well	SM1-1	9/6/1995			18626		800	5466		28930			422.4	421.6				
Well	SM1-1	6/13/2000			29193		1381	11927		44950			609.6	660.8				
Well	SM1-1	6/5/2001			33535		1435	13747		47137								
Well	SM1-1	9/5/2001			27056		1312	11142		42414								
Well	SM1-1	6/5/2002			1646		425	1351		3081								
Well	SM1-1	6/24/2002			25414		219	11360		41938			566.7	565.2				
Well	SM1-1	9/17/2003			24338		7893	10609		35122			539.8	692.1				
Well	SM1-2	4/28/1982	0		5934		559	746	10000	8746	0.1							
Well	SM1-2	8/30/1982	0		940	0.08	549	1088	2610	1928								
Well	SM1-2	11/17/1982	0		1900		547	1659	5800	3688								
Well	SM1-2	2/15/1983	0		900		500	1126		1820								
Well	SM1-3	5/26/1983	0.52		1810	0.25	406		4500	3384	0.53							
Well	SM1-3	6/28/1983	0.8		1800	0.15	640	1300	3600	2896	0.9							
Well	SM1-2	8/29/1983	0.01		900	0.18	593	840	2900	1850	0.39							
Well	SM1-2	11/7/1983	0.56		2100	0.23	612	1930		3452								
Well	SM1-2	2/21/1984	0.1		5500		671	4700	9000	7302	0.1							
Well	SM1-2	5/3/1984	0.13		5250			4210		7612			117.43	126.49	0.05	2.26	805	
Well	SM1-2	8/2/1984	<0.01		800			730		1530			25.18	25.28	<0.05	<0.01	122	
Well	SM1-2	11/19/1984	<0.01		1650			1692		3276			48.77	50.34	0.15	1.19	351	
Well	SM1-2	2/26/1985	0.03		8800			3750		14000			196.2	200.62	0.1	3.02	692	
Well	SM1-2	5/8/1985	<0.01		9000			3654		11848			190.83	200.31	<0.05	1.5	670	
Well	SM1-2	8/14/1985	<0.01		3250			3050		5242			83.29	88.38	0.1	1	545	
Well	SM1-2	11/21/1985	0.08		3200			2810		5442			84.6	83.29	0.07	2.16	496	
Well	SM1-2	6/30/1986	0.14		1600			1108		2863			45.49	46.1	0.25	0.34	179	
Well	SM1-2	12/23/1986	0.85		4200			3595		6926					46.9	2.85	667.6	
Well	SM1-2	4/2/1987	0.03	0.02	5227		553	3980		8328	0.23							
Well	SM1-2	6/1/1987	0.03	0.01	3128		524	1984		6190	0.05	0.05						
Well	SM1-2	9/17/1987	0.2	0.1	5640		704	4894		8910	0.05	0.05						
Well	SM1-2	12/15/1987	0.01	0.04	1714		350	1104		2792	0.05	0.05						
Well	SM1-2	3/21/1988	0.06	0.14	9384		719	5609		14582	0.05	0.05						
Well	SM1-2	6/10/1988	0.05	0.03	2188		443	1029	4090	2240								
Well	SM1-2	9/22/1988	0.83	0.45	5756		718	4922	7450	9374	0.05	0.05						
Well	SM1-2	9/8/1993			1005		370	648		1822			27.28	29.79				

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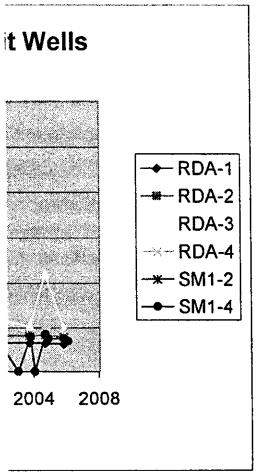
SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
Well	SM1-2	6/6/1994			287		2640	815		3006			36.82	65.55				
Well	SM1-2	9/6/1995			378		435	604		940			26.9	17.2				
Well	SM1-2	6/13/2000			607		418	744		1751								
Well	SM1-2	6/5/2001			737		452	586		1420								
Well	SM1-2	6/30/2003																No Access. Well buried by County road
Well	SM1-2	6/23/2004																No Access
Well	SM1-2	5/11/2005																Dry Wells
Well	SM1-2	11/27/2006																Buried by County Road
Well	SM1-3	2/15/1982			8830		240	2252		13500	0.06							
Well	SM1-3	4/30/1982			17579		1290	499	30500	23695	0.2							
Well	SM1-3	8/30/1982			19340		240	2368	31500	24099	0.1							
Well	SM1-3	11/17/1982			18000		402	2491	41000	32030	0.07							
Well	SM1-2	5/26/1983	7.4		29000		489		41500	48024	0.48							
Well	SM1-2	6/28/1983	7.2		25000	0.3	605	8770	45000	50050	0.3							
Well	SM1-3	8/29/1983	0.45		23000	0.14	544	9950	50000	54784	0.2	0.28						
Well	SM1-3	11/7/1983	8		33500	0.09	616	4960		55128		0.15						
Well	SM1-3	2/21/1984	7.8		32000	0.12	596	8250	46000	46308	0.4	0.17						
Well	SM1-3	5/3/1984	7.5		32000	0.1	560	10000		56772		0.33						
Well	SM1-3	8/2/1984	7		33000	0.08	620	10000		50500								
Well	SM1-3	11/19/1984	6		34500	0.05	635	11000		50528								
Well	SM1-3	2/26/1985	5.4		35500		617	11000		53400								
Well	SM1-3	5/3/1984	7.5		32000			10500		56772			761.84	722.87	0.19	0.36	2290	
Well	SM1-3	8/2/1984	7		33000			10460		50500			746.92	753.07	0.08	0.43	2381	
Well	SM1-3	11/19/1984	6		34500			10584		50528			771.52	774.74	0.2	0.74	2440	
Well	SM1-3	2/26/1985	5.4		35500			11160		53400			801.3	804.22	0.21	0.78	2446	
Well	SM1-3	5/8/1985	4		36000			11404		51600			817.08	813.25	0.08	0.43	2500	
Well	SM1-3	8/14/1985	3.5		35000			11160		53604			821.27	784.38	0.39	0.56	2434	
Well	SM1-3	11/21/1985	3.75		35500			10950		51344			846.08	833.58	0.41	0.48	2383	
Well	SM1-3	6/30/1986	1.27		40000			11230		59522			873.8	880.8	0.18	0.57	2439	
Well	SM1-3	12/23/1986	3.18		41000			11140		59130			894.83	906.88	3.61	1.33	2437	
Well	SM1-3	5/18/1989			35274		690	9686		52334			708.11	788.15			2360	
Well	SM1-3	9/11/1989			39020		680	10488		54396			837.15	860.46			4850	
Well	SM1-3	6/4/1990	0.01		36953		712	10308		55942	<5.	<5.	753.34	794.96				
Well	SM1-3	9/19/1990			39357		676	10891		60330			813.73	873.62				
Well	SM1-3	6/10/1991			37332		652	10817		56630			825.88	830.61				
Well	SM1-3	9/24/1991			33834		634	9173		56844			753.76	756.49				
Well	SM1-3	5/26/1992			38979		636			54788			832.77	863.76				
Well	SM1-3	9/2/1992			32352		580	10494		54980			757.48	729.3				
Well	SM1-3	6/7/1993			36550		604	10860		54050			799.82	818.83				
Well	SM1-3	9/8/1993			38485		588	9808		52794			726.03	858.19				
Well	SM1-3	6/6/1994			35809		918	9685		51654			723.26	803.95				
Well	SM1-3	9/7/1994			36632		560	10088		52878			745.2	815.75				
Well	SM1-3	6/6/1995			34000		600	8830		51490			698.4	751.4				
Well	SM1-3	9/6/1995			36469		555	9512		52154			771.3	804				
Well	SM1-3	6/13/2000			33328		763	9407		53499								
Well	SM1-3	6/5/2001			35205		676	9012		51156								
Well	SM1-3	9/5/2001			35812		573	9284		54564								
Well	SM1-3	6/24/2002			35992		837	9579		51047								
Well	SM1-3	9/24/2002			34004			9240		51269								
Well	SM1-3	9/16/2003			48641		593	15557		70600								
Well	SM1-3	6/18/2004			44750		574	13652		65224								
Well	SM1-3	5/11/2005			50360		618	19348		87210								Verified by Lab Report
Well	SM1-3	7/20/2005			52390		792	21769		92910								Referenced lab notes
Well	SM1-3	6/28/2006			52552		670	20256		82434								
Well	SM1-3	9/28/2006			33556		758	18951		82780								
Well	SM1-4	4/28/1982			3103	0.05	1680	492	6000	4232								
Well	SM1-4	8/30/1982			1700	0.07	437	1673	4100	3195								
Well	SM1-4	11/29/1982			1600		510	1432	3600	2580								
Well	SM1-4	2/15/1983			1970		420	1879		3210								
Well	SM1-4	6/28/1983	0.18		1500		435	1345	3500	3033								
Well	SM1-4	8/29/1983	0.01		1900	0.09	383	1700	4300	3468								
Well	SM1-4	11/7/1983	0.08		1750	0.21	374	1690		3052								
Well	SM1-4	2/21/1984	0.04		1900		331	1670	3750	3100								
Well	SM1-4	8/2/1984	<0.01		1700			1450		2740			43.13	43.97	<0.05	0.02	190	
Well	SM1-4	11/19/1984	0.02		1600			1336		2614			40.98	41.15	0.09	<0.01	251	
Well	SM1-4	2/26/1985	0.02		1250			1070		1996			31.89	33.03	0.07	0.03	154	
Well	SM1-4	5/8/1985	<0.01		1250			1041		2010			32.88	33.45	<0.05	<0.01	150	

Emery Water Quality Data - Qal

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
Well	SM1-4	8/14/1985	<0.01		1440			1360		2481			40.31	38.1	<0.05	0.02	88	
Well	SM1-4	11/21/1985	0.08		1700			1400		2708			43.38	44.16	0.1	0.04	177	
Well	SM1-4	6/30/1986	0.01		1400			1138		2372			37.93	37.54	<0.05	0.01	145	
Well	SM1-4	12/23/1986	0.14		1200			1045		2031			33.12	32.54	8.77	0.44	132.5	
Well	SM1-4	5/26/1989			2638		284	1450		4276			62.25	62.84			203	
Well	SM1-4	9/11/1989			2058		338	1614		3386			50.49	51.66			275	
Well	SM1-4	6/8/1990	<0.01	0.095	2293		355	1708		3824	0.44	<0.05	54.78	57.07				
Well	SM1-4	6/10/1991			2251		344	1785		3690			54.88	55.83				
Well	SM1-4	5/26/1992			1753		366			3148			44.96	45.56				
Well	SM1-4	9/2/1992			1844		758	1634		3162			54.08	55.4				
Well	SM1-4	6/7/1993			1764		372	1539		2836			50.42	45.83				
Well	SM1-4	6/6/1994			2140		450	1545		3532			49.85	55.7				
Well	SM1-4	9/7/1994			2346		412	1645		3726			57.81	59.44				
Well	SM1-4	6/6/1995			1900		460	1100		3030			38.6	50.3				
Well	SM1-4	9/6/1995			854		375	1064		2230			56.7	26.1				
Well	SM1-4	6/5/2000			1506		465	1159		2601								
Well	SM1-4	6/4/2001			1858		405	1297		3041								
Well	SM1-4	9/23/2002			1635			1231		2906								
Well	SM1-4	9/18/2003																Dry
Well	SM1-4	6/18/2004			2371		493	1730		3920					32.7	0.63		
Well	SM1-4	9/25/2004																probe stops at 66'
Well	SM1-4	5/23/2005			2502		499	1813		4223								
Well	SM1-4	7/20/2005			1977		667	1536		3700								
Well	SM1-4	6/28/2006			2173		563	1794		3761								
Well	SM1-4	9/28/2006			1830		440	1611		3440								
Number of Observations:			66	18	359	23	192	230	159	361	28	13	133	133	30	36	59	
Maximum:			17.0	10.3	94336	0.30	7893	21769	51100	92910	5.40	0.60	894.8	906.9	46.9	3.02	4850	
Minimum:			0.00	0.0	287	0.00	168	492	2610	940	0.05	0.05	25.2	17.2	0.05	0.01	88	
Mean:			2.01	0.63	10670	0.13	681.3	4854.8	11955	16555	0.46	0.18	287.1	298.6	3.22	0.86	1150	
Standard Deviation:			3.25	2.42	12862	0.08	607.4	4191.0	11462	18820	1.01	0.16	274.5	282.7	10.25	0.75	1039	
Equivalent weights of means:					222.1													



Emery Water Quality Data - Kmb

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH units	F-Sp. Cond. umhos/cm	Flow GPM	L-pH units	TSS mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l
Well	T1-B	6/30/1986					7.6	4							0.12								447		<1.	228
Well	T1-B	5/26/1989											347		<0.02		280	0.36	52		4710		304		<1.	140
Well	T1-B	9/11/1989											399		0.02		391	0.26	50		5405		424			190
Well	T1-B	6/8/1990							0.23	<0.001	0.5	<0.1	612	<0.1	<0.2	<0.02	406	0.2	26	0.001	4390	<0.1	405			29
Well	T1-B	9/17/1990											622		<0.02		421	0.61	26		4290		402			160
Well	T1-B	6/17/1991											315		<0.1		303	0.41	27		5105		428			190
Well	T1-B	9/23/1991											267		<0.4		285	0.48	35		4820		410			66
Well	T1-B	5/26/1992											345		<0.2		242	<0.1	23		4510		390			56
Well	T1-B	9/2/1992											391		<0.2		276	0.63	27		4800		727			115
Well	T1-B	6/7/1993											390		1.62		258	0.87	27		4410		394			111
Well	T1-B	9/8/1993											355		<0.1		240	0.3	25		4135		416			114
Well	T1-B	6/6/1994											355		0.2		239	0.2	24		4000		440			118
Well	T1-B	9/7/1994	16.5	7.3	4980								375		0.07		245	0.22	27		4100		406			105
Well	T1-B	6/6/1995	12.3	7.0	3530								193		<0.1		210	0.2	21		4000		530		<5.	117
Well	T1-B	9/6/1995	16.0	6.9	5170								358		0.2		231	0.3	21		4510		510		<5.	124
Well	T1-B	6/5/2000	14.2	6.9	17920								484		<0.1		264	<0.1	24		4485		636		<5.	167
Well	T1-B	6/4/2001	12.7	6.9	16740								420		<0.1		225	<0.1	24		3830		571		<5.	450
Well	T1-B	6/18/2004																								
Well	T1-B	9/25/2004																								
Well	T1-B	5/11/2005																								
Well	T1-B	7/11/2005																								
Well	T1-B	9/28/2006																								
Well	USGS 3-1	9/27/2004	11.3	7.2	4850								424		2.2		273	1.13	31.9		268		532		< 5.	53
	Number of Observations:		6	6	6	0	1	1	1	1	1	1	17	1	7	1	17	14	17	1	17	1	18	0	5	18
	Maximum:		16.5	7.3	17920		7.6	4	0.23	<0.001	0.5	<0.1	622	<0.1	2.2	<0.02	421	1.13	52	0.001	5405	<0.1	727		<5	450
	Minimum:		11.3	6.9	3530		7.6	4	0.23	<0.001	0.5	<0.1	193	<0.1	0.02	<0.02	210	0.2	21	0.001	268	<0.1	304		<1	29
	Mean:		13.8	7.0	8865.0		7.6	4	0.23	<0.001	0.5	<0.1	391.3	<0.1	0.6329	<0.02	281.71	0.4407	28.876	0.001	4221.6	<0.1	465.1			140.7
	Standard Deviation:		2.1	0.2	6593.0		--	--	--	--	--	--	106.4	--	0.8907	--	64.062	0.2812	9.0248	--	1098.9	--	102.0		--	93.0
	Equivalent weights of means:												19.5				23.2		0.7		183.6		7.6			4.0

Emery Water Quality Data - Kmb

SITE TYPE	SITE NAME	DATE	NO3 mg/l	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
Well	T1-B	6/30/1986	0.08	<0.01	0.05	16000			2960	25500	24232			348.8	348.5	0.24	0.36	472	
Well	T1-B	5/26/1989				10533		304	2016		17062			248.9	231.2			305	
Well	T1-B	9/11/1989				13118		424	2601		19806			291.1	289.3			450	
Well	T1-B	6/8/1990				12200		405	3195		17998	<0.1	<0.5	257.7	265.1				
Well	T1-B	9/17/1990				12159		402	3281		18176			255.1	267.9				
Well	T1-B	6/17/1991				11648		428	2030		20164			265.9	258.5				
Well	T1-B	9/23/1991				11484		410	1836		17770			249.7	251.2				
Well	T1-B	5/26/1992				10825		402			16506			236.1	236.9				
Well	T1-B	9/2/1992				11978		727	2109		16548			254.1	269.3				
Well	T1-B	6/7/1993				10949		394	2033		15910			235.4	240.9				
Well	T1-B	9/8/1993				11936		416	1872		15360			220.0	262.2				
Well	T1-B	6/6/1994				11442		440	1867		15656			214.0	252.4				
Well	T1-B	9/7/1994				9660		406	1942		15544			219.9	213.9				
Well	T1-B	6/6/1995				11000		430	1350		15500			200.9	241.0				
Well	T1-B	9/6/1995				9531		415	1845		14630			233.1	210.3				
Well	T1-B	6/5/2000				5542		521	2296		16673								
Well	T1-B	6/4/2001				9471		468	1975		14757								
Well	T1-B	6/18/2004																	Not enough water to sample
Well	T1-B	9/25/2004																	Not enough water to sample
Well	T1-B	5/11/2005																	Not enough water to sample
Well	T1-B	7/11/2005																	Not enough water to sample
Well	T1-B	9/28/2006																	Not enough water to sample
Well	USGS 3-1	9/27/2004				2513		532	2183		4531								Dissolved metals filtered at lab
	Number of Observations:		1	1	1	18	0	17	17	1	18	1	1	15	15	1	1	3	
	Maximum:		0.08	<0.01	0.05	16000		727	3281	25500	24232	<0.1	<0.5	348.79	348.5	0.24	0.36	472	
	Minimum:		0.08	<0.01	0.05	2513		304	1350	25500	4531	<0.1	<0.5	200.9	210.3	0.24	0.36	305	
	Mean:		0.08	<0.01	0.05	10666		442.6	2199.5	25500	16490	<0.1	<0.5	248.7	255.9	0.24	0.36	409	
	Standard Deviation:		--	--	--	2883.1		88.9	519.7	--	3798	--	--	35.8	33.2	--	--	90.7	
	Equivalent weights of means:					222.1													

Emery Water Quality Data - Kmf(u)

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-Sp. Cond. umhos/cm	Flow GPM	L-pH units	TSS mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l
Well	AA-U	5/23/2005																								
Well	BRYANT-U	6/24/1981					7.9	<2.							1								162.8		<1.	54.7
Well	BRYANT-U	3/12/1984					8.6	16							2.64								193		46	102
Well	BRYANT-U	6/13/1984					8.5																171		24	120
Well	BRYANT-U	9/24/1984					9.8																47		108	77
Well	BRYANT-U	3/25/1985					7.4																214		<1.	65
Well	BRYANT-U	6/20/1985					9.2	6							<0.05								100		86	77
Well	BRYANT-U	5/19/1989											3		<0.02		3	<0.01	4		451				136	89
Well	BRYANT-U	9/11/1989											1		0.18		1	0.01	5		410				127	85
Well	BRYANT-U	6/8/1990							0.74	<0.001	0.25	<0.01	21	<0.01	<0.02	<0.02	15	<0.01	3	<0.001	350	<0.01	72		138	70
Well	BRYANT-U	9/17/1990											2		0.03		9	0.01	3		412		92		123	77
Well	BRYANT-U	6/17/1991											2		1.58		1	0.01	3		340				172	59
Well	BRYANT-U	9/30/1991											35		0.06		19	0.02	3		351		238		16	43
Well	BRYANT-U	6/15/1992											2		0.07		1	<0.01	3		327				88	84
Well	BRYANT-U	9/2/1992											29		0.1		19	0.02	3		356		243			49
Well	BRYANT-U	6/7/1993											2		1.12		3	0.01	5		374		74		332	50
Well	BRYANT-U	9/8/1993											2		0.02		4	<0.01	4		349		100		128	49
Well	BRYANT-U	6/20/1994	14.9	9.3	1480								2		0.14		2	<0.01	5		359		86		204	54
Well	BRYANT-U	9/7/1994	15.3	8.5	1470								1		<0.02		1	<0.01	3		393		58		136	63
Well	BRYANT-U	6/6/1995	12.9	9.1	1840								2		<0.1		3	<0.1	3		340		<5.		300	72
Well	BRYANT-U	9/5/1995	17.3	7.9	1700								6		<0.1		9	<0.1	4		396		55		155	80
Well	BRYANT-U	6/13/2000	13.6	8.5	1940								2		<0.1		<1.	<0.1	3		367		<5.		247	44
Well	BRYANT-U	6/5/2001	13.4	8.5	1850								2		<0.1		1	<0.1	3		355		<5.		160	52
Well	BRYANT-U	9/5/2001	15.1	9.1	2060								2		<0.1		1	<0.05	4		365		<5.		88	53.1
Well	BRYANT-U	6/24/2002	14.7	8.7	1840								2		<0.1		<1.	<0.05	3		363		<5.		130	45
Well	BRYANT-U	9/24/2002	14.1	7.5	1810								4		<0.1		9	<0.05	3		363		99.75		51	47
Well	BRYANT-U	9/18/2003																								
Well	BRYANT-U	9/25/2004																								
Well	BRYANT-U	12/27/2004																								
Well	BRYANT-U	5/26/2005	13.5	8.5	9480								318		< .03		209	0.491	11.9		1970					83
Well	BRYANT-U	7/22/2005	13.8	8.4	1920			58					14.9		< .03		15.7	0.008	3.01		327					42
Well	BRYANT-U	6/30/2006																								
Well	BRYANT-U	9/27/2006																								
Well	H-U	9/17/2003																								
Well	LEWIS-U	6/20/1985					8.3	1							<0.05								285		<1.	41
Well	LEWIS-U	9/19/1985					8.3	<0.5							<0.05								288		<1.	38
Well	LEWIS-U	6/24/1986					8.5	<0.5							<0.05								268		30	31
Well	LEWIS-U	6/30/1989											1		0.03		1	<0.01	1		370		286		20	29
Well	LEWIS-U	9/11/1989											1		0.02		1	0.01	2		330		276		32	26
Well	LEWIS-U	6/8/1990							0.5	0.002	0.29	<0.01	17	<0.01	0.09	<0.02	11	<0.01	1	<0.001	300	0.03	275		40	44
Well	LEWIS-U	9/17/1990											<1.		<0.02		2	<0.01	1		340		280		32	30
Well	LEWIS-U	6/5/1991											27		0.25		16	<0.01	1		270		264		36	31
Well	LEWIS-U	9/23/1991											5		<0.04		2	0.02	1		365		274		28	28
Well	LEWIS-U	5/26/1992											2		<0.02		1	<0.01	1		316		274		32	30
Well	LEWIS-U	9/2/1992											2		0.07		1	<0.01	1		281		290		28	30
Well	LEWIS-U	6/7/1993											2		<0.02		2	<0.01	1		335		266		32	29
Well	LEWIS-U	9/7/1993											2		<0.02		1	<0.01	1		302		290		32	29
Well	LEWIS-U	6/6/1994											3		<0.02		2	<0.01	1		328		294		68	32
Well	LEWIS-U	9/7/1994	15.9	7.6	1250								2		<0.02		2	<0.01	1		338		286		28	33
Well	LEWIS-U	6/6/1995	12.5	7.7	1110								7		<0.1		19	<0.1	1		330		300		40	30
Well	LEWIS-U	9/5/1995	16	7.5	1250								4		<0.1		7	<0.1	1		346		295		40	29
Well	LEWIS-U	6/13/2000	14.2	7.7	1560								2		<0.1		2	<0.1	<1.		325		336		17	26
Well	LEWIS-U	6/5/2001	13.4	7.8	1550								3		<0.1		2	<0.1	1		319		330		17	32
Well	LEWIS-U	9/5/2001	13.9	7.9	1550								2		<0.1		2	<0.05	1		331		306		21	33.1
Well	LEWIS-U	6/24/2002	15.8	7.9	1590								3		<0.1		2	<0.05	1		324		326		17	26
Well	LEWIS-U	9/24/2002	13.1	7.9	1540								3		<0.1		1.5	<0.05	<1.		330		326		16	25
Well	LEWIS-U	9/17/2003																								
Well	LEWIS-U	3/29/2004																								
Well	LEWIS-U	6/18/2004																								
Well	LEWIS-U	9/25/2004																								
Well	LEWIS-U	9/27/2006																								
Well	LEWIS-U	11/20/2006																								
Well	MUDDY2	12/28/2004																								
Well	MUDDY2	3/25/2005																								
Well	MUDDY2	5/12/2005																								
Well	MUDDY2	7/20/2005																								

Emery Water Quality Data - Kmf(u)

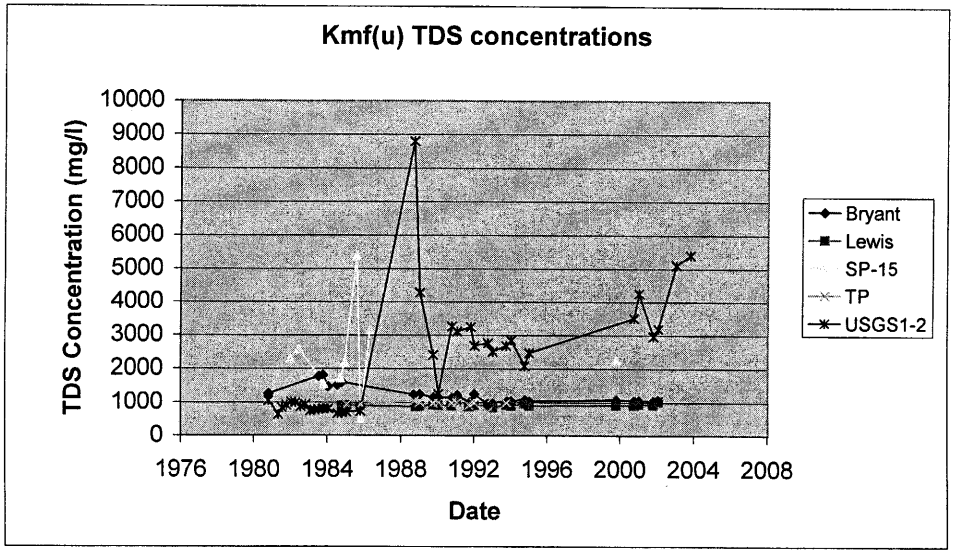
SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-Sp. Cond. umhos/cm	Flow GPM	L-pH units	TSS mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l
Well	MUDDY2	11/17/2005																								
Well	MUDDY2	3/9/2006																								
Well	MUDDY2	6/28/2006																								
Well	R2-U	9/17/2003																								
Well	R2-U	3/18/2004																								
Well	R2-U	9/20/2004																								
Well	R2-U	12/28/2004																								
Well	R2-U	3/24/2005																								
Well	R2-U	5/23/2005																								
Well	R2-U	6/29/2006																								
Spring	SP-15	8/30/1982					6.8		1.99														281		<1.	16.3
Spring	SP-15	2/15/1983							2														260		<1.	17
Spring	SP-15	6/26/1984					7.2																240		<1.	14
Spring	SP-15	5/21/1985							<0.05														233		<1.	26
Spring	SP-15	8/14/1985							<0.05														256		<1.	19
Spring	SP-15	3/31/1986					4	828							0.33								<1.		<1.	69
Spring	SP-15	6/30/1986					7.65	25							<0.05								256		<1.	8
Spring	SP-15	12/23/1986							<0.5														35		0	24.7
Spring	SP-15	12/4/1995				0																				
Spring	SP-15	3/4/1997				0																				
Spring	SP-15	6/2/1997				0																				
Spring	SP-15	9/10/1997				0																				
Spring	SP-15	12/3/1997				0																				
Spring	SP-15	3/2/1998				0																				
Spring	SP-15	6/1/1998				0																				
Spring	SP-15	9/1/1998				0																				
Spring	SP-15	6/13/2000	13.9	7.6	1790								328		<0.1		102	0.2	3		90		175		<5.	12
Spring	SP-15	3/21/2001				0																				
Spring	SP-15	6/5/2001				0																				
Spring	SP-15	9/4/2001				0																				
Spring	SP-15	12/10/2001				0																				
Spring	SP-15	1/1/2002				0																				
Spring	SP-15	3/6/2002				0																				
Spring	SP-15	6/8/2002				0																				
Spring	SP-15	6/30/2003				0																				
Spring	SP-15	9/18/2003				0																				
Spring	SP-15	12/26/2003				0																				
Spring	SP-15	3/10/2004				0																				
Spring	SP-15	6/23/2004				0																				
Spring	SP-15	9/25/2004				0																				
Spring	SP-15	12/28/2004				0																				
Spring	SP-15	3/31/2005				0																				
Spring	SP-15	5/23/2005				0																				
Spring	SP-15	7/19/2005				0																				
Spring	SP-15	11/22/2005				0																				
Spring	SP-15	3/9/2006				0																				
Spring	SP-15	6/27/2006				0																				
Spring	SP-15	9/29/2006				0																				
Spring	SP-15	11/28/2006				0																				
Well	T1-U	3/29/2004																								
Well	T1-U	12/28/2004																								
Well	T1-U	3/31/2005																								
Well	T1-U	5/11/2005																								
Well	T1-U	7/11/2005																								
Well	T1-U	11/22/2005																								
Well	T1-U	9/28/2006																								
Well	T1-U	11/20/2006																								
Well	T2-U	9/17/2003																								
Well	T2-U	3/29/2004																								
Well	T2-U	6/18/2004																								
Well	T2-U	12/28/2004																								
Well	TP-U	7/31/1985					9.9	85							<0.05								158		370	53
Well	TP-U	9/26/1985					9.5	78							1.6								254		218	52
Well	TP-U	6/30/1986					9.5	165							0.11								138		312	46
Well	TP-U	5/26/1989											<1.		0.35		<1.	<0.01	3		402		32		336	49
Well	TP-U	9/11/1989											1		0.07		1	0.01	2		369		140		440	45

Emery Water Quality Data - Kmf(u)

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-Sp. Cond. umhos/cm	Flow GPM	L-pH units	TSS mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l
Well	TP-U	6/8/1990							0.46	<0.001	0.3	<0.01	2	<0.01	<0.02	<0.02	<1.	<0.01	1	<0.001	348	0.04	29		490	48
Well	TP-U	9/18/1990											<1.		0.07		<1.	<0.01	1		386		302		204	55
Well	TP-U	6/17/1991											2		21		<1.	0.09	1		339		310		218	55
Well	TP-U	9/23/1991											2		0.06		<1.	<0.01	1		437		284		246	48
Well	TP-U	5/26/1992											1		<0.02		<1.	<0.01	1		341		106		384	45
Well	TP-U	9/2/1992											1		<0.02		<1.	<0.01	1		348				80	48
Well	TP-U	6/7/1993											<1.		0.3		<1.	<0.01	1		349				56	46
Well	TP-U	9/8/1993											<1.		<0.02		<1.	<0.01	1		379		82		472	45
Well	TP-U	6/6/1994											<1.		<0.02		1	<0.01	1		389					46
Well	TP-U	9/7/1994	17.2	8.8	2980								<1.		<0.02		<1.	<0.01	1		417		82		464	55
Well	TP-U	9/17/2003																								
Well	TP-U	9/23/2004																								
Well	TP-U	12/28/2004																								
Well	TP-U	3/31/2005																								
Well	TP-U	5/11/2005																								
Well	TP-U	7/11/2005																								
Well	TP-U	11/22/2005																								
Well	TP-U	3/9/2006																								
Well	TP-U	6/28/2006																								
Well	USGS 1-2	6/24/1981					7.6	355.5							24								410.6		<1.	25.7
Well	USGS 1-2	12/30/1981					8.3																561		<1.	51.1
Well	USGS 1-2	3/16/1982					7.5																484		<1.	34.1
Well	USGS 1-2	6/15/1982					8.1																458		<1.	33.5
Well	USGS 1-2	9/20/1982					7.7																418		<1.	33
Well	USGS 1-2	12/10/1982					7.6																386		<1.	30.6
Well	USGS 1-2	3/22/1983					7.3																412		<1.	25
Well	USGS 1-2	6/30/1983					7.65																451		<1.	27
Well	USGS 1-2	9/26/1983					7.55																436		<1.	21
Well	USGS 1-2	12/29/1983					7.3																472		<1.	18
Well	USGS 1-2	3/8/1984					7.6	253							0.22								447		<1.	26
Well	USGS 1-2	6/13/1984					7.5																380		<1.	21
Well	USGS 1-2	9/24/1984					7.4																376		<1.	17
Well	USGS 1-2	3/27/1985					7.45																354		<1.	21
Well	USGS 1-2	6/20/1985					7.35	5							<0.05								330		<1.	18
Well	USGS 1-2	9/19/1985					7.45	58							<0.05								324		<1.	18
Well	USGS 1-2	6/24/1986					7.1	20							<0.05								336		<1.	17
Well	USGS 1-2	5/19/1989											241		<0.02		474	0.13	17		2030		456			209
Well	USGS 1-2	9/11/1989											307		0.02		290	0.21	12		521		458			68
Well	USGS 1-2	6/4/1990							1.07	0.004	0.37	<0.01	175	<0.01	0.03	<0.02	146	0.06	6	<0.001	418	0.01	450			45
Well	USGS 1-2	9/18/1990											68		<0.02		58	0.06	5		298		366			<1.
Well	USGS 1-2	6/17/1991											312		0.97		162	0.52	7		369		378			46
Well	USGS 1-2	9/24/1991											376		<0.02		170	0.67	8		410		374			50
Well	USGS 1-2	6/24/1992											281		0.53		155	0.37	7		462		462			40
Well	USGS 1-2	9/2/1992											249		0.24		102	0.32	6		372		428			37
Well	USGS 1-2	6/7/1993											242		0.83		150	0.32	7		471		450			44
Well	USGS 1-2	9/8/1993											179		0.04		129	0.21	7		446		494			45
Well	USGS 1-2	6/6/1994											268		0.12		110	0.51	6		397		450			39
Well	USGS 1-2	9/7/1994	12.5	8.4									288		<0.02		103	0.52	6		393		440			26
Well	USGS 1-2	6/6/1995	9.7	8.2									154		<0.1		95	0.3	5		450		580		<5.	31
Well	USGS 1-2	9/6/1995	18.5	7.5	3250								230		0.4		85	0.3	6		446		605		<5.	35
Well	USGS 1-2	6/5/2001	12.5	7.5	4320								223		0.2		204	0.1	9		518		582		<5.	65
Well	USGS 1-2	9/5/2001	14.6	7.5	5450								254		<0.1		230	0.11	9		592		627		<5.	64.3
Well	USGS 1-2	6/24/2002	15.5	7.5	3710								185		<0.1		148	0.27	7		456		493		<5.	41
Well	USGS 1-2	9/23/2002	12.3	6.4	3910								215		<0.1		174	0.28	7		491		501		<5.	41
Well	USGS 1-2	9/17/2003	13.3	7.1	5870								331		< .005		311	0.486	13.4		743		626		< 5.	78
Well	USGS 1-2	6/18/2004	14.5	7.1	6530								369		0.04		346	0.511	14.2		797		469		< 5.	71
Well	USGS 1-2	12/28/2004																								
Well	USGS 1-2	3/25/2005																								
Well	USGS 1-2	5/11/2005																								
Well	USGS 1-2	7/19/2005																								
Well	USGS 1-2	6/28/2006																								

Emery Water Quality Data - Kmf(u)

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-Sp. Cond. umhos/cm	Flow GPM	L-pH units	TSS mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l
	Number of Observations:		30	30	28	30	33	14	6	2	4	4	66	4	38	0	61	33	71	4	73	3	95	0	57	109
	Maximum:		18.5	9.3	9480		9.9	828	2	0.004	0.37	<0.01	376	<0.01	24	0	474	0.67	17	<0.001	2030	0.04	627	0	490	209
	Minimum:		9.7	6.4	1110		4	1	0.46	0.002	0.25	<0.01	1	<0.01	0.02	0	1	0.008	1	<0.001	90	0.01	29	0	0	8
	Mean:		14.3	8.0	2736		7.9	139.5	1.13	0.003	0.3	<0.01	88.286	<0.01	1.55	#DIV/0!	68.0	0.22	4.0	<0.001	427.0	0.03	303.1	#DIV/0!	138.4	45.2
	Standard Deviation:		1.8	0.7	1985	--	1.1	223.9	0.71	0.001	0.0	--	126	--	5.05	#DIV/0!	103.2	0.20	3.6	--	281.9	0.02	149.6	#DIV/0!	136.6	26.0
	Equivalent weights of means:												4.4				5.6		0.1		18.6		5.0			1.3



Emery Water Quality Data - Kmf(u)

SITE TYPE	SITE NAME	DATE	NO3 mg/l	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
Well	AA-U	5/23/2005																Oil in Well
Well	BRYANT-U	6/24/1981	<0.01	<0.01		768.5	162.8	559.3	1720	1256			21.4	20.5	6	6	19	
Well	BRYANT-U	3/12/1984	0.05	<0.01	0.02	1000		225	2600	1770			25.75	26.88	5.44	0.06	30	
Well	BRYANT-U	6/13/1984	<0.01	<0.01	0.04	1050		191	2720	1813			25.47	28.67	1.5	0.01	32	
Well	BRYANT-U	9/24/1984	<0.01	<0.01	<0.01	900		130	2350	1475			21.59	21.85	0.91	<0.01	23	
Well	BRYANT-U	3/25/1985	<0.01	<0.01	0.07	795		203	2400	1519			23.1	22.67	8.55	0.09	25	
Well	BRYANT-U	6/20/1985	0.04	<0.01	0.05	755		118	2310	1602			21.83	21.62	3.08	0.03	21	
Well	BRYANT-U	5/19/1989				617	160	20		1232			20.34	18.65			10	
Well	BRYANT-U	9/11/1989				677	167	2		1238			18.2	19.94			2	
Well	BRYANT-U	6/8/1990				593	210	114		1152	<0.05	<0.05	17.76	18.61				
Well	BRYANT-U	9/17/1990				562	215	42		1148			19.04	18.26				
Well	BRYANT-U	6/17/1991				506	172	9		1130			15.22	15.72				
Well	BRYANT-U	9/30/1991				652	254	165		1224			18.83	19.98				
Well	BRYANT-U	6/15/1992				529	88			998			14.65	15.22				
Well	BRYANT-U	9/2/1992				681	243	150		1250			18.75	20.53				
Well	BRYANT-U	6/7/1993				348	406	17		954			16.93	16.83				
Well	BRYANT-U	9/8/1993				531	228	21		1000			15.89	17.08				
Well	BRYANT-U	6/20/1994				500	290	13		1026			16.19	17.81				
Well	BRYANT-U	9/7/1994				593	194	7		1042			17.5	18.1				
Well	BRYANT-U	6/6/1995				230	430	20		1070			15.1	16.8				
Well	BRYANT-U	9/5/1995				607	305	52		1040			18.3	21				
Well	BRYANT-U	6/13/2000				465	214	5		1073								
Well	BRYANT-U	6/5/2001				553	170	9		1048								
Well	BRYANT-U	9/5/2001				536	179	9		1058								
Well	BRYANT-U	6/24/2002				529	217	5		1036			16	16.6				
Well	BRYANT-U	9/24/2002				589		47		1067								
Well	BRYANT-U	9/18/2003																Power off. Could not sample.
Well	BRYANT-U	9/25/2004																Fuse blown. No power to pump.
Well	BRYANT-U	12/27/2004																Fuse blown to pump
Well	BRYANT-U	5/26/2005				6884		378		7963								
Well	BRYANT-U	7/22/2005				699		148		1172								
Well	BRYANT-U	6/30/2006																No access to sample
Well	BRYANT-U	9/27/2006																No power to sample
Well	H-U	9/17/2003																Oily
Well	LEWIS-U	6/20/1985	0.02	<0.01	0.1	380		18	1600	895			14.03	14.07	0.12	<0.01	4	
Well	LEWIS-U	9/19/1985	<0.01	<0.01	0.04	456		25	1405	912			15.81	16.33	0.13	0.01	2	
Well	LEWIS-U	6/24/1986	0.03	<0.01	0.05	370		13	1510	887			15.15	14.94	<0.05	<0.01	1	
Well	LEWIS-U	6/30/1989				358	306	7		876			16.44	14.45			2	
Well	LEWIS-U	9/11/1989				370	308	2		882			14.6	14.66			1	
Well	LEWIS-U	6/8/1990				362	315	88		916	0.05	<0.05	14.98	15.13				
Well	LEWIS-U	9/17/1990				360	312	6		910			15.1	14.64				
Well	LEWIS-U	6/5/1991				370	300	133		886			14.57	14.64				
Well	LEWIS-U	9/23/1991				445	302	21		1060			16.5	16.17				
Well	LEWIS-U	5/26/1992				348	306			876			14.11	14.27				
Well	LEWIS-U	9/2/1992				270	318	9		898			12.57	12.87				
Well	LEWIS-U	6/7/1993				381	298	13		902			15.03	14.77				
Well	LEWIS-U	9/7/1993				329	322	9		830			13.5	14.16				
Well	LEWIS-U	6/6/1994				403	318	16		924			14.77	15.72				
Well	LEWIS-U	9/7/1994				387	314	13		888			15.16	15.33				
Well	LEWIS-U	6/6/1995				370	310	100		960			16.3	14.8				
Well	LEWIS-U	9/5/1995				389	310	39		890			15.8	15.1				
Well	LEWIS-U	6/13/2000				353	304	13		906								
Well	LEWIS-U	6/5/2001				429	298	16		911								
Well	LEWIS-U	9/5/2001				400	286	13		938								
Well	LEWIS-U	6/24/2002				387	296	16		921			14.4	14.7				
Well	LEWIS-U	9/24/2002				387		12		1015								
Well	LEWIS-U	9/17/2003																Dry
Well	LEWIS-U	3/29/2004																probe stops at 215 feet
Well	LEWIS-U	6/18/2004																probe hangs up no water to sample
Well	LEWIS-U	9/25/2004																Not enough water to sample
Well	LEWIS-U	9/27/2006																No access to sample or probe for depth
Well	LEWIS-U	11/20/2006																No Access to the hole
Well	MUDDY2	12/28/2004																Broken Pipe
Well	MUDDY2	3/25/2005																665+ Dry
Well	MUDDY2	5/12/2005																655+ Dry
Well	MUDDY2	7/20/2005																Well is dry

Emery Water Quality Data - Kmf(u)

SITE TYPE	SITE NAME	DATE	NO3 mg/l	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
Well	MUDDY2	11/17/2005																Well is broken at 510 ft.
Well	MUDDY2	3/9/2006																Broken down in well.
Well	MUDDY2	6/28/2006																Buried by county road
Well	R2-U	9/17/2003																Dry
Well	R2-U	3/18/2004																dry
Well	R2-U	9/20/2004																Site was dry
Well	R2-U	12/28/2004																Dry
Well	R2-U	3/24/2005																Dry
Well	R2-U	5/23/2005																Dry
Well	R2-U	6/29/2006																Dry
Spring	SP-15	8/30/1982	0.37	<0.01		1400		1813	3500	2313					0.24	0.09	91	
Spring	SP-15	2/15/1983	0.39	<0.01		1680		1744		2580					0.39	0.1	90	
Spring	SP-15	6/26/1984	0.11			840			1900	1549			24.13	22.69			81	
Spring	SP-15	5/21/1985	0.14	<0.01		1040		1190		1720			28.04	27.05	0.21	0.06	95	
Spring	SP-15	8/14/1985	0.1	<0.01		1400		1550		2198			35.11	34.81	<0.05	0.02	142	
Spring	SP-15	3/31/1986	6.22	0.18	0.08	4000		2580	6500	5392					0.33	4.54	331	
Spring	SP-15	6/30/1986	0.02	<0.01	0.06	180		366	880	523			9.29	9.09	0.23	<0.01	42	
Spring	SP-15	12/23/1986	2.74	0.06		2000		1925		3142			44.36	43.04	4.51	1.42	180	
Spring	SP-15	12/4/1995																
Spring	SP-15	3/4/1997																
Spring	SP-15	6/2/1997																
Spring	SP-15	9/10/1997																
Spring	SP-15	12/3/1997																
Spring	SP-15	3/2/1998																
Spring	SP-15	6/1/1998																
Spring	SP-15	9/1/1998																
Spring	SP-15	6/13/2000				1113	143	1239		2269								
Spring	SP-15	3/21/2001																
Spring	SP-15	6/5/2001																
Spring	SP-15	9/4/2001																
Spring	SP-15	12/10/2001																
Spring	SP-15	1/1/2002																
Spring	SP-15	3/6/2002																
Spring	SP-15	6/8/2002																
Spring	SP-15	6/30/2003																
Spring	SP-15	9/18/2003																dry
Spring	SP-15	12/26/2003																frozen
Spring	SP-15	3/10/2004																damp
Spring	SP-15	6/23/2004																dry
Spring	SP-15	9/25/2004																Site was dry
Spring	SP-15	12/28/2004																Site was dry
Spring	SP-15	3/31/2005																
Spring	SP-15	5/23/2005																Irrigation water flowing from above springs
Spring	SP-15	7/19/2005																Irrigation water only
Spring	SP-15	11/22/2005																
Spring	SP-15	3/9/2006																No Flow in 1st. Quarter.
Spring	SP-15	6/27/2006																
Spring	SP-15	9/29/2006																
Spring	SP-15	11/28/2006																
Well	T1-U	3/29/2004																Just moist
Well	T1-U	12/28/2004																Well is Dry
Well	T1-U	3/31/2005																Well is Dry
Well	T1-U	5/11/2005																Well is Dry
Well	T1-U	7/11/2005																Well is Dry
Well	T1-U	11/22/2005																Well is Dry
Well	T1-U	9/28/2006																Well is Dry
Well	T1-U	11/20/2006																Well is Dry
Well	T2-U	9/17/2003																Probe Stops in Mud
Well	T2-U	3/29/2004																muddy
Well	T2-U	6/18/2004																hits mud
Well	T2-U	12/28/2004																Well is Dry
Well	TP-U	7/31/1985	<0.01	<0.01	0.04	125		15	1400	429			14.82	14.68	22.6	0.25	2	
Well	TP-U	9/26/1985	0.04	<0.01	0.05	280		20	1648	942			16.56	16.75	19.6	0.24	2	
Well	TP-U	6/30/1986	0.02	<0.01	0.06	150		13	1780	948			17.53	17.58	0.12	0.04	1	
Well	TP-U	5/26/1989				327	368	<7.		1048			17.63	15.6			<1.	
Well	TP-U	9/11/1989				163	580	7		994			16.42	16.28			1	

Emery Water Quality Data - Kmf(u)

SITE TYPE	SITE NAME	DATE	NO3 mg/l	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
Well	TP-U	6/8/1990				245	519	1		978	<0.05	<0.05	15.36	16.87				
Well	TP-U	9/18/1990				243	506	<7.		998			16.88	16.76				
Well	TP-U	6/17/1991				72	528	1		990			14.96	13.61				
Well	TP-U	9/23/1991				286	530	1		986			19.27	17.95				
Well	TP-U	5/26/1992				255	490			918			15	16.42				
Well	TP-U	9/2/1992				364	308	<2.		992			15.31	15.15				
Well	TP-U	6/7/1993				233	416	<7.		720								
Well	TP-U	9/8/1993				241	554	<7.		1160			16.57	17.4				
Well	TP-U	6/6/1994				288	542	2		990			17.17	18.18				
Well	TP-U	9/7/1994				288	546	<7.		1322			18.24	18.51				
Well	TP-U	9/17/2003																Dry
Well	TP-U	9/23/2004																Site was dry
Well	TP-U	12/28/2004																Dry
Well	TP-U	3/31/2005																Dry
Well	TP-U	5/11/2005																Dry
Well	TP-U	7/11/2005																Dry
Well	TP-U	11/22/2005																Dry
Well	TP-U	3/9/2006																Dry
Well	TP-U	6/28/2006																Dry
Well	USGS 1-2	6/24/1981	<0.01	<0.01		616.5	410.6	740.2	1460	1043			22.5	21.5	39	7	36	
Well	USGS 1-2	12/30/1981	0.016	<0.002	0.068	169		428	1150	638			15.9	15.9	1.43	0.17	27	
Well	USGS 1-2	3/16/1982	0.03	<0.002	0.3	365		458	1380	837			16.6	18	1.31	0.19	18	
Well	USGS 1-2	6/15/1982	0.04	<0.002	0.296	436		526	1450	910			19.2	19.2	1.1	0.14	18	
Well	USGS 1-2	9/20/1982	0.03	<0.01	0.3	510		564	1600	1020					0.97	0.1	20	
Well	USGS 1-2	12/10/1982	0.026	<0.01	0.287	500		544	1380	988			19.8	19	0.93	0.08	23	
Well	USGS 1-2	3/22/1983	<0.01	<0.01		240		181	1150	871			13.5	14	0.89	0.16	21	
Well	USGS 1-2	6/30/1983	0.18	0.62	0.2	240		210	1500	942			13.43	13.16	3.3	0.14	28	
Well	USGS 1-2	9/26/1983	0.19	0.02	0.31	250		134	1400	746			8.85	13	1.16	0.06	12	
Well	USGS 1-2	12/29/1983	0.07	<0.01	<0.01	240		124	1300	764			11.9	13.24	0.2	0.04	12	
Well	USGS 1-2	3/8/1984	0.08	<0.01	0.06	240		140	1150	781			12.35	13.07	0.63	0.06	17	
Well	USGS 1-2	6/13/1984	<0.01	<0.01	0.07	230		137	1300	804			11.55	12.99	0.96	0.05	15	
Well	USGS 1-2	9/24/1984	<0.01	<0.01	<0.01	280		150	1300	800			12.55	13.84	1.35	0.07	12	
Well	USGS 1-2	3/27/1985	<0.01	<0.01	0.05	180		122	1200	670			11.27	11.43	0.4	0.08	11	
Well	USGS 1-2	6/20/1985	0.06	0.02	0.02	240		102	1250	684			12.09	12.11	0.2	0.03	10	
Well	USGS 1-2	9/19/1985	0.01	<0.01	0.07	280		110	1100	709			12.01	12.83	0.85	0.06	12	
Well	USGS 1-2	6/24/1986	0.04	0.04	0.07	260		109	1250	736			12.69	12.61	0.36	0.06	11	
Well	USGS 1-2	5/19/1989				5886	456	2546		8788			140.68	138.58			474	
Well	USGS 1-2	9/11/1989				2696	458	1957		4274			62.37	67.68			295	
Well	USGS 1-2	6/4/1990				1455	450	1036		2414	<0.05	<0.05	39.27	40.82				
Well	USGS 1-2	9/18/1990				584	366	408		1248			21.4	19.56				
Well	USGS 1-2	6/17/1991				1819	378	1444		3262			45.3	47.05				
Well	USGS 1-2	9/24/1991				1976	374	1637		3112			50.99	50.38				
Well	USGS 1-2	6/24/1992				1893	462	1338		3246								
Well	USGS 1-2	9/2/1992				1482	428	1041		2682			37.34	40.72				
Well	USGS 1-2	6/7/1993				1646	450	1220		2758			45.31	44.8				
Well	USGS 1-2	9/8/1993				1461	494	976		2508			39.33	41.82				
Well	USGS 1-2	6/6/1994				1531	450	1121		2682			40.04	42.24				
Well	USGS 1-2	9/7/1994				1389	440	1142	2890	2842			40.29	38.7				
Well	USGS 1-2	6/6/1995				1000	470	780	2050	2080			35.1	31.2				
Well	USGS 1-2	9/6/1995				1257	495	924		2470			37.9	37.1				
Well	USGS 1-2	6/5/2001				2210	477	1397		3502								
Well	USGS 1-2	9/5/2001				2495	514	1581		4254								
Well	USGS 1-2	6/24/2002				1683	405	1071		2961			41.4	44.3				
Well	USGS 1-2	9/23/2002				1789		1253		3187								
Well	USGS 1-2	9/17/2003				3203	513	2107		5103			74.8	79.1				
Well	USGS 1-2	6/18/2004				3545		2346		5406								
Well	USGS 1-2	12/28/2004																Dry
Well	USGS 1-2	3/25/2005																Dead Mouse in Bottom
Well	USGS 1-2	5/11/2005																Dry
Well	USGS 1-2	7/19/2005																Dry
Well	USGS 1-2	6/28/2006																Dry

Emery Water Quality Data - Kmf(u)

SITE TYPE	SITE NAME	DATE	NO3 mg/l	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
	Number of Observations:		26	6	25	110	69	100	35	110	4	4	89	89	34	32	44	
	Maximum:		6.22	0.62	0.31	6884	580	2580	6500	8788	0.05	<0.05	140.7	138.6	39	7	474	
	Minimum:		0.01	0.02	0.02	72	88	1	880	429	<0.05	<0.05	8.9	9.1	0.12	0.01	1	
	Mean:		0.43	0.1567	0.11	863.1	352.9	478.1	1813.8	1620.6	<0.05	<0.05	22.7	23.0	3.79	0.67	52.3	
	Standard Deviation:		1.29	0.2347	0.10	1054.7	122.4	673.3	1004.6	1387.8	--	--	17.4	17.5	8.02	1.74	96.1	
	Equivalent weights of means:					18.0												

Emery Water Quality Data - Kmf(u) + Kmf(m)

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-Sp. Cond. umhos/cm	Flow GPM	L-pH units	TSS mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l
Well	EMRIA2	6/24/1981					6.3	7.5							41								265.7		<1.
Well	EMRIA2	12/3/1981					6.5																526		<1.
Well	EMRIA2	3/16/1982					6.6																449		<1.
Well	EMRIA2	6/15/1982					6.5																427		<1.
Well	EMRIA2	9/17/1982					7																447		<1.
Well	EMRIA2	12/10/1982					7.4																417		<1.
Well	EMRIA2	3/22/1983					6.9																437		<1.
Well	EMRIA2	6/30/1983					6.9																503		<1.
Well	EMRIA2	9/26/1983					7.15																464		<1.
Well	EMRIA2	12/29/1983					7.5																495		<1.
Well	EMRIA2	3/8/1984					7.2	51							<0.05								475		<1.
Well	EMRIA2	6/13/1984					7.1																412		<1.
Well	EMRIA2	9/24/1984					7.3																409		<1.
Well	EMRIA2	3/27/1985					7																371		<1.
Well	EMRIA2	7/31/1985					6.6	25							<0.05								414		<1.
Well	EMRIA2	9/19/1985					6.7	16							<0.05								416		<1.
Well	EMRIA2	6/24/1986					7	22							<0.05								413		<1.
Well	EMRIA2	5/19/1989											455		<0.02		999	3.46	44		307		434		
Well	EMRIA2	9/12/1989											462		0.02		1350	5.3	20		290		406		
Well	EMRIA2	6/8/1990							0.57	0.005	0.28	<0.01	662	<0.01	0.34	<0.02	1675	5.4	12	0.008	630	0.14	371		
Well	EMRIA2	9/19/1990											483		2.13		2100	7.54	11		381		257		
Well	EMRIA2	6/10/1991											636		337		893	19.4	5		829				
Well	EMRIA2	9/24/1991											709		71.4		687	13.9	6		801				
Well	EMRIA2	5/26/1992											356		119		391	11.2	6		1410				
Well	EMRIA2	9/2/1992											622		50.6		521	10.5	6		681				
Well	EMRIA2	6/7/1993					3.8						402		118		391	11	7		423				
Well	EMRIA2	9/8/1993											388		68.6		352	8.48	7		436				
Well	EMRIA2	6/6/1994											371		19.3		367	12	7		419				
Well	EMRIA2	9/7/1994	12.9	5.6									405		111		350	12	8		450				
Well	EMRIA2	6/6/1995											215		39		300	13	6		390		<5.		<5.
Well	EMRIA2	9/6/1995	14	6.4	5270		3.24						330		20		346	11.7	7		458		<5.		<5.
Well	EMRIA2	6/5/2001	12.9	6.5	6810								456		18		755	1.2	20		414		698		<5.
Well	EMRIA2	9/5/2001	14.7	7.4	7260								454		7.8		789	1.39	20		444		580		<5.
Well	EMRIA2	6/24/2002	14.3	6.6	7490								435		50.2		931	4.34	16		432		395		<5.
Well	EMRIA2	9/24/2002	13.1	6.6	7700								413		2		880	2.82	17		464		504		<5.
Well	EMRIA2	9/24/2002	13.1	6.6	7700																				
Well	EMRIA2	9/16/2003	17.3	5.2	5000								444		53.4		1480	7.78	13.4		451		23		< 5.
Well	EMRIA2	6/18/2004	12.7	5	9650								438		4.79		1430	0.829	10.7		429		< 5.		< 5.
Well	EMRIA2	9/25/2004	13.8	4.8	7650								438		29.9		682	11.3	11.5		567		< 5.		< 5.
Well	EMRIA2	5/11/2005	12.4	4.7	8160								438		< .03		654	9.69	13.2		716				
Well	EMRIA2	7/22/2005	14	5.1	7200								393		14.6		568	10.3	12.4		550				
Well	EMRIA2	6/28/2006	14.3	4.3	12490								449		81.8		1350	18.5	21.9		882		< 5.		< 5.
Well	EMRIA2	9/27/2006	15.7	7.4	12230								407.55		76.56		1240.5	18.591	3.62		824.92		< 5.		< 5.
Number of Observations:			14	14	13	0	19	5	1	1	1	1	25	1	30	1	25	25	25	1	25	1	26	0	28
Maximum:			17.3	7.4	12490	--	7.5	51	0.57	0.005	0.28	<0.01	709	<0.01	337	<0.02	2100	19.4	44	0.008	1410	0.14	698	--	<5.
Minimum:			12.4	4.3	5000	--	3.24	7.5	0.57	0.005	0.28	<0.01	215	<0.01	<0.02	<0.02	300	0.829	3.62	0.008	290	0.14	23	--	<1.
Mean:			13.9	5.9	8046.9	--	6.6	24.3	0.57	0.005	0.28	<0.01	450.5	<0.01	55.7	<0.02	859.3	9.3	12.5	0.008	563.2	0.14	423.4	--	--
Standard Deviation:			1.3	1.0	2243.4	--	1.1	16.4	--	--	--	--	107.5	--	70.8	--	485.7	5.3	8.5	--	244.5	--	119.1	--	--
Equivalent weights of means:													22.5				70.7		0.3		24.5		6.9		

Emery Water Quality Data - Kmf(u) +

SITE TYPE	SITE NAME	DATE	Cl mg/l	NO3 mg/l	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
Well	EMRIA2	6/24/1981	55.4	<0.01	<0.01		3374.3	265.7	1366.8	6000	4790			75.4	76.9	47	9	300	
Well	EMRIA2	12/3/1981	58.8	<0.002	<0.002	0.019	1729		2025	4620	2760			47.7	47.9	0.74	5.62	172	
Well	EMRIA2	3/16/1982	56.8	<0.002	<0.002	0.003	2017		2356	5800	3324			53.2	52.3	0.46	5.02	238	
Well	EMRIA2	6/15/1982		<0.002	<0.002		4082		3661	8000	6012			84.9	92.3	4.9	3.95	299	
Well	EMRIA2	9/17/1982	36	4	<0.01	<0.01	3900		3723	8400	5865					5	3.07	300	
Well	EMRIA2	12/10/1982	32	3.7	<0.01	<0.01	1800		2002	4500	2790			47	46.8	3.3	1.92	120	
Well	EMRIA2	3/22/1983	60	0.033	0.025	<0.01	12000		836	4600	5323					0.27	0.36	97	
Well	EMRIA2	6/30/1983	83	9.56	0.041	0.29	3000		3380	5500	510.5			77.01	73.05	0.19	1.89	535	
Well	EMRIA2	9/26/1983	59	4.98	0.02	0.31	3200		3240	6000	4897			76	75.89	0.38	0.09	494	
Well	EMRIA2	12/29/1983	48	0.9	<0.01	<0.01	3060		3230	5100	4577			75.11	74.97	0.18	0.07	489	
Well	EMRIA2	3/8/1984	57	3.58	0.02	0.04	3000		3300	5000	4542			77.1	72	0.25	0.11	513	
Well	EMRIA2	6/13/1984	53	0.8	<0.01	0.07	2900		3350	5000	4461			78.06	70.13	0.16	0.06	528	
Well	EMRIA2	9/24/1984	39	1.4	<0.01	<0.01	3000		3100	4700	4400			72.25	71.76	0.11	0.02	607	
Well	EMRIA2	3/27/1985	44	0.11	<0.01	0.05	3250		3144	6200	4596			73.48	76.34	0.2	0.08	461	
Well	EMRIA2	7/31/1985	45	1.3	<0.01	0.08	3000		3070	5800	4455			70.95	72.02	0.49	0.16	452	
Well	EMRIA2	9/19/1985	45	0.23	<0.01	0.07	2900		3050	4350	4335			70.11	69.98	0.16	0.44	456	
Well	EMRIA2	6/24/1986	50	0.83	0.01	0.08	3100		3138	5000	4786			74.02	74.21	<50.	0.3	466	
Well	EMRIA2	5/19/1989	59				5639	434	5233		8016			119.32	128.75			1000	
Well	EMRIA2	9/12/1989	65				7285	406	6690		9960			147.08	162.92			4795	
Well	EMRIA2	6/8/1990	600				8965	371	8523		13204	0.18	<0.05	198.48	212.48				
Well	EMRIA2	9/19/1990	79				9936	257	9818		14722			213.4	216.01				
Well	EMRIA2	6/10/1991	65				7454		5251		13994			141.63	158.35				
Well	EMRIA2	9/24/1991	45				6244		4589		9966			127.18	132.38				
Well	EMRIA2	5/26/1992	42				5268				7456			112.06	111.8				
Well	EMRIA2	9/2/1992	59				5063		3691		7314			103.94	107.98				
Well	EMRIA2	6/7/1993	53				4766		2608		6670								
Well	EMRIA2	9/8/1993	47				4281		2413		5436			71.8	91.22				
Well	EMRIA2	6/6/1994	49				5268		2432		7900			69.02	112				
Well	EMRIA2	9/7/1994	47				5804		2448	6480	7490			114.8	123.2				
Well	EMRIA2	6/6/1995	240				6000		1770		9240			52.4	131.7				
Well	EMRIA2	9/6/1995	6				5005		2249		7280			64.9	104.4				
Well	EMRIA2	6/5/2001	50				5090	572	4248		7289								
Well	EMRIA2	9/5/2001	33.7				3143	475	4383		7861								
Well	EMRIA2	6/24/2002	55				5771	324	4920		8253			117.5	128.2				
Well	EMRIA2	9/24/2002	60				5229		4655		7980								
Well	EMRIA2	9/24/2002																	
Well	EMRIA2	9/16/2003	86				8157			7203		11163							
Well	EMRIA2	6/18/2004	73				8739			6982		2181							
Well	EMRIA2	9/25/2004	62				6602			3902		8843							Diss. metals filtered in lab
Well	EMRIA2	5/11/2005	70				5770			3787		8474							
Well	EMRIA2	7/22/2005	78				5207			3320		8473							
Well	EMRIA2	6/28/2006	159				13327			6680		18568							
Well	EMRIA2	9/27/2006	106				12866			6126		8175							
Number of Observations:			41	17	17	15	42	8	34	25	35	8	1	29	29	17	17	19	
Maximum:			600	9.56	0.041	0.31	13327	572	9818	8400	14722	18568	<0.05	213.4	216.01	47	9	4795	
Minimum:			6	<0.002	<0.002	<0.001	1729	257	836	3320	510.5	0.18	<0.05	47	46.8	0.11	0.02	97	
Mean:			75.9	2.4	0.02	0.1	5385.5	388.1	3643.9	5562.0	6641.6	8234.6	<0.05	93.3	102.3	4.0	1.9	648.5	
Standard Deviation:			91.6	2.7	0.01	0.1	2853.8	107.2	1857.5	1279.2	3108.7	5609.9	--	41.2	43.8	11.6	2.6	1024.7	
Equivalent weights of mean			2.1				112.1												

Emery Water Quality Data - Kmf(l)

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-Sp. Cond. umhos/cm	Flow GPM	L-pH units	TSS mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l
Well	KEMMERER-L	6/24/1981					8.3	19							9								173.3		<1.
Well	KEMMERER-L	3/16/1982					8.8																183		56.7
Well	KEMMERER-L	6/15/1982					8.7																242		35.8
Well	KEMMERER-L	9/17/1982					8.5																227		30.8
Well	KEMMERER-L	3/22/1983					9.1																178		76
Well	KEMMERER-L	6/30/1983					8.15																403		<1.
Well	KEMMERER-L	12/29/1983					8.2																302		<1.
Well	KEMMERER-L	6/13/1984					8.5																226		16
Well	KEMMERER-L	9/24/1984					8.3																230		<1.
Well	KEMMERER-L	3/25/1985					8.6																200		42
Well	KEMMERER-L	6/24/1985					8.9	24							<0.05								206		40
Well	KEMMERER-L	9/19/1985					8.5	34							<0.05								205		40
Well	KEMMERER-L	6/24/1986					8.5	31							0.06								185		58
Well	KEMMERER-L	5/18/1989											6		0.22		9	<0.01	4		285		214		32
Well	KEMMERER-L	9/11/1989											4		0.43		8	0.01	6		215		140		120
Well	KEMMERER-L	6/4/1990							0.45	<0.001	0.17	<0.01	13	<0.01	<0.02	<0.02	13	0.02	3	<0.001	176	<0.01	137		13
Well	KEMMERER-L	9/17/1990											5		0.03		14	<0.01	4		218		192		44
Well	KEMMERER-L	6/10/1991											17		0.03		14	<0.01	3		175		160		64
Well	KEMMERER-L	9/24/1991											3		<0.02		5	<0.01	4		225		166		72
Well	KEMMERER-L	5/26/1992											2		<0.02		5	<0.01	3		191		158		88
Well	KEMMERER-L	9/2/1992											2		0.02		5	<0.01	3		199		126		88
Well	KEMMERER-L	6/7/1993											3		0.58		8	<0.01	4		217		162		88
Well	KEMMERER-L	9/7/1993											2		<0.02		6	<0.01	3		201		180		72
Well	KEMMERER-L	6/6/1994											2		<0.02		8	<0.01	3		205		200		
Well	KEMMERER-L	9/7/1994	18	7	1350								2		<0.02		7	<0.01	3		216		180		76
Well	KEMMERER-L	6/6/1995	13.4	7.4	910								4		<0.1		11	<0.1	3		210		100		110
Well	KEMMERER-L	9/5/1995	21.6	8.2	960								4		<0.1		12	<0.1	3		220		170		70
Well	KEMMERER-L	6/13/2000	19.5	7.6	1030								4		<0.1		13	<0.1	3		192		265		<5.
Well	KEMMERER-L	3/23/2001				11																			
Well	KEMMERER-L	6/5/2001	16.2	7.6	1150								5		<0.1		14	<0.1	3		186		166		49
Well	KEMMERER-L	9/5/2001	21.5	8	1020								4		<0.1		13	<0.05	4		192		186		34
Well	KEMMERER-L	6/24/2002	22.6	7.8	1020								4		<0.1		12	<0.05	3		181		199		30
Well	KEMMERER-L	9/24/2002	15.8	7.3	1200								4		<0.1		13	<0.05	3		185		194		36
Well	KEMMERER-L	9/18/2003	15.9	9.4	1.14	8							3.45		< .01		13.6	<.01	3.45		181		206		35
Well	KEMMERER-L	6/18/2004	19.1	9.3	1130								4.06		< .03		13.3	0.006	3.57		188		157		62
Well	KEMMERER-L	9/25/2004	14.9	9.8	1.26								1.34		< .03		0.91	0.001	2.58		240		260		274
Well	KEMMERER-L	5/24/2005	18.4	9.5	1204								4.22		< .03		13.8	0.006	3.44		176				
Well	KEMMERER-L	7/22/2005	25.3	9.1	1004	4		< 5.					3.63		< .03		11.9	0.005	3.3		169				
Well	KEMMERER-L	6/29/2006	21.8	9.2	1006	10							4.15		< .03		14.4	0.006	3.64		186		147		67
Well	KEMMERER-L	9/27/2006	13.6	9.5	999	10							3.5		< .03		12.53	0.005	3.46		180.82		364		70
Well	ZZ-L	6/24/1981					8.2	30							19								379.1		<1.
Well	ZZ-L	12/3/1981					8.1																654		<1.
Well	ZZ-L	3/16/1982					7.9																536		<1.
Well	ZZ-L	6/15/1982					7.8																590		<1.
Well	ZZ-L	9/20/1982					7.9																538		<1.
Well	ZZ-L	12/28/1982					7.5																511		<1.
Well	ZZ-L	6/30/1983					8.1																620		<1.
Well	ZZ-L	9/26/1983					8.05																579		<1.
Well	ZZ-L	3/8/1984					7.9	379							0.12								598		<1.
Well	ZZ-L	6/13/1984					7.8																492		<1.
Well	ZZ-L	9/24/1984					7.6																499		<1.
Well	ZZ-L	3/26/1985					7.6																495		<1.
Well	ZZ-L	6/20/1985					7.45	44							<0.05								479		<1.
Well	ZZ-L	9/19/1985					7.3	113							0.15								494		<1.
Well	ZZ-L	6/30/1986					7.9	8							<0.05								496		<1.
Well	ZZ-L	5/18/1989											<1.		0.07		3	<0.01	3		306		356		256
Well	ZZ-L	9/11/1989											1		0.02		4	0.01	4		276		320		240
Well	ZZ-L	6/8/1990							0.53	<0.001	0.43	<0.01	2	<0.01	<0.02	<0.02	4	<0.01	2	<0.001	250	0.98	202		345
Well	ZZ-L	9/18/1990											2		<0.02		4	<0.01	3		301		424		132
Well	ZZ-L	6/17/1991											2		<0.02		4	<0.01	3		254		340		236
Well	ZZ-L	9/23/1991											3		<0.02		7	<0.01	3		320		398		152
Well	ZZ-L	5/26/1992											2		<0.02		4	<0.01	2		254		310		180
Well	ZZ-L	9/2/1992											1		<0.02		3	<0.01	2		257		220		280
Well	ZZ-L	6/7/1993											1		0.07		2	<0.01	3		301		276		336
Well	ZZ-L	9/8/1993											<1.		<0.02		<1.	<0.01	3		303		246		384
Well	ZZ-L	6/6/1994											1		<0.02		1	<0.01	3		302		226		424
Well	ZZ-L	9/7/1994	13.3	9.1	990								1		<0.02		1	<0.01	3		309		246		372
Well	ZZ-L	6/6/1995											3		<0.1		3	<0.1	2		250		80		270
Well	ZZ-L	9/6/1995					10.01						6		0.1		2	<0.1	3		348		118		305
Well	ZZ-L	9/17/2003																							
Well	ZZ-L	12/23/2003																							
Well	ZZ-L	3/18/2004																							
Well	ZZ-L	6/23/2004																							

Emery Water Quality Data - Kmf(l)

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-Sp. Cond. umhos/cm	Flow GPM	L-pH units	TSS mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l
Well	ZZ-L	9/24/2004																							
Well	ZZ-L	12/28/2004																							
Well	ZZ-L	3/31/2005																							
Well	ZZ-L	5/12/2005																							
Well	ZZ-L	7/20/2005																							
Well	ZZ-L	11/17/2005																							
Well	ZZ-L	3/9/2006																							
Well	ZZ-L	6/30/2006																							
Well	ZZ-L	9/28/2006																							
Well	ZZ-L	11/27/2006																							
	Number of Observations:		16	16	16	5	29	9	2	2	2	2	38	2	49	2	39	40	40	2	40	2	66	0	45
	Maximum:		25.3	9.8	1350	11	10.01	379	0.53	<0.001	0.43	<0.01	17	<0.01	19	<0.02	14.4	0.02	6	<0.001	348	0.98	654	--	424
	Minimum:		13.3	7	1.14	4	7.3	8	0.45	<0.001	0.17	<0.01	1	<0.01	<0.01	<0.02	0.91	0.001	2	<0.001	169	<0.01	80	--	13
	Mean:		18.2	8.5	936.0	8.6	8.2	75.8	0.49	<0.001	0.30	<0.01	3.7	<0.01	2.0	<0.02	8.0	0.008	3.2	<0.001	231.0	0.5	289.6	--	131.1
	Standard Deviation:		3.7	1.0	381.6	2.8	0.6	117.6	0.06	<0.001	0.18	<0.01	3.1	<0.01	5.2	<0.02	4.7	0.005	0.7	<0.001	50.1	--	151.8	--	118.0
	Equivalent weights of means:												0.2				0.7		0.1		10.0		4.7		

Emery Water Quality Data - Kmf(l)

SITE TYPE	SITE NAME	DATE	Cl mg/l	NO3 mg/l	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
Well	KEMMERER-L	6/24/1981	16	<0.01	<0.01		402	173.3	396.3	1010	800			15.1	12.1	10	9	20	
Well	KEMMERER-L	3/16/1982	22.2	0.037	<0.002	0.383	447		269	1050	783			14.4	16.4	2.05	0.18	19	
Well	KEMMERER-L	6/15/1982	25.7	0.039	<0.002	0.29	449		326	1130	810			15	16.6	1.97	0.19	17	
Well	KEMMERER-L	9/17/1982	13	<0.01	<0.01	0.2	250		308	820	713					1.9	0.1	17.5	
Well	KEMMERER-L	3/22/1983	24	0.026	0.016	0.27	294		117	900	631			10.8	11.9	0.23	0.1	17	
Well	KEMMERER-L	6/30/1983	75	1.38	0.02	0.43	660		575	2200	1320			22.94	22.46	9.8	0.36	79	
Well	KEMMERER-L	12/29/1983	19	0.11	<0.01	0.05	200		92	1050	646			9.39	9.65	2.64	0.2	13	
Well	KEMMERER-L	6/13/1984	21	<0.01	<0.01	0.15	220		83	1090	667			8.13	9.7	1.65	0.05	7	
Well	KEMMERER-L	9/24/1984	18	<0.01	<0.01	0.01	240		75	1050	625			9.8	10.11	0.93	0.2	10	
Well	KEMMERER-L	3/25/1985	18	<0.01	<0.01	0.09	200		74	1100	556			9.41	9.52	2.71	0.1	13	
Well	KEMMERER-L	6/24/1985	21	0.1	0.03	0.08	240		72	1050	645			10.32	10.51	0.58	0.03	11	
Well	KEMMERER-L	9/19/1985	19	<0.01	<0.01	0.04	270		70	975	622			10.65	11	0.37	0.02	12	
Well	KEMMERER-L	6/24/1986	17	0.04	0.01	0.05	230		65	1080	611			10.88	10.9	0.21	0.01	11	
Well	KEMMERER-L	5/18/1989	26				428	246	52		924			13.68	14.64			9	
Well	KEMMERER-L	9/11/1989	19				239	260	43		626			10.47	10.75			8	
Well	KEMMERER-L	6/4/1990	18				253	150	86		646	<0.05	<0.05	9.54	8.82				
Well	KEMMERER-L	9/17/1990	19				226	236	70		614			11.09	10				
Well	KEMMERER-L	6/10/1991	21				233	224	100		580			9.78	9.96				
Well	KEMMERER-L	9/24/1991	20				228	238	28		696			10.56	10.11				
Well	KEMMERER-L	5/26/1992	22				173	246			554			8.99	9.17				
Well	KEMMERER-L	9/2/1992	21				202	214	26		576			9.34	9.11				
Well	KEMMERER-L	6/7/1993	20				200	250	40		602			10.46	9.76				
Well	KEMMERER-L	9/7/1993	20				201	252	30		526			9.51	9.82				
Well	KEMMERER-L	6/6/1994	25				259	268	38		626			9.85	11.5				
Well	KEMMERER-L	9/7/1994	26				239	256	34		578			10.26	10.87				
Well	KEMMERER-L	6/6/1995	23				170	260	60		700			10.2	9.5				
Well	KEMMERER-L	9/5/1995	23				184	255	59		580			10.8	9.6				
Well	KEMMERER-L	6/13/2000	14				248	218	64		613								
Well	KEMMERER-L	3/23/2001																	
Well	KEMMERER-L	6/5/2001	16				267	217	70		601								
Well	KEMMERER-L	9/5/2001	16.1				256	208	64		600								
Well	KEMMERER-L	6/24/2002	12				212	214	59		677			9.1	9				
Well	KEMMERER-L	9/24/2002	13				225		64		578								
Well	KEMMERER-L	9/18/2003	15				242		227	650	579								
Well	KEMMERER-L	6/18/2004	13				255			650	563								
Well	KEMMERER-L	9/25/2004	14				29		533	700	661				10.6	11.7			Diss. metals filtered in lab
Well	KEMMERER-L	5/24/2005	13				257		211	670	610								
Well	KEMMERER-L	7/22/2005	14				248		210	580	571								
Well	KEMMERER-L	6/29/2006	15				238		214	700	603								
Well	KEMMERER-L	9/27/2006	15				216		218	600	770				9.2	9.3			
Well	ZZ-L	6/24/1981	18.9	<0.01	<0.01		384.2	379.1	340.3	1120	852			17.2	15.8	21	6	9	
Well	ZZ-L	12/3/1981	23.2	0.011	<0.002	0.062	165		383	1050	603			15.6	16.9	0.8	0.09	9	
Well	ZZ-L	3/16/1982	23.1	0.017	<0.002	0.15	210		375	1200	671			15.8	15.5	0.49	0.09	22	
Well	ZZ-L	6/15/1982	24.2	0.16	<0.002	0.136	177		394	1300	600			16.8	16.9	0.36	0.07	20	
Well	ZZ-L	9/20/1982	23.7	0.11	<0.01	0.12	300		411	1200	753					0.4	0.05	21	
Well	ZZ-L	12/28/1982	19.3	0.161	<0.01	0.1			474	910	540			14	14.2	0.4	0.06	18	
Well	ZZ-L	6/30/1983	19	2.18	0.02	0.54	110		61	1850	834			10.52	13.07	1.1	0.03	5	
Well	ZZ-L	9/26/1983	20	0.3	0.02	0.11	175		74	1500	784			11.14	13.72	0.57	0.02	7	
Well	ZZ-L	3/8/1984	17	0.06	<0.01	0.06	120		90	1200	759			12.91	12.8	0.19	<0.01	9	
Well	ZZ-L	6/13/1984	15	<0.01	<0.01	0.08	145		73	1320	815			11.23	13.3	0.6	0.02	7	
Well	ZZ-L	9/24/1984	15	<0.01	<0.01	<0.01	200		90	1310	820			13.29	14.58	1.25	0.04	7	
Well	ZZ-L	3/26/1985	18	<0.01	<0.01	0.08	80		83	1400	670			11.98	12.09	0.6	0.03	9	
Well	ZZ-L	6/20/1985	18	0.02	0.04	0.12	200		72	1380	777			13.69	14.27	0.41	0.02	8	
Well	ZZ-L	9/19/1985	16	<0.01	<0.01	0.07	168		75	1205	779			13.8	13.85	1.07	0.05	8	
Well	ZZ-L	6/30/1986	15	0.41	0.09	0.08	170		60	1310	754			13.91	13.88	<0.05	<0.01	6	
Well	ZZ-L	5/18/1989	15				19	612	10		700			13.74	13.06			6	
Well	ZZ-L	9/11/1989	14				16	560	19		678			12.63	11.93			4	
Well	ZZ-L	6/8/1990	14				23	547	21		720	<0.05	<0.05	11.48	11.82				
Well	ZZ-L	9/18/1990	17				76	556	21		744			13.75	13.19				
Well	ZZ-L	6/17/1991	17				8	576	21		708			11.68	12.16				
Well	ZZ-L	9/23/1991	14				101	550	36		726			14.88	13.51				
Well	ZZ-L	5/26/1992	16				74	490			688			11.66	11.8				
Well	ZZ-L	9/2/1992	47				<2.	500	15		692			11.66	11.27				
Well	ZZ-L	6/7/1993	14				<2.	612	11		710								
Well	ZZ-L	9/8/1993	13				2	630	<7.		840			13.28	13.01				
Well	ZZ-L	6/6/1994	15				<2.	650	7		710			13.5	13.38				
Well	ZZ-L	9/7/1994	15				10	618	7		702			13.81	12.99				
Well	ZZ-L	6/6/1995	14				2	520	20		580			11.3	10.7				
Well	ZZ-L	9/6/1995	16				1	604	23		700			15.6	12.6				
Well	ZZ-L	9/17/2003																	No Access
Well	ZZ-L	12/23/2003																	No Access
Well	ZZ-L	3/18/2004																	No Access
Well	ZZ-L	6/23/2004																	No Access

Emery Water Quality Data - Kmf(l)

SITE TYPE	SITE NAME	DATE	Cl mg/l	NO3 mg/l	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
Well	ZZ-L	9/24/2004																	Broken off. Can't monitor
Well	ZZ-L	12/28/2004																	Site was dry
Well	ZZ-L	3/31/2005																	Pipe Broken
Well	ZZ-L	5/12/2005																	Pipe is broken
Well	ZZ-L	7/20/2005																	Well is Broken
Well	ZZ-L	11/17/2005																	Well is broken
Well	ZZ-L	3/9/2006																	Broken
Well	ZZ-L	6/30/2006																	Broken
Well	ZZ-L	9/28/2006																	Broken pipe
Well	ZZ-L	11/27/2006																	Broken pipe. Can't monitor
	Number of Observations:		68	17	8	25	64	34	64	35	68	2	2	54	56	29	26	32	
	Maximum:		75	2.18	0.09	0.54	660	650	575	2200	1320	<0.05	<0.05	22.94	22.46	21	9	79	
	Minimum:		12	0.011	0.01	0.01	1	150	7	580	526	<0.05	<0.05	8.13	8.82	0.19	0.01	4	
	Mean:		19.3	0.30	0.03	0.15	202.6	376.2	131.1	1094.6	685.2	<0.05	<0.05	12.2	12.2	2.9	0.7	13.7	
	Standard Deviation:		8.6	0.58	0.03	0.13	121.1	173.6	143.8	340.4	118.5	<0.05	<0.05	2.7	2.6	4.8	2.1	13.0	
	Equivalent weights of means:		0.5				4.2												

APPENDIX VI-4

Water Rights

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Utah Division of Water Rights

Select Related Information

(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/31/2007

WATER RIGHT: **94-2** APPLICATION/CLAIM NO.: A2107 CERT. NO.: 490

OWNERSHIP

NAME: Muddy Creek Irrigation Company
ADDR: P.O. Box 104
Emery UT 84522

DATES, ETC.

LAND OWNED BY APPLICANT?

FILED:	|PRIORITY: 01/11/1913	|PUB BEGAN:	|PUB ENDED:	|NEWSPAPER:	
ProtestEnd:	|PROTESTED: [No]	|HEARNG HLD:	|SE ACTION: [ ]	|ActionDate:	|PROOF DUE:
EXTENSION:	|ELEC/PROOF:[ ]	|ELEC/PROOF:	|CERT/WUC:	|LAP, ETC:	|LAPS LETTER:
RUSH LETTR:	|RENOVATE:	|RECON REQ:	|TYPE: [ ]		

PD Book No. 1 Map: *
Type of Right: Application to Appropriate Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)

FLOW: 51.3 acre-feet SOURCE: North Fork of Muddy Creek
COUNTY: Sanpete COMMON DESCRIPTION:

POINT OF DIVERSION -- SURFACE:
(1) S 650 ft E 1610 ft from NW cor, Sec 04, T 20S, R 4E, SLBM
Diverting Works: Source:

Stream Alt Required?: No

POINTS OF REDIVERSION:
(1) N 1175 ft W 1003 ft from SE cor, Sec 04, T 20S, R 4E, SLBM
Diverting Works: Source:
(2) S 590 ft W 1685 ft from NE cor, Sec 21, T 21S, R 6E, SLBM
Diverting Works: Source:
(3) N 2540 ft E 740 ft from SW cor, Sec 22, T 21S, R 6E, SLBM
Diverting Works: Source:

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 617788. Water Rights Appurtenant to the following use(s):
94-2,11,12,32,33
40,47,55,56,57
793,1134,1135

###IRRIGATION: Group Total: 83.01 acres Div Limit: 0.0 acft. PERIOD OF USE: 04/01 TO 10/31
Sole Supply for Irrigation for 94-2 in this Group has NOT YET been evaluated
Water User's Claim 11 is limited to the irrigation requirements of 20.76 acres.

###PLACE OF USE: *-------NORTH WEST QUARTER------*-------NORTH EAST QUARTER------*-------SOUTH WEST QUARTER------*-------SOUTH EAST QUARTER------* Section

	* NW	NE	SW	SE	* NW	NE	SW	SE	* NW	NE	SW	SE	* NW	NE	SW	SE	*	Totals
Sec 36 T 21S R 6E SLBM	*				*				*		3.6800	5.6500	*				*	9.3300
Sec 01 T 22S R 6E SLBM	*LOT 3																	14.5300

SUPPLEMENTAL GROUP NO. 617800. Water Rights Appurtenant to the following use(s):
94-2,12,32,33,40
47,55,56,57,793
1134,1135

###IRRIGATION: Group Total: 7237.46 acres Div Limit: 0.0 acft. PERIOD OF USE: 04/01 TO 10/31
Sole Supply for Irrigation for 94-2 in this Group has NOT YET been evaluated

###STOCKWATER: Group Total: 3500.0000 Stock Div Limit: PERIOD OF USE: 01/01 TO 12/31
Sole Supply for Stockwatering for 94-2 in this Group has NOT YET been evaluated

###DOMESTIC: Group Total: 20.0000 Families Div Limit: PERIOD OF USE: 01/01 TO 12/31
Sole Supply for Families for 94-2 in this Group has NOT YET been evaluated
Moore, Utah

###PLACE OF USE:

	*NORTH WEST QUARTER				*NORTH EAST QUARTER				*SOUTH WEST QUARTER				*SOUTH EAST QUARTER				Section
	* NW	NE	SW	SE	* NW	NE	SW	SE	* NW	NE	SW	SE	* NW	NE	SW	SE	* Totals
Sec 22 T 21S R 6E SLBM	*				*				*	2.8600			*15.5300	13.9200			* 32.3100
Sec 23 T 21S R 6E SLBM	*				*				*13.0200	4.5100			*10.6400		25.3800	1.7100	* 55.2600
Sec 26 T 21S R 6E SLBM	*				*18.0100	2.1300			*21.9100	6.9600	5.2400	6.8800	*				* 61.1300
Sec 27 T 21S R 6E SLBM	*				*				*				*	17.6000	10.5600	7.6100	* 35.7700
Sec 33 T 21S R 6E SLBM	*				*				*				*	4.1800			* 4.1800
Sec 34 T 21S R 6E SLBM	* 1.5800	19.9800	28.0000	33.3300	*25.7500	18.1800	23.9300	9.8200	*29.2400	22.0300	7.0800	12.6900	*13.4300	4.7900	6.0600		* 255.8900
Sec 35 T 21S R 6E SLBM	* 3.6800	7.8700		17.0300	*		5.4400		*				*11.4600		19.2400		* 64.7200
Sec 04 T 21S R 7E SLBM	*				*				*				*		17.8900		* 17.8900
Sec 09 T 21S R 7E SLBM	*	0.5600			*23.6600	1.1300			*				*				* 25.3500
Sec 16 T 21S R 7E SLBM	*22.5200	18.1000		37.8700	*		30.1700		*28.7100	34.2600	28.6300	36.5900	*36.1300		37.2200		* 310.2000
Sec 17 T 21S R 7E SLBM	*		3.7200	34.1400	*33.5700	36.8500	11.1400	10.6400	*24.8100	36.1100	7.3900	12.4500	*11.8300	7.2400	38.2300	28.2500	* 296.3700
Sec 19 T 21S R 7E SLBM	*				*				*				*	3.1900		22.1900	* 25.3800
Sec 20 T 21S R 7E SLBM	*20.6300	26.9000	2.5300	12.6900	*24.6500	26.7000	23.7500	36.3000	*				25.3800	26.6900	*		28.0900	20.0000	36.8500	* 311.1600
Sec 21 T 21S R 7E SLBM	*26.7400	36.7700	26.2400	29.0700	*32.2700				*38.5900	3.0200	37.4700	0.0900	*				* 230.2600
Sec 28 T 21S R 7E SLBM	*40.1200	3.2800	3.9300	12.6100	*		2.4600		*				*				* 62.4000
Sec 29 T 21S R 7E SLBM	*15.0300	18.3800	12.9400	27.7600	*27.7100	39.1200	15.2300	12.2800	*17.5200	29.7200	38.4800	39.3000	*20.4700		24.8900	4.0900	* 342.9200
Sec 30 T 21S R 7E SLBM	*			14.5800	* 6.7100	20.8800	9.2700	10.4500	*	11.7400			*21.4500		11.5500	24.8100	* 131.4400
Sec 31 T 21S R 7E SLBM	*				*	23.7500			*	0.4000	6.5500		*20.4700	0.4100	7.3700	23.4900	* 82.4400
Sec 32 T 21S R 7E SLBM	*38.4900	16.2900			*22.9000	12.3600			* 6.2200		8.7500		*	4.8600	0.2400	15.0700	* 125.1800
Sec 33 T 21S R 7E SLBM	* 4.5000				*				*11.7400	5.3200	15.9200	15.3200	*21.2900	0.7800	20.4700		* 95.3400
Sec 25 T 22S R 5E SLBM	*				*				*				*	3.9300		18.4200	* 22.3500
Sec 36 T 22S R 5E SLBM	*				*	7.7000			*				*				* 7.7000
Sec 01 T 22S R 6E SLBM	*				*				*		6.7100		*				* 6.7100
Sec 02 T 22S R 6E SLBM	* 9.4100	5.3200	2.4600	15.8900	* 8.8400	1.4700	22.3100	0.4200	*	5.2400	30.0000		*13.2700	3.4500	6.6300	18.0100	* 142.7200
Sec 03 T 22S R 6E SLBM	*	11.7100			*		10.8100		*	6.7100	13.7800	4.5400	*16.4400	18.3000	39.6700	40.0000	* 161.9600
Sec 04 T 22S R 6E SLBM	*				*		3.1700		*	6.3000		18.1800	*22.6200	28.7400	9.7600	7.7700	* 96.5400
Sec 08 T 22S R 6E SLBM	*				*			1.4700	*				*	9.5800		5.1600	* 16.2100
Sec 09 T 22S R 6E SLBM	* 4.3400	19.7700	31.8500	23.7500	* 8.0200	2.7900	7.7900	11.7700	*40.0000	33.5700	34.0200	27.9600	*31.7700	30.3000	27.5900	35.2100	* 370.5000
Sec 10 T 22S R 6E SLBM	*25.8300	39.6300	39.9200	24.4700	*39.8000	40.0000	22.5200	39.6600	*15.4300	38.4000	24.2700	32.7500	*	20.4700	24.5700		* 427.7200
Sec 11 T 22S R 6E SLBM	*37.7000	6.9600	12.9400		*		3.5800	0.7400	*23.0900	34.7200	2.8700	21.9400	*12.2800		0.0900		* 157.0100
Sec 12 T 22S R 6E SLBM	*23.7500	2.1300	16.5000	7.6200	*				*				*				* 50.0000
Sec 13 T 22S R 6E SLBM	*		19.2400		*				*12.9400				*				* 32.1800
Sec 14 T 22S R 6E SLBM	*			20.8800	*		25.0600	12.6300	*	16.3800	35.6200	9.5800	*32.8400	37.0100	11.6300	6.1800	* 207.8100
Sec 15 T 22S R 6E SLBM	*18.0100	5.8000		3.0600	* 0.8400		19.5700	9.3800	*15.0000		25.4700	2.3700	*17.7800	30.4600	8.0200	30.7900	* 186.6500
Sec 16 T 22S R 6E SLBM	*16.9100	14.3300	38.7100	37.2700	*22.1900	7.6900	33.4900	16.5500	*39.9700	36.3600	19.5700	15.7100	*35.7000	30.1300	5.4400	17.3600	* 387.3800
Sec 17 T 22S R 6E SLBM	*		0.7400	16.6200	*24.1500	20.5100	37.7900	35.9100	*10.8100	26.8600	0.2900	13.2700	*40.0000	36.3200	19.9800	28.8600	* 312.1100
Sec 19 T 22S R 6E SLBM	*				*				* 0.0700	0.1600	0.8200	24.8100	*		5.7300	2.7300	* 34.3200
Sec 20 T 22S R 6E SLBM	*16.5400	24.2400	22.8200	31.7700	*28.9200	32.1000	34.1600	27.7200	* 0.4100	26.6100	11.8700	30.1700	*22.9200	23.3400	32.7500	29.0700	* 395.4100
Sec 21 T 22S R 6E SLBM	*19.5700	22.0300	27.4100	29.3100	* 1.1500	4.7100	18.1800	12.9700	*26.6500	35.4100	27.4900	37.7500	*34.8000	10.6500	22.8300	7.2900	* 338.2000
Sec 22 T 22S R 6E SLBM	*33.9800	32.7500	12.3700	32.3400	*24.1100	15.9400	35.1300	3.1100	*21.2600	4.4900		14.5300	* 6.2400	6.9600	10.1100	19.4900	* 272.8100
Sec 23 T 22S R 6E SLBM	*21.4500	11.6700	38.2400	35.6200	*31.2800		23.0900		*23.3400	5.0800	9.5800		*				* 199.3500
Sec 27 T 22S R 6E SLBM	*			* 2.4800	0.6200				*				*				* 3.1000
Sec 28 T 22S R 6E SLBM	*20.9200	26.8200	8.6800	14.0400	*25.2200	1.6400	20.0600	21.7000	*				*				* 139.0800

Sec 29 T 22S R 6E SLBM	1.6400	22.2700	13.5100		16.8900	12.6900		2.0500	7.7800								76.8300
Sec 30 T 22S R 6E SLBM	2.8700	29.8500		1.8800	32.6300	11.4600	25.8800	12.2800	22.1100		28.6600						167.6200
Sec 31 T 22S R 6E SLBM	16.4300		12.3600	10.3500													39.1400
Sec 05 T 22S R 7E SLBM	LOT 4																39.5300
Sec 06 T 22S R 7E SLBM	LOT 1																7.7800
Sec 07 T 22S R 7E SLBM		12.1200			17.8000	11.3500											41.2700
Sec 08 T 22S R 7E SLBM	3.2800																3.2800

SUPPLEMENTAL GROUP NO. 617801. Water Rights Appurtenant to the following use(s):
94-2,12,30,32,33
40,47,55,56,57
793,1134,1135

###IRRIGATION: Group Total: 30.7 acres Div Limit: 0.0 acft. PERIOD OF USE: 04/01 TO 10/31
Sole Supply for Irrigation for 94-2 in this Group has NOT YET been evaluated

###PLACE OF USE:	NORTH WEST QUARTER NW	NE	SW	SE	NORTH EAST QUARTER NW	NE	SW	SE	SOUTH WEST QUARTER NW	NE	SW	SE	SOUTH EAST QUARTER NW	NE	SW	SE	Section Totals
Sec 29 T 22S R 6E SLBM				10.6000			8.6000						11.5000				30.7000

SUPPLEMENTAL GROUP NO. 617802. Water Rights Appurtenant to the following use(s):
94-2,12,32,33,40
47,55,56,57,81
793,1134,1135,1190,1191

###IRRIGATION: Group Total: 121.72 acres Div Limit: 0.0 acft. PERIOD OF USE: 04/01 TO 10/31
Sole Supply for Irrigation for 94-2 in this Group has NOT YET been evaluated

###PLACE OF USE:	NORTH WEST QUARTER NW	NE	SW	SE	NORTH EAST QUARTER NW	NE	SW	SE	SOUTH WEST QUARTER NW	NE	SW	SE	SOUTH EAST QUARTER NW	NE	SW	SE	Section Totals
Sec 31 T 22S R 6E SLBM														11.4600		29.9700	41.4300
Sec 32 T 22S R 6E SLBM									17.9100	0.1800	29.1800	2.0900					49.3600
Sec 05 T 23S R 6E SLBM	LOT 4																7.4700
Sec 06 T 23S R 6E SLBM	LOT 1																23.4600

SUPPLEMENTAL GROUP NO. 617803. Water Rights Appurtenant to the following use(s):
94-2,12,32,33,40
47,55,56,57,793
1134,1135,1178,1179

###IRRIGATION: Group Total: 184.93 acres Div Limit: 0.0 acft. PERIOD OF USE: 04/01 TO 10/31
Sole Supply for Irrigation for 94-2 in this Group has NOT YET been evaluated

###PLACE OF USE:	NORTH WEST QUARTER NW	NE	SW	SE	NORTH EAST QUARTER NW	NE	SW	SE	SOUTH WEST QUARTER NW	NE	SW	SE	SOUTH EAST QUARTER NW	NE	SW	SE	Section Totals
Sec 29 T 22S R 6E SLBM									5.8000		20.1400	34.1500					60.0900
Sec 30 T 22S R 6E SLBM												6.2200	9.6600	12.1000	12.2800		40.2600
Sec 31 T 22S R 6E SLBM		10.6400			28.9100	11.8700	22.1100	11.0500									84.5800

SUPPLEMENTAL GROUP NO. 617804. Water Rights Appurtenant to the following use(s):
94-2,12,32,33,40
47,55,56,57,65
303,793,1134,1135

###DOMESTIC: Group Total: 15.0000 Families Div Limit: PERIOD OF USE: 01/01 TO 12/31
Sole Supply for Families for 94-2 in this Group has NOT YET been evaluated
Families are outside the corporate limits of Emery Town

SUPPLEMENTAL GROUP NO. 618204. Water Rights Appurtenant to the following use(s):
94-2,12,32,33,40
47,55,56,57,65

303,304,325,793,1134
1135,1682,1764

###MUNICIPAL: Emery
Acre Feet Allowed by this Right for this Use:
PERIOD OF USE: 01/01 TO 12/31

###PLACE OF USE:	NORTH WEST QUARTER NW	NE	SW	SE	NORTH EAST QUARTER NW	NE	SW	SE	SOUTH WEST QUARTER NW	NE	SW	SE	SOUTH EAST QUARTER NW	NE	SW	SE	Section Totals
Sec 03 T 22S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000
Sec 04 T 22S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000
Sec 09 T 22S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000
Sec 10 T 22S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000

This Right (94-2) has an evaluated sole-supply total for irrigation of 0.0000 acres.

This Right (94-2) is a member of 7 supplemental water right groups with irrigated acreage totaling 7750.5900 acres.

Storage from 01/01 to 12/31, inclusive, in Emery-Larsen Reservoir with a maximum capacity of 145.000 acre-feet, located in:

	NORTH-WEST¼				NORTH-EAST¼				SOUTH-WEST¼				SOUTH-EAST¼			
Height of Dam:																
Area Inundated:	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 04 T 20S R 4E SLBM													X	X	X	X

Small Dam Required?: No

OTHER COMMENTS**********

The water is stored from 1/1-12/31 in a reservoir embraced in the SE1/4 of Sec.4, T20S, R4E SLBM

**********END OF DATA**********

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Utah Division of Water Rights

Select Related Information

(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/26/2007

WATER RIGHT: **94-30** APPLICATION/CLAIM NO.: A18324 CERT. NO.: 4542

OWNERSHIP

NAME: Osburn Bret Carter
ADDR: Lawrence, J.R.
P.O. Box 24
Emery UT 84522
INTEREST: 100% REMARKS: Joint Tenants

NAME: J.R. Lawrence
ADDR: Carter, Osburn Bret
P.O. Box 24
Emery UT 84522
INTEREST: 100% REMARKS: Joint Tenants

DATES, ETC.

LAND OWNED BY APPLICANT?

FILED:	|PRIORITY: 12/20/1946	|PUB BEGAN:	|PUB ENDED:	|NEWSPAPER:	
ProtestEnd:	|PROTESTED: [No]	|HEARNG HLD:	|SE ACTION: [Approved]	|ActionDate:	|PROOF DUE:
EXTENSION:	|ELEC/PROOF: [ ]	|ELEC/PROOF:	|CERT/WUC:	|LAP, ETC:	|LAPS LETTER:
RUSH LETTR:	|RENOVATE:	|RECON REQ:	|TYPE: [ ]		

PD Book No. 1 Map: *
Type of Right: Application to Appropriate Source of Info: Proposed Determination Status: Certificate

LOCATION OF WATER RIGHT*(Points of Diversion: Click on Location to access PLAT Program.)**

FLOW: 0.45 cfs SOURCE: Unnamed Springs
COUNTY: Emery COMMON DESCRIPTION:

POINTS OF DIVERSION -- SURFACE:
(1) S 770 ft E 370 ft from N4 cor, Sec 29, T 22S, R 6E, SLBM
Diverting Works: Source: Spring No. 1
(2) S 875 ft W 470 ft from N4 cor, Sec 29, T 22S, R 6E, SLBM
Diverting Works: Source: Spring No. 2
(3) S 1040 ft W 1050 ft from N4 cor, Sec 29, T 22S, R 6E, SLBM
Diverting Works: Source:

Stream Alt Required?: No

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 617801. Water Rights Appurtenant to the following use(s):
94-2,12,**30**,32,33
40,47,55,56,57
793,1134,1135

###IRRIGATION: Group Total: 30.7 acres Div Limit: 0.0 acft. PERIOD OF USE: 04/01 TO 10/31

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Utah Division of Water Rights

Select Related Information

(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/31/2007

WATER RIGHT: **94-52** APPLICATION/CLAIM NO.: A35182 CERT. NC.:
CHANGES: a8423 Approved

OWNERSHIP

NAME: Consolidation Coal Company
ADDR: Attn: John Gefferth
P.O. Box 566
Sesser IL 62884
INTEREST: 100% REMARKS: Western/Non-Mining Operations

DATES, ETC.

LAND OWNED BY APPLICANT? No
FILED: 04/22/1963|PRIORITY: 04/22/1963|PUB BEGAN: |PUB ENDED: |NEWSPAPER:
ProtestEnd: |PROTESTED: [No]|HEARNG HLD: |SE ACTION: [ ]|ActionDate:10/08/1965|PROOF DUE: 10/31/2010
EXTENSION: |ELEC/PROOF:[ ]|ELEC/PROOF: |CERT/WUC: |LAP, ETC: |LAPS LETTER:
RUSH LETTR: |RENOVATE: |RECON REQ: |TYPE: [ ]
PD Book No. 1 Map:
Type of Right: Application to Appropriate Source of Info: Proposed Determination Status: Approved

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)

FLOW: 2400.0 acre-feet SOURCE: Underground Water Well
COUNTY: Emery COMMON DESCRIPTION: Walker Flat Quad.

POINT OF DIVERSION -- UNDERGROUND: (Click Well ID# link for more well data.)
(1) S 2270 ft E 1700 ft from NW cor, Sec 33, T 22S, R 6E, SLBM
DIAMETER OF WELL: 12 ins. DEPTH: 500 to 1500 ft. YEAR DRILLED: WELL LOG? No WELL ID#: 4286
Comment:

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 618249.

###IRRIGATION: 10000.0 acres Div Limit: 0.0 acft. PERIOD OF USE: 04/01 TO 11/01

###INDUSTRIAL: Industrial and mining-all uses relating to mining and processing coal. PERIOD OF USE: 01/01 TO 12/31
Acre Feet Allowed by this Right for this Use:

###PLACE OF USE:	NORTH WEST QUARTER				NORTH EAST QUARTER				SOUTH WEST QUARTER				SOUTH EAST QUARTER				Section Totals
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	
Sec 26 T 21S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000
Sec 27 T 21S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000
Sec 34 T 21S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000
Sec 35 T 21S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000
Sec 36 T 21S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000
Sec 01 T 22S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000
Sec 02 T 22S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000
Sec 03 T 22S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000

Sec 09 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 10 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 11 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 12 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 13 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 14 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 15 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 16 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 17 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 20 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 21 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 22 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 23 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 24 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 26 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 27 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 28 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 29 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 30 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 31 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 32 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 33 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 06 T 23S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000

OTHER COMMENTS

canal, and used to supplement the company water rights, being decreed rights of diversion, from which the water will be pumped, directly into the present
It is proposed to drill this well at the point described under the point
Answer to protest by protestant on 7/25/1963, 1/8/1982 Emery Town
Application protested by Kemmerer Coal Company (Withdrawn) on 07/03/1963.
in Muddy Creek and applications on file in the State Engineer's office.

APPLICATIONS FOR EXTENSIONS OF TIME WITHIN WHICH TO SUBMIT PROOF

FILED: 02/22/2002|PUB BEGAN: 03/26/2002|PUB ENDED: 04/03/2002|NEWSPAPER: Emery County Progress
ProtestEnd:04/22/2002|PROTESTED: [No]|HEARNG HLD: |SE ACTION: Approved]|ActionDate:01/13/2006|PROOF DUE: 10/31/2010

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Select Related Information

(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/26/2007

WATER RIGHT: **94-53** APPLICATION/CLAIM NO.: A35194 CERT. NO.:

OWNERSHIP

NAME: Consolidation Coal Company
ADDR: Attn: John Gefferth
P.O. Box 566
Sesser IL 62844
INTEREST: 100% REMARKS: Western/Non-Mining Operations

DATES, ETC.

LAND OWNED BY APPLICANT? No

FILED: 04/24/1963	PRIORITY: 04/24/1963	PUB BEGAN:	PUB ENDED:	NEWSPAPER:	
ProtestEnd:	PROTESTED: [No]	HEARNG HLD:	SE ACTION: [ ]	ActionDate:07/25/1963	PROOF DUE: 01/31/2009
EXTENSION:	ELEC/PROOF:[ ]	ELEC/PROOF:	CERT/WUC:	LAP, ETC:	LAPS LETTER:
RUSH LETTR:	RENOVATE:	RECON REQ:	TYPE: [ ]		

PD Book No. 1 Map:
Type of Right: Application to Appropriate Source of Info: Proposed Determination Status: Approved

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)

FLOW: 3.0 cfs SOURCE: Underground Water Well
COUNTY: Emery COMMON DESCRIPTION: 1.5 mi. SW of Emery

POINT OF DIVERSION -- UNDERGROUND: (Click Well ID# link for more well data.)
(1) S 1228 ft E 27 ft from N4 cor, Sec 17, T 22S, R 6E, SLBM
DIAMETER OF WELL: 12 ins. DEPTH: 154 to ft. YEAR DRILLED: WELL LOG? No WELL ID#: 21327
Comment:

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 618252.

###INDUSTRIAL: Industrial processing of Coal, steam elec generation, & hydraulic trns of coal PERIOD OF USE: 01/01 TO 12/31
Acre Feet Allowed by this Right for this Use: 2171.93994

###PLACE OF USE:	NORTH WEST QUARTER				NORTH EAST QUARTER				SOUTH WEST QUARTER				SOUTH EAST QUARTER				Section
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	Totals
Sec 33 T 22S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000

OTHER COMMENTS

Applicant owns title to mineral rights.

PROTESTANTS

NAME: Emery Town
ADDR: c/o Gary L. Petty, Mayor

NAME:
ADDR:

15 South Center
Emery UT 84522

APPLICATIONS FOR EXTENSIONS OF TIME WITHIN WHICH TO SUBMIT PROOF

FILED: 01/29/1999|PUB BEGAN: 02/09/1999|PUB ENDED: 02/17/1999|NEWSPAPER: Emery County Progress
ProtestEnd:03/08/1999|PROTESTED: [No]|HEARNG HLD: |SE ACTION: [Approved]|ActionDate:05/13/1999|PROOF DUE: 01/31/2004

FILED: 01/23/2004|PUB BEGAN: 02/10/2004|PUB ENDED: 02/17/2004|NEWSPAPER: Emery County Progress
ProtestEnd:03/08/2004|PROTESTED: [No]|HEARNG HLD: |SE ACTION: [Approved]|ActionDate:09/09/2004|PROOF DUE: 01/31/2009

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(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/26/2007

WATER RIGHT: **94-54** APPLICATION/CLAIM NO.: A35204 CERT. NO :
CHANGES: a19840 Approved

OWNERSHIP

NAME: Consolidation Coal Company
ADDR: Attn: John Gefferth
P.O. Box 566
Sesser IL 62884
INTEREST: 100% REMARKS: Western Non-Mining Operations

DATES, ETC.

LAND OWNED BY APPLICANT? No

FILED: 04/27/1963	PRIORITY: 04/27/1963	PUB BEGAN:	PUB ENDED:	NEWSPAPER:	
ProtestEnd:	PROTESTED: [No]	HEARNG HLD:	SE ACTION: [ ]	ActionDate:09/26/1963	PROOF DUE: 01/31/2009
EXTENSION:	ELEC/PROOF: [ ]	ELEC/PROOF:	CERT/WUC:	LAP, ETC:	LAPS LETTER:
RUSH LETTR:	RENOVATE:	RECON REQ:	TYPE: [ ]		

PD Book No. 1 Map:
Type of Right: Application to Appropriate Source of Info: Proposed Determination Status: Approved

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)

FLOW: 5.0 cfs SOURCE: Underground Water Well
COUNTY: Emery COMMON DESCRIPTION: 4 mi. SW of Emery

POINT OF DIVERSION -- UNDERGROUND: (Click Well ID# link for more well data.)
(1) S 253 ft W 152 ft from NE cor, Sec 30, T 22S, R 6E, SLBM
DIAMETER OF WELL: 10 ins. DEPTH: 1000 to 2000 ft. YEAR DRILLED: WELL LOG? NO WELL ID#:
Comment:
(2) N 4 ft E 828 ft from S4 cor, Sec 31, T 22S, R 6E, SLBM
DIAMETER OF WELL: 10 ins. DEPTH: 1000 to 2000 ft. YEAR DRILLED: WELL LOG? NO WELL ID#:
Comment:
(3) N 483 ft E 474 ft from W4 cor, Sec 31, T 22S, R 6E, SLBM
DIAMETER OF WELL: 10 ins. DEPTH: 1000 to 2000 ft. YEAR DRILLED: WELL LOG? NO WELL ID#:
Comment:

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 618256.

###IRRIGATION:	87.7 acres	Div Limit: 0.0 acft.	PERIOD OF USE: 04/01 TO 10/31
###STOCKWATER:	180.0000 Stock Units	Div Limit:	PERIOD OF USE: 01/01 TO 12/31
###INDUSTRIAL:	Processing of coal, steam electric generation, & hydraulic trans. of coal		PERIOD OF USE: 01/01 TO 12/31
	Acre Feet Allowed by this Right for this Use: 3264.0599		

###PLACE OF USE:

	NORTH WEST QUARTER				NORTH EAST QUARTER				SOUTH WEST QUARTER				SOUTH EAST QUARTER				Section
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	Totals

Sec 19 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 30 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000
Sec 33 T 22S R 6E SLBM	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*X	|X	|X	|X	*	0.0000

PLACE OF USE for STOCKWATERING

	NORTH-WEST¼				NORTH-EAST¼				SOUTH-WEST¼				SOUTH-EAST¼			
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 19 T 22S R 6E SLBM	* X:	X:	X:	X*	* X:	X:	X:	X*	* X:	X:	X:	X*	* X:	X:	X:	X*
Sec 30 T 22S R 6E SLBM	* X:	X:	X:	X*	* X:	X:	X:	X*	* X:	X:	X:	X*	* X:	X:	X:	X*
Sec 33 T 22S R 6E SLBM	* X:	X:	X:	X*	* X:	X:	X:	X*	* X:	X:	X:	X*	* X:	X:	X:	X*

OTHER COMMENTS

Applicant owns mineral rights only to land where well site #1 is located.
Applicant owns all rights in fee to land where well site #2 and #3 are located
Point of diversion as given: S 5533' & W 152' from NE corner, Section 19,
T22S, R6E, SLBM.

PROTESTANTS

NAME: Emery Town
ADDR: c/o Gary L. Petty, Mayor
15 South Center
Emery UT 84522

NAME:
ADDR:

APPLICATIONS FOR EXTENSIONS OF TIME WITHIN WHICH TO SUBMIT PROOF

FILED: 01/29/1999|PUB BEGAN: 02/09/1999|PUB ENDED: 02/17/1999|NEWSPAPER: Emery County Progress
ProtestEnd:03/08/1999|PROTESTED: [No]|HEARNG HLD: |SE ACTION: [Approved]|ActionDate:05/13/1999|PROOF DUE: 01/31/2004

FILED: 01/23/2004|PUB BEGAN: 02/10/2004|PUB ENDED: 02/17/2004|NEWSPAPER: Emery County Progress
ProtestEnd:03/08/2004|PROTESTED: [No]|HEARNG HLD: |SE ACTION: [Approved]|ActionDate:09/09/2004|PROOF DUE: 01/31/2009

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(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/31/2007

WATER RIGHT: **94-64** APPLICATION/CLAIM NO.: A35936 CERT. NO.:

OWNERSHIP

NAME: Consolidation Coal Company
ADDR: Attn: John Gefferth
P.O. Box 566
Sesser IL 62884
INTEREST: 100% REMARKS: Western/Non-Mining Operations

DATES, ETC.

LAND OWNED BY APPLICANT?
FILED: 03/04/1964|PRIORITY: 03/04/1964|PUB BEGAN: |PUB ENDED: |NEWSPAPER:
ProtestEnd: |PROTESTED: [No]|HEARNG HLD: |SE ACTION: [ ]|ActionDate:06/10/1968|PROOF DUE: 01/31/2009
EXTENSION: |ELEC/PROOF:[ ]|ELEC/PROOF: |CERT/WUC: |LAP, ETC: |LAPS LETTER:
RUSH LETTR: |RENOVATE: |RECON REQ: |TYPE: [ ]
PD Book No. 1 Map:
Type of Right: Application to Appropriate Source of Info: Proposed Determination Status: Approved

LOCATION OF WATER RIGHT*(Points of Diversion: Click on Location to access PLAT Program.)**

FLOW: 5.0 cfs SOURCE: Underground Water Well
COUNTY: Emery COMMON DESCRIPTION: 9-12 mi. S & SW of Emery

POINT OF DIVERSION -- UNDERGROUND: (Click Well ID# link for more well data.)
(1) S 677 ft E 830 ft from NW cor, Sec 07, T 23S, R 6E, SLBM
DIAMETER OF WELL: ins. DEPTH: to ft. YEAR DRILLED: WELL LOG? NO WELL ID#:
Comment:

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 618266. Water Rights Appurtenant to the following use(s):
94-64,561

###INDUSTRIAL: Industrial processing of coal, steam generation, & hydraulic transportation PERIOD OF USE: 01/01 TO 12/31
Acre Feet Allowed by this Right for this Use:

###PLACE OF USE:	NORTH WEST QUARTER				NORTH EAST QUARTER				SOUTH WEST QUARTER				SOUTH EAST QUARTER				Section
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	Totals
Sec 33 T 22S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000

PROTESTANTS

NAME: Emery Town
ADDR: c/o Gary L. Petty, Mayor
15 South Center
Emery UT 84522

NAME:
ADDR:

APPLICATIONS FOR EXTENSIONS OF TIME WITHIN WHICH TO SUBMIT PROOF

FILED: 01/29/1999|PUB BEGAN: 02/09/1999|PUB ENDED: 02/17/1999|NEWSPAPER: Emery County Progress
ProtestEnd:03/08/1999|PROTESTED: [No]|HEARNG HLD: |SE ACTION: [Approved]|ActionDate:05/13/1999|PROOF DUE: 01/31/2004

FILED: 01/23/2004|PUB BEGAN: 02/11/2004|PUB ENDED: 02/18/2004|NEWSPAPER: Salina Sun
ProtestEnd:03/09/2004|PROTESTED: [No]|HEARNG HLD: |SE ACTION: [Approved]|ActionDate:09/09/2004|PROOF DUE: 01/31/2009

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(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/31/2007

WATER RIGHT: **94-65** APPLICATION/CLAIM NO.: A36025 CERT. NC.:

OWNERSHIP

NAME: Town of Emery
ADDR: Emery UT 84522

DATES, ETC.

LAND OWNED BY APPLICANT?
FILED: 04/06/1964|PRIORITY: 03/12/1970|PUB BEGAN: |PUB ENDED: |NEWSPAPER:
ProtestEnd: |PROTESTED: [No]|HEARNG HLD: |SE ACTION: [ ]|ActionDate:08/19/1964|PROOF DUE:
EXTENSION: |ELEC/PROOF:[Election]|ELEC/PROOF: |CERT/WUC: |LAP, ETC: |LAPS LETTER:
RUSH LETTR: |RENOVATE: |RECON REQ: |TYPE: [ ]
PD Book No. 1 Map: *
Type of Right: Application to Appropriate Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT*(Points of Diversion: Click on Location to access PLAT Program.)**

FLOW: 0.27 cfs SOURCE: Underground Water Well
COUNTY: Emery COMMON DESCRIPTION:

POINT OF DIVERSION -- UNDERGROUND: (Click Well ID# link for more well data.)
(1) S 200 ft E 1485 ft from W4 cor, Sec 04, T 22S, R 6E, SLBM
DIAMETER OF WELL: 10 ins. DEPTH: 1614 to ft. YEAR DRILLED: WELL LOG? No WELL ID#: 21051
Comment:

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 617804. Water Rights Appurtenant to the following use(s):
94-2,12,32,33,40
47,55,56,57,**65**
303,793,1134,1135

###DOMESTIC: Group Total: 15.0000 Families Div Limit: PERIOD OF USE: 01/01 TO 12/31
Sole Supply for Families for 94-65 in this Group has NOT YET been evaluated
Families are outside the corporate limits of Emery Town

SUPPLEMENTAL GROUP NO. 618204. Water Rights Appurtenant to the following use(s):
94-2,12,32,33,40
47,55,56,57,**65**
303,304,325,793,1134
1135,1682,1764

###MUNICIPAL: Emery PERIOD OF USE: 01/01 TO 12/31
Acre Feet Allowed by this Right for this Use:

###PLACE OF USE: *-------NORTH WEST QUARTER------*-------NORTH EAST QUARTER------*-------SOUTH WEST QUARTER------*-------SOUTH EAST QUARTER------* Section

	* NW	NE	SW	SE	* NW	NE	SW	SE	* NW	NE	SW	SE	* NW	NE	SW	SE	*	Totals
Sec 03 T 22S R 6E SLBM	*X	X	X	X	*X	X	X	X	*X	X	X	X	*X	X	X	X	*	0.0000
Sec 04 T 22S R 6E SLBM	*X	X	X	X	*X	X	X	X	*X	X	X	X	*X	X	X	X	*	0.0000
Sec 09 T 22S R 6E SLBM	*X	X	X	X	*X	X	X	X	*X	X	X	X	*X	X	X	X	*	0.0000
Sec 10 T 22S R 6E SLBM	*X	X	X	X	*X	X	X	X	*X	X	X	X	*X	X	X	X	*	0.0000

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Select Related Information

(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/26/2007

WATER RIGHT: **94-81** APPLICATION/CLAIM NO.: A39733 CERT. NO.:
CHANGES: a12246 WUC Signed

OWNERSHIP

NAME: Osburn Bret Carter
ADDR: Lawrence, J.R.
P.O. Box 24
Emery UT 84522
INTEREST: 100% REMARKS: Joint Tenants

NAME: J.R. Lawrence
ADDR: Carter, Osburn Bret
P.O. Box 24
Emery UT 84522
INTEREST: 100% REMARKS: Joint Tenants

DATES, ETC.

LAND OWNED BY APPLICANT?

FILED:	|PRIORITY: 09/15/1969	|PUB BEGAN:	|PUB ENDED:	|NEWSPAPER:	
ProtestEnd:	|PROTESTED: [No]	|HEARNG HLD:	|SE ACTION: [ ]	|ActionDate:	|PROOF DUE:
EXTENSION:	|ELEC/PROOF:[ ]	|ELEC/PROOF:	|CERT/WUC:	|LAP, ETC:	|LAPS LETTER:
RUSH LETTR:	|RENOVATE:	|RECON REQ:	|TYPE: [ ]		

PD Book No. 1 Map: *
Type of Right: Application to Appropriate Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT*(Points of Diversion: Click on Location to access PLAT Program.)**

FLOW: 0.037 cfs SOURCE: Underground Water Well
COUNTY: Emery COMMON DESCRIPTION:

POINT OF DIVERSION -- SURFACE:
(1) S 570 ft W 1145 ft from E4 cor, Sec 31, T 22S, R 6E, SLBM
Diverting Works: Source:

Stream Alt Required?: No

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 617802. Water Rights Appurtenant to the following use(s):
94-2,12,32,33,40
47,55,56,57,**81**
793,1134,1135,1190,1191

###IRRIGATION: Group Total: 121.72 acres Div Limit: 0.0 acft. PERIOD OF USE: 04/01 TO 10/31
Sole Supply for Irrigation for 94-81 in this Group has NOT YET been evaluated

###PLACE OF USE: *-------NORTH WEST QUARTER------*-------NORTH EAST QUARTER------*-------SOUTH WEST QUARTER------*-------SOUTH EAST QUARTER------* Section

	* NW	NE	SW	SE	* NW	NE	SW	SE	* NW	NE	SW	SE	* NW	NE	SW	SE *	Totals
Sec 31 T 22S R 6E SLBM	*				*				*				*	11.4600		29.9700*	41.4300
Sec 32 T 22S R 6E SLBM	*				*				*17.9100	0.1800	29.1800	2.0900	*			*	49.3600
Sec 05 T 23S R 6E SLBM	*LOT 4																7.4700
Sec 06 T 23S R 6E SLBM	*LOT 1																23.4600

SUPPLEMENTAL GROUP NO. 617824. Water Rights Appurtenant to the following use(s):
94-81,1190,1191

###STOCKWATER: Group Total: 160.0000 Stock Div Limit: PERIOD OF USE: 01/01 TO 12/31
Sole Supply for Stockwatering for 94-81 in this Group has NOT YET been evaluated
Water User`s Claims 1190,1191 are limited to the stockwatering requirements of 113 cattle.

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(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/26/2007

WATER RIGHT: **94-92** APPLICATION/CLAIM NO.: D2563 CERT. NO.:

OWNERSHIP**********

NAME: Consolidation Coal Company
ADDR: 1800 Washington Road
Pittsburg PA 15241

DATES, ETC.**********

LAND OWNED BY APPLICANT?
FILED: 02/26/1972 | PRIORITY: 00/00/1903 | PUB BEGAN: | PUB ENDED: | NEWSPAPER:
ProtestEnd: | PROTESTED: [No] | HEARNG HLD: | SE ACTION: [ ] | ActionDate: | PROOF DUE:
EXTENSION: | ELEC/PROOF: [ ] | ELEC/PROOF: | CERT/WUC: | LAP, ETC: | LAPS LETTER:
RUSH LETTR: | RENOVATE: | RECON REQ: | TYPE: [ ]
PD Book No. 1 Map: *
Type of Right: Diligence Claim Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)**********

FLOW: SOURCE: Unnamed Spring Stream
COUNTY: Emery COMMON DESCRIPTION:

POINT OF DIVERSION -- POINT TO POINT:
(1)Stockwatering directly on stream from a point at S 660 ft. E 1980 ft. from W4 corner, Sec 23, T22S, R6E, SLBM,
to a point at N 660 ft. E 660 ft. from SW corner, Sec 23, T22S, R6E, SLBM.
COMMENT: Administratively updated by State Engineer.

USES OF WATER RIGHT**********

SUPPLEMENTAL GROUP NO. 618330.

###STOCKWATER: 100.0000 Stock Units Div Limit: PERIOD OF USE: 01/01 TO 12/31

PLACE OF USE for STOCKWATERING**********

NORTH-WEST¼	NORTH-EAST¼	SOUTH-WEST¼	SOUTH-EAST¼

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(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/31/2007

WATER RIGHT: **94-285** APPLICATION/CLAIM NO.: A44305 CERT. NO.:
CHANGES: a13987 Approved

OWNERSHIP

NAME: Consolidation Coal Company
ADDR: Attn: John Gefferth
P.O. Box 566
Sesser IL 62884

DATES, ETC.

LAND OWNED BY APPLICANT?
FILED: 10/18/1974|PRIORITY: 10/18/1974|PUB BEGAN: |PUB ENDED: |NEWSPAPER:
ProtestEnd: |PROTESTED: [No]|HEARNG HLD: |SE ACTION: [ ]|ActionDate:07/02/1981|PROOF DUE: 07/31/2011
EXTENSION: |ELEC/PROOF:[ ]|ELEC/PROOF: |CERT/WUC: |LAP, ETC: |LAPS LETTER:
RUSH LETTR: |RENOVATE: |RECON REQ: |TYPE: [ ]
PD Book No. 1 Map:
Type of Right: Application to Appropriate Source of Info: Proposed Determination Status: Approved

LOCATION OF WATER RIGHT*(Points of Diversion: Click on Location to access PLAT Program.)**

FLOW: 5.0 cfs SOURCE: Underground Water Tunnel
COUNTY: Emery COMMON DESCRIPTION: Walker Falt Quad

POINT OF DIVERSION -- UNDERGROUND: (Click Well ID# link for more well data.)
(1) S 50 ft W 530 ft from NE cor, Sec 32, T 22S, R 6E, SLBM
DIAMETER OF WELL: ins. DEPTH: to ft. YEAR DRILLED: WELL LOG? No WELL ID#: 21325
Comment:
(2) S 1920 ft E 1920 ft from NW cor, Sec 33, T 22S, R 6E, SLBM
DIAMETER OF WELL: ins. DEPTH: to ft. YEAR DRILLED: WELL LOG? NO WELL ID#:
Comment:

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 618193. Water Rights Appurtenant to the following use(s):
94-285,1597

###MINING: DISTRICT: Emery NAME: Browning Coal PERIOD OF USE: 01/01 TO 12/31
ORES: Coal
Acre Feet Allowed by this Right for this Use:
Administratively changed on Feb 14, 2007, by deleting the Domestic entry for 200 persons, and adding it to this Mining entry. The purpose was to supply water for mining and produce power for operations and 200 employees.

###POWER: Unnamed Power Plant Steam Generation Power Plant, rated at 2000 MW. PERIOD OF USE: 01/01 TO 12/31
Acre Feet Allowed by this Right for this Use:

###INDUSTRIAL: Industrial processing of coal and hydraulic transportation of coal. PERIOD OF USE: 01/01 TO 12/31
Acre Feet Allowed by this Right for this Use:

###PLACE OF USE:	NORTH WEST QUARTER				NORTH EAST QUARTER				SOUTH WEST QUARTER				SOUTH EAST QUARTER				Section Totals
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	
Sec 32 T 22S R 6E SLBM					X	X	X										0.0000
Sec 33 T 22S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		0.0000

APPLICATIONS FOR EXTENSIONS OF TIME WITHIN WHICH TO SUBMIT PROOF

FILED: 01/31/2000|PUB BEGAN: 02/15/2000|PUB ENDED: 02/10/2000|NEWSPAPER: Emery County Progress
ProtestEnd:03/13/2000|PROTESTED: [No]|HEARNG HLD: |SE ACTION: [Approved]|ActionDate:07/19/2000|PROOF DUE: 07/31/2005

FILED: 07/26/2005|PUB BEGAN: 11/08/2005|PUB ENDED: 11/15/2005|NEWSPAPER: Emery County Progress
ProtestEnd:12/05/2005|PROTESTED: [No]|HEARNG HLD: |SE ACTION: [Approved]|ActionDate:03/10/2006|PROOF DUE: 07/31/2011

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(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/31/2007

WATER RIGHT: **94-303** APPLICATION/CLAIM NO.: A46247 CERT. NO.: 12075

OWNERSHIP

NAME: Town of Emery
ADDR: P.O. Box 108
Emery UT 84522

DATES, ETC.

LAND OWNED BY APPLICANT?
FILED: 04/13/1976|PRIORITY: 04/13/1976|PUB BEGAN: |PUB ENDED: |NEWSPAPER:
ProtestEnd: |PROTESTED: [No]|HEARNG HLD: |SE ACTION: [Approved]|ActionDate:09/14/1976|PROOF DUE:
EXTENSION: |ELEC/PROOF:[Proof]|ELEC/PROOF:01/28/1983|CERT/WUC: |LAP, ETC: |LAPS LETTER:
RUSH LETTR: |RENOVATE: |RECON REQ: |TYPE: [ ]
PD Book No. 1 Map: *
Type of Right: Application to Appropriate Source of Info: Proposed Determination Status: Certificate

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)

FLOW: 0.45 cfs SOURCE: Underground Water Well
COUNTY: Emery COMMON DESCRIPTION:

POINT OF DIVERSION -- UNDERGROUND: (Click Well ID# link for more well data.)
(1) S 237 ft E 1536 ft from W4 cor, Sec 04, T 22S, R 6E, SLBM
DIAMETER OF WELL: 10 ins. DEPTH: 2535 to ft. YEAR DRILLED: WELL LOG? No WELL ID#: 3477
Comment:

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 617804. Water Rights Appurtenant to the following use(s):
94-2,12,32,33,40
47,55,56,57,65
303,793,1134,1135

###DOMESTIC: Group Total: 15.0000 Families Div Limit: PERIOD OF USE: 01/01 TO 12/31
Sole Supply for Families for 94-303 in this Group has NOT YET been evaluated
Families are outside the corporate limits of Emery Town

SUPPLEMENTAL GROUP NO. 618204. Water Rights Appurtenant to the following use(s):
94-2,12,32,33,40
47,55,56,57,65
303,304,325,793,1134
1135,1682,1764

###MUNICIPAL: Emery PERIOD OF USE: 01/01 TO 12/31
Acre Feet Allowed by this Right for this Use:

###PLACE OF USE:	NORTH WEST QUARTER				NORTH EAST QUARTER				SOUTH WEST QUARTER				SOUTH EAST QUARTER				Section
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	Totals
Sec 03 T 22S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000
Sec 04 T 22S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000
Sec 09 T 22S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000
Sec 10 T 22S R 6E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000

OTHER COMMENTS**********

2535 ft.
10 inch diameter well cased from 0 ft. to 1555 ft. open hole from 1555 ft. to

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(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/26/2007

WATER RIGHT: **94-320** APPLICATION/CLAIM NO.: A52368 CERT. NO.:

OWNERSHIP

NAME: Morgan Robertson
ADDR: P.O. Box 65
Emery UT 84522

DATES, ETC.

LAND OWNED BY APPLICANT?
FILED: 11/17/1978 | PRIORITY: 11/17/1978 | PUB BEGAN: | PUB ENDED: | NEWSPAPER:
ProtestEnd: | PROTESTED: [No] | HEARNG HLD: | SE ACTION: [ ] | ActionDate:03/30/1979 | PROOF DUE:
EXTENSION: | ELEC/PROOF: [Election] | ELEC/PROOF:12/14/1981 | CERT/WUC: | LAP, ETC: | LAPS LETTER:
RUSH LETTR: | RENOVATE: 03/20/1995 | RECON REQ: | TYPE: [ ]
PD Book No. 1 Map: *
Type of Right: Application to Appropriate Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT*(Points of Diversion: Click on Location to access PLAT Program.)**

FLOW: 0.015 cfs SOURCE: Undergrounc Water Well
COUNTY: Emery COMMON DESCRIPTION:

POINT OF DIVERSION -- UNDERGROUND: (Click Well ID# link for more well data.)
(1) N 1200 ft E 70 ft from S4 cor, Sec 30, T 22S, R 6E, SLBM
DIAMETER OF WELL: 4 ins. DEPTH: 620 to ft. YEAR DRILLED: WELL LOG? No WELL ID#: 9562
Comment:

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 617821. Water Rights Appurtenant to the following use(s):
94-320,1178,1179,1180,1181
1182

###STOCKWATER: Group Total: 2000.0000 Stock Div Limit: PERIOD OF USE: 01/01 TO 12/31
Sole Supply for Stockwatering for 94-320 in this Group has NOT YET been evaluated

SUPPLEMENTAL GROUP NO. 618215.
94-320

###IRRIGATION: 0.0 acres of the Group Total: 0.1 acres Div Limit: 0.0 acft. PERIOD OF USE: 04/01 TO 10/31

###DOMESTIC: 1.0000 Family Div Limit: PERIOD OF USE: 01/01 TO 12/31

###PLACE OF USE:	NORTH WEST QUARTER				NORTH EAST QUARTER				SOUTH WEST QUARTER				SOUTH EAST QUARTER				Section
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	Totals
Sec 29 T 22S R 6E SLBM									X								0.0000
Sec 30 T 22S R 6E SLBM													0.1000				0.1000

PLACE OF USE for STOCKWATERING

	NORTH-WEST¼				NORTH-EAST¼				SOUTH-WEST¼				SOUTH-EAST¼			
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 29 T 22S R 6E SLBM									X							
Sec 30 T 22S R 6E SLBM												X		X	X	

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(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/26/2007

WATER RIGHT: **94-732** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP**********

NAME: Price Field Office USA Bureau of Land Management
ADDR: 125 South 600 West
Price UT 84501

DATES, ETC.**********

LAND OWNED BY APPLICANT?

FILED:	|PRIORITY: 00/00/1879	|PUB BEGAN:	|PUB ENDED:	|NEWSPAPER:	
ProtestEnd:	|PROTESTED: [No]	|HEARNG HLD:	|SE ACTION: [ ]	|ActionDate:	|PROOF DUE:
EXTENSION:	|ELEC/PROOF:[ ]	|ELEC/PROOF:	|CERT/WUC:	|LAP, ETC:	|LAPS LETTER:
RUSH LETTR:	|RENOVATE:	|RECON REQ:	|TYPE: [ ]		

PD Book No. 1 Map: *
Type of Right: Diligence Claim Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)**********

FLOW: SOURCE: Quitchupah Creek
COUNTY: Emery COMMON DESCRIPTION:

POINT OF DIVERSION -- POINT TO POINT:
(1)Stockwatering directly on stream from a point at S 660 ft. W 660 ft. from NE corner, Sec 04, T23S, R6E, SLBM,
to a point at N 660 ft. E 660 ft. from S4 corner, Sec 04, T23S, R6E, SLBM.
COMMENT: Administratively updated by State Engineer.

USES OF WATER RIGHT**********

SUPPLEMENTAL GROUP NO. 617778. Water Rights Appurtenant to the following use(s):
94-730,731,**732**,733,790
1057,1058,1059,1060,1061
1062,1063,1064,1065,1066
1067,1068,1069,1070,1071
1072,1073,1074,1075,1076
1077,1078,1079,1080,1081

1082,1083,1084,1085,1086
1087,1088,1089,1090,1112
1113,1114,1115,1116,1117

###STOCKWATER: Group Total: 529.0000 Stock Div Limit: PERIOD OF USE: 01/01 TO 12/31

Sole Supply for Stockwatering for 94-732 in this Group has NOT YET been evaluated

Saleratus Allotment

PLACE OF USE for STOCKWATERING

	NORTH-WEST¼				NORTH-EAST¼				SOUTH-WEST¼				SOUTH-EAST¼			
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 04 T 23S R 6E SLBM	*	:	:	: *	*	:	X:	: *	*	:	:	: *	*	:	:	X: *

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(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/26/2007

WATER RIGHT: **94-939** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP**********

NAME: Price Field Office USA Bureau of Land Management
ADDR: 125 South 600 West
Price UT 84501

DATES, ETC.**********

LAND OWNED BY APPLICANT?

FILED:	|PRIORITY: 00/00/1879	|PUB BEGAN:	|PUB ENDED:	|NEWSPAPER:	
ProtestEnd:	|PROTESTED: [No]	|HEARNG HLD:	|SE ACTION: [ ]	|ActionDate:	|PROOF DUE:
EXTENSION:	|ELEC/PROOF: [ ]	|ELEC/PROOF:	|CERT/WUC:	|LAP, ETC:	|LAPS LETTER:
RUSH LETTR:	|RENOVATE:	|RECON REQ:	|TYPE: [ ]		

PD Book No. 1 Map: *
Type of Right: Diligence Claim Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)**********

FLOW: SOURCE: Intermittent Stream
COUNTY: Sevier COMMON DESCRIPTION:

POINT OF DIVERSION -- POINT TO POINT:
(1)Stockwatering directly on stream from a point at S 660 ft. W 660 ft. from N4 corner, Sec 13, T22S, R5E, SLBM,
to a point at N 660 ft. W 660 ft. from E4 corner, Sec 13, T22S, R5E, SLBM.
COMMENT: Administratively updated by State Engineer.

USES OF WATER RIGHT**********

SUPPLEMENTAL GROUP NO. 617790. Water Rights Appurtenant to the following use(s):
94-636,937,938,**939**,1102

###STOCKWATER: Group Total: 20.0000 Stock U Div Limit: PERIOD OF USE: 01/01 TO 12/31
Sole Supply for Stockwatering for 94-939 in this Group has NOT YET been evaluated
E. Olsen Allotment

```
==========================================================================================================================
PLACE OF USE for STOCKWATERING*****************************************************************************************
==========================================================================================================================
                                NORTH-WEST¼       NORTH-EAST¼       SOUTH-WEST¼       SOUTH-EAST¼
                                NW NE SW SE       NW NE SW SE       NW NE SW SE       NW NE SW SE
Sec 13 T 22S R  5E SLBM        *  : X:  :  *     *  :  :  : X*     *  :  :  :  *     *  :  :  :  *
**********************************************************************************************************************
*****************************************************E N D   O F   D A T A*******************************************
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(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/26/2007

WATER RIGHT: **94-1080** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP

NAME: Price Field Office USA Bureau of Land Management
ADDR: 125 South 600 West
Price UT 84501

DATES, ETC.

LAND OWNED BY APPLICANT?

FILED:	PRIORITY: 00/00/1879	PUB BEGAN:	PUB ENDED:	NEWSPAPER:	
ProtestEnd:	PROTESTED: [No]	HEARNG HLD:	SE ACTION: [ ]	ActionDate:	PROOF DUE:
EXTENSION:	ELEC/PROOF: [ ]	ELEC/PROOF:	CERT/WUC:	LAP, ETC:	LAPS LETTER:
RUSH LETTR:	RENOVATE:	RECON REQ:	TYPE: [ ]		

PD Book No. 1 Map: *
Type of Right: Diligence Claim Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT (Points of Diversion: Click on Location to access PLAT Program.)

FLOW: SOURCE: Intermittent Stream
COUNTY: Sevier COMMON DESCRIPTION:

POINT OF DIVERSION -- POINT TO POINT:
(1)Stockwatering directly on stream from a point at S 660 ft. E 660 ft. from NW corner, Sec 01, T23S, R5E, SLBM,
to a point at N 660 ft. W 660 ft. from E4 corner, Sec 01, T23S, R5E, SLBM.
COMMENT: Administratively updated by State Engineer.

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 617778. Water Rights Appurtenant to the following use(s):
94-730,731,732,733,790
1057,1058,1059,1060,1061
1062,1063,1064,1065,1066
1067,1068,1069,1070,1071
1072,1073,1074,1075,1076
1077,1078,1079,**1080**,1081

1082,1083,1084,1085,1086
1087,1088,1089,1090,1112
1113,1114,1115,1116,1117

###STOCKWATER: Group Total: 529.0000 Stock Div Limit: PERIOD OF USE: 01/01 TO 12/31

Sole Supply for Stockwatering for 94-1080 in this Group has NOT YET been evaluated

Saleratus Allotment

PLACE OF USE for STOCKWATERING

	NORTH-WEST¼				NORTH-EAST¼				SOUTH-WEST¼				SOUTH-EAST¼			
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 01 T 23S R 5E SLBM	X:	:	:	*	*	:	:	: X*	*	:	:	:	*	*	:	:	:	*

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(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/31/2007

WATER RIGHT: **94-1180** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP**********

NAME: Morgan Robertson
ADDR: P.O. Box 65
Emery UT 84522

DATES, ETC.**********

LAND OWNED BY APPLICANT?

FILED:	|PRIORITY: 00/00/1879	|PUB BEGAN:	|PUB ENDED:	|NEWSPAPER:	
ProtestEnd:	|PROTESTED: [No]	|HEARNG HLD:	|SE ACTION: [ ]	|ActionDate:	|PROOF DUE:
EXTENSION:	|ELEC/PROOF:[ ]	|ELEC/PROOF:	|CERT/WUC:	|LAP, ETC:	|LAPS LETTER:
RUSH LETTR:	|RENOVATE:	|RECON REQ:	|TYPE: [ ]		

PD Book No. 1 Map: *
Type of Right: Diligence Claim Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)**********

FLOW: SOURCE: Quitchumpah Creek
COUNTY: Emery COMMON DESCRIPTION:

POINT OF DIVERSION -- POINT TO POINT:
(1)Stockwatering directly on stream from a point at S 660 ft. W 1980 ft. from E4 corner, Sec 30, T22S, R6E, SLBM,
to a point at S 660 ft. W 650 ft. from E4 corner, Sec 30, T22S, R6E, SLBM.
COMMENT: Administratively updated by State Engineer.

USES OF WATER RIGHT**********

SUPPLEMENTAL GROUP NO. 617821. Water Rights Appurtenant to the following use(s):
94-320,1178,1179,**1180**,1181
1182

###STOCKWATER: Group Total: 2000.0000 Stock Div Limit: PERIOD OF USE: 01/01 TO 12/31
******Sole Supply for Stockwatering for 94-1180 in this Group has NOT YET been evaluated******

PLACE OF USE for STOCKWATERING

	NORTH-WEST¼				NORTH-EAST¼				SOUTH-WEST¼				SOUTH-EAST¼			
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 30 T 22S R 6E SLBM	*	:	:	:	*	*	:	:	:	*	*	:	:	:	*	* X: X:	:	*

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WATER RIGHT: **94-1189** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP

NAME: Canyon Fuel Company, L.L.C.
ADDR: 225 North 5th Street, Suite 900
Grand Junction CO 81501

DATES, ETC.

LAND OWNED BY APPLICANT?

FILED:	PRIORITY: 00/00/1879	PUB BEGAN:	PUB ENDED:	NEWSPAPER:	
ProtestEnd:	PROTESTED: [No]	HEARNG HLD:	SE ACTION: [ ]	ActionDate:	PROOF DUE:
EXTENSION:	ELEC/PROOF: [ ]	ELEC/PROOF:	CERT/WUC:	LAP, ETC:	LAPS LETTER:
RUSH LETTR:	RENOVATE:	RECON REQ:	TYPE: [ ]		

PD Book No. 1 Map: *
Type of Right: Diligence Claim Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)

FLOW: SOURCE: Quitchumpah Creek
COUNTY: Sevier COMMON DESCRIPTION:

POINT OF DIVERSION -- POINT TO POINT:
(1)Stockwatering directly on stream from a point at N 660 ft. E 1980 ft. from W4 corner, Sec 24, T22S, R5E, SLBM,
to a point at S 660 ft. W 660 ft. from E4 corner, Sec 24, T22S, R5E, SLBM.
COMMENT: Administratively updated by State Engineer.

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 617823. Water Rights Appurtenant to the following use(s):
94-1183,1184,1185,1186,1187
1188,**1189**,1218

###STOCKWATER: Group Total: 150.0000 Stock Div Limit: PERIOD OF USE: 01/01 TO 12/31
Sole Supply for Stockwatering for 94-1189 in this Group has NOT YET been evaluated

PLACE OF USE for STOCKWATERING

	NORTH-WEST¼				NORTH-EAST¼				SOUTH-WEST¼				SOUTH-EAST¼			
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 24 T 22S R 5E SLBM	*	:	:	: X*	*	:	:	: *	*	:	:	: *	*	: X:	:	*

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(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/26/2007

WATER RIGHT: **94-1191** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP

NAME: Osburn Bret Carter
ADDR: Lawrence, J.R.
P.O. Box 24
Emery UT 84522
INTEREST: 100% REMARKS: Joint Tenants

NAME: J.R. Lawrence
ADDR: Carter, Osburn Bret
P.O. Box 24
Emery UT 84522
INTEREST: 100% REMARKS: Joint Tenants

DATES, ETC.

LAND OWNED BY APPLICANT?
FILED: |PRIORITY: 00/00/1884|PUB BEGAN: |PUB ENDED: |NEWSPAPER:
ProtestEnd: |PROTESTED: [No]|HEARNG HLD: |SE ACTION: [ ]|ActionDate: |PROOF DUE:
EXTENSION: |ELEC/PROOF:[ ]|ELEC/PROOF: |CERT/WUC: |LAP, ETC: |LAPS LETTER:
RUSH LETTR: |RENOVATE: |RECON REQ: |TYPE: [ ]
PD Book No. 1 Map: *
Type of Right: Decree Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT*(Points of Diversion: Click on Location to access PLAT Program.)**

FLOW: 5.25 cfs SOURCE: Quitchumpah Creek
COUNTY: Sevier COMMON DESCRIPTION:

POINT OF DIVERSION -- SURFACE:
(1) S 1050 ft W 85 ft from E4 cor, Sec 24, T 22S, R 5E, SLBM
Diverting Works: Source:

Stream Alt Required?: No

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 617802. Water Rights Appurtenant to the following use(s):
94-2,12,32,33,40
47,55,56,57,81
793,1134,1135,1190,**1191**

###IRRIGATION: Group Total: 121.72 acres Div Limit: 0.0 acft. PERIOD OF USE: 04/01 TO 10/31
Sole Supply for Irrigation for 94-1191 in this Group has NOT YET been evaluated

###PLACE OF USE:	NORTH WEST QUARTER				NORTH EAST QUARTER				SOUTH WEST QUARTER				SOUTH EAST QUARTER				Section
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	Totals

Sec 31 T 22S R 6E SLBM	*				*				*				*		11.4600		29.9700	*	41.4300
Sec 32 T 22S R 6E SLBM	*				*				*17.9100	0.1800	29.1800	2.0900	*					*	49.3600
Sec 05 T 23S R 6E SLBM	*LOT 4																		7.4700
Sec 06 T 23S R 6E SLBM	*LOT 1																		23.4600

SUPPLEMENTAL GROUP NO. 617824. Water Rights Appurtenant to the following use(s):
94-81,1190,**1191**

###STOCKWATER: Group Total: 160.0000 Stock Div Limit: PERIOD OF USE: 01/01 TO 12/31

******Sole Supply for Stockwatering for 94-1191 in this Group has NOT YET been evaluated******

Water User`s Claims 1190,1191 are limited to the stockwatering requirements of 113 cattle.

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Select Related Information

(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/31/2007

WATER RIGHT: **94-1193** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP

NAME: Osburn Bret Carter
ADDR: Lawrence, J.R.
P.O. Box 24
Emery UT 84522
INTEREST: 100% REMARKS: Joint Tenants

NAME: J.R. Lawrence
ADDR: Carter, Osburn Bret
P.O. Box 24
Emery UT 84522
INTEREST: 100% REMARKS: Joint Tenants

DATES, ETC.

LAND OWNED BY APPLICANT?

FILED:	|PRIORITY: 00/00/1879	|PUB BEGAN:	|PUB ENDED:	|NEWSPAPER:	
ProtestEnd:	|PROTESTED: [No]	|HEARNG HLD:	|SE ACTION: [ ]	|ActionDate:	|PROOF DUE:
EXTENSION:	|ELEC/PROOF: [ ]	|ELEC/PROOF:	|CERT/WUC:	|LAP, ETC:	|LAPS LETTER:
RUSH LETTR:	|RENOVATE:	|RECON REQ:	|TYPE: [ ]		

PD Book No. 1 Map: *
Type of Right: Diligence Claim Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)

FLOW: 0.011 cfs SOURCE: Unnamed Springs
COUNTY: Emery COMMON DESCRIPTION:

POINTS OF DIVERSION -- SURFACE:
(1) S 770 ft E 370 ft from N4 cor, Sec 29, T 22S, R 6E, SLBM
Diverting Works: Source:
(2) S 875 ft W 470 ft from N4 cor, Sec 29, T 22S, R 6E, SLBM
Diverting Works: Source:
(3) S 1040 ft W 1050 ft from N4 cor, Sec 29, T 22S, R 6E, SLBM

Diverting Works: Source:

Stream Alt Required?: No

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 617825. Water Rights Appurtenant to the following use(s):
94-1192,**1193**

###STOCKWATER: Group Total: 200.0000 Stock Div Limit: PERIOD OF USE: 01/01 TO 12/31

Sole Supply for Stockwatering for 94-1193 in this Group has NOT YET been evaluated

**********E N D O F D A T A**********

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(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/26/2007

WATER RIGHT: **94-1215** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP**********

NAME: Castle Valley Ranches L.L.C.
ADDR: c/o John F. Bates
455 South 300 East #200
Salt Lake City UT 84111
INTEREST: 100% REMARKS: a Utah Limited Liability Company

DATES, ETC.**********

LAND OWNED BY APPLICANT?

FILED:	|PRIORITY: 00/00/1879	|PUB BEGAN:	|PUB ENDED:	|NEWSPAPER:	
ProtestEnd:	|PROTESTED: [No]	|HEARNG HLD:	|SE ACTION: [ ]	|ActionDate:	|PROOF DUE:
EXTENSION:	|ELEC/PROOF:[ ]	|ELEC/PROOF:	|CERT/WUC:	|LAP, ETC:	|LAPS LETTER:
RUSH LETTR:	|RENOVATE:	|RECON REQ:	|TYPE: [ ]		

PD Book No. 1 Map: *
Type of Right: Diligence Claim Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)**********

FLOW: 0.015 cfs SOURCE: Unnamed Springs
COUNTY: Emery COMMON DESCRIPTION:

POINTS OF DIVERSION -- SURFACE:

(1) N 100 ft E 520 ft from W4 cor, Sec 28, T 22S, R 6E, SLBM
Diverting Works: Source:
(2) N 410 ft E 500 ft from W4 cor, Sec 28, T 22S, R 6E, SLBM
Diverting Works: Source:
(3) N 495 ft E 370 ft from W4 cor, Sec 28, T 22S, R 6E, SLBM
Diverting Works: Source:
(4) N 560 ft E 300 ft from W4 cor, Sec 28, T 22S, R 6E, SLBM
Diverting Works: Source:

Stream Alt Required?: No

USES OF WATER RIGHT**********

SUPPLEMENTAL GROUP NO. 617832.

###STOCKWATER: 100.0000 Stock Units Div Limit: PERIOD OF USE: 01/01 TO 12/31

**********E N D O F D A T A**********

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Select Related Information

(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/31/2007

WATER RIGHT: **94-1216** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP

NAME: Castle Valley Ranches L.L.C.
ADDR: c/o John F. Bates
455 South 300 East #200
Salt Lake City UT 84111
INTEREST: 100% REMARKS: a Utah Limited Liability Company

DATES, ETC.

LAND OWNED BY APPLICANT?

FILED:	PRIORITY: 00/00/1879	PUB BEGAN:	PUB ENDED:	NEWSPAPER:	
ProtestEnd:	PROTESTED: [No]	HEARNG HLD:	SE ACTION: [ ]	ActionDate:	PROOF DUE:
EXTENSION:	ELEC/PROOF: [ ]	ELEC/PROOF:	CERT/WUC:	LAP, ETC:	LAPS LETTER:
RUSH LETTR:	RENOVATE:	RECON REQ:	TYPE: [ ]		

PD Book No. 1 Map: *
Type of Right: Diligence Claim Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)

FLOW: SOURCE: Quitchumpah Creek
COUNTY: Emery COMMON DESCRIPTION:

POINT OF DIVERSION -- POINT TO POINT:
(1)Stockwatering directly on stream from a point at N 660 ft. E 1980 ft. from W4 corner, Sec 30, T22S, R6E, SLBM,
to a point at S 1980 ft. E 660 ft. from N4 corner, Sec 30, T22S, R6E, SLBM.
COMMENT: Administratively updated by State Engineer.

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 617833. Water Rights Appurtenant to the following use(s):
94-1216,1217

###STOCKWATER: Group Total: 400.0000 Stock Div Limit: PERIOD OF USE: 01/01 TO 12/31

Sole Supply for Stockwatering for 94-1216 in this Group has NOT YET been evaluated

PLACE OF USE for STOCKWATERING

	NORTH-WEST¼				NORTH-EAST¼				SOUTH-WEST¼				SOUTH-EAST¼			
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 30 T 22S R 6E SLBM	*	:	:	: X*	*	:	: X:	*	*	:	:	:	*	*	:	:	:	*

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Select Related Information

(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/31/2007

WATER RIGHT: **94-1217** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP**********

NAME: Castle Valley Ranches LLC
ADDR: Attn: John F. Bates
455 South 300 East #200
Salt Lake City UT 84111
INTEREST: 100% REMARKS: a Utah Limited Liability Company

DATES, ETC.**********

LAND OWNED BY APPLICANT?

FILED:	|PRIORITY: 00/00/1879	|PUB BEGAN:	|PUB ENDED:	|NEWSPAPER:	
ProtestEnd:	|PROTESTED: [No]	|HEARNG HLD:	|SE ACTION: [ ]	|ActionDate:	|PROOF DUE:
EXTENSION:	|ELEC/PROOF:[ ]	|ELEC/PROOF:	|CERT/WUC:	|LAP, ETC:	|LAPS LETTER:
RUSH LETTR:	|RENOVATE:	|RECON REQ:	|TYPE: [ ]		

PD Book No. 1 Map: *
Type of Right: Diligence Claim Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)**********

FLOW: SOURCE: Quitchumpah Creek
COUNTY: Emery COMMON DESCRIPTION:

POINT OF DIVERSION -- POINT TO POINT:
(1)Stockwatering directly on stream from a point at N 660 ft. W 660 ft. from E4 corner, Sec 30, T22S, R6E, SLBM,
to a point at N 660 ft. W 660 ft. from E4 corner, Sec 30, T22S, R6E, SLBM.
COMMENT: Administratively updated by State Engineer.

USES OF WATER RIGHT**********

SUPPLEMENTAL GROUP NO. 617833. Water Rights Appurtenant to the following use(s):
94-1216,**1217**

###STOCKWATER: Group Total: 400.0000 Stock Div Limit: PERIOD OF USE: 01/01 TO 12/31

Sole Supply for Stockwatering for 94-1217 in this Group has NOT YET been evaluated

PLACE OF USE for STOCKWATERING

	NORTH-WEST¼				NORTH-EAST¼				SOUTH-WEST¼				SOUTH-EAST¼			
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 30 T 22S R 6E SLBM	*	:	:	*	*	:	:	X*	*	:	:	*	*	:	:	*

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WATER RIGHT: **94-1285** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP

NAME: Josiah K. and Etta Marie Eardley
ADDR: 2433 South Highway 10
Price, UT 84501
INTEREST: 100% REMARKS: joint tenants

DATES, ETC.

LAND OWNED BY APPLICANT?

FILED:	|PRIORITY: 00/00/1879	|PUB BEGAN:	|PUB ENDED:	|NEWSPAPER:	
ProtestEnd:	|PROTESTED: [No]	|HEARNG HLD:	|SE ACTION: [ ]	|ActionDate:	|PROOF DUE:
EXTENSION:	|ELEC/PROOF: [ ]	|ELEC/PROOF:	|CERT/WUC:	|LAP, ETC:	|LAPS LETTER:
RUSH LETTR:	|RENOVATE:	|RECON REQ:	|TYPE: [ ]		

PD Book No. 1 Map: *
Type of Right: Diligence Claim Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT*(Points of Diversion: Click on Location to access PLAT Program.)**

FLOW: SOURCE: Quitchumpah Creek
COUNTY: Emery COMMON DESCRIPTION:

POINT OF DIVERSION -- POINT TO POINT:
(1)Stockwatering directly on stream from a point at S 660 ft. E 660 ft. from NW corner, Sec 30, T22S, R6E, SLBM,
to a point at S 660 ft. E 660 ft. from NW corner, Sec 30, T22S, R6E, SLBM.
COMMENT: Administratively updated by State Engineer.

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 617875. Water Rights Appurtenant to the following use(s):
94-1285,1318

###STOCKWATER: Group Total: 100.0000 Stock Div Limit: PERIOD OF USE: 01/01 TO 12/31
Sole Supply for Stockwatering for 94-1285 in this Group has NOT YET been evaluated

SUPPLEMENTAL GROUP NO. 618166. Water Rights Appurtenant to the following use(s):
94-1285,1318,1866

###STOCKWATER: Group Total: 108.0000 Stock Div Limit: PERIOD OF USE: 01/01 TO 12/31
Sole Supply for Stockwatering for 94-1285 in this Group has NOT YET been evaluated

PLACE OF USE for STOCKWATERING

	NORTH-WEST¼	NORTH-EAST¼	SOUTH-WEST¼	SOUTH-EAST¼
	NW NE SW SE	NW NE SW SE	NW NE SW SE	NW NE SW SE
Sec 30 T 22S R 6E SLBM	* X: : : *	* : : : *	* : : : *	* : : : *

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WATER RIGHT: **94-1315** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP**********

NAME: Alonzo Olsen
ADDR: P. O. Box 74
Emery UT 84522

DATES, ETC.**********

LAND OWNED BY APPLICANT?

FILED:	|PRIORITY: 00/00/1879	|PUB BEGAN:	|PUB ENDED:	|NEWSPAPER:	
ProtestEnd:	|PROTESTED: [No]	|HEARNG HLD:	|SE ACTION: [ ]	|ActionDate:	|PROOF DUE:
EXTENSION:	|ELEC/PROOF: [ ]	|ELEC/PROOF:	|CERT/WUC:	|LAP, ETC:	|LAPS LETTER:
RUSH LETTR:	|RENOVATE:	|RECON REQ:	|TYPE: [ ]		

PD Book No. 1 Map: *
Type of Right: Diligence Claim Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)**********

FLOW: SOURCE: Quitchumpah Creek
COUNTY: Emery COMMON DESCRIPTION:

POINT OF DIVERSION -- POINT TO POINT:
(1)Stockwatering directly on stream from a point at N 660 ft. E 1980 ft. from W4 corner, Sec 30, T22S, R6E, SLBM,
to a point at N 660 ft. E 1980 ft. from W4 corner, Sec 30, T22S, R6E, SLBM.
COMMENT: Administratively updated by State Engineer.

USES OF WATER RIGHT**********

SUPPLEMENTAL GROUP NO. 617892.

###STOCKWATER: 30.0000 Stock Units Div Limit: PERIOD OF USE: 01/01 TO 12/31

PLACE OF USE for STOCKWATERING**********

NORTH-WEST¼ NORTH-EAST¼ SOUTH-WEST¼ SOUTH-EAST¼

```
                                NW NE SW SE       NW NE SW SE       NW NE SW SE       NW NE SW SE
Sec 30 T 22S R  6E SLBM        *  :  :  : X*     *  :  :  :  *     *  :  :  :  *     *  :  :  :  *
*****************************************************************************************************************
*****************************************************E N D   O F   D A T A*****************************************
*****************************************************************************************************************
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(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/31/2007

WATER RIGHT: **94-1316** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP**********

NAME: George E. Olsen
ADDR: 5829 Oak Knolls Road
Simi CA 93063

DATES, ETC.**********

LAND OWNED BY APPLICANT?

FILED:	|PRIORITY: 00/00/1879	|PUB BEGAN:	|PUB ENDED:	|NEWSPAPER:	
ProtestEnd:	|PROTESTED: [No]	|HEARNG HLD:	|SE ACTION: [ ]	|ActionDate:	|PROOF DUE:
EXTENSION:	|ELEC/PROOF: [ ]	|ELEC/PROOF:	|CERT/WUC:	|LAP, ETC:	|LAPS LETTER:
RUSH LETTR:	|RENOVATE:	|RECON REQ:	|TYPE: [ ]		

PD Book No. 1 Map: *
Type of Right: Diligence Claim Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)**********

FLOW: SOURCE: Quitchumpah Creek
COUNTY: Emery COMMON DESCRIPTION:

POINT OF DIVERSION -- POINT TO POINT:
(1)Stockwatering directly on stream from a point at S 660 ft. W 660 ft. from N4 corner, Sec 30, T22S, R6E, SLBM,
to a point at S 660 ft. W 660 ft. from N4 corner, Sec 30, T22S, R6E, SLBM.
COMMENT: Administratively updated by State Engineer.

USES OF WATER RIGHT**********

SUPPLEMENTAL GROUP NO. 617893. Water Rights Appurtenant to the following use(s):
94-1316,1317

###STOCKWATER: Group Total: 50.0000 Stock U Div Limit: PERIOD OF USE: 01/01 TO 12/31
Sole Supply for Stockwatering for 94-1316 in this Group has NOT YET been evaluated

PLACE OF USE for STOCKWATERING**********

	NORTH-WEST¼				NORTH-EAST¼				SOUTH-WEST¼				SOUTH-EAST¼			
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 30 T 22S R 6E SLBM	*	X:	:	*	*	:	:	:	*	*	:	:	:	*	*	:	:	:	*

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(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/26/2007

WATER RIGHT: **94-1317** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP

NAME: George E. Olsen
ADDR: 5829 Oak Knolls Road
Simi CA 93063

DATES, ETC.

LAND OWNED BY APPLICANT?

FILED:	PRIORITY: 00/00/1879	PUB BEGAN:	PUB ENDED:	NEWSPAPER:	
ProtestEnd:	PROTESTED: [No]	HEARNG HLD:	SE ACTION: [ ]	ActionDate:	PROOF DUE:
EXTENSION:	ELEC/PROOF: [ ]	ELEC/PROOF:	CERT/WUC:	LAP, ETC:	LAPS LETTER:
RUSH LETTR:	RENOVATE:	RECON REQ:	TYPE: [ ]		

PD Book No. 1 Map: *
Type of Right: Diligence Claim Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT***(Points of Diversion: Click on Location to access PLAT Program.)

FLOW: SOURCE: Quitchumpah Creek
COUNTY: Emery COMMON DESCRIPTION:

POINT OF DIVERSION -- POINT TO POINT:
(1)Stockwatering directly on stream from a point at S 660 ft. E 660 ft. from W4 corner, Sec 29, T22S, R6E, SLBM,
to a point at S 660 ft. E 660 ft. from W4 corner, Sec 29, T22S, R6E, SLBM.
COMMENT: Administratively updated by State Engineer.

USES OF WATER RIGHT

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(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/26/2007

WATER RIGHT: **94-1318** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP

NAME: Josiah K. and Etta Marie Eardley
ADDR: 2433 South Highway 10
Price, UT 84501
INTEREST: 100% REMARKS: joint tenants

DATES, ETC.

LAND OWNED BY APPLICANT?

FILED:	|PRIORITY: 00/00/1879	|PUB BEGAN:	|PUB ENDED:	|NEWSPAPER:	
ProtestEnd:	|PROTESTED: [No]	|HEARNG HLD:	|SE ACTION: [ ]	|ActionDate:	|PROOF DUE:
EXTENSION:	|ELEC/PROOF: [ ]	|ELEC/PROOF:	|CERT/WUC:	|LAP, ETC:	|LAPS LETTER:
RUSH LETTR:	|RENOVATE:	|RECON REQ:	|TYPE: [ ]		

PD Book No. 1 Map: *
Type of Right: Diligence Claim Source of Info: Proposed Determination Status: Water User's Claim

LOCATION OF WATER RIGHT*(Points of Diversion: Click on Location to access PLAT Program.)**

FLOW: SOURCE: Quitchumpah Creek
COUNTY: Emery COMMON DESCRIPTION:

POINT OF DIVERSION -- POINT TO POINT:
(1)Stockwatering directly on stream from a point at S 660 ft. W 660 ft. from N4 corner, Sec 30, T22S, R6E, SLBM,
to a point at N 660 ft. E 1980 ft. from W4 corner, Sec 30, T22S, R6E, SLBM.
COMMENT: Administratively updated by State Engineer.

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 617875. Water Rights Appurtenant to the following use(s):
94-1285,**1318**

###STOCKWATER: Group Total: 100.0000 Stock Div Limit: PERIOD OF USE: 01/01 TO 12/31
Sole Supply for Stockwatering for 94-1318 in this Group has NOT YET been evaluated

SUPPLEMENTAL GROUP NO. 618166. Water Rights Appurtenant to the following use(s):
94-1285,**1318**,1866

###STOCKWATER: Group Total: 108.0000 Stock Div Limit: PERIOD OF USE: 01/01 TO 12/31
Sole Supply for Stockwatering for 94-1318 in this Group has NOT YET been evaluated

PLACE OF USE for STOCKWATERING

	NORTH-WEST¼				NORTH-EAST¼				SOUTH-WEST¼				SOUTH-EAST¼			
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 30 T 22S R 6E SLBM	*	: X:	: X*		*	:	:	: *	*	:	:	: *	*	:	:	: *

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Select Related Information

(WARNING: Water Rights makes NO claims as to the accuracy of this data.) RUN DATE: 07/26/2007

WATER RIGHT: **94-1716** APPLICATION/CLAIM NO.: CERT. NO.:

OWNERSHIP

NAME: Price Field Office USA Bureau of Land Management
ADDR: 125 South 600 West
Price UT 84501

DATES, ETC.

LAND OWNED BY APPLICANT?

FILED:	|PRIORITY: 00/00/1879	|PUB BEGAN:	|PUB ENDED:	|NEWSPAPER:	
ProtestEnd:	|PROTESTED: [No]	|HEARNG HLD:	|SE ACTION: [ ]	|ActionDate:	|PROOF DUE:
EXTENSION:	|ELEC/PROOF:[ ]	|ELEC/PROOF:	|CERT/WUC:	|LAP, ETC:	|LAPS LETTER:
RUSH LETTR:	|RENOVATE:	|RECON REQ:	|TYPE: [ ]		

PD Book No. Map: *
Type of Right: Diligence Claim Source of Info: Water User's Claim Status:

LOCATION OF WATER RIGHT*(Points of Diversion: Click on Location to access PLAT Program.)**

FLOW: SOURCE: Miller Canyon
COUNTY: Emery COMMON DESCRIPTION:

POINT OF DIVERSION -- POINT TO POINT:
(1)Stockwatering directly on stream from a point at S 660 ft. E 660 ft. from NW corner, Sec 26, T22S, R6E, SLBM,
to a point at N 660 ft. W 660 ft. from SE corner, Sec 26, T22S, R6E, SLBM.
COMMENT: Administratively updated by State Engineer.

USES OF WATER RIGHT

SUPPLEMENTAL GROUP NO. 618013.
94-1716

###STOCKWATER:	958.0000 Stock Units	Div Limit:	PERIOD OF USE: 01/01 TO 12/31
Lone Tree Allotment			
###WILDLIFE:	160 Bighorn Sheep, 243 Antelope, 91 Deer		PERIOD OF USE: 01/01 TO 12/31
	Acre Feet Allowed by this Right for this Use:		

SUPPLEMENTAL GROUP NO. 618209. Water Rights Appurtenant to the following use(s):
94-311,**1716**

###IRRIGATION:	Group Total: 815.0 acres	Div Limit: 0.0 acft.	PERIOD OF USE: 02/01 TO 11/31
Sole Supply for Irrigation for 94-1716 in this Group has NOT YET been evaluated			
###STOCKWATER:	Group Total: 1035.0000 Stock	Div Limit:	PERIOD OF USE: 01/01 TO 12/31
Sole Supply for Stockwatering for 94-1716 in this Group has NOT YET been evaluated			

###DOMESTIC: Group Total: 6.0000 Families Div Limit: PERIOD OF USE: 01/01 TO 12/31

Sole Supply for Families for 94-1716 in this Group has NOT YET been evaluated

###PLACE OF USE:	NORTH WEST QUARTER				NORTH EAST QUARTER				SOUTH WEST QUARTER				SOUTH EAST QUARTER				Section
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	Totals
Sec 20 T 23S R 5E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000
Sec 21 T 23S R 5E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000
Sec 22 T 23S R 5E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000
Sec 28 T 23S R 5E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000
Sec 29 T 23S R 5E SLBM	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	0.0000

PLACE OF USE for STOCKWATERING

	NORTH-WEST¼				NORTH-EAST¼				SOUTH-WEST¼				SOUTH-EAST¼			
	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE	NW	NE	SW	SE
Sec 26 T 22S R 6E SLBM	X															X

OTHER COMMENTS

* Map: Emery East Quad

**********END OF DATA**********

APPENDIX VI-5

Surface Water Monitoring –
Flow and Water Quality Data

Surface Water Quality Data

Station: 1
Description: Quitchupah Creek above Pond #1 tributary

Type	Date	Wat. Temp	F-pH (units)	DO (mg/l)	Fld EC (umhos/cm)	Flow (gpm)	L-pH (units)	TSS (mg/l)	O/G (mg/l)	NH3 (mg/l)	D-As (mg/l)	D-B (mg/l)	D-Cd (mg/l)	D-Ca (mg/l)	D-Cu (mg/l)	D-Fe (mg/l)	D-Pb (mg/l)	D-Mg (mg/l)	D-Mn (mg/l)	D-K (mg/l)	D-Se (mg/l)	D-Na (mg/l)	D-Zn (mg/l)	Bicarb (mg/l)	Acidity (mg/l)
Stream	10/26/1979		7.9		2856	471		22	1					171		0.03		128		5		363		375.76	0
Stream	12/6/1979		7.8		1078			1055	0																
Stream	1/3/1980		7.8		700			1374	2																
Stream	2/8/1980		7.8		1311			278	1					93		0.09		54		3		135		331.84	0
Stream	3/16/1980		8.0		986	5652		1196	1																
Stream	4/19/1980		7.6		713	4199		5330	1																
Stream	5/22/1980		8.0		688	7043		633	1					63		0.04		33		4		53		230.58	0
Stream	6/11/1980		8.2		749	5428		443	1																
Stream	7/16/1980		8.4		1194	2826		273	1																
Stream	8/12/1980		8.2		2257	1346		17	1					145		0.11		114		6		230		374.54	0
Stream	9/18/1980		8.0		1392	2871		1413	1																
Stream	10/12/1980		8.2		4101	1391		249	1																
Stream	11/9/1980		8.2		1147	2378		307	0					65		0.02		104		4		150		237.9	
Stream	12/10/1980		8.2		1990	1794		46	1																
Stream	1/10/1981		8.4		876	3499		68	1																
Stream	2/10/1981		8.2		1705	1211		833	2					112		0.02		77		4		182		301.34	0
Stream	3/17/1981		8.4		1581	1750		285	0																
Stream	4/13/1981						8.3	1073	<0.5							4.44									
Stream	5/20/1981						8.1	19.5	<0.5							0.14								367.5	
Stream	6/23/1981						8.2	12.0	4.8																
Stream	7/16/1981						8.3	13.5	<0.5																
Stream	8/20/1981								<0.5							1.07								342	
Stream	9/28/1981						8.2	155	<0.5																
Stream	10/30/1981						8.3	103	0.8																
Stream	12/29/1981						8.4	66.5																345	
Stream	3/16/1982	6.8	7.9	12	1170	3141.6	8.1	850																312	
Stream	6/16/1982						8.2	350																266	
Stream	9/20/1982						8	89.5																335	
Stream	12/27/1982						7.3	16.5																328	
Stream	6/8/1983						8																	354	
Stream	6/30/1983						6.95																	238	
Stream	12/13/1983						8.1	348	<0.5															366	
Stream	3/15/1984						8.05	804	<0.5															394	
Stream	6/12/1984						7.65	938	<0.5															260	
Stream	9/13/1984						7.4	1156	<0.5															300	
Stream	12/17/1984						7.5	196	<0.5															277	
Stream	6/6/1985						7.6	739	<0.5															246	
Stream	7/22/1985						7.65	2322	0.9															276	
Stream	9/27/1985						7.4	237	<0.5															307	
Stream	5/21/1986						7.2	1047	<0.5															248	
Stream	10/6/1986						7.95	1172	<0.5															267	
Stream	9/20/1990							6						149		0.11		93	<0.01	6		478		330	
Stream	11/6/1990							50						152		0.02		80	0.03	4		232		328	
Stream	3/26/1991							392						93		<0.02		61	<0.01	4		306		300	
Stream	6/3/1991							8110						87		<0.02		50	<0.01	3		249		280	
Stream	9/13/1991							384	2					105		0.04		64	<0.01	5		283		304	
Stream	12/12/1991							762						89		<0.02		56	<0.01	3		195		288	
Stream	3/11/1992							896						86		<0.02		52	<0.01	3		100		254	
Stream	5/6/1992							42						177		0.1		73	0.02	5		389		316	
Stream	9/3/1992							82						135		<0.02		81	0.01	5		349		384	
Stream	12/2/1992	2.2	6.9		1100			426						119		<0.02		65	0.02	3		134		296	
Stream	6/1/1993							566						139		0.0018		55	0.15	3		105		246	
Stream	9/7/1993							6						223		0.12		120	0.08	5		319		358	
Stream	12/6/1993							60						117		<0.02		68	0.03	4		188		322	
Stream	3/7/1994	8.3	7.7		910	3769.92		1370						74		<0.02		44	<0.01	4		142		226	
Stream	6/1/1994	16.6	7.4		1950	1077.12		8						152		0.07		82	0.03	5		225		235	
Stream	9/6/1994	14.6	7.8		2230	749.496		8						146		0.13		94	<0.01	5		346		338	
Stream	12/5/1994	4.5	7.6		850			210						80		0.02			<0.005	3		140		290	
Stream	3/1/1995	8.9	7.6		1010	4936.8		290						94		<0.1		60	<0.1	4		142		270	
Stream	6/5/1995	13.2	8		620	24055.68		1330						66		<0.1		30	<0.1	2		53		540	
Stream	9/5/1995	15.7	7		1520	1270.104		120						101		<0.1		63	<0.1	4		184		360	
Stream	12/4/1995	4.3	7.9		900	6700.584		220						78		<0.1		54	<0.1	3		131		335	
Stream	3/11/1996	8.4	7.8		900	10771.2		694						63		<0.03		38	<0.04	2.2		105		323	<7.
Stream	6/3/1996	20.6	8.2		1570	9245.28		72						77		<0.1		41	<0.1	3		151		348	
Stream	9/3/1996	14.7	8		2530	538.56		39						139		<0.1		93	<0.1	5		307		428	
Stream	12/2/1996	3.2	8.3		1410			12						118		<0.1		76	<0.1	5		576		442	

Surface Water Quality Data

Station: 1
Description: Quitchupah Creek above Pond #1 tributary

Type	Date	Wat. Temp	F-pH (units)	DO (mg/l)	Fld EC (umhos/cm)	Flow (gpm)	L-pH (units)	TSS (mg/l)	O/G (mg/l)	NH3 (mg/l)	D-As (mg/l)	D-B (mg/l)	D-Cd (mg/l)	D-Ca (mg/l)	D-Cu (mg/l)	D-Fe (mg/l)	D-Pb (mg/l)	D-Mg (mg/l)	D-Mn (mg/l)	D-K (mg/l)	D-Se (mg/l)	D-Na (mg/l)	D-Zn (mg/l)	Bicarb (mg/l)	Acidity (mg/l)
Stream	3/4/1997	2.3	7.9		1230	4039.2		168						113		<0.1		72	<0.1	4		193		408	
Stream	6/2/1997	14.2	8.2		1450	5982.504		607						63		<0.1		33	<0.1	1		56		328	
Stream	9/10/1997	17.7	7.9		1320	5161.2		816						72		<0.1		47	<0.1	2		112		320	
Stream	12/3/1997	2.7	7.4		2330	2616.504		88						114		<0.1		82	<0.1	4		251		443	
Stream	3/3/1998	1.2	7.9		1480	942.48		236						84		<0.1		56	<0.1	3		128		357	
Stream	6/1/1998	13.2	8.2		950	3545.52		435						59		<0.1		35	<0.1	2		57		306	<10.
Stream	9/1/1998	16.6	7.4		1580	4209.744		401						87		<0.1		58	<0.1	5		160		373	<10.
Stream	12/1/1998	3.4	7		1790	3069.792		97						98		<0.1		70	<0.1	4		176		397	<10.
Stream	3/1/1999	2.9	6.9		1080	2392.104		570						68		<0.1		42	<0.1	3		79		350	<10.
Stream	6/1/1999	11.1	8		1010	5129.784		876						71		<0.1		41	<0.1	2		70		350	<10.
Stream	9/7/1999	12.6	7.8		1240	11.6		420						76		<0.1		50	<0.1	3		87		325	<10.
Stream	12/6/1999	1.8	7.7		1840			76						104		<0.1		70	<0.1	4		147		410	<10.
Stream	3/15/2000	5.2	7.3		1550	4384.776		214						86		<0.1		63	<0.1	4		147		387	<10.
Stream	6/5/2000	15.1	7.5		3190	718.08		25						173		<0.1		113	<0.1	5		418		477	<10.
Stream	3/9/2001	4.6	7.1		1520	2154.24		671						83		<0.1		57	<0.1	4		123		372	<5.
Stream	9/4/2001	16	7.9		1760	2962.08		166						100		<0.1		73	<0.05	4		159		350	<5.
Stream	12/10/2001	1	7		2070	0		125						114		<0.1		80	<0.05	4		195		414	<5.
Stream	3/6/2002	1.8	7		1850	4.8		715						114		<0.1		91	<0.05	5		132		377	<5.
Stream	6/5/2002	14.5	7.1		3840	1.2		15						185		0.2		136	0.05	6		521		500	<5.
Stream	7/22/2002					0																			
Stream	9/23/2002	10.9	6.7		1580	359.04		272						99.3		<0.1		82	0.07	5		128		346	<5.
Stream	12/12/2002	5.2	8.42		1570	7.2		197						80		<0.1		62	<0.05	4		113		367	6
Stream	9/16/2003	14	8.4		3440	2.6		474						113		< .005		101	0.013	8.44		549		467	10
Stream	12/31/2003	1.3	8.4		1110	0		490						84.8		< .005		56.4	0.008	3.32		64.5		372	< 5.
Stream	3/10/2004	7.6	8.4		1270	6808.296		740						83.6		< .03		56.5	0.005	4.2		105		364	< 5.
Stream	6/2/2004	12	8.4		1010	8.3		288						81.5		0.05		47	0.003	2.64		60.6		260	< 5.
Stream	9/25/2004	6.7	8.4		1821	2.16		8						129		< .03		91.5	0.029	4.92		163		320	< 5.
Stream	12/14/2004	5.9	8.8		1654	4.1		199						88.1		< .03		63.2	< .002	4.57		146		318	< 5.
Stream	3/25/2005	7.9	8.8		1530	2993.047		258						86.9		0.03		62.1	0.008	3.74		129		300	5
Stream	5/16/2005	15.6	8.6		1475	10021.7		638						89.7		< .03		58.7	< .002	3.89		125		307	< 5.
Stream	7/21/2005	20.2	8.3		1614	3.43		< 5.						111		< .03		77.7	0.01	4.55		135		287	< 5.
Stream	11/15/2005	4.3	8.4		1520	16.2		319						98.3		< .03		68.7	0.011	5.1		140		298	< 5.
Stream	3/15/2006	3.1	8.6		1594	9330.552		160						101		< .03		73.2	0.015	4.61		140		290	< 5.
Stream	6/22/2006	15.9	8.6		985	11.76		118						71.9		< .03		46.6	0.005	2.61		74.4		236	< 5.
Stream	9/25/2006	10.3	9.5		2270	1126.488		15						123.73		< .03		88.12	0.041	5.88		255.01		330	< 5.
Stream	11/15/2006	0.3	7.6		2220	6.8553		71						152.16		< .03		98.08	0.106	4.67		213.3		344	< 5.
	No. of Obs.:	49	66	1	66	60	23	81	21	0	0	0	0	66	0	21	0	65	22	66	0	66	0	85	8
	Maximum:	20.6	9.5	12	4101	24055.68	8.4	8110	4.8	--	--	--	--	223	--	4.44	--	136	0.15	8.44	--	576	--	540	10
	Minimum:	0.3	6.7	12	620	0	6.95	<5	0	--	--	--	--	59	--	0.0018	--	30	0.003	1	--	53	--	226	0
	Mean:	9.0	7.9	12.0	1571.8	3102.4	7.9	542.8	1.2	--	--	--	--	105.5	--	0.33	--	69.3	0.0	4.02	--	192.3	--	332.6	2.6
	Std. Dev.:	5.9	0.5	--	719.8	3926.8	0.4	1017.8	1.0	--	--	--	--	34.3	--	0.97	--	23.6	0.0	1.22	--	122.1	--	62.9	3.9
	Equivalent weights of means:													5.27				5.70		0.10		8.37		5.45	

Surface Water Quality Data

Station: 1
Description: Quitchupah Creek

Type	Date	Carb (mg/l)	Cl (mg/l)	Hydroxide (mg/l)	NO3 (mg/l)	NO2 (mg/l)	O-PO4 (mg/l)	SO4 (mg/l)	T-P (mg/l)	T-Alk (mg/l)	T-Hardns (mg/l)	Lab EC (umhos/cm)	TDS (mg/l)	Set Solids (mg/l)	D-Al (mg/l)	D-Mb (mg/l)	T-Cats	T-Anis	T-Fe (mg/l)	T-Mn (mg/l)	COMMENTS
Stream	10/26/1979	4.01	37		0.54		0.01	1275		316	994		2226				34.98	33.95	0.50	0.02	
Stream	12/6/1979							694					1022						5.25	0.05	
Stream	1/3/1980							165					706						1.40	0.14	
Stream	2/8/1980	6.00	24		0.25		0.10	339		275	472		912				15.04	13.41	0.14	0.05	
Stream	3/16/1980							365					898						12.0	0.20	
Stream	4/19/1980							328					694						13.3	1.06	
Stream	5/22/1980	20.04	20		0.50		0.34	167		223	344		506				8.30	8.54	10.0	0.94	
Stream	6/11/1980							168					562						8.3	0.20	
Stream	7/16/1980							362					1022						0.62	0.03	
Stream	8/12/1980	10.02	35		0.59		0.02	1000		325	838		1880				26.78	28.35	0.19	0.01	
Stream	9/18/1980							538					1094						5.70	0.09	
Stream	10/12/1980							2080					2964						3.11	0.11	
Stream	11/9/1980	24.06	37		1.40		0.03	648		237	589		1048				18.43	19.35	0.64	0.15	
Stream	12/10/1980							1040					1672						0.49	0.02	
Stream	1/10/1981							240					678						0.55	0.02	
Stream	2/10/1981	10.80	39		0.45		0.00	640		265	594		1428				19.95	19.78	1.63	0.06	
Stream	3/17/1981							258					1000						2.20	0.18	
Stream	4/13/1981							847.7					1128						12.1	0.29	
Stream	5/20/1981	<1.	66.5		0.008	0.006		1613.1	0.01	367.5	824.7		2762						0.62	0.06	
Stream	6/23/1981							872.4					1699						0.36	0.04	
Stream	7/16/1981							4139.7					6966						0.12	0.2	
Stream	8/20/1981	<1.	35.9		0.012	<0.002			0.142	342	972						26.4	11.5			
Stream	9/28/1981							700					1281						1.32	0.21	
Stream	10/30/1981							695					1052						1.63	0.19	
Stream	12/29/1981	15	33.3		<0.002	<0.002	0.12	658			673	1550	1041				19.1	22.1	0.83	0.11	
Stream	3/16/1982		34.4					457			661	1420	916						3.44	0.31	
Stream	6/16/1982	<1.	19.3		<0.002	<0.002	0.414	473			544	1050	813				15.2	15.7	3.2	0.3	
Stream	9/20/1982	<1.	43.1		<0.01	<0.01	0.391	650			731	2200	1318						4	0.27	
Stream	12/27/1982	<1.	45.5		<0.01	<0.01	<0.01	580			673	1920	1225				19.7	20	3	0.27	
Stream	6/8/1983	<1.	38		0.85	<0.001	0.12	500			565	1800	1057				17.1	17.29	1.91	0.09	
Stream	6/30/1983	<1.	18		0.98	0.02	0.27	140			318	800	496				6.7	7.3	3.27	0.51	
Stream	12/13/1983	<1.	26		0.9		<0.01	500		300	565	1600	1088				17.52	17.14	0.75	0.07	
Stream	3/15/1984	<1.	32		0.1		<0.01	330		323	460	1200	830				14.23	14.24	1.05	0.19	
Stream	6/12/1984	<1.	29		0.01		0.1	165		260	341	900	501				9.27	9.46	0.69	0.16	
Stream	9/13/1984	<1.	29		<0.01		0.07	480		300	560	1480	980				16.54	16.82	11.4	0.32	
Stream	12/17/1984	<1.	23		0.06		0.11	250		277	390	1000	655				11.36	11.4	0.38	0.03	
Stream	6/6/1985	<1.	19		0.06		0.18	200		246	340	875	503				9.24	9.62	1.59	0.19	
Stream	7/22/1985	<1.	21		0.04		0.07	500		276	540	1475	994				16.49	16.53	4.52	0.41	
Stream	9/27/1985	<1.	45		0.31		0.05	800		307	745	2184	1497				23.94	24.08	0.58	0.07	
Stream	5/21/1986	<1.	22		0.2		0.11	270		248	377	1000	645				11.09	11.21	0.44	0.16	
Stream	10/6/1986	<1.	44.5		0.12		0.21	560		267	575	1870	1109				18.44	18.26	0.61	0.15	
Stream	9/20/1990	15	74					1282		345	754		2224	<0.2					0.39	0.03	
Stream	11/6/1990	0	57					873		328	766		1670	<0.2					0.83	0.06	
Stream	3/26/1991	0	46					794		300	483		1288	<0.2			23.22	23.96	6.37	0.12	
Stream	6/3/1991	0	34					650		280	5038		1234	45					158	2.61	
Stream	9/13/1991	0	56					788		304	567		1468	<0.2			23.08	24.2	6.09	0.12	
Stream	12/12/1991	8	31					519		296	577		1020	<0.3					2.4	0.14	
Stream	3/11/1992	0	28					348		254	634		766	0.4			13.04	13.17	11	0.21	
Stream	5/6/1992	16	50					1150		332	801		1934	<0.2			32.08	32.19	0.39	0.03	
Stream	9/3/1992	0	58					1085		384	663		1838	<0.2			28.88	32.09	1.07	0.07	
Stream	12/2/1992	4	37					512		300	685		1140	<0.2			17.25	17.79	5.8	0.16	
Stream	6/1/1993	0	26					453		246	619		832	0.6			16.16	15.16	3.07	0.16	
Stream	9/7/1993	12	69					1338		370	1055		2370	<0.4			35.16	37.43	0.39	0.1	
Stream	12/6/1993	0	38					591		322	574		1206	<0.5			19.8	19.92	1.3	0.04	
Stream	3/7/1994	0	24					403		226	689		812	6.7			13.66	13.66	20	0.31	
Stream	6/1/1994	0	43					901		235	827		1618	<0.2			24.35	24.83	0.75	0.09	
Stream	9/6/1994	12	57					1062		350	703		1886	<0.4			30.36	30.9	180	<0.01	
Stream	12/5/1994	10	31					490		300	530		970	<0.1					4.3	0.067	
Stream	3/1/1995	25	35					430		265	560		960	<0.5			17.7	15.2	4.8	<0.1	
Stream	6/5/1995	20	12					120		470	580		470	2			13.8	12.4	9.5	0.3	
Stream	9/5/1995	10	36					604		310	624		1240	<0.5			21.6	19.8	2.7	0.1	
Stream	12/4/1995	20	27					404		310	504		880	<0.5			16.3	15.3	3.8	<0.1	
Stream	3/11/1996	<2.	21					341		265	506		740	4.8			14.8	13	11.15	0.16	
Stream	6/3/1996	24	26					460		324	574		897	1.4			18.3	16.8	11.4	0.2	
Stream	9/3/1996	<5.	62					838		351	805		1991	<0.5			30.5	26.2	1.2	<0.1	
Stream	12/2/1996	<5.	43					995		362	700		1497	<0.5			29.2	41.1	1.5	<0.1	

Surface Water Quality Data

Station: 1
Description: Quitchupah Creek

Type	Date	Carb (mg/l)	Cl (mg/l)	Hydroxide (mg/l)	NO3 (mg/l)	NO2 (mg/l)	O-PO4 (mg/l)	SO4 (mg/l)	T-P (mg/l)	T-Alk (mg/l)	T-Hardns (mg/l)	Lab EC (umhos/cm)	TDS (mg/l)	Set Solids (mg/l)	D-Al (mg/l)	D-Mb (mg/l)	T-Cats	T-Anls	T-Fe (mg/l)	T-Mn (mg/l)	COMMENTS
Stream	3/4/1997	<5.	40					696		335	682		1340	<0.5			22.6	22.3	3	<0.1	
Stream	6/2/1997	<5.	12					254		277	532		570	0.6			13.5	11	8	0.2	
Stream	9/10/1997	<5.	23					412		262	373		810	0.6					6.5	0.2	
Stream	12/3/1997	<5.	45					887		363	622		1610	<0.5			23.5	27	1.8	<0.1	
Stream	3/3/1998	<5.	29					467		293	440		996	0.8					2.9	<0.1	
Stream	6/1/1998	18	14					137		208	291		547	<0.5					4.2	0.1	
Stream	9/1/1998	<5.	35					535		306	456		907	0.5					4.5	0.1	
Stream	12/1/1998	<5.	30					457		325	533		1146	<0.5					1.2	<0.1	
Stream	3/1/1999	<5.	19					248		293	343		643	<0.5					7	0.1	
Stream	6/1/1999	<5.	16					247		287	346		620	0.5					6.3	0.2	
Stream	9/7/1999	<5.	17					374		266	396		796	<0.4					3.4	<0.1	
Stream	12/6/1999	<5.	25					388		336	548		1180	<0.4					0.9	<0.1	
Stream	3/15/2000	<5.	30					506		317	474		938	<0.4					3.6	<0.1	
Stream	6/5/2000	<5.	73					1297		391	897		2485	<0.4					0.6	<0.1	
Stream	3/9/2001	<5.	25					454		605	442		844	0.6					9.1	0.1	
Stream	9/4/2001	<5.	35.4					631		287	550		1239	<0.1					2.7	0.05	
Stream	12/10/2001	<5.	42.5					627.4		340	614		1361	<0.1			20.9	21	2	0.06	
Stream	3/6/2002	<5.	25					664		312	659		1292	0.3					6.2	0.11	
Stream	6/5/2002	<5.	99					1660		410	1022		3020	<0.1					1.1	<0.1	
Stream	7/22/2002																				
Stream	9/23/2002	9	23					552			585		1110	<0.1						0.07	
Stream	12/12/2002	<5.	21					502		305	455		1019	<0.1					3.2	0.05	
Stream	9/16/2003	< 5.	47					1519		390	698		2509	1.3			38	40.6	3.98	0.115	
Stream	12/31/2003	< 5.	15					324			444		640	0.7						0.159	
Stream	3/10/2004	9	20					367			442		809	2						0.163	
Stream	6/2/2004	< 5.	16					290		260	397		651	0.3					4.66	0.091	
Stream	9/25/2004	< 5.	36					721		320	699		1380	< .1			21.2	22.4	0.35	0.034	
Stream	12/14/2004	< 5.	24					516		318	480		1041	0.6					4.79	0.078	
Stream	3/25/2005	5	28					451			473		984	0.9						0.063	
Stream	5/16/2005	7	41					760		313	466		806	0.9					9.94	0.204	
Stream	7/21/2005	16	30					581		302	597		1179	< .1					0.22	0.017	
Stream	11/15/2005	< 5.	20					450		298	528		1024	0.4					3.82	0.07	
Stream	3/15/2006	< 5.	35					481		290	554		1054	0.2					2.17	0.041	
Stream	6/22/2006	< 5.	14					256		238	371		632	< .1					2.48	0.032	
Stream	9/25/2006	< 5.	51					818		330	672		1671	< .1			24.7	25.1	0.46	0.055	
Stream	11/15/2006	< 5.	47					787		344	784		1646	< .1					2.05	0.124	
	No. of Obs.:	35	85	0	19	2	19	100	2	74	85	17	100	23	0	0	49	49	96	86	
	Maximum:	25	99	–	1.4	0.02	0.414	4139.7	0.142	605	5038	2200	6966	45	–	–	38	41.1	180	2.61	
	Minimum:	0	12	–	0.008	0.006	0	120	0.01	208	291	800	470	0.2	–	–	6.7	7.3	0.12	0.01	
	Mean:	9.4	34.6	–	0.4	0.0	0.1	644.4	0.1	309.5	639.6	1430.8	1243.2	3.1	–	–	20.0	20.0	7.1	0.18	
	Std. Dev.:	8.1	15.9	–	0.4	0.0	0.1	504.7	0.1	58.1	510.5	456.4	796.6	9.3	–	–	7.3	8.3	24.1	0.31	
	Equivalent weights	0.31	0.98					13.42													

Surface Water Quality Data

Station: 1A
Description: Quitchupah Creek at State Road 10

Type	Date	Wat. Temp	F-pH (units)	DO (mg/l)	Fld EC (umhos/cm)	Flow (gpm)	L-pH (units)	TSS (mg/l)	O/G (mg/l)	NH3 (mg/l)	D-As (mg/l)	D-B (mg/l)	D-Cd (mg/l)	D-Ca (mg/l)	D-Cu (mg/l)	D-Fe (mg/l)	D-Pb (mg/l)	D-Mg (mg/l)	D-Mn (mg/l)	D-K (mg/l)	D-Se (mg/l)	D-Na (mg/l)	D-Zn (mg/l)	Bicarb (mg/l)	Acidity (mg/l)
Stream	3/10/1989						8.1	1267	<1.			0.32						63		5		281		254	
Stream	12/26/1989							28	1					121		0.05		80	0.03	5		168		400	
Stream	3/22/1990							54	<1.	<0.05	<0.001	0.23	<0.005	86	0.02	0.61	<0.02	44	0.2	3	<0.001	108	0.53	224	
Stream	5/18/1990							70	<1.	0.05	0.002	0.48	<0.005	173	<0.01	0.11	<0.02	134	<0.01	6	0.001	406	<0.01	332	
Stream	9/20/1990							20	3					197		<0.02		95	<0.01	7		227		270	
Stream	11/6/1990							406	1					187		0.27		87	0.05	6		196		342	
Stream	3/26/1991							756	1					94		<0.02		58	<0.01	4		172		280	
Stream	9/13/1991							190						92		<0.02		59	<0.01	5		134		262	
Stream	12/11/1991							386	10					115		<0.02		69	<0.01	5		157		274	
Stream	3/11/1992							1558	3					94		<0.02		64	<0.01	4		130		236	
Stream	9/3/1992							96	59					116		<0.02		70	0.01	6		159		180	
Stream	12/2/1992							44	<1.					123		<0.02		72	0.03	5		136		288	
Stream	6/1/1993							378	<1.					102		0.85		43	0.12	3		56		220	
Stream	12/6/1993							20	<1.					113		0.04		69	0.02	5		146		306	
Stream	3/7/1994	8.2	7.9		7600	3052		926	<1.					78		0.05		46	<0.01	4		100		228	
Stream	12/5/1994	4.3	8.3		810			120						86		0.01			0.007	3.8		110		295	
Stream	3/1/1995	8.2	8.3		890	3860		180	<5.					80		<0.1		55	<0.1	4		103		255	
Stream	6/5/1995	14.1	9.3		510	8123		340	<5.					70		<0.1		31	<0.1	2		40		360	
Stream	9/5/1995	16.6	7.2		890	821		160	<5.					61		<0.1		43	<0.1	4		78		295	
Stream	12/4/1995	5.7	7.7		890	1360		50	<5.					78		<0.1		61	<0.1	3		106		305	
Stream	3/11/1996	11.6	7.7		480	3061		333	<2.					77		<0.03		49	<0.04	3.1		81		321	<7.
Stream	6/3/1996	16	8.3		700	8976		175	<4.					57		<0.1		31	<0.1	1		40		236	
Stream	9/3/1996	17.9	8.3		2010	18		12	<2.					125		<0.1		78	<0.1	6		173		373	
Stream	12/2/1996	2.7	8.4		999			117	<2.					102		<0.1		64	<0.1	4		108		380	
Stream	3/4/1997	2.7	8		950	3456		193	<2.					93		<0.1		63	<0.1	5		97		363	
Stream	6/2/1997	18.6	8.5		640	2617		261	<2.					51		<0.1		27	<0.1	1		26		268	
Stream	9/10/1997	14.6	7.9		1280	2603		189	<2.					72		<0.1		52	<0.1	3		88		323	
Stream	12/3/1997	2.2	7.4		1410	1571		99	<2.					88		<0.1		65	<0.1	4		92		353	
Stream	3/3/1998	0.7	7.9		1410	839		110	<2.					83		<0.1		62	<0.1	4		93		344	
Stream	6/1/1998	16.1	8		780	3142		224	<2.					56		<0.1		35	<0.1	2		36		313	<10.
Stream	9/1/1998	16.8	7.8		970	2513		382	<2.					65		<0.1		44	<0.1	3		63		274	<10.
Stream	12/1/1998	5.1	7.6		5.59	2509		161	<2.					75		<0.1		56	<0.1	3		77		345	<10.
Stream	3/1/1999	6.6	7		1120	1831		416	<2.					71		<0.1		46	<0.1	4		71		308	<10.
Stream	6/1/1999	11.8	8.3		770	4398		363	<2.					61		<0.1		34	<0.1	2		36		296	<10.
Stream	9/7/1999	13.8	8		1010	4039		813	<2.					57		<0.1		40	<0.1	2		46		287	<10.
Stream	12/6/1999	1.8	7.2		1430			62	<2.					87		<0.1		65	<0.1	5		90		354	<10.
Stream	3/15/2000	7.9	8.4		1410	2150		168	<2.					79		<0.1		61	<0.1	4		98		361	<10.
Stream	6/5/2000	15.9	7.7		1340	359		11	<2.					85		<0.1		62	<0.1	5		106		298	<10.
Stream	3/9/2001	4.6	7		1220	1436		520	<2.					84		<0.1		57	<0.1	4		80		343	<5.
Stream	6/4/2001	11.2	7.8		1220	2392		127	<2.					67		<0.1		42	<0.1	3		48		263	<5.
Stream	9/4/2001	16.3	8.1		1120	2154		273	<2.					72		<0.1		56	<0.05	4		70		299	<5.
Stream	12/10/2001	1	7		1730	0		68	<2.					92		<0.1		56	<0.05	2		23		398	<5.
Stream	3/6/2002	2.9	6.9		1570	1674		867	<2.					107		<0.1		89	<0.05	<5.		77		346	<5.
Stream	9/23/2002	11.2	6.4		1270	337		233						85		<0.1		72	<0.05	5		68		339	<5.
Stream	12/12/2002	6.4	7.91		1480	5.3		75	3					75		<0.1		61	<0.05	4		62		332	<5.
Stream	9/16/2003	18	8.5		1020	3.1		12	< 2.					75.1		< .005		64.5	< .005	4.36		61.8		297	< 5.
Stream	12/31/2003	2	8.6		1130	0		440	< 2.					83.4		< .005		61.6	0.007	4.07		52.7		346	< 5.
Stream	3/10/2004	6.3	8.5		1240	3770		350	< 2.					83.6		0.226		62.9	0.005	4.22		63.9		378	< 5.
Stream	6/2/2004	12.1	8.6		0.86	7.2		371	< 2.					68.8		< .03		43.9	< .002	2.92		38.4		247	< 5.
Stream	9/25/2004	8.4	8.6		1120	0.6		8	< 2.					85.8		< .03		66	0.007	4.91		62.3		280	< 5.
Stream	12/14/2004	7.2	9.5		1214	2.8		161	< 2.					76.5		< .03		58.6	< .002	4.03		56.7		271	< 5.
Stream	3/25/2005	7.5	8.9		1130	2962		181	2					76.4		0.03		58.1	0.002	3.68		60.9		276	5
Stream	5/16/2005	14.6	8.7		1216	8047		700	< 2.					77.6		< .03		49.8	< .002	3.24		47		280	< 5.
Stream	7/21/2005	21.3	8.5		1018	2.7		8	< 2.					69.9		< .03		55	< .002	4.02		53.6		222	< 5.
Stream	11/15/2005	1.8	8.9		1131	14.3		175	< 2.					90.6		< .03		66.5	0.005	4.52		59.1		280	< 5.
Stream	3/15/2006	5.7	8.7		1178	9479		96	< 2.					90		< .03		66.4	0.007	4.44		65.3		270	< 5.
Stream	6/22/2006	17.1	8.6		993	2.2		13	< 2.					75.8		< .03		57.4	0.005	3.42		53.9		232	< 5.
Stream	9/25/2006	11.6	9.6		1391	991		12	< 2.					89.91		< .03		66.85	0.014	5.57		102.73		271	< 5.
Stream	11/15/2006	1.1	7.8		1334	6.2		237	< 2.					94.8		< .03		65.72	0.026	4.74		99.21		312	< 5.
	No. of Obs.:	45	45	0	45	42	1	59	9	2	2	3	2	58	1	10	0	58	17	58	1	59	1	59	1
	Maximum:	21.3	9.6	--	7600	9478.656	8.1	1558	59	0.05	0.002	0.48	<0.005	197	0.02	0.85	--	134	0.2	7	0.001	406	0.53	400	5
	Minimum:	0.7	6.4	--	0.86	0	8.1	8	1	<0.05	<0.001	0.23	<0.005	51	<0.01	0.01	--	27	0.002	1	0.001	23	0.53	180	5
	Mean:	9.5	8.1	--	1222.9	2252.0	8.1	272.3	9.2	<0.05	--	0.3	<0.005	89.1	--	0.22	--	59.5	0.03	4.0	0.001	97.3	0.5	299.7	5.0
	Std. Dev.:	5.9	0.7	--	1043.6	2511.2	--	310.9	18.9	--	--	0.1	--	28.3	--	0.29	--	17.2	0.05	1.2	--	65.0	--	49.1	--
	Equivalent weights of means:													4.45				4.90		0.10		4.23		4.91	

Surface Water Quality Data

Station: 1A
Description: Quitchupah Creek :

Type	Date	Carb (mg/l)	Cl (mg/l)	Hydroxide (mg/l)	NO3 (mg/l)	NO2 (mg/l)	O-PO4 (mg/l)	SO4 (mg/l)	T-F (mg/l)	T-Alk (mg/l)	T-Hardns (mg/l)	Lab EC umhos/cm	TDS (mg/l)	Set Solids (mg/l)	D-Al (mg/l)	D-Mb (mg/l)	T-Cats	T-Anis	T-Fe (mg/l)	T-Mn (mg/l)	COMMENTS
Stream	3/10/1989	0	44					718		254	486	1870	1352				22.21	21.39	28.7	0.32	
Stream	12/26/1989	0	47					539		400	631		1154	<0.2			20.13	20.63	0.4	0.03	
Stream	3/22/1990	0	29				<0.1	305		224	395		672	24.1	1.18	<0.05	12.74	11.7	37.5	0.25	
Stream	5/18/1990	0	150				<0.1	1434		332	982		2626	<0.4	<0.05	<0.05	37.66	40.95	0.79	0.07	
Stream	9/20/1990	10	72					897		280	882		1708	<0.2					0.79	0.02	
Stream	11/6/1990	0	64					901		342	844		1730	<0.2					4.15	0.12	
Stream	3/26/1991	0	43					515		280	473		1046	<0.2			17.13	17.62	9.97	0.19	
Stream	9/13/1991	0	38					381		262	482		942	<0.2			15.46	14.31	1.34	0.06	
Stream	12/11/1991	12	42					517		286	588		1078	<0.3					3.4	0.08	
Stream	3/11/1992	12	42					527		248	795		1032	0.6			15.77	17.2		0.25	
Stream	9/3/1992	0	52					622		180	596		1222	<0.2			18.69	18.12	0.8	0.05	
Stream	12/2/1992	12	40					566		300	615		1126	<0.2			18.17	19.01	0.58	0.03	
Stream	6/1/1993	0	19					249		220	447		562	0.2			11.17	10.16	1.31	0.12	
Stream	12/6/1993	0	42					498		306	619		1050	<0.5			17.86	17.75	0.39	0.03	
Stream	3/7/1994	12	26					317		240	549		758	10			12.18	12.18	27	0.22	
Stream	12/5/1994	10	39					460		305	550		960	0.2					1.6	0.042	
Stream	3/1/1995	25	34					340		250	480		830	<0.5			14.3	13	3.1	<0.1	
Stream	6/5/1995	15	15					150		320	420		400	1.5			10.2	9.9	3.8	0.2	
Stream	9/5/1995	10	24					299		260	418		680	<0.5			12	12.1	3.1	<0.1	
Stream	12/4/1995	20	32					391		275	483		810	<0.5			14.3	14.7	1.1	<0.1	
Stream	3/11/1996	<2.	29					341		263	515		758	<0.5			14.1	13.2	5.06	0.08	
Stream	6/3/1996	19	14					144		255	358		434	<0.5			8.9	7.9	2.4	<0.1	
Stream	9/3/1996	<5.	50					623		306	683		1387	<0.5			21.8	20.5	0.4	<0.1	
Stream	12/2/1996	<5.	34					479			614		1037	<0.5			17.4	17.2	1.9	<0.1	
Stream	3/4/1997	<5.	30					530		298	617		960	<0.5			17.1	17.8	2.5	<0.1	
Stream	6/2/1997	7	10					116		231	365		390	<0.5			8.6	7.3	2.4	<0.1	
Stream	9/10/1997	<5.	30					238		264	427		820	<0.5					2.1	<0.1	
Stream	12/3/1997	<5.	29					458		289	487		940	<0.5					1.7	<0.1	
Stream	3/3/1998	<5.	31					419		282	463		933	0.9					1.6	<0.1	
Stream	6/1/1998	<5.	15					111		256	284		475	<0.5					1.5	<0.1	
Stream	9/1/1998	21	22					246		260	343		441	<0.5					3.8	<0.1	
Stream	12/1/1998	7	26					221		294	418		706	<0.5					1.7	<0.1	
Stream	3/1/1999	6	23					269		263	367		642	<0.5					9	0.1	
Stream	6/1/1999	9	11					139		258	292		207	0.5					4.9	0.1	
Stream	9/7/1999	<5.	13					214		239	307		556	<0.4					5.7	0.1	
Stream	12/6/1999	8	20					292		304	485		896	<0.4					0.7	<0.1	
Stream	3/15/2000	<5.	29					372		295	448		802	<0.4					2.7	<0.1	
Stream	6/5/2000	<5.	30					396		250	468		925	<0.4					0.1	<0.1	
Stream	3/9/2001	<5.	19					293		285	444		791	0.6					6.4	0.1	
Stream	6/4/2001	7	13					214		227	340		513	<0.2			9	9.4	0.6	<0.1	
Stream	9/4/2001	<5.	19.7					330		251	410		701	0.2					2.5	<0.05	
Stream	12/10/2001	<5.	40.1					489.1		327	460		1074	<0.1					0.1	<0.05	
Stream	3/6/2002	<5.	17					556			634		1063	0.6						0.11	
Stream	9/23/2002	<5.	16					383			509		855	<0.1						0.06	
Stream	12/12/2002	<5.	16					363		272	438		811	<0.1					0.7	<0.05	
Stream	9/16/2003	< 5.	16					315		249	453		696	< .1			11.9	11.9	0.201	0.013	
Stream	12/31/2003	< 5.	14					244			462		659	0.4						0.106	
Stream	3/10/2004	< 5.	21					314			468		724	0.4						0.096	
Stream	6/2/2004	< 5.	11					205		251	353		542	0.3					3.05	0.083	
Stream	9/25/2004	< 5.	16					331		283	486		767	< .1			12.5	12.9	0.24	0.01	
Stream	12/14/2004	< 5.	15					305		271	432		695	0.2					2.11	0.035	
Stream	3/25/2005	5	17					274			430		664	0.3						0.045	
Stream	5/16/2005	9	19					360		290	399		534	1.3					10.3	0.263	
Stream	7/21/2005	33	15					237		255	401		641	< .1					0.16	0.003	
Stream	11/15/2005	< 5.	15					280		280	500		724	0.2					1.88	0.041	
Stream	3/15/2006	< 5.	26					292		270	498		1268	< .1					1.35	0.028	
Stream	6/22/2006	< 5.	16					266		232	426		634	< .1					0.14	0.008	
Stream	9/25/2006	< 5.	33					398		271	500		912	< .1			14.6	14.6	0.29	0.033	
Stream	11/15/2006	< 5.	32					339		312	507		866	0.2					3.1	0.083	
	No. of Obs.:	31	59	0	0	0	2	59	0	53	59	1	59	19	1	2	26	26	53	38	
	Maximum:	33	150	--	--	--	<0.1	1434	--	400	982	1870	2626	24.1	1.18	<0.05	37.66	40.95	37.5	0.32	
	Minimum:	0	10	--	--	--	<0.1	111	--	180	284	1870	207	0.2	1.18	<0.05	8.6	7.3	0.1	0.003	
	Mean:	8.7	29.6	--	--	--	<0.1	390.2	--	273.5	495.4	1870.0	867.5	2.2	1.2	<0.05	15.6	15.5	4.0	0.09	
	Std. Dev.:	8.4	20.8	--	--	--	--	216.6	--	35.6	136.8	--	376.7	5.7	--	--	5.9	6.5	7.2	0.08	
	Equivalent weights	0.29	0.84					8.12													

Surface Water Quality Data

Station: 2
Description: Upper Christiansen Wash

Type	Date	Wat. Temp	F-pH (units)	DO (mg/l)	Fld EC (umhos/cm)	Flow (gpm)	L-pH (units)	TSS (mg/l)	O/G (mg/l)	NH3 (mg/l)	D-As (mg/l)	D-B (mg/l)	D-Cd (mg/l)	D-Ca (mg/l)	D-Cu (mg/l)	D-Fe (mg/l)	D-Pb (mg/l)	D-Mg (mg/l)	D-Mn (mg/l)	D-K (mg/l)	D-Se (mg/l)	D-Na (mg/l)	D-Zn (mg/l)	Bicarb (mg/l)	Acidity (mg/l)
Stream	10/26/1979		8.1		8443	175		27	0					290		0		421		15		1360		453.84	0
Stream	12/6/1979		8		9638	314		417	1																
Stream	1/3/1980		8.1		7899			107	1																
Stream	2/8/1980		8		7312			363	1					333		0.05		240		12		950		523.38	0
Stream	3/16/1980		8.1		5985	265		393	1																
Stream	4/19/1980		8		2171	763		5240	1																
Stream	5/22/1980		8.2		1564	1292		1148	1					90		0.61		80		7		162		275.72	0
Stream	6/11/1980		8.2		1500	2064		956	1																
Stream	7/16/1980		8.4		711	2064		511	1																
Stream	8/12/1980		8.3		2665	713		130	1					139		0.2		153		6		265		319.64	0
Stream	9/18/1980		8		2534	1292		40	1																
Stream	10/12/1980		8		2999	1292		204	1																
Stream	11/9/1980		7.9		4910	1422		3789	1					344		0.02		405		11		1280		581.94	
Stream	12/10/1980		8.2		8915	197		534	1																
Stream	1/10/1981		8		2289	2230		96	1																
Stream	2/10/1981		8.2		4940	462		746	2					202		0.04		248		7		537		311.1	0
Stream	3/17/1981		8.2		4286	538		828	0																
Stream	4/13/1981						8.2	768	<0.5							6.39									
Stream	5/29/1981						8.5	246.5	2							0.07								340.2	
Stream	6/23/1981						8.3	128	7.4																
Stream	7/16/1981						8.3	15.5	<0.5																
Stream	8/20/1981								1							1.65								497	
Stream	9/28/1981						8.3	666	<0.5																
Stream	10/20/1981						8.2	216	1																
Stream	12/29/1981						8.3	340																396	
Stream	3/16/1982	4.1	8.2	14	2081	3590	8.1	1236																323	
Stream	6/16/1982						8	544																290	
Stream	9/17/1982						8.1	40																404	
Stream	12/27/1982						7.4	76.5																293	
Stream	3/10/1983						8.2	1359																386	
Stream	6/22/1983						8.1	283																	
Stream	9/8/1983						8.2																	357	
Stream	12/13/1983						8.2	152																366	
Stream	3/15/1984						8.1	3592																361	
Stream	6/11/1984						7.4	844																270	
Stream	9/13/1984						7.6	735																328	
Stream	12/17/1984						7.4	142																293	
Stream	6/5/1985						7.6	123																324	
Stream	7/22/1985						7.65	5622																268	
Stream	9/26/1985						7.8	106																327	
Stream	5/20/1986						7.15	2540																252	
Stream	10/6/1986						7.55	3460																227	
Stream	3/13/1989						8.2	1015				0.21		76				61		4		201		223	
Stream	5/30/1989						8.1	62				0.56		325				367		17		842		316	
Stream	9/12/1989							882						505				535	0.12	25		1560		438	
Stream	3/22/1990							460	<1.	0.1	0.004	0.14	<0.005	116	<0.01	0.02	<0.02	103	0.07	4	0.002	270	<0.01	260	
Stream	5/21/1990							26	<1.	0.14	<0.001	0.8	<0.005	496	0.03	0.19	<0.02	520	0.33	30	0.03	1350	<0.01	450	
Stream	9/20/1990							74						515		<0.02		484	0.03	14		1430		425	
Stream	11/6/1990							56						434		<0.02		404	0.58	10		1560		1263	
Stream	3/26/1991							528						135		0.02		110	0.07	3		326		264	
Stream	6/4/1991							72						400		<0.2		436	<0.1	30		1060		282	
Stream	9/13/1991							78						209		0.06		183	0.15	10		531		336	
Stream	12/11/1991							568						241		<0.02		209	0.33	6		499		366	
Stream	3/11/1992							1102						100		<0.02		83	<0.01	3		160		250	
Stream	5/6/1992							78						143		<0.02		128	<0.01	11		182		288	
Stream	9/3/1992							232						567		<0.02		451	0.29	14		1185		474	
Stream	12/2/1992	2.1	6.6		1700			192						167		<0.02		126	0.23	2		260		314	
Stream	6/1/1993							70						90		0.52		59	0.07	5		120		246	
Stream	9/7/1993							78						164		<0.02		140	0.11	7		314		224	
Stream	12/6/1993							60						104		<0.02		72	0.11	2		121		286	
Stream	3/7/1994	5	8.2		560	4308		2032						54		0.03		33	0.02	2		55		172	
Stream	6/1/1994	14.7	7.7		1200	1436		650						110		0.06		75	<0.01	6		111		190	
Stream	9/6/1994	12.1	7.6		8160	103		253						448		0.17		480	0.06	14		1490		436	
Stream	12/5/1994	3.5	7.2		2000			18						190		<0.01			0.34	3.9		350		330	
Stream	3/1/1995	7.1	8		550	4394		1350						58		<0.1		40	<0.1	2		73		210	
Stream	6/5/1995	12.7	7.8		2500	108		80						210		0.1		155	0.2	5		305		380	
Stream	9/5/1995	19.4	6.8		3900	898		25						199		<0.1		208	<0.1	7		502		410	
Stream	12/4/1995	6	7.5		1470	1167		635						107		<0.1		105	<0.1	2		226		355	
Stream	3/11/1996	11.3	7.7		1530	1257		1219						96		<0.03		72	<0.04	2.8		165		309	<7.

Surface Water Quality Data

Station: 2
Description: Upper Christiansen Wash

Type	Date	Wat. Temp	F-pH (units)	DO (mg/l)	Fld EC (umhos/cm)	Flow (gpm)	L-pH (units)	TSS (mg/l)	O/G (mg/l)	NH3 (mg/l)	D-As (mg/l)	D-B (mg/l)	D-Cd (mg/l)	D-Ca (mg/l)	D-Cu (mg/l)	D-Fe (mg/l)	D-Pb (mg/l)	D-Mg (mg/l)	D-Mn (mg/l)	D-K (mg/l)	D-Se (mg/l)	D-Na (mg/l)	D-Zn (mg/l)	Bicarb (mg/l)	Acidity (mg/l)
Stream	6/3/1996	23	8.5		1900			89						100		<0.1		73	<0.1	5		139		317	
Stream	9/3/1996	21.3	8.1		4290	242		26						167		<0.1		149	<0.1	6		502		381	
Stream	12/2/1996	3.2	7.9		3180			134						239		<0.1		205	0.3	5		555		514	
Stream	3/4/1997	2.9	8		750	2513		252						71		<0.1		49	<0.1	1		83		317	
Stream	6/2/1997	22.9	8.3		2150	1885		79						96		<0.1		94	<0.1	7		251		341	
Stream	9/10/1997	17.3	7.9		960	3299		2778						58		<0.1		33	<0.1	1		46		228	
Stream	12/3/1997	1.8	7.8		1080	3617		827						65		<0.1		44	<0.1	1		60		316	
Stream	3/3/1998	2.6	7.4		1660	673		772						85		<0.1		72	<0.1	2		33		309	
Stream	6/1/1998	19.2	8.2		1360	1167		298						77		<0.1		53	<0.1	3		110		324	<10.
Stream	9/1/1998	19.4	7.8		2070	2693		50						114		<0.1		101	0.1	10		198		339	<10.
Stream	12/1/1998	3.6	7.2		1270	4308		760						68		<0.1		45	<0.1	1		64		376	<10.
Stream	3/1/1999	8.7	7.5		2840	673		940						156		<0.1		128	0.1	4		308		469	<10.
Stream	6/1/1999	15	7.9		1730	4174		10300						273		<0.1		190	<0.1	5		123		1746	<10.
Stream	9/7/1999	18.8	7.7		3670	898		752						241		<0.1		168	0.3	7		350		457	<10.
Stream	12/6/1999	1.7	7.3		3550			496						220		0.3		166	0.3	4		390		490	<10.
Stream	3/15/2000	7.8	8.7		112	1885		681						69		<0.1		47	<0.1	1		78		329	<10.
Stream	6/5/2000	18.7	7.8		2120	839		385						147		<0.1		112	<0.1	8		178		426	<10.
Stream	3/9/2001	5.1	6.9		1280	1795		1756						72		0.2		53	<0.1	2		114		489	<5.
Stream	6/4/2001	15.7	7.5		1180	2693		652						83		<0.1		52	<0.1	4		87		281	<5.
Stream	9/4/2001	18.4	7.8		7900	673		10						386		<0.1		355	<0.05	11		1088		476	<5.
Stream	12/10/2001	1.3	6.9		2060	0		260						113		<0.1		80	0.11	3		185		373	<5.
Stream	3/6/2002	1.8	6.8		3690	1.5		1917						209		<0.1		161	0.2	5		417		464	<5.
Stream	6/5/2002	19.2	6.9		4010	0.45		142						243		<0.1		191	0.18	7		447		413	<5.
Stream	9/23/2002	15.4	7		8330	45		57						438		<0.1		375	0.43	14		1195		555	<5.
Stream	12/12/2002	1.5	8.09		1450	2.3		729						81		<0.1		52	<0.05	2		104		369	6
Stream	9/16/2003	11.4	8.3		4040	0.08		32						464		< .005		415	0.101	17.1		1240		506	25
Stream	12/31/2003					0																			
Stream	3/10/2004	4.5	8.4		1340	1077		2208						92		< .03		55	0.053	2.37		100		415	< 5.
Stream	6/2/2004	14.7	8.4		1650	1.7		314						119		0.18		78.7	0.038	5.08		117		296	< 5.
Stream	9/25/2004	3.7	8.4		8720	0.2		28						237		< .03		225	0.165	7		635		460	< 5.
Stream	12/14/2004	1.6	8.6		2180	0.8		908						117		< .03		90.6	0.052	2.86		213		296	< 5.
Stream	3/25/2005	6.1	9		1170	1459		461						69.5		< .03		48.8	0.04	0.74		81.1		253	< 5.
Stream	5/16/2005	16.6	8.6		4230	615		316						198		< .03		198	0.025	9.26		593		340	< 5.
Stream	7/21/2005	20.2	8.4		1425	0.93		33						91.8		< .03		62.9	0.005	5		114		256	< 5.
Stream	11/15/2005	0.1	8.4		3940	0.6		297						232		< .03		181	0.517	6.2		446		374	< 5.
Stream	3/15/2006	1.5	8.4		3130	3115		2128						163		0.03		133	0.112	4.22		332		351	< 5.
Stream	6/22/2006	16.2	8.3		2300	1.3		69						123		0.03		103	0.035	8.65		233		273	< 5.
Stream	9/25/2006	9.8	9.3		8660	27		23						458.57		< .03		417.57	0.533	13.06		1224.4		470	< 5.
Stream	11/15/2006	0.1	7.6		2120	1.9		263						121.44		< .03		97.43	0.147	3.32		226.46		301	< 5.
	No. of Obs.:	49	66	1	66	60	26	105	21	2	2	4	2	71	2	23	0	70	39	71	2	71	0	90	7
	Maximum:	23	9.3	14	9638	4393.752	8.5	10300	7.4	0.14	0.004	0.8	<0.005	567	0.03	6.39	--	535	0.58	30	0.03	1560	--	1746	25
	Minimum:	0.1	6.6	14	112	0	7.15	10	0	0.1	<0.001	0.14	<0.005	54	<0.01	0	--	33	0.005	0.74	0.002	33	--	172	0
	Mean:	10.0	7.9	14.0	3241.0	1212.0	8.0	789.3	1.3	0.12	--	0.43	<0.005	197.4	<0.005	0.5	--	176.3	0.18	7.1	0.0	457.2	--	377.3	4.4
	Std. Dev.:	7.4	0.5	--	2504.9	1299.0	0.4	1384.4	1.5	0.03	--	0.31	--	136.0	--	1.3	--	142.0	0.15	6.1	0.0	450.0	--	195.4	9.3
	Equivalent weights of means:													9.85				14.51		0.18		19.89		6.18	

Surface Water Quality Data

Station: 2
Description: Upper Christiansen '

Type	Date	Carb (mg/l)	Cl (mg/l)	Hydroxide (mg/l)	NO3 (mg/l)	NO2 (mg/l)	O-PO4 (mg/l)	SO4 (mg/l)	T-P (mg/)	T-Alk (mg/l)	T-Hardns (mg/l)	Lab EC umhos/cm	TDS (mg/l)	Set Solids (mg/l)	D-Al (mg/l)	D-Mb (mg/l)	T-Cats	T-Anis	T-Fe (mg/l)	T-Mn (mg/l)	COMMENTS
Stream	10/26/1979	9	153				0.01	4530		389	2584		7150				108.65	106.83	0.75	0.09	
Stream	12/6/1979							5150					8428						2.15	0.14	
Stream	1/3/1980							2325					6632						1.97	0.67	
Stream	2/8/1980	16.02	233				0.05	3240		432	2383		6060				78.01	85.04	0.26	0.59	
Stream	3/16/1980							3320					5362						9.75	0.53	
Stream	4/19/1980							825					1780						14.8	1.31	
Stream	5/22/1980	19.02	28				0.04	620		258	596		1194				18.33	18.93	4.8	0.24	
Stream	6/11/1980							819					1176						11	0.23	
Stream	7/16/1980							257					622						1.88	0.05	
Stream	8/12/1980	13.02	42				0.03	1240		285	975		2150				31.21	32.79	0.36	0.04	
Stream	9/18/1980							925					2034						0	0.07	
Stream	10/12/1980							1660					1856						2.68	0.18	
Stream	11/9/1980	16.02	110				0.02	5440		507	2623		5922				106.52	126.9	7.6	2.05	
Stream	12/10/1980							5000					8338						0.63	0.38	
Stream	1/10/1981							1010					1890						0.73	0.1	
Stream	2/10/1981	23.04	70				0	2080		293	1520		3632				54.02	51.23	1.96	0.1	
Stream	3/17/1981							848					2564						3.5	0.68	
Stream	4/13/1981							1209.8					1973						11.89	0.49	
Stream	5/29/1981	25.2	74.8		<0.002	<0.002		1736.5	0.104	365.4	814.9		3258						3.28	0.2	
Stream	6/23/1981							1045.2					1880						1.29	0.19	
Stream	7/16/1981							905.3					1702						0.23	0.16	
Stream	8/20/1981	<1.	169		0.124	<0.002			0.003	497	1186						37	18.4			
Stream	9/28/1981							2502					2754						1.61	0.57	
Stream	10/20/1981							1082					1307						1.59	0.36	
Stream	12/29/1981	<1.	40.4		0.16	<0.002	0.309	1129			1544	2400	1892				38.6	32.3	2.21	0.44	
Stream	3/16/1982		38.6		0.3			971			928	2330	1703						3.1	0.39	
Stream	6/16/1982	<1.	31		0.22	<0.002	0.41	753			764	1660	1203				22.2	22.4	3.17	0.4	
Stream	9/17/1982	<1.	36.5		10.01	<0.01	0.305	2000			1596	4000	3123						4	0.39	
Stream	12/27/1982	<1.	21		0.21	<0.01	0.2	650			755	1420	1066				20.2	20	2.99	0.3	
Stream	3/10/1983	<1.	23		0.2	<0.01	0.1	890			884	1810	1413				23.2	26.8	2.8	0.27	
Stream	6/22/1983		52		4.12	0.042	0.14	900		301	815	2650	1937				26.5	26.22	0.15	0.18	
Stream	9/8/1983	<1.	36		3.7	<0.001	0.1	1020			880	2700	1767				27.84	28.12	1.14	0.3	
Stream	12/13/1983	<1.	38		7.4		0.03	1050		300	930	2750	2042				32.23	28.94	0.68	0.28	
Stream	3/15/1984	<1.	31		0.84		0.07	800		296	695	1950	1490				22.52	23.46	2.05	0.56	
Stream	6/11/1984	<1.	23		0.25		0.23	600		270	622	1650	1108				18.1	18.55	1.47	0.19	
Stream	9/13/1984	<1.	42		0.8		0.08	1500		328	1180	3100	2508				38.29	38.98	6.1	0.46	
Stream	12/17/1984	<1.	31		0.27		0.07	800		293	675	1900	1438				22.64	23.4	0.37	0.15	
Stream	6/5/1985	<1.	40		0.25		0.15	900		324	837	2300	1562				26.38	26.36	1.17	0.18	
Stream	7/22/1985	<1.	30		0.18		0.1	880		268	825	2280	1656				26.53	24.54	4.56	1.4	
Stream	9/26/1985	<1.	47		0.96		0.06	1400		327	980	3425	2423				36.85	37.02	0.35	0.15	
Stream	5/20/1986	<1.	19		0.74		0.17	460		252	465	1400	916				15.25	15.16	0.94	0.36	
Stream	10/6/1986	<1.	15.3		0.21		0.24	280		227	365	920	629				10.85	10.81	0.45	0.28	
Stream	3/13/1989	0	28					554		223	440	1480	1046				17.75	16.88	41	0.75	
Stream	5/30/1989	0	101					3645		316	2317	5790	5882				83.83	85.69	0.51	0.4	
Stream	9/12/1989	0	210					6182		438	3456		9782	4.2			138.41	144.46	12.4	0.33	
Stream	3/22/1990	0	32				<0.1	934		260	712		1750	28.2	<0.05	<0.05	26.23	25.71	29.5	0.4	
Stream	5/21/1990	0	140					5178		450	3372		7790	<0.3	<0.05	<0.05	127.62	121.66	0.39	0.51	
Stream	9/20/1990	0	92					5351		425	3272		9858	<0.2					0.61	0.06	
Stream	11/6/1990	160						3408		2020	2748		8764	<0.2					1.26	0.6	
Stream	3/26/1991	0	37					1173		264	789		1948	<0.2			30.19	30.95	8.96	0.37	
Stream	6/4/1991	0	140					4764		282	2842		7598	<0.2					0.47	0.18	
Stream	9/13/1991	0	65					2138		336	1322		3444	<0.2			49.08	53.44	0.48	0.2	
Stream	12/11/1991	12	52					2087		378	1497		3348	<0.3					1.71	0.52	
Stream	3/11/1992	0	23					667		250	765		1258	0.6			18.92	19.65	11	0.3	
Stream	5/6/1992	12	25					934		300	923		1606	<0.2			25.94	26.31	0.92	0.09	
Stream	9/3/1992	0	150					5030		474	4364		7830	<0.2			117.84	119.31	1.79	0.89	
Stream	12/2/1992	4	32					1120		318	996		1882	<0.2			30.17	30.78	2.3	0.28	
Stream	6/1/1993	0	13					461		246	505		846	<0.2			14.75	14.97	2.16	0.08	
Stream	9/7/1993	20	38					1434		244	1010		2388	<0.4			33.68	36.06	2.23	0.18	
Stream	12/6/1993	0	17					469		286	585		1034	<0.5			16.48	16.04	2.5	0.15	
Stream	3/7/1994	0	7					202		172	797		476	11.1			7.88	7.88	33	0.5	
Stream	6/1/1994	80	16					556		270	998		1007	1.5			16.69	17.52	16.2	0.45	
Stream	9/6/1994	12	200					6009		448	2958		8806	<0.4			127.68	140.75	1.59	0.16	
Stream	12/5/1994	10	45					1590		340	1160		2620	<0.1					1.8	0.42	
Stream	3/1/1995	25	12					240		220	540		540	28			9.4	9.7	22.6	0.3	
Stream	6/5/1995	25	38					1400		360	1220		2630	<0.5			38.2	37.3	1.3	0.3	
Stream	9/5/1995	10	54					2088		355	1475		3200	<0.5			54.1	52	0.3	0.1	
Stream	12/4/1995	15	27					825		310	700		1470	0.8			23.8	24.3	9.9	0.3	
Stream	3/11/1996	<2.	22					703		253	832		1208	14.5			24.1	20.3	18.05	0.43	

Surface Water Quality Data

Station: 2
Description: Upper Christiansen '

Type	Date	Carb (mg/l)	Cl (mg/l)	Hydroxide (mg/l)	NO3 (mg/l)	NO2 (mg/l)	O-PO4 (mg/l)	SO4 (mg/l)	T-P (mg/l)	T-Alk (mg/l)	T-Hardns (mg/l)	Lab EC umhos/cm	TDS (mg/l)	Set Solids (mg/l)	D-Al (mg/l)	D-Mb (mg/l)	T-Cats	T-Anis	T-Fe (mg/l)	T-Mn (mg/l)	COMMENTS
Stream	6/3/1996	16	20					518		286	624		1157	<0.5			19	17.1	1.6	<0.1	
Stream	9/3/1996	<5.	54					1653		312	1126		3001	<0.5			45.7	42.2	1	0.1	
Stream	12/2/1996	<5.	64					998		421	1580		3960	<0.5			31	58.4	2.4	0.4	
Stream	3/4/1997	<5.	12					399		360	470		750	<0.5			13.3	13.8	3.3	0.1	
Stream	6/2/1997	8	28					861		292	685		1660	<0.5			25.9	24.6	1	<0.1	
Stream	9/10/1997	<5.	7					210		188	281		490	17					8.3	0.5	
Stream	12/3/1997	<5.	10					268		259	343		620	1.5			9.5	11	6.8	0.2	
Stream	3/3/1998	<5.	21					626		253	753		1280	1.5					11.2	0.3	
Stream	6/1/1998	7	15					384		277	411		903	<0.5					3.5	0.1	
Stream	9/1/1998	22	38					835		315	701		1523	<0.5					0.7	0.2	
Stream	12/1/1998	<5.	11					217		315	355		599	<0.5					6.2	0.2	
Stream	3/1/1999	<5.	32							389	917		2242	<0.5					15	0.4	
Stream	6/1/1999	<5.	15					751		1431	1464		1150	21					150.7	2	
Stream	9/7/1999	<5.	46					1661		378	1294		3090	<0.4					6.9	<0.1	
Stream	12/6/1999	<5.	42					1590		402	1233		2859	<0.4					4.9	0.4	
Stream	3/15/2000	<5.	12					280		277	366		526	2					15.8	0.3	
Stream	6/5/2000	<5.	18					854		349	828		1007	0.6					8.5	0.4	
Stream	3/9/2001	<5.	22					405		401	398		836	28					34.9	0.6	
Stream	6/4/2001	12	9					373		251	421		760	0.4			12.3	13	7	0.2	
Stream	9/4/2001	<5.	119.9					3696		390	2426		7659	<0.1					<0.1	<0.05	
Stream	12/10/2001	<5.	20.8					686.2		306	612		1361	<0.1			20.3	21	3.6	0.2	
Stream	3/6/2002	<5.	48					1411		761	1185		3049	1.7					18.3	0.71	
Stream	6/5/2002	6	48					1953		348	1393		3359	<0.1					1.9	0.31	
Stream	9/23/2002	<5.	126					5112			2638		7931	<0.1						0.55	
Stream	12/12/2002	5	10					413		311	416		946	0.5					9.8	0.22	
Stream	9/16/2003	< 5.	137					4478		415	2868		7415	< .1			111.7	105.4	0.584	0.117	
Stream	12/31/2003																				frozen
Stream	3/10/2004	6	11					455			458		863	12						0.925	
Stream	6/2/2004	9	16					597		305	621		1095	0.3					5.76	0.207	
Stream	9/25/2004	< 5.	142					5571		460	1518		7930	< .1					0.54	0.19	
Stream	12/14/2004	< 5.	20					855		296	665		1560	2					15.6	0.433	
Stream	3/25/2005	< 5.	10					306		257	375		694	1.7					10.2	0.186	
Stream	5/16/2005	27	78					1935		367	1310		3362	0.7					8.32	0.308	
Stream	7/21/2005	27	13					19		283	488		986	< .1					0.48	0.031	
Stream	11/15/2005	< 5.	40					1810		374	1325		3137	3					9	0.636	
Stream	3/15/2006	< 5.	41					1279		351	955		2318	4.5					27.16	0.622	
Stream	6/22/2006	< 5.	27					792		273	731		1714	< .1					1.06	0.077	
Stream	9/25/2006	< 5.	128					4778		470	2865		8137	< .1			110.8	112.5	0.17	0.556	
Stream	11/15/2006	< 5.	20					789		301	704		1548	1.8					6.08	0.199	
	No. of Obs.:	44	90		0 19	9	23	105	2	82	91	20	106	26		0 2	55	55	103	102	
	Maximum:	160	233	--	10.01	0.042	0.41	6182	0.104	2020	4364	5790	9858	28.2	--	<0.05	138.41	144.46	150.7	2.05	
	Minimum:	0	7	--	0.124	<0.001	0	19	0.003	172	281	920	476	0.3	--	<0.05	7.88	7.88	0	0.031	
	Mean:	14.8	51.4	--	1.63	--	0.13	1654.4	0.054	364.3	1195.8	2395.8	2858.8	7.3	--	<0.05	41.3	42.1	7.3	0.37	
	Std. Dev.:	26.3	49.9	--	2.77	--	0.11	1584.3	0.071	237.7	859.9	1095.6	2513.4	9.5	--	--	35.6	37.2	16.3	0.34	
	Equivalent weights c	0.49	1.45					34.44													

Surface Water Quality Data

Station: 3
Description: Quitchupah Creek below Christiansen Wash

Type	Date	Wat. Temp	F-pH (units)	DO (mg/l)	Fld EC (umhos/cm)	Flow (gpm)	L-pH (units)	TSS (mg/l)	O/G (mg/l)	NH3 (mg/l)	D-As (mg/l)	D-B (mg/l)	D-Cd (mg/l)	D-Ca (mg/l)	D-Cu (mg/l)	D-Fe (mg/l)	D-Pb (mg/l)	D-Mg (mg/l)	D-Mn (mg/l)	D-K (mg/l)	D-Se (mg/l)	D-Na (mg/l)	D-Zn (mg/l)	Bicarb (mg/l)	Acidity (mg/l)
Stream	10/26/1979		8.1		4070	1382		18	0					164		0		175		7		600		397.72	0
Stream	12/6/1979		8.1		1137	4890		970	0																
Stream	1/3/1980		8.3		1337	4159		291	2																
Stream	2/8/1980		8.2		1739	8030		130	1					109		0.02		94		4		235		305	0
Stream	3/16/1980		8.3		1202	3275		1434	1																
Stream	4/19/1980		8		1310	3871		4830	1																
Stream	5/22/1980		8.3		912	7985		4744	1					76		0.14		44		4		80		242.78	0
Stream	6/11/1980		8.2		1331	7761		395	1																
Stream	7/16/1980		8.4		1735	5697		582	1																
Stream	8/12/1980		8.6		2338	1660		28	1					130		0.15		126		6		260		317.2	0
Stream	9/18/1980		8.3		2381	5787		1036	1																
Stream	10/12/1980		8.2		2455	4217		406	1																
Stream	11/9/1980		8.3		2310	5199		676	1					129		0.07		146		5		620		341.6	
Stream	12/10/1980		8.3		2786	3454		110	1																
Stream	1/10/1981		8.4		1254	4890		9	1																
Stream	2/10/1981		8.3		2320	2490		377	0					125		0.01		104		4		265		248.88	0
Stream	3/17/1981		8.4		3177	4100		437	0																
Stream	4/13/1981						8.4	671	<0.5							3.6									
Stream	5/20/1981															0.13								414.8	
Stream	6/23/1981						8.4	15	6.4																
Stream	7/16/1981						8.4	25.5	<0.5																
Stream	8/20/1981								<0.5							1.39								349	
Stream	9/28/1981						8.3	170	<2.																
Stream	10/30/1981						8.4	144	<0.5																
Stream	12/29/1981						8.3	138																418	
Stream	3/16/1982	6.7	7.9	11.9	1542	8976	8.2	525																314	
Stream	6/16/1982						8.2	394																281	
Stream	9/20/1982						8.1	76.5																339	
Stream	12/27/1982						7.4	48.5																309	
Stream	3/10/1983						8.3	324																313	
Stream	3/15/1983						8.3	488																334	
Stream	6/22/1983						8.3	150.5																	
Stream	9/8/1983						8.15																	356	
Stream	12/13/1983						8.3	177																393	
Stream	3/15/1984						8.2	2364																421	
Stream	6/12/1984						7.8																	260	
Stream	9/14/1984						7.9	408																322	
Stream	12/18/1984						7.8	168																292	
Stream	6/6/1985						7.7	710																252	
Stream	7/23/1985						7.85	14336																250	
Stream	9/27/1985						7.9	62																310	
Stream	5/21/1986						7.4	1754																243	
Stream	10/6/1986						7.8	2078																255	
Stream	3/13/1989							2307				0.3		79				53		4		198		248	
Stream	5/30/1989						7.9	18				0.7		105				108		12		669		284	
Stream	9/13/1989							32						141		0.12		154	0.02	11		642		354	
Stream	12/26/1989							106	2					133		0.05		94	0.04	8		315		432	
Stream	3/22/1990							1016	<1.	<0.05	0.004	0.28	<0.005	106	0.04	0.12	<0.02	79	0.11	4	0.002	259	0.26	250	
Stream	5/18/1990							8	<1.	0.17	0.001	0.65	<0.005	169	<0.01	0.19	<0.02	146	<0.01	7	0.002	672	<0.01	378	
Stream	9/20/1990							148						152		0.12		92	<0.01	6		431		315	
Stream	11/6/1990							28						157		0.08		114	0.04	5		449		357	
Stream	3/26/1991							274						111		0.02		74	<0.01	4		257		300	
Stream	6/3/1991							4514						91		<0.02		57	<0.01	3		209		250	
Stream	9/13/1991							218						117		0.07		83	<0.01	6		352		272	
Stream	12/11/1991							286						99		<0.02		63	<0.01	3		174		288	
Stream	3/11/1992							1522						82		<0.02		58	<0.01	3		110		254	
Stream	5/6/1992							54						125		<0.02		98	<0.01	7		307		310	
Stream	9/3/1992							276						150		0.04		99	0.01	6		347		382	
Stream	12/2/1992							70						137		<0.02		85	0.06	4		177		306	
Stream	6/1/1993							212						116		0.78		60	0.07	4		110		250	
Stream	9/7/1993							66						166		<0.02		128	<0.01	7		310		310	
Stream	12/6/1993							58						112		<0.02		68	0.03	3		172		318	
Stream	3/7/1994	6.6	7.9		780	11085		1590						73		0.02		45	0.01	3		112		248	
Stream	6/1/1994	18.8	7.8		1600	4533		623						120		0.06		82	<0.01	6		172		260	
Stream	9/6/1994	21	7.7		3320	1310		22						122		0.12		130	<0.01	6		543		280	
Stream	12/5/1994	3.1	7.7		840			140						91		<0.01			0.013	3		140		280	
Stream	3/1/1995	6.1	7.5		740	9874		890						77		0.2		51	<0.1	3		103		245	
Stream	6/5/1995	15.2	8		790	25133		840						73		0.1		37	<0.1	2		75		450	
Stream	9/5/1995	15.4	7.1		2180	2289		265						123		<0.1		100	<0.1	5		303		405	

Surface Water Quality Data

Station: 3
Description: Quitchupah Creek below Christiansen Wash

Type	Date	Wat. Temp	F-pH (units)	DO (mg/l)	Fld EC (umhos/cm)	Flow (gpm)	L-pH (units)	TSS (mg/l)	O/G (mg/l)	NH3 (mg/l)	D-As (mg/l)	D-B (mg/l)	D-Cd (mg/l)	D-Ca (mg/l)	D-Cu (mg/l)	D-Fe (mg/l)	D-Pb (mg/l)	D-Mg (mg/l)	D-Mn (mg/l)	D-K (mg/l)	D-Se (mg/l)	D-Na (mg/l)	D-Zn (mg/l)	Bicarb (mg/l)	Acidity (mg/l)
Stream	12/4/1995	5.5	8		890	10744		205						77		<0.1		55	<0.1	2		103		320	
Stream	3/11/1996	8	7.7		1100	11826		915						71		0.04		45	<0.04	2.1		95		309	<7.
Stream	6/3/1996	11.8	8.2		1040	17010		120						80		<0.1		51	<0.1	3		101		301	
Stream	9/3/1996							16						124		0.2		102	<0.1	5		394		415	
Stream	12/2/1996	2	8.2		1450			77						124		<0.1		85	<0.1	5		251		420	
Stream	3/4/1997	4.1	8		1020	8034		124						90		<0.1		61	<0.1	4		118		350	
Stream	6/2/1997	16	8.3		1190	14918		468						71		<0.1		44	<0.1	2		85		344	
Stream	9/10/1997	17.7	8		1120	12207		1594						73		<0.1		46	<0.1	2		103		303	
Stream	12/3/1997	1.3	7.6		1370	8617		262						84		<0.1		58	<0.1	2		104		343	
Stream	3/3/1998	2.5	8		1770	2989		191						89		<0.1		68	<0.1	3		133		330	
Stream	6/1/1998	11.2	7.9		1010	4937		407						68		<0.1		44	<0.1	2		62		296	<10.
Stream	9/1/1998	15.9	7.8		1840	8258		318						66		<0.1		38	<0.1	6		114		366	<10.
Stream	12/1/1998	2.4	7		1600	8603		140						102		<0.1		69	<0.1	4		137		372	<10.
Stream	3/1/1999	2.7	7		1120	4789		720						70		<0.1		44	<0.1	3		73		356	<10.
Stream	6/1/1999	10	8		1010	13464		1500						74		<0.1		45	<0.1	3		66		473	<10.
Stream	9/7/1999	12.7	7.8		1570	9191		277						92		<0.1		60	<0.1	3		111		344	<10.
Stream	12/6/1999	1	7.2		1920	0		57						116		<0.1		77	<0.1	4		174		405	<10.
Stream	3/15/2000	4.6	7.8		1390	9156		752						79		<0.1		56	<0.1	2		103		356	<10.
Stream	6/5/2000	13.7	7.5		2570	2513		155						139		<0.1		112	<0.1	8		300		427	<10.
Stream	3/9/2001	2.8	7.9		1380	6912		1028						81		<0.1		57	<0.1	3		109		374	<5.
Stream	6/4/2001	9.4	7.2		1070	11521		312						75		<0.1		45	<0.1	3		65		293	<5.
Stream	9/4/2001	14.1	7.7		2050	3828		296						106		<0.1		88	<0.05	5		214		361	<5.
Stream	12/10/2001	0.8	6.9		2020	0		88						111		<0.1		79	<0.05	3		193		398	<5.
Stream	3/6/2002	1.2	7		1860	7.2		136						121		<0.1		95	<0.05	5		129		376	<5.
Stream	6/5/2002	13.6	7		2690	2.9		17						140		<0.1		124	<0.05	7		334		411	<5.
Stream	9/23/2002	10.4	7		1620	942		153						101		<0.1		84	<0.05	5		115		229	<5.
Stream	12/12/2002	3.3	7.75		1400	14		210						82		<0.1		59	<0.05	4		83		377	<5.
Stream	9/16/2003	11.6	8.5		1940	2.9		19						103		<.01		86.6	<.01	5.09		183		347	< 5.
Stream	12/31/2003	1.2	8.6		1620	0		544						91.2		0.005		64	0.019	3.53		80		351	< 5.
Stream	3/10/2004	4.2	8.5		1310	13437		912						87.7		<.03		58.6	0.005	3.29		87.8		404	< 5.
Stream	6/2/2004	12.1	8.6		1390	17		197						99.9		<.03		67.9	<.002	4.02		105		261	< 5.
Stream	9/25/2004	7.5	8.6		2.02	3.1		25						131		<.03		104	0.005	4.64		189		316	< 5.
Stream	12/14/2004	4.3	8.6		1579	5.0		260						88.6		0.04		66	<.002	3.98		135		308	< 5.
Stream	3/25/2005	6.2	9		1340	22		365						83.7		<.03		59	0.008	3.14		103		293	< 5.
Stream	5/16/2005	14.4	8.5		1249	11521		818						87.7		<.03		58.9	<.002	3.84		119		308	< 5.
Stream	7/21/2005	18.8	8.4		1895	10		55						105		<.03		85.6	<.002	5.54		202		285	< 5.
Stream	11/15/2005	1.1	8.9		1375	21		443						96		<.03		70.6	0.014	4.27		98.6		299	< 5.
Stream	3/15/2006	2	8.9		1419	13895		266						99.3		<.03		71.1	0.013	4.13		99.4		287	< 5.
Stream	6/22/2006	14	8.5		1042	20		125						75.2		<.03		51.8	0.004	3		74.1		252	< 5.
Stream	9/25/2006	7.3	9.3		2340	2145		14						133.1		<.03		103.73	0.031	5.65		251.44		323	< 5.
Stream	11/15/2006	0.1	7.6		1654	7.0		242						116.84		<.03		78.86	0.045	3.71		145.37		305	< 5.
	No. of Obs.:	48	65	1	65	63	25	106	19	2	2	4	2	73	2	28	0	72	19	73	2	73	1	93	5
	Maximum:	21	9.3	11.9	4070	25132.8	8.4	14336	6.4	0.17	0.004	0.7	<0.005	169	0.04	3.6	--	175	0.11	12	0.002	672	0.26	473	0
	Minimum:	0.1	6.9	11.9	2.02	0	7.4	8	0	<0.05	0.001	0.28	<0.005	66	<0.01	0	--	37	0.004	2	0.002	62	0.26	229	0
	Mean:	8.3	8.0	11.9	1612.5	5613.2	8.1	680.2	1.2	0.1	0.0	0.48	<0.005	105.0	--	0.3	--	78.7	0.029	4.4	0.0	211.1	0.3	325.7	0.0
	Std. Dev.:	5.9	0.5	--	685.5	5268.7	0.3	1598.0	1.4	--	0.0	0.22	--	26.6	--	0.7	--	30.2	0.027	1.9	0.0	156.0	--	57.0	0.0
	Equivalent weights of means:													5.24				6.47		0.11		9.18		5.34	

Surface Water Quality Data

Station: 3
Description: Quitchupah Creek

Type	Date	Carb (mg/l)	Cl (mg/l)	Hydroxide (mg/l)	NO3 (mg/l)	NO2 (mg/l)	O-PO4 (mg/l)	SO4 (mg/l)	T-P (mg/l)	T-Alk (mg/l)	T-Hardns (mg/l)	Lab EC umhos/cm	TDS (mg/l)	Set Solids (mg/l)	D-Al (mg/l)	D-Mb (mg/l)	T-Cats	T-Anis	T-Fe (mg/l)	T-Mn (mg/l)	COMMENTS
Stream	10/26/1979	6	78				0.01	1320		339	1201		3248				48.86	36.59	0.43	0.02	
Stream	12/6/1979							688					1130						4	0.02	
Stream	1/3/1980							469					1222						1.15	0.04	
Stream	2/8/1980	9	160				0.02	555		252	662		1364				23.5	21.43	0.16	0.04	
Stream	3/16/1980							330					1042						16.3	0.34	
Stream	4/19/1980							694					1104						8	0.94	
Stream	5/22/1980	0	24				0.05	314		200	390		670				11.03	11.31	9.2	0.72	
Stream	6/11/1980							600					1048						13	0.2	
Stream	7/16/1980							537					1322						2.38	0.04	
Stream	8/12/1980	23.46	41				0.01	1115		301	849		1870				28.32	30.44	0.19	0.01	
Stream	9/18/1980							625					1706						4.4	0.06	
Stream	10/12/1980							1510					2070						3.86	0.13	
Stream	11/9/1980	25.08	54				0.01	1470		324	921		2176				45.55	38.64	0.65	0.2	
Stream	12/10/1980							1460					2300						0.49	0.03	
Stream	1/10/1981							465					996						0.37	0.03	
Stream	2/10/1981	25.08	53				0.02	910		246	739		2030				26.42	25.4	0.92	0.02	
Stream	3/17/1981							613					1820						2.3	0.26	
Stream	4/13/1981							1193.4					2019						15.25	0.31	
Stream	5/20/1981	<1.	93.7		0.009	0.007		1720.1	0.112	414.8	727.5		2923						4.8	0.22	
Stream	6/23/1981							1687.2					2903						1.23	0.07	
Stream	7/16/1981							1423.8					2687						0.7		
Stream	8/20/1981	<1.	49.6		<0.002	<0.002			0.006	349	1100						30.2	12.1			
Stream	9/28/1981							1177					2012						1.81	0.27	
Stream	10/30/1981							1383					1814						1.74	0.23	
Stream	12/29/1981	<1.	59.6		<0.002	<0.002	0.198	901			917	2200	1630				26.5	28.5	1.27	0.21	
Stream	3/16/1982		39.6					720			888	1790	1280				24.9	22.1	2.36	0.34	
Stream	6/16/1982	<1.	39.2		0.019	<0.002	0.49	428			537	1410	802				14.8	15.7	2.21	0.3	
Stream	9/20/1982	<1.	77.1		0.02	<0.01	0.4	890			905	3120	1868						2.16	0.31	
Stream	12/27/1982	<1.	36.7		0.03	<0.01	0.197	550			643	1780	1074				16.8	18.7	2.27	0.31	
Stream	3/10/1983	<1.	39		<0.01	<0.01	0.2	790			822	1700	1311				21.4	23.8	2.29	0.36	
Stream	3/15/1983	<1.	36		0.28	<0.01	<0.01	550			654	1650	1070				20.8	19.3	3.35	0.23	
Stream	6/22/1983		41		0.082	0.018	0.001	700		305	714	2150	1502				21.36	21.83	0.64	0.1	
Stream	9/8/1983	<1.	40		1.9	0.05	0.07	720			700	2300	1430				22.96	22.01	1.52	0.16	
Stream	12/13/1983	<1.	51		1.95		0.01	950		322	720	2600	1843				29.36	27.67	0.57	0.08	
Stream	3/15/1984	<1.	26		0.38		0.02	400		345	515	1300	958				15.94	15.97	1.79	0.39	
Stream	6/12/1984	<1.	32		0.09		0.15	320		260	431	1290	1089				13.55	12.78	1.03	0.19	
Stream	9/14/1984	<1.	45		0.14		0.09	950		322	760	2350	1707				27.23	27.5	3.8	0.11	
Stream	12/18/1984	<1.	30		0.16		0.11	450		292	520	1400	1008				16.21	16.06	0.35	0.05	
Stream	6/6/1985	<1.	31		0.16		0.08	420		252	455	1400	867				14.77	14.67	1.81	0.00017	
Stream	7/23/1985	<1.	29		0.14		0.11	680		250	665	1790	1144				20.52	19.99	3	2.5	
Stream	9/27/1985	<1.	42		0.78		0.05	880		310	770	2312	1645				25.7	25.72	0.35	0.07	
Stream	5/21/1986	<1.	24		0.33		0.14	340		243	397	1150	744				12.59	12.62	0.3	0.36	
Stream	10/6/1986	<1.	33.8		0.13		0.28	520		255	500	1420	1026				16.98	16.89	0.65	0.19	
Stream	3/13/1989	0	34	0				482		248	415	1400	978				17.11	16.03	42	0.68	
Stream	5/30/1989		90	0				1809		284	705	3560	2996				43.85	46.19	0.59	0.04	
Stream	9/13/1989		88	0				1823		354	984		2884	0.1			48.21	47.83	1.1	0.03	
Stream	12/26/1989	0	47					912		432	718		1744	<0.2			28.43	29.11	1.02	0.04	
Stream	3/22/1990		40				<0.1	868		250	589		1430	9.8	0.09	<0.05	23.28	24.35	27	0.3	
Stream	5/18/1990	0	100				<0.1	2072		378	1021		3396	<0.3	<0.05	<0.05	50.17	53.87	0.51	0.04	
Stream	9/20/1990		68					1264		315	757		2170	<0.2					2.2	0.03	
Stream	11/6/1990	0	78					1474		357	873		2554	<0.2					0.95	0.06	
Stream	3/26/1991		46					864		300	581		1476	<0.2			23.03	25.43	5.44	0.12	
Stream	6/3/1991	12	32					661		262	2156		1200	37.5					62.6	0.89	
Stream	9/13/1991		68					1070		272	675		1896	<0.2			28.3	29.81	3.85	0.07	
Stream	12/11/1991	8	30					531		296	555		1112	<0.3					1.16	0.08	
Stream	3/11/1992	0	26					389		254	731		864	0.6			13.77	13.98	15	0.28	
Stream	5/6/1992	28	45					969		338	737		1886	<0.2			27.98	28.37	0.58	0.04	
Stream	9/3/1992	0	58					1210		382	800		2080	<0.2			31.04	34.67	3.24	0.1	
Stream	12/2/1992	8	37					735		314	707		1340	<0.2			21.71	22.75	0.73	0.07	
Stream	6/1/1993	0	21					434		250	525		812	<0.2			15.66	14.7	1.19	0.08	
Stream	9/7/1993	32	50					1255		342	959		2296	<0.4			32.62	34.6	1.76	0.04	
Stream	12/6/1993		34					560		318	618		1212	<0.5			18.82	19.07	1.6	0.05	
Stream	3/7/1994		17					329		248	720		692	6.7			12.35	12.34	26	0.38	
Stream	6/1/1994	70	25					718		330	636		1300	1			20.45	22.38	14.5	0.06	
Stream	9/6/1994	28	68					1589		308	838		2534	<0.4			40.81	41.43	0.46	<0.01	
Stream	12/5/1994	10	30	<2.				540		290	560		1040	<0.1					3.3	0.083	
Stream	3/1/1995	25	22					290		240	540		760	3.5			12.5	11.5	15	0.2	
Stream	6/5/1995	10	14					230		390	540		640	1.5			14	12.9	8.5	0.2	
Stream	9/5/1995	10	43					1044		345	856		1830	<0.5			31.1	29.9	5.3	0.1	

Surface Water Quality Data

Station: 3
Description: Quitchupah Creek

Type	Date	Carb (mg/l)	Cl (mg/l)	Hydroxide (mg/l)	NO3 (mg/l)	NO2 (mg/l)	O-PO4 (mg/l)	SO4 (mg/l)	T-P (mg/l)	T-Alk (mg/l)	T-Hardns (mg/l)	Lab EC umhos/cm	TDS (mg/l)	Set Solids (mg/l)	D-Al (mg/l)	D-Mb (mg/l)	T-Cats	T-Anis	T-Fe (mg/l)	T-Mn (mg/l)	COMMENTS
Stream	12/4/1995	15	22					356		285	492		820	<0.5			14.6	13.8	3.6	<0.1	
Stream	3/11/1996	<2.	21					384		253	577		741	7.9			16	13.7	14	0.22	
Stream	6/3/1996	13	20					374		269	479		810	<0.5			14.2	13.7	1.9	<0.1	
Stream	9/3/1996	<5.	55					1013		340	811		2258	<0.5			34.7	29.4	0.7	<0.1	
Stream	12/2/1996	<5.	46					842			751		1711	<0.5			26.9	25.7	1.3	<0.1	
Stream	3/4/1997	<5.	27					451		303	541		1000	<0.5			16.4	15.9	2.1	<0.1	
Stream	6/2/1997	6	17					328		292	571		760	0.6			15.7	13.1	6.3	0.2	
Stream	9/10/1997	<5.	19					376		248	372		710	4					11.8	0.3	
Stream	12/3/1997	<5.	21					457		281	449		810	<0.5			13.5	15.7	3.4	<0.1	
Stream	3/3/1998	<5.	27					550		271	502		1161	<0.5					2.5	<0.1	
Stream	6/1/1998	30	13					202		293	351		538	<0.5					3.9	0.1	
Stream	9/1/1998	18	37					704		331	321		861	<0.5					5	0.1	
Stream	12/1/1998	<5.	25					389		309	539		994	<0.5					1.9	<0.1	
Stream	3/1/1999	<5.	16					262		298	356		646	<0.5					7.4	0.1	
Stream	6/1/1999	<5.	13					269		394	370		670	1.4					16.7	0.4	
Stream	9/7/1999	<5.	20					487		288	477		1020	<0.4					3.7	0.6	
Stream	12/6/1999	<5.	27					496		335	607		1313	<0.4					0.9	<0.1	
Stream	3/15/2000	<5.	19					406		298	428		670	0.8					8.8	0.2	
Stream	6/5/2000	11	50					950		368	808		1276	<0.4					4.7	0.1	
Stream	3/9/2001	<5.	21					432		312	437		881	<0.4					17.4	0.3	
Stream	6/4/2001	5	10					258		249	373		614	0.4			10.3	10.6	3.3	<0.1	
Stream	9/4/2001	<5.	45.9					797		296	627		1510	0.1					4.1	0.05	
Stream	12/10/2001	<5.	32.4					645.9		326	602		1374	<0.1			20.5	20.9	1.8	0.07	
Stream	3/6/2002	<5.	27					693		309	693		1301	<0.1					2.2	<0.05	
Stream	6/5/2002	<5.	63					1176		344	860		2189	<0.1					0.4	<0.05	
Stream	9/23/2002	7	21					548			598		1138	<0.1						0.05	
Stream	12/12/2002	<5.	16					418		313	448		924	<0.1					3.6	0.07	
Stream	9/16/2003	6	34					672		295	614		1295	< .1			20.4	20.8	0.288	0.012	
Stream	12/31/2003	< 5.	18					362			491		754	0.5						0.118	
Stream	3/10/2004	< 5.	19					378			460		788	5						0.000005	
Stream	6/2/2004	28	19					496		289	529		958	0.3					3.74	0.079	
Stream	9/25/2004	< 5.	34					836		315	755		1574	< .1			23.4	24.7	0.52	0.016	
Stream	12/14/2004	< 5.	22					533		308	493		1037	0.5					4.51	0.077	
Stream	3/25/2005	< 5.	20					382		293	452		862	1.5					8.88	0.114	
Stream	5/16/2005	9	27					570		317	462		822	1.2					12.7	0.245	
Stream	7/21/2005	33	35					544		319	615		1366	< .1					1.26	0.03	
Stream	11/15/2005	< 5.	20					390		299	530		925	0.9					5.22	0.134	
Stream	3/15/2006	< 5.	28					401		287	541		902	0.3					4.36	0.071	
Stream	6/22/2006	< 5.	15					274		252	401		685	< .1					2.51	0.036	
Stream	9/25/2006	< 5.	42					894		323	760		1744	< .1			26.3	26.3	0.36	0.041	
Stream	11/15/2006	< 5.	24					535		305	616		1172	1					5.88	0.105	
	No. of Obs.:	36	94	3	17	3	23	109	2	82	94	21	109	24	1	2	59	59	106	95	
	Maximum:	70	160	0	1.95	0.05	0.49	2072	0.112	432	2156	3560	3396	37.5	0.09	<0.05	50.17	53.87	62.6	2.5	
	Minimum:	0	10	0	0.009	0.007	0.001	202	0.006	200	321	1150	538	0.1	0.09	<0.05	10.3	10.6	0.16	0.000005	
	Mean:	14.2	38.3	0.0	0.388	0.025	0.12	734.6	0.059	303.5	649.5	1908.2	1396.1	3.6	0.1	<0.05	23.5	22.9	5.2	0.19	
	Std. Dev.:	14.4	23.3	0.0	0.608	0.022	0.13	411.8	0.075	43.3	239.8	635.4	644.4	7.7	--	--	9.9	9.7	8.5	0.30	
	Equivalent weights	0.47	1.08					15.29													

Surface Water Quality Data

Station: 4
Description: Quitchupah Creek at old USGS Gaging Station

Type	Date	Wat. Temp	F-pH (units)	DO (mg/l)	Fld EC (umhos/cm)	Flow (gpm)	L-pH (units)	TSS (mg/l)	C/G (mg/l)	NH3 (mg/l)	D-As (mg/l)	D-B (mg/l)	D-Cd (mg/l)	D-Ca (mg/l)	D-Cu (mg/l)	D-Fe (mg/l)	D-Pb (mg/l)	D-Mg (mg/l)	D-Mn (mg/l)	D-K (mg/l)	D-Se (mg/l)	D-Na (mg/l)	D-Zn (mg/l)	Bicarb (mg/l)	Acidity (mg/l)	Carb (mg/l)
Stream	10/26/1979		8		3721	1081		22	0					138		0		126		6		580		378.2	0	7.02
Stream	12/6/1979		8.1		1397	4141		304	1																	
Stream	1/3/1980		8.2		911	3149		652	2																	
Stream	2/8/1980		8.1		1229	6639		293	1					98		0.05		59		3		135		297.68	0	9
Stream	3/16/1980		8.2		954	3015		937	1																	
Stream	4/19/1980		8		856	2768		5358	1																	
Stream	5/22/1980		8.4		954	7088		5084	1					66		0.18		33		3		62		247.66	0	4.01
Stream	6/11/1980		8.2		1292	6146		1120	1																	
Stream	7/16/1980		8.5		2486	3418		319	1																	
Stream	8/12/1980		8.3		2678	1453		28	1					139		0.16		126		6		240		391.62	0	10.02
Stream	9/18/1980		8.3		2529	3625		1810	1																	
Stream	10/12/1980		7.9		4601	1750		765	1																	
Stream	11/9/1980		8.4		1279	2476		402	1					82		0.03		68		4		470		275.72		32.04
Stream	12/10/1980		8.2		2249	1839		118	2																	
Stream	1/10/1981		8.3		856	3499		68	1																	
Stream	2/10/1981		8.3		2332	1256		546	0					123		0.03		97		5		300		285.48	0	49.08
Stream	3/17/1981		8.5		2720	2090		180	1																	
Stream	4/13/1981						8.4	702	<0.5							3.68										
Stream	5/18/1981						8.5	809.5	8.2							0.01								469.4		23.1
Stream	6/23/1981						8.4	149	<0.5																	
Stream	7/16/1981						8.4	48.5	<0.5																	
Stream	8/20/1981								<0.5							1.04								350		<1.
Stream	9/28/1981						8.3	74.5	<0.5																	
Stream	10/30/1981						8.4	955	<0.5																	
Stream	12/29/1981						8.2	93																426		<1.
Stream	3/16/1982	7	7.8	10.7	1420	4488	8.2	933																314		
Stream	6/16/1982						8.2	258																272		<1.
Stream	9/17/1982						8.1	81																333		<1.
Stream	12/27/1982						7.4	17																330		<1.
Stream	3/10/1983						8.2	519																311		<1.
Stream	6/22/1983						8.15	878																		
Stream	9/8/1983						8.1																	355		<1.
Stream	12/13/1983						8.3	216	<0.5															370		<1.
Stream	3/16/1984						8.1	802	<0.5															398		<1.
Stream	6/12/1984						7.6	963	0.9															254		<1.
Stream	9/13/1984						7.5	1279	<0.5															265		<1.
Stream	12/18/1984						7.6	61	0.5															291		<1.
Stream	6/6/1985						7.8	802	<0.5															256		<1.
Stream	7/23/1985						7.75	16624	<0.5															251		<1.
Stream	9/27/1985						7.6	89	<0.5															316		<1.
Stream	5/20/1986						7.6	989	<0.5															257		<1.
Stream	10/6/1986							1932	<0.5															303		<1.
Stream	3/13/1989						8.1	2280	<1.			0.32		90				64		4		194		250		
Stream	5/30/1989						7.9	8	1			0.7		110				114		12		723		288		
Stream	9/13/1989							32	1					136		0.12		109	0.01	10		652		354		
Stream	12/26/1989							84						133		0.09		105	0.02	6		521		484		
Stream	3/22/1990							672	<1.	<0.05	0.004	0.35	<0.005	113	<0.01	0.04	<0.02	60	<0.01	4	<0.001	193	0.02	272		
Stream	5/18/1990							30	<1.	0.11	0.001	0.56	<0.005	117	<0.01	0.15	<0.02	86	<0.01	5	0.001	531	<0.01	364		
Stream	9/20/1990							26	2					142		0.09		89	<0.01	5		486		335		15
Stream	11/6/1990							58	1					119		0.04		68	0.03	4		280		322		0
Stream	3/26/1991							302	1					92		0.04		61	<0.01	4		307		296		0
Stream	6/3/1991							6972	<1.					87		<0.02		49	<0.01	2		221		240		16
Stream	9/13/1991							244	5					108		0.08		70	<0.01	6		338		318		
Stream	12/12/1991							414	2					93		<0.02		56	<0.01	3		175		278		16
Stream	3/11/1992							1142	1					83		<0.02		53	<0.01	3		110		226		12
Stream	5/6/1992							44	2					169		<0.02		115	0.01	6		483		352		12
Stream	9/3/1992							108	39					155		0.03		86	0.02	6		272		318		
Stream	12/2/1992							70	1					134		<0.02		77	0.02	3		158		302		
Stream	6/1/1993							704	<1.					123		0.99		56	0.09	3		102		252		
Stream	9/7/1993							82	<1.					197		<0.02		122	<0.01	6		334		302		12
Stream	12/6/1993							60	<1.					117		<0.02		69	0.02	4		183		326		0
Stream	3/7/1994	9.7	7.8		1020	4847		760	<1.					78		<0.02		46	<0.01	4		147		208		12
Stream	6/1/1994	15.9	7.5		2400	1930		6	<1.					161		0.44		97	0.02	5		361		260		20
Stream	9/6/1994	20.2	7.9		3220	1046		54	8					86		0.03		90	<0.01	6		568		292		20
Stream	12/5/1994	3.2	7.6		800			130	<2.					86		0.01			<0.005	2.9		140		285		10
Stream	3/1/1995	9.7	7.5		930	5722		270	<5.					93		<0.1		60	<0.1	4		150		250		35
Stream	6/5/1995	13.2	7.9		630	24549		900	<5.					67		0.2		30	<0.1	2		58		470		10
Stream	9/5/1995	15	7.2		1690	1194		170	<5.					103		<0.1		65	<0.1	4		233		290		10
Stream	12/4/1995	5.6	7.9		1470	9425		205	<5.					73		<0.1		50	<0.1	2		90		305		20
Stream	3/11/1996	8.2	7.8		960	11444		759	<2.					68		<0.03		41	<0.04	2.2		85		309	<7.	<2.
Stream	6/3/1996	12.3	8.2		850	11444		140	<4.					69		<0.1		38	<0.1	2		86		280		11
Stream	9/3/1996							14	<2.					126		<0.1		93	<0.1	6		377		437		<5.
Stream	12/2/1996	2	8.3		1500			69	<2.					125		<0.1		86	<0.1	5		275		432		<5.

Surface Water Quality Data

Station: 4
Description: Quitchupah Creek at old USGS Gaging Station

Type	Date	Wat. Temp	F-pH (units)	DO (mg/l)	Fld EC (umhos/cm)	Flow (gpm)	L-pH (units)	TSS (mg/l)	O/G (mg/l)	NH3 (mg/l)	D-As (mg/l)	D-B (mg/l)	D-Cd (mg/l)	D-Ca (mg/l)	D-Cu (mg/l)	D-Fe (mg/l)	D-Pb (mg/l)	D-Mg (mg/l)	D-Mn (mg/l)	D-K (mg/l)	D-Se (mg/l)	D-Na (mg/l)	D-Zn (mg/l)	Bicarb (mg/l)	Acidity (mg/l)	Carb (mg/l)
Stream	3/4/1997	3.3	8		1060	4847		85	<2.					98		<0.1		70	<0.1	4		146		370		<5.
Stream	6/2/1997	16.5	8.3		1060	6683		498	<2.					66		<0.1		39	<0.1	2		80		335		<5.
Stream	9/10/1997	17.6	8		1450	6059		52	<2.					82		<0.1		53	<0.1	3		150		323		<5.
Stream	12/3/1997	1	7.5		1960	3231		50	<2.					109		<0.1		83	<0.1	4		189		389		<5.
Stream	3/3/1998	1.5	8.1		1470	1495		134	3					83		<0.1		57	<0.1	3		106		348		<5.
Stream	6/1/1998	11.4	8		860	4398		447	4					61		<0.1		37	<0.1	2		51		344	<10.	<5.
Stream	9/1/1998	16	7.7		1640	5498		453	<2.					94		<0.1		67	<0.1	5		156		389	<10.	<5.
Stream	12/2/1998	2.4	6.9		1590	3667		119	<2.					98		<0.1		69	<0.1	4		144		372	<10.	<5.
Stream	3/1/1999	2.4	6.9		990	3290		870	<2.					67		<0.1		42	<0.1	2		68		344	<10.	<5.
Stream	6/1/1999	9.7	7.5		1090	6701		704	<2.					71		<0.1		43	<0.1	2		81		352	<10.	7
Stream	9/7/1999	12.7	7.6		1310	7181		414	<2.					80		<0.1		52	<0.1	3		95		341	<10.	<5.
Stream	12/6/1999	1.6	7.3		1780	0		31	<2.					108		<0.1		74	<0.1	4		160		409	<10.	<5.
Stream	3/15/2000	4.6	7.6		1500	6463		167	<2.					88		<0.1		64	<0.1	3		131		378	<10.	<5.
Stream	6/5/2000	14.7	7.2		2380	1346		166	<2.					123		<0.1		94		8		278		441	<10.	<5.
Stream	3/9/2001	3.1	7.3		1360	3231		678	<2.					84		<0.1		58	<0.1	3		111		373	<5.	<5.
Stream	6/4/2001	9.6	7.2		950	6579		190	<2.					71		<0.1		41	<0.1	2		63		293	<5.	6
Stream	9/4/2001	14.6	7.6		1950	3231		446	<2.					101		<0.1		82	<0.05	6		207		344	<5.	7
Stream	12/10/2001	0.5	7		2060	0		74	<2.					109		<0.1		78	<0.05	4		211		411	<5.	<5.
Stream	3/6/2002	1.2	7.1		1740	5.4		195	<2.					117		<0.1		94	<0.05	5		117		372	<5.	<5.
Stream	6/5/2002	13.6	7		2690	2.9		20	<2.					126		<0.1		115	<0.05	8		313		421	<5.	<5.
Stream	9/23/2002	10.1	6.7		1570	1.5		146						99		<0.1		77	<0.05	5		113		342	<5.	7
Stream	12/12/2002	3.8	8.43		1540	11		231	<2.					83		<0.1		63	<0.05	4		96		336	<5.	<5.
Stream	9/16/2003	12.1	8.4		1650	6.3		38	< 2.					102		< .01		81.5	< .01	5.12		172		392	< 5.	< 5.
Stream	12/31/2003	1.2	8.5		1140	0		275	< 2.					85.1		0.005		57.7	0.009	3.34		65.4		355	< 5.	< 5.
Stream	3/10/2004	4.4	8.5		1310	10053		1194	< 2.					83.5		< .03		56.3	0.002	4.44		98.3		426	< 5.	7
Stream	6/2/2004	12	8.5		1070	10		184	< 2.					79.4		< .03		50.8	< .002	2.98		68.9		242	< 5.	16
Stream	9/24/2004	12.3	8.6		1776	2.1		6	< 2.					118		< .03		85.9	0.008	4.7		152		300	< 5.	< 5.
Stream	12/14/2004	5	8.6		1546	1.0		457	< 2.					87.6		0.11		63.1	< .002	4.39		135		313	< 5.	< 5.
Stream	3/25/2005	6.6	8.9		1400			324	< 2.					84.5		< .03		62.2	0.003	3.89		116		305	< 5.	< 5.
Stream	5/16/2005	14.6	8.6		1365	9963		926	< 2.					84.4		< .03		54.4	< .002	3.6		116		350	< 5.	< 5.
Stream	7/21/2005	19.5	8.3		1936	9.8		74	< 2.					98.1		< .03		79.5	< .002	5.25		205		286	< 5.	30
Stream	11/15/2005	1.1	8.6		1295	18		487	< 2.					94.5		< .03		66.2	0.006	4.28		92.5		300	< 5.	< 5.
Stream	3/15/2006	3.6	8.6		1650	10246		317	< 2.					105		< .03		75.1	0.011	4.3		137		294	< 5.	< 5.
Stream	6/22/2006	15.1	8.5		948	16		180	< 2.					68.2		< .03		45.7	0.003	2.53		63.2		239	< 5.	< 5.
Stream	9/25/2006	9.1	9.5		2400	1342		97	< 2.					129.2		< .03		99.12	0.026	5.71		259.64		322	< 5.	< 5.
Stream	11/15/2006	0.1	7.5		1842	6.9		114	< 2.					132.02		< .03		85.72	0.051	4.49		165.13		322	< 5.	< 5.
	No. of Obs.:	48	65	1	65	62	25	107	34	2	2	4	2	73	2	25	0	72	18	73	1	73	1	92	5	32
	Maximum:	20.2	9.5	10.7	4601	24549.36	8.5	16624	39	0.11	0.004	0.7	<0.005	197	<0.01	3.68	–	126	0.09	12	0.001	723	0.02	484	0	49.08
	Minimum:	0.1	6.7	10.7	630	0	7.4	6	0	<0.05	0.001	0.32	<0.005	61	<0.01	0	–	30	0.002	2	0.001	51	0.02	208	0	0
	Mean:	8.6	8.0	10.7	1619.4	3824.5	8.0	700.3	2.9	–	0.0	0.5	<0.005	102.3	<0.01	0.3	–	71.2	0.0	4.3	0.001	212.8	0.02	327.9	0.0	13.9
	Std. Dev.:	5.8	0.6	–	736.3	4181.7	0.3	1850.6	6.7	–	0.0	0.2	–	27.1	–	0.8	–	23.4	0.0	1.8	–	154.7	–	59.4	0.0	10.7
	Equivalent weights of means:													5.11				5.86		0.11		9.26		5.37		0.46

Surface Water Quality Data

Station: 4
Description: Quitchupah Creek :

Type	Date	Cl (mg/l)	Hydroxide (mg/l)	NO3 (mg/l)	NO2 (mg/l)	O-PO4 (mg/l)	SO4 (mg/l)	T-P (mg/l)	T-Alk (mg/l)	T-Hardns (mg/l)	Lab EC umhos/cm	TDS (mg/l)	Set Solids (mg/l)	D-Al (mg/l)	D-Mb (mg/l)	T-Cats	T-Anis	T-Fe (mg/l)	T-Mn (mg/l)	COMMENTS
Stream	10/26/1979	79				0.01	1675		341	946		2734				42.63	43.61	0.51	0.01	
Stream	12/6/1979						1800					2740						10.8	0.08	
Stream	1/3/1980						256					848						1.2	0.06	
Stream	2/8/1980	140				0.03	350		246	487		956				15.7	16.45	0.22	0.04	
Stream	3/16/1980						300					1206						12	0.19	
Stream	4/19/1980						300					778						10.5	1.1	
Stream	5/22/1980	20				0	184		210	333		510				8.82	8.64	6.7	0.9	
Stream	6/11/1980						569					930						14	0.14	
Stream	7/16/1980						825					1810						1.5	0.03	
Stream	8/12/1980	47				0.01	840		339	876		2130				27.9	25.64	0.16	0.02	
Stream	9/18/1980						975					1023						4.5	0.08	
Stream	10/12/1980						2410					3614						11	0.2	
Stream	11/9/1980	40				0.01	700		282	493		1102				30.24	21.33	0.55	0.11	
Stream	12/10/1980						1150					1772						0.49	0.02	
Stream	1/10/1981						180					666						0.32	0.07	
Stream	2/10/1981	60				0.04	850		316	701		1776				27.3	25.74	1.3	0.04	
Stream	3/17/1981						503					1755						2	0.15	
Stream	4/13/1981						1341.5					2197						20.08	0.29	
Stream	5/18/1981	136		<0.002	<0.002		2008.1	0.024	492.5	1169.4		3207						20.08	0.43	
Stream	6/23/1981						1695.4					3172						0.99	0.05	
Stream	7/16/1981						1423.8					1645						0.87	0.16	
Stream	8/20/1981	61.7		<0.002	<0.002			0.016	350	974						28.4	12.4			
Stream	9/28/1981						774					1453						1.45	0.21	
Stream	10/30/1981						1000					1194						1.14	0.17	
Stream	12/29/1981	56.5		<0.002	<0.002	0.117	938			1014	2190	1533				28.3	29.4	0.96	0.17	
Stream	3/16/1982	45.5		<0.002	<0.002		576			738	1670	1039				21.6	19.3	4.22	0.27	
Stream	6/16/1982	41.5		<0.002	<0.002	0.359	328			439	1280	710				12.7	13.5	3.99	0.32	
Stream	9/17/1982	48.8		<0.01	<0.01	0.34	1400			1334	3120	2206						2.97	0.3	
Stream	12/27/1982	56.5		<0.01	<0.01	0.199	610			695	2110	1188				19.9	20.9	3.4	0.37	
Stream	3/10/1983	53.5		<0.01	<0.01	0.2	560			694	1400	980				19.7	19.4	3	0.36	
Stream	6/22/1983	30		0.465	0.015	0.19	270		259	420	1200	736				11.19	11.66	1.13	0.26	
Stream	9/8/1983	46		1.14	0.01	0.14	680			615	2200	1270				21.14	21.28	2.13	0.09	
Stream	12/13/1983	46		1.25		<0.01	775		303	630	2300	1589				25.17	23.51	0.55	0.08	
Stream	3/16/1984	50		0.16		0.08	660		326	530	1850	1358				21.05	21.68	0.77	0.15	
Stream	6/12/1984	32		<0.01		0.11	215		254	353	1000	588				10.47	10.47	0.87	0.18	
Stream	9/13/1984	31		<0.01		0.09	520		265	560	1510	1031				17.03	17.03	10	0.26	
Stream	12/18/1984	28		0.08		0.07	300		291	415	1100	732				12.59	12.86	0.2	0.02	
Stream	6/6/1985	33		0.08		0.08	300		256	380	1200	754				12.68	12.31	2.9	0.2	
Stream	7/23/1985	33		0.06		0.1	506		251	530	1490	900				16.57	16.5	1.8	2.52	
Stream	9/27/1985	49		0.18		0.06	780		316	712	2276	1560				24.07	23.95	0.38	0.05	
Stream	5/20/1986	36		0.22		0.08	465		257	421	1500	968				16.08	15.85	0.53	0.16	
Stream	10/6/1986	66.2		0.1		0.3	900		303	685	2280	1164				26.86	26.68	0.58	0.12	
Stream	3/13/1989	43					543		250	487	1530	1088				18.39	17.61	29	0.5	
Stream	5/30/1989	91					1778		288	742	3510	3028				46.97	45.65	0.32	0.03	
Stream	9/13/1989	84					1665		354	787		2758	0.1			44.69	44.4	0.46	0.02	
Stream	12/26/1989	69					1315		484	763		2314	<0.2			38.34	39.23	0.76	0.02	
Stream	3/22/1990	39				<0.1	632		272	529		1054	1.3	0.05	<0.05	19.17	19.8	14.5	0.15	
Stream	5/18/1990	76				<0.1	1408		364	645		2406	<0.3	0.13	<0.05	36.4	38.98	0.51	0.03	
Stream	9/20/1990	72					1282		350	720		2252	<0.2					0.56	0.02	
Stream	11/6/1990	53					813		322	598		1592	<0.2					1.23	0.05	
Stream	3/26/1991	47					794		296	480		1426	<0.2			23.21	23.91	4.81	0.08	
Stream	6/3/1991	42					595		256	3431		1134	52.5					107	1.54	
Stream	9/13/1991	57					990		318	581		1684	<0.2			26.17	28.75	3.35	0.06	
Stream	12/12/1991	30					475		294	497		956	<0.3					3.31	0.08	
Stream	3/11/1992	29					436		238	668		832	0.6			13.41	14.73	14	0.22	
Stream	5/6/1992	65					1523		364	908		2622	<0.2			39.29	41.08	0.46	0.03	
Stream	9/3/1992	55					978		318	730		1714	<0.2			26.93	28.44	1.18	0.08	
Stream	12/2/1992	38					636		302	674		1176	<0.2			20.04	20.46	0.85	0.04	
Stream	6/1/1993	26					403		252	527		800	<0.2			15.31	14.23	6.74	0.1	
Stream	9/7/1993	71					1338		314	995		2374	<0.4			34.71	36.37	1.83	0.03	
Stream	12/6/1993	36					580		326	592		1182	<0.5			19.66	19.71	1.2	0.04	
Stream	3/7/1994	29					428		220	581		924	<0.7			14.24	14.2	18	0.2	
Stream	6/1/1994	57					1216		280	851		2084	<0.1			32.02	32.73	0.5	0.02	
Stream	9/6/1994	77					1482		312	577		2366	<0.4			36.83	39.52	1.17	0.01	
Stream	12/5/1994	32	<2.				490		295	530		990	<0.1					3.2	0.048	
Stream	3/1/1995	35					440		265	530		970	<0.5			17.2	15.4	4.7	<0.1	
Stream	6/5/1995	13					170		410	530		490	1.5			13.1	11.9	9.5	0.2	
Stream	9/5/1995	39					870		330	704		1370	<0.5			25.1	24.3	3.2	0.1	
Stream	12/4/1995	23					341		285	448		710	<0.5			13	13.4	3.3	<0.1	
Stream	3/11/1996	20					253		253	495		677	5.2			10.5	10.9	11.2	0.15	
Stream	6/3/1996	23					259		248	393		649	<0.5			11.8	11	2.2	<0.1	
Stream	9/3/1996	65					1163		358	783		2160	<0.5			34	33.2	0.7	<0.1	
Stream	12/2/1996	51					861			746		1763	<0.5			28	26.4	1.6	<0.1	

Surface Water Quality Data

Station: 4
Description: Quitchupah Creek

Type	Date	Cl (mg/l)	Hydroxide (mg/l)	NO3 (mg/l)	NO2 (mg/l)	O-PO4 (mg/l)	SO4 (mg/l)	T-P (mg/l)	T-Alk (mg/l)	T-Hardns (mg/l)	Lab EC umhos/cm	TDS (mg/l)	Set Solids (mg/l)	D-Al (mg/l)	D-Mb (mg/l)	T-Cats	T-Anis	T-Fe (mg/l)	T-Mn (mg/l)	COMMENTS
Stream	3/4/1997	35					529		303	603		1160	<0.5			19	18	1.7	<0.1	
Stream	6/2/1997	16					288		275	568		670	0.6					7.5	0.2	
Stream	9/10/1997	27					227		264	423		970	1.6					7.4	0.2	
Stream	12/3/1997	31					730		319	614		1400	<0.5			20.6	22.4	1	<0.1	
Stream	3/3/1998	29					468		285	442		956	<0.5					2.4	<0.1	
Stream	6/1/1998	13					152		282	305		952	1.1					4.5	0.1	
Stream	9/1/1998	35					588		319	511		967	0.6					5	0.1	
Stream	12/2/1998	27					432		313	529		1066	<0.5					1.7	<0.1	
Stream	3/1/1999	16					338		288	340		601	<0.5					8.7	0.1	
Stream	6/1/1999	18					283		300	354		672	<0.4					4.4	0.1	
Stream	9/7/1999	22					388		279	414		862	<0.4					4	0.1	
Stream	12/6/1999	28					368		336	574		1204	<0.4					0.6	<0.1	
Stream	3/15/2000	27					487		310	483		715	<0.4					4.5	0.1	
Stream	6/5/2000	50					663		361	694		1391	<0.4					2.8	<0.1	
Stream	3/9/2001	25					435		310	449		887	<0.4					11.3	0.2	
Stream	6/4/2001	11					233		250	346		583	0.5			9.7	10.2	1.9	<0.1	
Stream	9/4/2001	47.3					736		293	590		1419	0.3					5.1	0.07	
Stream	12/10/2001	41.8					642.6		337	593		1366	<0.1			21.1	21.3	1.2	<0.05	
Stream	3/6/2002	26					666		305	679		1257	<0.1					2.3	<0.05	
Stream	6/5/2002	66					1065		345	788		1998	<0.1					0.6	<0.05	
Stream	9/23/2002	22					539			564		1104	<0.1						0.05	
Stream	12/12/2002	20					463		301	467		991	<0.1					4.2	0.07	
Stream	9/16/2003	33					623		327	590		1196	< .1			19.4	20.3	0.685	0.018	
Stream	12/31/2003	16					310			450		676	0.1						0.066	
Stream	3/10/2004	25					383			440		834	6						0.398	
Stream	6/2/2004	16					297		257	407		654	0.2			11.2	11.8	3.09	0.048	
Stream	9/24/2004	33					668		300	648		1261	< .1			19.7	20.8	0.25	0.015	DIS.METALS FILTERED @ LAB
Stream	12/14/2004	23					499		313	479		963	1					5.36	0.086	
Stream	3/25/2005	24					407		305	467		850	1.5					8.02	0.083	
Stream	5/16/2005	27					540		350	435		803	1.5					13.5	0.272	
Stream	7/21/2005	< 1.					33		315	572		1359	< .1					1.76	0.029	
Stream	11/15/2005	20					350		300	509		844	1					6.51	0.132	
Stream	3/15/2006	32					512		294	571		1074	0.5					3.32	0.057	
Stream	6/22/2006	13					240		239	358		596	< .1					3.65	0.054	
Stream	9/25/2006	50					909		322	731		1767	< .1			26	26.8	0.45	0.044	
Stream	11/15/2006	32					600		322	683		1351	< .1					2.88	0.079	
	No. of Obs.:	92	0	10	10	22	108	2	82	93	20	108	20	2	2	58	58	105	93	
	Maximum:	140	–	1.25	0.015	0.359	2410	0.024	492.5	3431	3510	3614	52.5	0.13	<0.05	46.97	45.65	107	2.52	
	Minimum:	11	–	0.06	0.01	0	33	0.016	210	305	1000	490	0.1	0.05	<0.05	8.82	8.64	0.16	0.01	
	Mean:	41.6	–	0.4	0.013	0.12	705.0	0.020	303.6	627.3	1835.8	1337.9	3.9	0.09	<0.05	22.5	22.2	5.2	0.18	
	Std. Dev.:	23.2	–	0.4	0.004	0.11	457.4	0.006	47.4	347.4	664.9	668.2	11.5	0.06	–	9.4	9.7	11.3	0.33	
	Equivalent weights	1.17					14.68													

Surface Water Quality Data

Station: 5
Description: Christiansen Wash above Mine Fan

Type	Date	Wat. Temp	F-pH (units)	DO (mg/l)	Fld EC (umhos/cm	Flow (gpm)	L-pH (units)	TSS (mg/l)	O/G (mg/l)	NH3 (mg/l)	D-As (mg/l)	D-B (mg/l)	D-Cd (mg/l)	D-Ca (mg/l)	D-Cu (mg/l)	D-Fe (mg/l)	D-Pb (mg/l)	D-Mg (mg/l)	D-Mn (mg/l)	D-K (mg/l)	D-Se (mg/l)	D-Na (mg/l)	D-Zn (mg/l)	Bicarb (mg/l)	Acidity (mg/l)	Carb (mg/l)
Stream	10/26/1979		8.3		4939	314		16	0					218		0		162		8		648		409.92	0	7.02
Stream	12/6/1979		8.1		3285	763		808	0																	
Stream	1/3/1980		8.3		4397	202		60	2																	
Stream	2/8/1980		8.2		4649	1404		105	1					115		0.05		248		8		500		417.24	0	8.04
Stream	3/16/1980		8.4		4309	265		244	2																	
Stream	4/19/1980		8.1		2214	561		3336	1																	
Stream	5/22/1980		8.4		1709	897		609	1					101		0.23		91		7		164		296.46	0	8.04
Stream	6/11/1980		8.4		1601	1615		907	0																	
Stream	7/16/1980		8.4		800	2288		667	1																	
Stream	8/12/1980		8.6		1832	767		27	1					110		0.13		120		6		195		296.46	0	20.04
Stream	9/18/1980		8.3		1931	2153		52	1																	
Stream	10/12/1980		8.2		1970	1682		83	1																	
Stream	11/9/1980		8.2		4975	1507		245	1					194		0.09		313		9		650		286.7		31.08
Stream	12/10/1980		8.3		5194	1615		86	0																	
Stream	1/10/1981		8.3		2488	2288		52	0																	
Stream	2/10/1981		8.3		3346	238		257	0					163		0.73		180		6		350		258.64	0	25.08
Stream	3/17/1981		8.4		3800	498		244	8																	
Stream	4/13/1981						8.4	922	<0.5							5.69										
Stream	5/20/1981						8.3	181.5	<0.5							0.09								382.2		<1.
Stream	6/23/1981						8.4	114	1																	
Stream	7/16/1981						8.5	15	0.6																	
Stream	8/20/1981								<0.5							0.48								420		<1.
Stream	9/28/1981						8.4	47	<0.5																	
Stream	10/30/1981						8.4	165	<0.5																	
Stream	12/29/1981						8.1	198																400		<1.
Stream	3/16/1982	5.8	8	12	2029	3142	8.1	1230																337		<1.
Stream	6/16/1982						8.1	569																326		<1.
Stream	9/20/1982						8.1	24																370		<1.
Stream	12/27/1982						7.5	84.5																309		<1.
Stream	3/10/1983						8.3	572																314		<1.
Stream	6/22/1983						8.4	918																		
Stream	9/8/1983						8.3																	362		<1.
Stream	12/13/1983						8.3	69																373		<1.
Stream	3/15/1984						8.3	2432																446		<1.
Stream	6/12/1984						7.8	326																290		<1.
Stream	9/14/1984						8	180																334		<1.
Stream	6/6/1985						7.7	186																302		<1.
Stream	7/23/1985						7.7	10104																255		<1.
Stream	9/27/1985						7.6	78																316		<1.
Stream	5/21/1986						7.3	2199																234		<1.
Stream	10/6/1986						7.95	2678																229		<1.
Stream	3/13/1989						8.2	1967				0.23		99				80		3		202		248		
Stream	5/30/1989						8.3	4				0.43		209				253		12		490		252		
Stream	9/13/1989							2						204		0.02		288	0.04	9		495		318		
Stream	3/22/1990							1208	<1.	0.08	0.006	0.18	<0.005	148	<0.01	<0.02	<0.02	110	0.01	4	0.002	243	<0.01	270		
Stream	5/18/1990							6	<1.	0.08	0.001	0.48	0.011	258	<0.01	0.08	<0.02	263	0.05	7	0.015	597	<0.01	360		
Stream	9/20/1990							112						188		<0.02		138	<0.01	5		251		295		
Stream	11/6/1990							6						289		<0.02		261	0.17	6		605		383		
Stream	3/26/1991							264						140		<0.02		115	0.05	4		254		276		
Stream	6/3/1991							164						178		<0.02		180	<0.01	7		422		252		16
Stream	9/13/1991							24						198		0.04		188	0.04	8		495		338		
Stream	12/12/1991							102						211		<0.02		189	0.15	6		400		340		4
Stream	3/11/1992							1408						95		<0.02		77	<0.01	3		130		250		
Stream	5/6/1992							64						109		<0.02		101	<0.01	9		121		260		24
Stream	9/3/1992							138						328		<0.02		260	0.02	8		590		349		
Stream	12/2/1992							104						165		<0.02		125	0.17	3		247		302		12
Stream	6/1/1993							174						102		0.76		64	0.08	4		113		230		16
Stream	9/7/1993							48						147		<0.02		133	0.02	7		300		296		36
Stream	12/6/1993							60						108		<0.02		78	0.07	2		135		284		0
Stream	3/7/1994	5.9	7.9		560	3905		1718						55		0.03		34	0.01	2		58		166		0
Stream	6/1/1994	16.3	7.9		1210	1481		903						107		0.04		75	<0.01	6		107		275		0
Stream	9/6/1994	18.3	7.8		3720	166		13						188		0.06		205	<0.01	5		484		292		24
Stream	12/5/1994	3.3	7.3		1760			26						170		<0.01			0.22	3.6		290		325		10
Stream	3/1/1995	6.8	7.9		620	7625		1360						60		<0.1		43	<0.1	2		75		210		25
Stream	6/5/1995	14.5	7.7		2330	13060		30						150		0.2		125	<0.1	3		280		330		30
Stream	9/5/1995	15.7	7.8		2940	785		25						157		<0.1		147	<0.1	5		395		370		20
Stream	12/4/1995	3.2	8		1250	2091		310						93		<0.1		77	<0.1	2		144		350		15
Stream	3/11/1996	8.1	7.8		1250	1436		1710						94		<0.03		70	<0.04	2		149		332	<7.	<2.
Stream	6/3/1996	12.5	8.1		1470	4668		93						102		<0.1		74	<0.1	5		134		342		16
Stream	9/3/1996							<5.						130		<0.1		118	<0.1	4		352		365		16
Stream	12/2/1996	1.9	8.3		1650			60						141		<0.1		120	<0.1	4		278		430		<5.
Stream	3/4/1997	3.4	8.1		930	3052		162						80		<0.1		57	<0.1	2		96		330		<5.
Stream	6/2/1997	16.5	8.3		1820	7069		68						107		<0.1		86	<0.1	6		164		358		7

Surface Water Quality Data

Station: 5
Description: Christiansen Wash above Mine Fan

Type	Date	Wat. Temp	F-pH (units)	DO (mg/l)	Fld EC (umhos/cm	Flow (gpm)	L-pH (units)	TSS (mg/l)	O/G (mg/l)	NH3 (mg/l)	D-As (mg/l)	D-B (mg/l)	D-Cd (mg/l)	D-Ca (mg/l)	D-Cu (mg/l)	D-Fe (mg/l)	D-Pb (mg/l)	D-Mg (mg/l)	D-Mn (mg/l)	D-K (mg/l)	D-Se (mg/l)	D-Na (mg/l)	D-Zn (mg/l)	Bicarb (mg/l)	Acidity (mg/l)	Carb (mg/l)
Stream	9/10/1997	16.8	8.1		890	5386		2628						61		<0.1		35	<0.1	2		51		261		<5.
Stream	12/3/1997	2.7	7.5		1050	3927		412						65		<0.1		45	<0.1	1		60		323		<5.
Stream	3/3/1998	2.5	7.8		2070	808		77						108		<0.1		94	<0.1	3		174		368	<10.	<5.
Stream	6/1/1998	11.5	8		1360	1212		223						92		<0.1		63	<0.1	3		105		284	<10.	42
Stream	9/1/1998	16.2	8.2		2080	2738		78						120		<0.1		102	<0.1	9		192		365	<10.	24
Stream	12/1/1998	2	7.1		1300	5027		10						73		<0.1		46	<0.1	2		56		362	<10.	5
Stream	3/1/1999	3	7.7		2850	799		154						160		<0.1		130	<0.1	4		261		433	<10.	<5.
Stream	6/1/1999	9.9	8.3		1060	7069		1710						75		<0.1		46	<0.1	4		54		569	<10.	<5.
Stream	9/7/1999	16	8.3		2480	1764		167						148		<0.1		110	0.1	4		179		425	<10.	<5.
Stream	12/6/1999	1.2	7.6		2440	0		85						146		0.2		110	<0.1	3		217		431	<10.	<5.
Stream	3/15/2000	4.5	8.3		1110	3110		1010						71		<0.1		49	<0.1	2		78		335	<10.	8
Stream	6/5/2000	13.1	7.7		3150	1100		293						215		<0.1		164	<0.1	7		318		467	<10.	14
Stream	3/9/2001	2.2	8.1		1420	3590		1696						76		0.1		55	<0.1	2		108		418	<5.	<5.
Stream	6/4/2001	9.2	7.2		1170	3635		979						88		<0.1		53	<0.1	4		82		341	<5.	5
Stream	9/4/2001	12.6	8.1		3210	1077		7						161		<0.1		156	<0.05	4		335		401	<5.	9
Stream	12/10/2001	1.4	6.8		1970	0		112						114		<0.1		84	0.06	3		175		381	<5.	<5.
Stream	3/6/2002	1.3	>7.		2530	2.1		56						148		<0.1		109	0.13	4		209		402	<5.	<5.
Stream	6/5/2002	11.1	6.9		3250	0.9		17						184		<0.1		158	<0.05	4		340		409	<5.	<5.
Stream	9/23/2002	10.1	7.7		3970	58		7						196		<0.1		171	0.11	6		436		401	<5.	8
Stream	12/12/2002	3.9	8.2		1230	2.1		143						78		<0.1		49	<0.05	2		67		361	<5.	<5.
Stream	9/16/2003	10	8.5		3560	0.26		< 5.						195		< .005		188	< .005	5.8		392		379	< 5.	6
Stream	12/31/2003	2.3	8.7		4220	0		82						253		0.08		204	0.328	6.29		429		473	< 5.	< 5.
Stream	3/10/2004	1.9	8.6		1600	2513		2862						99.3		< .03		62.4	0.022	2.52		107		504	< 5.	< 5.
Stream	6/2/2004	12.1	8.6		1950	5.9		185						136		< .03		97.4	0.008	5.63		162		311	< 5.	16
Stream	9/25/2004	6.5	8.7		2660	0.71		12						163		< .03		153	0.008	4.39		283		345	< 5.	< 5.
Stream	12/14/2004	2.1	8.6		1989	0		245						120		< .03		90.4	0.051	2.79		166		311	< 5.	< 5.
Stream	3/25/2005	5	9.5		1260			541						79.8		0.36		55.7	0.028	1.14		90.3		264	< 5.	12
Stream	5/16/2005	15.8	8.7		1935	1557		135						175		< .03		95.6	< .002	3.82		175		318	< 5.	24
Stream	7/21/2005	17.7	8.4		1664	1.4		33						106		< .03		75.7	0.003	4.91		130		287	< 5.	26
Stream	11/15/2005	1.8	9.6		1624	2.9		220						113		< .03		74.7	0.093	3.42		131		305	< 5.	< 5.
Stream	3/15/2006	1.9	9.7		1200	3252		457						84.7		< .03		56.6	0.031	1.83		74.3		283	< 5.	< 5.
Stream	6/22/2006	13.8	8.8		1256	3.3		30						88.3		< .03		63.1	0.01	4.16		88.9		285	< 5.	< 5.
Stream	9/25/2006	6.7	9.1		3430	785		7						177.13		< .03		158.21	0.037	4.32		350.77		364	< 5.	< 5.
Stream	11/15/2006	1.5	7.7		1543	2.4		275						105.39		< .03		77.83	0.054	3.21		127.74		304	< 5.	< 5.
	No. of Obs.:	48	64	1	65	62	25	103	9	2	2	4	2	72	2	21	0	71	30	72	2	72	0	90	5	37
	Maximum:	18.3	9.7	12	5194	13060.08	8.5	10104	8	0.08	0.006	0.48	0.011	328	<0.01	5.69	–	313	0.328	12	0.015	650	–	569	0	42
	Minimum:	1.2	6.8	12	560	0	7.3	2	<0.5	0.08	0.001	0.18	<0.005	55	<0.01	0	–	34	0.003	1	0.002	51	–	166	0	0
	Mean:	8.0	8.2	12.0	2268.6	1886.5	8.1	566.7	1.1	0.08	0.004	0.33	0.0	138.7	<0.01	0.5	–	120.1	0.072	4.6	0.009	247.3	–	335.7	0.0	15.4
	Std. Dev.:	5.7	0.5	–	1181.4	2377.5	0.3	1192.4	1.8	0.00	0.004	0.15	--	56.6	–	1.2	–	67.1	0.074	2.3	0.009	163.4	–	68.3	0.0	10.3
	Equivalent weights of means:													6.92				9.89		0.12		10.76		5.50		0.51

Surface Water Quality Data

Station: 5
Description: Christiansen Wash a

Type	Date	Cl (mg/l)	Hydroxide (mg/l)	NO3 (mg/l)	NO2 (mg/l)	O-PO4 (mg/l)	SO4 (mg/l)	T-P (mg/l)	T-Alk (mg/l)	T-Hardns (mg/l)	Lab EC umhos/cm	TDS (mg/l)	Set Solids (mg/l)	D-Al (mg/l)	D-Mb (mg/l)	T-Cats	T-Anis	T-Fe (mg/l)	T-Mn (mg/l)	COMMENTS
Stream	10/26/1979	92				0.01	1740		351	1611		4148				52.6	46.1	0.29	0.03	
Stream	12/6/1979						675					1140						3.75	0.05	
Stream	1/3/1980						1643					3876						0.7	0.31	
Stream	2/8/1980	71				0.03	1880		345	2525		3636				48.1	49.11	0.17	0.1	
Stream	3/16/1980						1780					3500						5.95	0.3	
Stream	4/19/1980						865					1790						15	0.92	
Stream	5/22/1980	32				0.03	720		259	679		1370				19.85	21.1	4.4	0.2	
Stream	6/11/1980						919					1328						10	0.24	
Stream	7/16/1980						280					710						5.38	0.07	
Stream	8/12/1980	81				0.25	825		278	779		1574				24	25.09	0.2	0.02	
Stream	9/18/1980						800					1496						1.89	0.04	
Stream	10/12/1980						783					1608						1.43	0.1	
Stream	11/9/1980	92				0.01	3090		289	1767		4552				63.95	72.88	1.01	0.42	
Stream	12/10/1980						2720					4246						0.08	0.1	
Stream	1/10/1981						1070					2022						1.23	0.07	
Stream	2/10/1981	48				0	1400		254	1146		2652				38.35	35.63	0.77	0.02	
Stream	3/17/1981						889					2041						2.8	0.44	
Stream	4/13/1981						855.9					1842						16.79	0.52	
Stream	5/20/1981	65		0.009	0.002		740	0.031	382.2	790.9		1634						1.68	0.3	
Stream	6/23/1981						1127.5					2211						0.6	0.15	
Stream	7/16/1981						946.5					3892						0.28	0.16	
Stream	8/20/1981	93.1		0.015	<0.002			0.081	420	1385						38.6	14.7			
Stream	9/28/1981						2403					2769						0.95	0.39	
Stream	10/30/1981						934					1698						1.54	0.31	
Stream	12/29/1981	35.1		0.125	<0.002	0.154	975			909	2140	1613				25	29	1.4	0.31	
Stream	3/16/1982	43.6		0.29	<0.002	0.525	1119			1029	2380	1778				29.6	31	1.68	0.45	
Stream	6/16/1982	38.2		0.21	<0.002	0.5	1025			923	2000	1600				27.7	29	1.66	0.41	
Stream	9/20/1982	72.7		0.2	<0.01	0.493	1400			1301	3750	2657						1.69	0.35	
Stream	12/27/1982	25.1		0.2	<0.01	0.31	700			853	1520	1160				21.8	21.5	2	0.4	
Stream	3/10/1983	20		0.19	<0.01	0.217	950			969	2150	1659				25.2	26.7	1.79	0.3	
Stream	6/22/1983	85		0.22	0.02	0.418	800		299	585	2800	1928				24.03	25.03	1.34	0.2	
Stream	9/8/1983	33		2.99	0.01	0.2	800			800	2400	1513				25.06	23.53	0.84	0.2	
Stream	12/13/1983	33				<0.01	1000		306	845	2400	1734				27.68	27.88	0.47	0.19	
Stream	3/15/1984	32		1.12		0.02	700		366	690	1875	1370				22.08	22.81	2.6	0.61	
Stream	6/12/1984	28		0.2		0.18	620		290	86	1800	1194				19.39	19.5	1.1	0.11	
Stream	9/14/1984	33		0.19		0.08	800		334	780	2100	1487				24.6	24.28	1.26	0.09	
Stream	6/6/1985	28		0.4		0.11	600		302	650	1750	1209				19.4	19.33	1.04	0.1	
Stream	7/23/1985	31		0.4		0.11	770		255	715	1900	1212				22.33	22.1	6.76	1.7	
Stream	9/27/1985	34		1.2		0.05	960		316	838	2389	1744				27.33	27.3	0.23	0.1	
Stream	5/21/1986	13		0.42		0.12	280		234	382	1000	628				10.74	10.88	0.54	0.53	
Stream	10/6/1986	16.4		0.24		0.37	300		229	390	980	656				11.31	11.3	0.83	0.28	
Stream	3/13/1989	29					609		248	576	1580	1168				20.48	18.56	35	0.61	
Stream	5/30/1989	66					2297			1560	3880	3832				53.07	55.13	0.1	0.06	
Stream	9/13/1989	61					2077		318	1691		3426	0.1			55.83	51.68	0.04	0.04	
Stream	3/22/1990	29				<0.1	893		270	821		1662	18.5	0.05	<0.05	27.22	24.97	3.06	0.07	
Stream	5/18/1990	75				<0.1	2741		360	1723		4402	<0.3	<0.05	<0.05	60.92	66.86	0.21	0.09	
Stream	9/20/1990	38					1159		295	1036		2070	<0.2					1.84	0.05	
Stream	11/6/1990	74					2628		383	2037		4442	<0.2					0.43	0.17	
Stream	3/26/1991	34					1124		276	822		1738	<0.2			27.71	30.08	3.83	0.21	
Stream	6/3/1991	51					1902		268	1187		3010	<0.2					2.61	0.14	
Stream	9/13/1991	52					2097		338	1321		3354	<0.2			47.3	52.25	0.21	0.09	
Stream	12/12/1991	45					1718		344	1571		2890	<0.3					0.7	0.32	
Stream	3/11/1992	20					572		250	799		1098	1.2			16.86	17.57	13	0.34	
Stream	5/6/1992	20					634		284	722		1264	<0.2			19.29	19.55	1.04	0.05	
Stream	9/3/1992	72					2651		349	1629		4152	<0.2			63.89	64.67	1.19	0.13	
Stream	12/2/1992	32					1105		314	983		1888	<0.2			29.45	30.38	1.4	0.2	
Stream	6/1/1993	13					465		246	545		838	<0.2			15.42	15.05	3.54	0.1	
Stream	9/7/1993	34					1300		332	962		2236	<0.4			31.64	34.89	1.27	0.04	
Stream	12/6/1993	18					560		284	606		1138	<0.5			17.79	17.94	2.2	0.1	
Stream	3/7/1994	12					214		166	1368		552	13.3			8.14	8.15	51	0.94	
Stream	6/1/1994	11					500		335	959		1007	2			16.36	17.51	20.4	0.37	
Stream	9/6/1994	62					2099		316	1255		3272	<0.4			47.64	52.14	0.09	<0.01	
Stream	12/5/1994	38	<2				1370		335	1070		2330	<0.1					0.77	0.29	
Stream	3/1/1995	12					270		215	590		600	28			9.8	10.3	22.5	0.4	
Stream	6/5/1995	37					1200		320	890		2140	<0.5			30.2	32.4	0.7	<0.1	
Stream	9/5/1995	45					1658		340	1143		2620	<0.5			41.9	42.5	0.3	<0.1	
Stream	12/4/1995	19					509		310	635		1090	<0.5			19	17.4	4.8	0.1	
Stream	3/11/1996	20					629		273	523		1155	20.4			16.9	19.1	24.7	0.51	
Stream	6/3/1996	20					549		307	656		1170	<0.5			19.5	18.1	1.6	<0.1	
Stream	9/3/1996	42					1163		327	878		2205	<0.5			34.2	31.9	0.2	<0.1	
Stream	12/2/1996	34					1356		353	948		2019	<0.5			32.1	36.2	1.3	0.1	
Stream	3/4/1997	15					436		270	501		850	<0.5			14.6	14.9	2.9	<0.1	
Stream	6/2/1997	23					648		304	665		1360	<0.5			21.2	20.2	1	<0.1	

Surface Water Quality Data

Station: 5
Description: Christiansen Wash a

Type	Date	Cl (mg/l)	Hydroxide (mg/l)	NO3 (mg/l)	NO2 (mg/l)	O-PO4 (mg/l)	SO4 (mg/l)	T-P (mg/l)	T-Alk (mg/l)	T-Hardns (mg/l)	Lab EC umhos/cm	TDS (mg/l)	Set Solids (mg/l)	D-Al (mg/l)	D-Mb (mg/l)	T-Cats	T-Anis	T-Fe (mg/l)	T-Mn (mg/l)	COMMENTS
Stream	9/10/1997	8					356		214	603		540	15					15	0.6	
Stream	12/3/1997	11					292		264	348		610	<0.5			9.6	11.7	4.5	0.1	
Stream	3/3/1998	24					871		302	657		1556	<5.					1.6	0.1	
Stream	6/1/1998	14					416		303	489		3128	0.8					2.9	0.1	
Stream	9/1/1998	41					837		338	720		1449	<0.5					1.2	0.1	
Stream	12/1/1998	7					162		306	372		554	<0.5					3.8	0.2	
Stream	3/1/1999	17					994		361	935		2130	<0.5					2.7	0.2	
Stream	6/1/1999	9					261		473	377		620	2					20	0.5	
Stream	9/7/1999	27					830		348	823		1760	<0.4					2.4	<0.1	
Stream	12/6/1999	22					837		353	818		1754	<0.4					1.8	0.1	
Stream	3/15/2000	10					305		287	379		698	3					14.3	0.3	
Stream	6/5/2000	38					1267		406	1212		2606	<0.4					4.2	0.3	
Stream	3/9/2001	13					427		343	416		831	2.8					25	0.5	
Stream	6/4/2001	8					319		289	438		775	1			12.4	12.6	9.2	0.2	
Stream	9/4/2001	36.3					1275		343	1044		2628	<0.1					<0.1	<0.05	
Stream	12/10/2001	21.6					677.9		313	631		1374	<0.1			20.3	21	1.9	0.1	
Stream	3/6/2002	26					946		337	818		1836	<0.1					1.1	0.15	
Stream	6/5/2002	37					1525		343	1110		2625	<0.1					0.4	0.08	
Stream	9/23/2002	48					1862			1194		3338	<0.1						0.11	
Stream	12/12/2002	8					305		278	397		760	<0.1					3	0.08	
Stream	9/16/2003	48					1639		320	1261		2792	< .1			42.4	41.9	0.081	< .005	
Stream	12/31/2003	49					1633			1472		3272	< .1						0.355	
Stream	3/10/2004	13					500			505		949	13						0.827	
Stream	6/2/2004	23					831		327	741		1302	0.2					3.66	0.132	
Stream	9/25/2004	36					1196		345	1037		2096	< .1			33.1	32.8	0.52	0.02	DIS.METALS FILTERED @ LAB
Stream	12/14/2004	18					766		311	672		1394	0.9					5.37	0.172	Flow is 0 because site was frozen
Stream	3/25/2005	11					350		276	429		799	1.8					11.1	0.179	
Stream	5/16/2005	107					679		342	831		1378	0.1					3.48	0.108	
Stream	7/21/2005	16					531		312	576		1105	< .1					0.33	0.003	
Stream	11/15/2005	16					510		305	590		1155	1.5					4.53	0.165	
Stream	3/15/2006	14					299		283	445		737	2.2					8.81	0.119	
Stream	6/22/2006	19					355		285	480		842	< .1					0.62	0.027	
Stream	9/25/2006	43					1397		364	1094		2660	< .1			37.2	37.6	0.14	0.041	
Stream	11/15/2006	15					476		304	594		1068	1.8					7.56	0.132	
	No. of Obs.:	91	0	18	3	22	106	2	80	91	19	106	21	1	2	56	56	102	96	
	Maximum:	107	--	2.99	0.02	0.525	3090	0.081	473	2525	3880	4552	28	0.05	<0.05	63.95	72.88	51	1.7	
	Minimum:	7	--	0.009	0.002	0	162	0.031	166	86	980	540	0.1	0.05	<0.05	8.14	8.15	0.04	0.003	
	Mean:	35.0	--	0.48	0.011	0.2	1018.3	0.056	310.2	885.8	2147.1	1896.0	6.2	0.1	<0.05	28.6	28.8	4.6	0.24	
	Std. Dev.:	22.9	--	0.70	0.009	0.2	640.0	0.035	48.0	418.5	747.9	1036.0	8.2	--	--	14.2	15.0	7.9	0.25	
	Equivalent weights c	0.99					21.20													

Surface Water Quality Data

Station: 8
Description: Unnamed Tributary to Quitchupah Creek above Pond #1

Type	Date	Wat. Temp	F-pH (units)	DO (mg/l)	Fld EC umhos/cm	Flow (gpm)	L-pH (units)	TSS (mg/l)	O/G (mg/l)	NH3 (mg/l)	D-As (mg/l)	D-B (mg/l)	D-Cd (mg/l)	D-Ca (mg/l)	D-Cu (mg/l)	D-Fe (mg/l)	D-Pb (mg/l)	D-Mg (mg/l)	D-Mn (mg/l)	D-K (mg/l)	D-Se (mg/l)	D-Na (mg/l)	D-Zn (mg/l)	Bicarb (mg/l)	Acidity (mg/l)
Stream	10/26/1979		8.2			4.5		3	1					512		0		1352		38		10000		750.3	0
Stream	12/6/1979		8			4.5		96	1																
Stream	3/16/1980		8.6			4.5		55	1																
Stream	4/19/1980		8.2		2321	22		498	1																
Stream	5/22/1980		8.8			4.5		59	1					153		0.04		235		15		1350		420.9	0
Stream	6/11/1980		8.5		2204	36		2139	1																
Stream	7/16/1980		8.6		3219	13		414	1																
Stream	9/18/1980		8.4		2273	90		531	1																
Stream	10/12/1980		7.8		3154	359		2944	1																
Stream	11/9/1980		8.3		2695	90		1608	1					129		0.05		120		7		540		317.2	
Stream	5/18/1981						8.4	2495	1.6							0.06								854.7	
Stream	7/17/1981						8.5	19	<0.5																
Stream	9/28/1981						8.9	23.5	1.4																
Stream	10/30/1981						8.7	385	<0.5																
Stream	3/16/1982	10.9	7.7	16.9	12454	180	8.5	84.5																606	
Stream	6/17/1982						8.2	1157																347	
Stream	9/17/1982						8.3	30.5																408	
Stream	9/8/1983						8.3																	562	
Stream	3/16/1984						8.6	53																602	
Stream	6/11/1984						7.7	3795																252	
Stream	9/13/1984						8.3	279																601	
Stream	6/5/1985						7.65	527																260	
Stream	9/26/1985						8.3	28																267	
Stream	5/20/1986						7.8	157																301	
Stream	10/6/1986						8.35	118																363	
Stream	12/4/1995					0																			
Stream	3/4/1997					0																			
Stream	6/2/1997					0																			
Stream	9/3/1997					0																			
Stream	12/1/1997					0																			
Stream	6/1/1998					0																			
Stream	9/1/1998					0																			
Stream	12/1/1998					0																			
Stream	3/15/2000	4	7.1		23600	<1.		38						256		<0.1		756	<0.1	14		5570		630	<10.
Stream	3/9/2001					0																			
Stream	3/6/2002	2.8	6.9		3370	0.6		643						198		<0.1		201	<0.05	10		266		431	<5.
Stream	6/5/2002	14.7	7.2		5700	0.08		5						261		<0.1		388	<0.05	12		649		304	<5.
Stream	9/23/2002					0																			
Stream	9/16/2003					0																			
Stream	12/31/2003					0																			
Stream	3/10/2004					0																			
Stream	6/2/2004					0																			
Stream	9/26/2004					0																			
Stream	12/14/2004					0																			
Stream	3/25/2005					0																			
Stream	5/16/2005					0																			
Stream	7/21/2005	22.1	8.1		2830	2.6		< 5.						94.8		0.06		104	0.007	7.82		383		390	< 5.
Stream	11/15/2005					0																			
Stream	3/15/2006					0																			
Stream	6/22/2006					0																			
Stream	9/25/2006					0																			
Stream	11/15/2006					0																			
	No. of Obs.:	5	15	1	11	37	15	27	12	0	0	0	0	7	0	5	0	7	4	7	0	7	0	19	4
	Maximum:	22.1	8.8	16.9	23600	358.88	8.9	3795	1.6	--	--	--	--	512	--	0.06	--	1352	0.007	38	--	10000	--	854.7	0
	Minimum:	2.8	6.9	16.9	2204	0	7.65	3	1	--	--	--	--	94.8	--	0	--	104	<0.05	7	--	266	--	252	<5
	Mean:	10.9	8.0	16.9	5801.8	21.9	8.3	673.5	1.1	--	--	--	--	229.1	--	0.0	--	450.9	--	14.8	--	2679.7	--	456.2	--
	Std. Dev.:	8.0	0.6	--	6607.8	67.0	0.4	1023.4	0.2	--	--	--	--	139.4	--	--	--	456.1	--	10.6	--	3730.8	--	176.9	--
	Equivalent weights of means:													11.43				37.10		0.38		116.57		7.48	

Surface Water Quality Data

Station: 8
Description: Unnamed Tributary

Type	Date	Carb (mg/l)	Cl (mg/l)	Hydroxide (mg/l)	NO3 (mg/l)	NO2 (mg/l)	O-PO4 (mg/l)	SO4 (mg/l)	T-P (mg/l)	T-Alk (mg/l)	T-Hardns (mg/l)	Lab EC umhos/cm	TDS (mg/l)	Set Solids (mg/l)	D-Al (mg/l)	D-Mb (mg/l)	T-Cats	T-Anis	T-Fe (mg/l)	T-Mn (mg/l)	COMMENTS
Stream	10/26/1979	34.08	1812				0	23000		676	7708		39386				572.74	544.77	0.22	0.13	
Stream	12/6/1979							21000					30670						5.1	0.3	
Stream	3/16/1980							11700					28750						0.64	0.09	
Stream	4/19/1980							715					1844						2.8	0.11	
Stream	5/22/1980	35.04	197				0.72	3500		406	1378		6194				86.08	86.69	0.69	0.01	
Stream	6/11/1980							763					1630						32	0.36	
Stream	7/16/1980							1050					2352						3	0.02	
Stream	9/18/1980							875					1604						1.9	0.16	
Stream	10/12/1980							1590					2180						78	0.59	
Stream	11/9/1980	30.06	104				0.11	1725		312	835		2874				39.99	45.08	0.81	0.25	
Stream	5/18/1981	23.1	118		0.014	0.01		2191	0.022	877.8	1627.1		3723						94	1.24	
Stream	7/17/1981							1420					4740						0.33	0.12	
Stream	9/28/1981							1506					1618						0.88	0.12	
Stream	10/30/1981							9139					9580						0.82	0.21	
Stream	3/16/1982	94.6	2076		0.47	<0.002	0.033	354			2327	31800	22214				947.9	81.3	0.68	0.36	
Stream	6/17/1982	<1.	78.3		0.41	<0.002	0.033	667			749	1500	1189				24.5	23.1	0.7	0.42	
Stream	9/17/1982	<1.	57.5		0.201	<0.01	<0.01	1100			870	2190	1877						0.63	0.32	
Stream	9/8/1983	<1.	505		4.99	0.01	0.26	5150			2030	13500	9976				132	130.7	0.46	0.16	
Stream	3/16/1984	34	1120		9.6		<0.01	15000		522	4330	24000	24224				341.48	354.35	0.27	0.15	
Stream	6/11/1984	<1.	95		<0.01		0.42	1325		252	671	3100	2180				33.65	35.31	0.21	0.31	
Stream	9/13/1984	<1.	2200		2.5		0.02	24000		601	6800	35000	38904				558.17	573.77	2.51	0.22	
Stream	6/5/1985	<1.	80		0.05		0.23	700		260	485	2075	1370				21.41	22.04	4.5	0.26	
Stream	9/26/1985	<1.	71		<0.01		0.12	780		267	516	2369	1507				24.2	23.59	0.13	0.02	
Stream	5/20/1986	<1.	58		0.2		0.12	650		301	524	1900	1297				21.26	21.2	0.66	0.04	
Stream	10/6/1986	80	950		1.55		0.18	11000		443	3575	18300	17700				270.33	264.7	0.3	0.09	
Stream	12/4/1995																				
Stream	3/4/1997																				
Stream	6/2/1997																				
Stream	9/3/1997																				
Stream	12/1/1997																				
Stream	6/1/1998																				
Stream	9/1/1998																				
Stream	12/1/1998																				
Stream	3/15/2000	45	984					14505		592	3752		22186	<0.4					0.1	<0.1	
Stream	3/9/2001																				
Stream	3/6/2002	<5.	139					1540		360	1322		2640	0.6					10.1	0.22	
Stream	6/5/2002	8	308					3017		262	2250		5228	<0.1					0.3	<0.05	
Stream	9/23/2002																				
Stream	9/16/2003																				
Stream	12/31/2003																				frozen
Stream	3/10/2004																				
Stream	6/2/2004																				dry
Stream	9/26/2004																				Dry
Stream	12/14/2004																				Site was dry
Stream	3/25/2005																				
Stream	5/16/2005																				
Stream	7/21/2005	< 5.	68					1095		390	665		2072	< .1					0.06	0.014	
Stream	11/15/2005																				Dry
Stream	3/15/2006																				No Flow in 1st. Quarter.
Stream	6/22/2006																				
Stream	9/25/2006																				
Stream	11/15/2006																				
No. of Obs.:		9	19	0	10	2	12	29	1	15	19	11	29	1	1	0	13	13	29	27	
Maximum:		94.6	2200	--	9.6	0.01	0.72	24000	0.022	877.8	7708	35000	39386	0.6	<0.1	--	947.9	573.77	94	1.24	
Minimum:		8	57.5	--	0.014	0.01	0	354	0.022	252	485	1500	1189	0.6	<0.1	--	21.26	21.2	0.06	0.01	
Mean:		42.7	580.0	--	2.0	0.01	0.19	5553.7	0.0	434.8	2232.3	12339.5	10058.9	0.6	<0.1	--	236.4	169.7	8.4	0.23	
Std. Dev.:		27.5	731.7	--	3.1	0.00	0.21	7325.1	--	184.7	2123.3	12979.5	12149.9	--	--	--	293.1	200.7	22.4	0.25	
Equivalent weights c		1.42	16.36					115.63													

Surface Water Quality Data

Station: 9
Description: Lower Ivie Creek

Type	Date	Wat. Temp	F-pH (units)	DO (mg/l)	Fld EC (umhos/cm	Flow (gpm)	L-pH (units)	TSS (mg/l)	O/G (mg/l)	NH3 (mg/l)	D-As (mg/l)	D-B (mg/l)	D-Cd (mg/l)	D-Ca (mg/l)	D-Cu (mg/l)	D-Fe (mg/l)	D-Pb (mg/l)	D-Mg (mg/l)	D-Mn (mg/l)	D-K (mg/l)	D-Se (mg/l)	D-Na (mg/l)	D-Zn (mg/l)	Bicarb (mg/l)	Acidity (mg/l)
Stream	1/3/1980		8		4578	67		8	2																
Stream	2/8/1980		8.2		2749			101	1					111		0		133		8		320		359.9	0
Stream	3/16/1980		8.2		2625	2288		1390	1																
Stream	4/19/1980		8.1		2530	1543		381	1																
Stream	5/22/1980		8.1		494	58318		11334	1					48		0.16		16.8		4.3		21		106.14	0
Stream	6/11/1980		8.5		1242	14714		83	1																
Stream	7/16/1980		8.3		4157	27		83	1																
Stream	8/12/1980		8.3		3703	22		9	1					163		0.18		220		12		390		208.62	0
Stream	11/10/1980		8.5		4301	404		8	0					219		0		271		10		440		250.1	
Stream	12/10/1980		8.4		3386	852		128	1																
Stream	1/9/1981		8.3		2245	1525		136	1																
Stream	2/1/1981		8.3		2886	1346		337	1					181		0.09		201		7		250		214.72	0
Stream	3/17/1981		8.4		3892	1122		130	0																
Stream	4/13/1981						8.5	213	<0.5							1.18									
Stream	5/18/1981						8.3	21	1							0.1								290.9	
Stream	12/29/1981						8.2	102																409	
Stream	3/19/1982	4.2	8.7	12.8	1152	2693	7.9	500																319	
Stream	9/17/1982						8.2	81																336	
Stream	3/10/1983						8.4	602																291	
Stream	6/22/1983						8.3	40.5																	
Stream	9/8/1983						7.5																	145	
Stream	12/29/1983						8																	360	
Stream	3/15/1984						8.2	72																273	
Stream	6/11/1984						7.6	52																161	
Stream	9/13/1984						7.65	206																160	
Stream	12/17/1984						7.55	49																255	
Stream	6/5/1985						7.4	7																180	
Stream	7/22/1985						7.6	145																156	
Stream	9/26/1985						7.5	25																161	
Stream	5/21/1986						7.4	335																129	
Stream	10/6/1986						7.9	5																295	
Stream	3/10/1989						7.9	26				0.13		133				86		4		78		192	
Stream	12/26/1989							150						306		0.42		394	0.09	9		441		436	
Stream	3/22/1990							144	<1.	0.12	0.001	0.52	<0.005	234	0.01	<0.02	<0.02	245	0.01	7	<0.001	454	<0.01	264	
Stream	5/21/1990							3244	<1.	0.1	0.002	0.55	0.006	207	<0.01	0.11	<0.02	227	<0.01	7	<0.001	429	<0.01	234	
Stream	9/21/1990							178						235		<0.02		185	0.02	8		348		273	
Stream	11/6/1990							48						277		<0.02		246	0.07	5		427		282	
Stream	3/26/1991							456						224		<0.02		242	<0.01	7		402		260	
Stream	6/4/1991							3520						57		0.12		26	<0.01	3		33		116	
Stream	9/13/1991							218						240		<0.02		216	0.04	9		418		250	
Stream	12/11/1991							118						164		<0.02		147	0.02	5		211		240	
Stream	3/11/1992							268						230		<0.02		270	<0.01	10		380		304	
Stream	5/6/1992							8						213		<0.02		237	0.02	7		419		212	
Stream	9/3/1992							66						225		<0.02		186	0.04	8		402		233	
Stream	12/2/1992							60						262		<0.02		260	0.11	7		488		330	
Stream	6/1/1993							46						145		0.34		124	0.04	5		205		208	
Stream	9/7/1993							12						196		<0.02		223	0.02	8		400		86	
Stream	12/6/1993							18						147		<0.02		128	0.03	4		190		300	
Stream	3/7/1994	8	7.9		2820	373		214						218		<0.02		247	0.07	8		396		340	
Stream	6/1/1994	15.4	7.8		3680	718		2						175		0.25		229	0.02	8		442		205	
Stream	9/6/1994	12.9	8.2		1930	4.5		13						100		0.08		84	<0.01	7		330		216	
Stream	12/5/1994	4	7.8		1210			120						120		<0.01			0.025	3.6		170		280	
Stream	3/1/1995	8.7	7.9		2430	1786		170						151		<0.1		168	<0.1	7		357		240	
Stream	6/5/1995	12.7	8.5		450	23786		1420						42		0.3		21	<0.1	2		28		210	
Stream	9/5/1995	18.6	6.9		2950	112		10						127		<0.1		150	<0.1	6		329		245	
Stream	12/4/1995	6.3	7.5		3070	341		25						193		<0.1		255	<0.1	6		461		320	
Stream	3/11/1996	16.2	7.9		3670	615		<5.						177		<0.03		199	<0.04	5.5		360		347	<7.
Stream	6/3/1996	22.3	8.2		4620	99		<5.						146		<0.1		179	<0.1	6		401		207	
Stream	9/3/1996							6						163		<0.1		114	<0.1	8		306		354	
Stream	12/2/1996	3.9	8.1		1600			15						148		<0.1		140	<0.1	5		228		373	
Stream	3/4/1997	3.3	7.7		1370	987		216						125		<0.1		106	<0.1	5		177		363	
Stream	6/2/1997	23.8	8.1		3290	539		<5.						161		<0.1		172	<0.1	7		347		335	
Stream	9/10/1997	19.4	7.8		3100	301		6						234		<0.1		151	0.1	7		274		303	
Stream	12/3/1997	2.8	7.3		2570	682		23						139		<0.1		135	<0.1	5		186		346	
Stream	3/3/1998	2.4	7		2550	561		120						141		<0.1		141	<0.1	6		195		345	<10.
Stream	6/1/1998	22.9	7.8		3600	539		<4.						190		<0.1		204	<0.1	8		341		320	<10.

Surface Water Quality Data

Station: 9
Description: Lower Ivie Creek

Type	Date	Wat. Temp	F-pH (units)	DO (mg/l)	Fld EC (umhos/cm	Flow (gpm)	L-pH (units)	TSS (mg/l)	O/G (mg/l)	NH3 (mg/l)	D-As (mg/l)	D-B (mg/l)	D-Cd (mg/l)	D-Ca (mg/l)	D-Cu (mg/l)	D-Fe (mg/l)	D-Pb (mg/l)	D-Mg (mg/l)	D-Mn (mg/l)	D-K (mg/l)	D-Se (mg/l)	D-Na (mg/l)	D-Zn (mg/l)	Bicarb (mg/l)	Acidity (mg/l)
Stream	9/1/1998	20.5	7.8		2960	22		174						133		<0.1		128	<0.1	7		371		296	<10.
Stream	12/1/1998	4.3	7.3		4450	112		<5.						234		<0.1		248	<0.1	8		367		352	<10.
Stream	3/1/1999	10.5	7.1		3870	85		<5.						231		<0.1		243	<0.1	9		347		368	<10.
Stream	6/1/1999	19	7.9		3100	718		32						192		<0.1		196	<0.1	14		243		347	<10.
Stream	9/7/1999	18.1	7.9		3600	171		<5.						236		<0.1		209	<0.1	10		265		311	<10.
Stream	12/6/1999	1.2	7.2		2630	0		22						176		<0.1		154	<0.1	6		186		417	<10.
Stream	3/15/2000	10.8	7.9		4140	166		<5.						225		<0.1		258	<0.1	10		372		359	<10.
Stream	6/5/2000	21.1	7.3		4520	0.1		16						274		<0.1		276	0.2	9		446		340	<10.
Stream	3/9/2001	5.8	7.1		3050	417		540						184		<0.1		173	<0.1	14		233		411	<5.
Stream	6/4/2001	15.9	7.1		3780	525		<5.						198		0.1		206	<0.1	9		388		301	<5.
Stream	9/4/2001	20.7	8		4100	180		<5.						165		<0.1		144	<0.05	11		532		182	<5.
Stream	12/10/2001	1.5	7.1		4770	0		<5.						250		<0.1		290	0.06	8		474		486	<5.
Stream	5/23/2002	10.2	7.1		4830	0.21		<5.	<2.					216		<0.1		291	<0.05	9		563		323	<5.
Stream	9/23/2002					0																			
Stream	12/12/2002	2.3	7.86		4400	0.08		14						163		<0.1		191	0.07	6		392		267	<5.
Stream	9/16/2003					0																			
Stream	12/31/2003					0																			
Stream	3/10/2004	6.6	8.4		3830	539		495						243		0.044		262	0.098	18.4		314		399	< 5.
Stream	6/2/2004	19.2	7.6		4530	0.1		8						135		< .03		259	0.219	10.6		487		319	10
Stream	9/24/2004					0																			
Stream	12/16/2004					0																			
Stream	3/25/2005	7.4	8.8		3450	349		45						195		< .03		217	0.043	8.81		298		317	< 5.
Stream	5/16/2005	10.7	8.7		6743	283		9173						50.9		< .03		21.7	< .002	3.37		38.6		519	< 5.
Stream	7/21/2005	25.4	8.4		1684	11		9						87		< .03		73.8	0.006	4.64		169		240	< 5.
Stream	11/15/2005	0.9	8.4		3630	2		14						185		< .03		217	0.041	8.49		333		304	< 5.
Stream	3/15/2006	7.4	8.4		3720	1234		25						234		< .03		260	0.086	11		301		329	< 5.
Stream	6/22/2006					0																			
Stream	9/26/2006	9.4	9.1		1454	190		9						188.89		< .03		217.56	0.019	7.26		334.57		236	< 5.
Stream	11/15/2006	2.4	7.8		3690	1.3		11						215.86		< .03		239.55	0.075	7.61		336.56		303	< 5.
	No. of Obs.:	41	54	1	54	57	19	75	4	2	2	3	2	63	1	16	11	62	27	63	0	63	0	79	5
	Maximum:	25.4	9.1	12.8	6743	58318	8.5	11334	2	0.12	0.002	0.55	0.006	306	0.01	1.18	0	394	0.219	18.4	–	563	–	519	10
	Minimum:	0.9	6.9	12.8	450	0	7.4	2	<0.5	0.1	0.001	0.13	<0.05	42	<0.01	0	<0.02	16.8	0.006	2	–	21	–	86	0
	Mean:	11.2	7.9	12.8	3181.1	2129.3	7.9	508.1	0.9	0.1	0.002	0.40	–	180.6	–	0.2	–	189.6	0.061	7.5	–	321.7	–	283.0	2.0
	Std. Dev.:	7.5	0.5	–	1222.3	8404.9	0.4	1733.8	–	0.0	0.001	0.23	–	57.5	–	0.3	–	74.4	0.052	2.8	–	125.4	–	85.4	4.5
	Equivalent weights of means:													9.01				15.60		0.19		13.99		4.64	

Surface Water Quality Data

Station: 9
Description: Lower Ivie Creek

Type	Date	Carb (mg/l)	Cl (mg/l)	Hydroxide (mg/l)	NO3 (mg/l)	NO2 (mg/l)	O-PO4 (mg/l)	SO4 (mg/l)	T-P (mg/l)	T-Alk (mg/l)	T-Hardns (mg/l)	Lab EC (umhos/cm	TDS (mg/l)	Set Solids (mg/l)	D-Al (mg/l)	D-Mb (mg/l)	T-Cats	T-Anis	T-Fe (mg/l)	T-Mn (mg/l)	COMMENTS
Stream	1/3/1980							1663					3888						0.28	0.22	
Stream	2/8/1980	7.02	115				0.02	1000		297	1212		2308				30.61	30.22	0.49	0.04	
Stream	3/16/1980							1260					2522						14.5	0.34	
Stream	4/19/1980							1060					2088						8.5	0.1	
Stream	5/22/1980	0	17				0.2	119		87	186		260				4.88	4.82	22	1.9	
Stream	6/11/1980							619					996						1.85	0.03	
Stream	7/16/1980							1837					3564						1.78	0.04	
Stream	8/12/1980	17.04	156				0.03	1790		202	1326		3132				43.51	45.71	0.26	0.02	
Stream	11/10/1980	32.04	165				0.01	2400		261	1751		3746				52.62	59.82	0.12	0.08	
Stream	12/10/1980							1800					2866						0.4	0.02	
Stream	1/9/1981							865					1834						0.86	0.04	
Stream	2/1/1981	25.08	111				0	1265		218	1285		2298				36.62	33.85	1.18	0.02	
Stream	3/17/1981							630					2022						0.29	0.13	
Stream	4/13/1981							880.6					1028						4.78	0.14	
Stream	5/18/1981	<1.	186		<0.002	<0.002		1934.1	0.02	290.9	871.7		3553						0.9	0.07	
Stream	12/29/1981	<1.	89.9		<0.002	<0.002	0.109	782			920	2500	1623				26.8	26.7	1.67	0.2	
Stream	3/19/1982	<1.	168		<0.002	<0.002	0.071	663			688	2100	1380						0.74	0.11	
Stream	9/17/1982	<1.	51.2		2.1	<0.01	0.09	1800			733	3630	2872						1.97	0.36	
Stream	3/10/1983	1	47		2	0.06	0.07	900			967	2000	1464				25.6	25.9	1.9	0.39	
Stream	6/22/1983		132		0.025	0.016	0.19	960		250	988	2750	2039				28.53	28.71	0.22	0.03	
Stream	9/8/1983	<1.	88		0.69	0.01	0.46	590			650	1800	1082				17.81	17.15	4.2	0.19	
Stream	12/29/1983	<1.	106		0.15	<0.01	<0.01	1150			1235	2850	2178				34.23	34.14	0.6	0.09	
Stream	3/15/1984	<1.	82		0.02		<0.01	200		224	425	990	624				11.04	10.97	0.45	0.05	
Stream	6/11/1984	<1.	26		0.11		0.12	80		161	225	575	297				5.34	5.62	0.18	0.02	
Stream	9/13/1984	<1.	59		<0.01		0.07	560		160	710	1510	1113				17.36	16.53	0.4	0.05	
Stream	12/17/1984	<1.	67		0.04		0.11	255		255	500	1025	708				11.93	12.3	0.18	0.03	
Stream	6/5/1985	<1.	98		0.04		0.1	600		180	775	1650	1137				18.76	18.86	0.15	0.03	
Stream	7/22/1985	<1.	80		0.03		0.04	660		156	845	1710	1233				19.89	19.12	0.4	0.08	
Stream	9/26/1985	<1.	88		0.01		0.01	800		161	946	1978	1416				22.55	22.36	0.09	0.07	
Stream	5/21/1986	<1.	19		0.09		0.08	75		129	201	440	256				4.71	4.68	1.22	0.15	
Stream	10/6/1986	<1.	100		0.06		0.06	500		295	805	1600	1104				19.22	19.14	0.14	0.03	
Stream	3/10/1989		70					475		192	685	1370	998				17.24	15.77	0.41	0.03	
Stream	12/26/1989		220					2455		436	2380		4400	<0.2			67.25	66.43	2.34	0.09	
Stream	3/22/1990		180				<0.1	1937		264	1590		3524	17.9	<0.05	<0.05	51.95	51	59.5	0.85	
Stream	5/21/1990		170				<0.1	1943		234	1448		3242	15	0.25	<0.05	48.02	50.24	35	0.43	
Stream	9/21/1990		130					1585		273	1346		2810	<0.2					2.47	0.13	
Stream	11/6/1990		180					2122		282	1866		3668	<0.2					0.92	0.07	
Stream	3/26/1991		175					1935		260	1552		3126	<0.2			48.91	50.74	6.52	0.14	
Stream	6/4/1991		22					181		116	1346		414	20					68.9	1.84	
Stream	9/13/1991		182					1655		250	1540		3480	<0.2			48.34	44.85	2.31	0.14	
Stream	12/11/1991	32	103					1010		272	1040		1892	<0.3					0.55	0.06	
Stream	3/11/1992		22					2118		304	1733		3546	<0.2			50.62	51.17	3.9	0.15	
Stream	5/6/1992	28	160					1949		240	1754		3206	<0.2			48.7	50.21	<0.02	0.02	
Stream	9/3/1992		158					1926		233	1309		3166	<0.2			44.4	49.53	0.54	0.09	
Stream	12/2/1992		187					2173		330	1920		3504	<0.2			56.07	57.47	0.67	0.11	
Stream	6/1/1993	16	88					928		224	860		1608	<0.2			26.57	26.43	0.53	0.04	
Stream	9/7/1993	12	177					2046		98	1425		3324	<0.4			45.89	49.88	<0.02	0.03	
Stream	12/6/1993		100					856		300	882		1750	<0.5			26.31	26.78	1.2	0.05	
Stream	3/7/1994		180					1799		340	1533		3246	<0.7			48.79	49.62	5.1	0.15	
Stream	6/1/1994	40	158					1970		245	1437		3270	<0.1			47.18	50.69	0.25	0.02	
Stream	9/6/1994	16	62					1013		232	551		1690	<0.4			26.59	27.65	0.18	<0.01	
Stream	12/5/1994	10	85	<2.				850		290	840		1600	<0.1					3.2	0.082	
Stream	3/1/1995	30	150					1400		250	1110		2490	<0.5			37.9	38.4	2.2	<0.1	
Stream	6/5/1995	30	15					80		220	380		290	2			8.7	6.5	19.5	0.7	
Stream	9/5/1995	15	93					1208		230	989		2210	<0.5			35.8	32.3	<0.1	<0.1	
Stream	12/4/1995	25	150					1984		300	1653		3270	<0.5			53.9	51.6	0.4	<0.1	
Stream	3/11/1996	4	143					1763		292	1371		2996	<0.5			45.8	46.6	0.08	<0.04	
Stream	6/3/1996	37	133					1486		232	1201		2983	<0.5			42.4	39.3	0.1	<0.1	
Stream	9/3/1996	<5.	91					1220		290	960		2241	<0.5			34	33.8	0.3	0.2	
Stream	12/2/1996	<5.	94					1247		306	968		1812	<0.5			29.4	34.7	0.2	<0.1	
Stream	3/4/1997	<5.	84					772		298	856		1474	<0.5			25.4	24.4	3.5	<0.1	
Stream	6/2/1997	<5.	15					1487		245	1158		2757	<0.5			39.8	36.9	0.1	<0.1	
Stream	9/10/1997	<5.	127					1223		249	1294		2750	<0.5					0.4	0.2	
Stream	12/3/1997	<5.	125					102		284	903		1930	<0.5			26.3	30	0.4	<0.1	
Stream	3/3/1998	<5.	109					1090		283	933		2039	<0.5					2.3	0.1	
Stream	6/1/1998	<5.	153					1517		262	1315		3119	<0.5					0.2	<0.1	

Surface Water Quality Data

Station: 9
Description: Lower Ivie Creek

Type	Date	Carb (mg/l)	Cl (mg/l)	Hydroxide (mg/l)	NO3 (mg/l)	NO2 (mg/l)	O-PO4 (mg/l)	SO4 (mg/l)	T-P (mg/l)	T-Alk (mg/l)	T-Hardns (mg/l)	Lab EC (umhos/cm	TDS (mg/l)	Set Solids (mg/l)	D-Al (mg/l)	D-Mb (mg/l)	T-Cats	T-Anis	T-Fe (mg/l)	T-Mn (mg/l)	COMMENTS
Stream	9/1/1998	13	113					685		264	859		1908	<0.5					2.9	<0.1	
Stream	12/1/1998	<5.	156					1722		293	1606		1512	<0.5					0.1	<0.1	
Stream	3/1/1999	6	202					1617		312	1577		3403	<0.5					<0.1	<0.1	
Stream	6/1/1999	<5.	133					1533		292	1287		2605	<0.4					0.5	<0.1	
Stream	9/7/1999	<5.	149					1628		255	1450		3130	<0.4					0.1	0.2	
Stream	12/6/1999	<5.	100					1069		342	1074		2057	<0.4					0.5	<0.1	
Stream	3/15/2000	8	190					2097		307	1624		3487	<0.4					0.2	<0.1	
Stream	6/5/2000	<5.	220					2247		278	1821		3989	<0.4					1.3	0.3	
Stream	3/9/2001	<5.	124					1320		337	1172		2336	0.4					8.8	0.2	
Stream	6/4/2001	6	170					1838		258	1343		3097	<0.2					<0.1	<0.1	
Stream	9/4/2001	10	211.5					2033		165	1005		3342	<0.1					<0.1	<0.05	
Stream	12/10/2001	<5.	168.4					2246.4		399	1818		3968	<0.1			57.2	59.5	<0.1	0.08	
Stream	5/23/2002	6	195					2435		275	1738		4156	<0.1			59.4	61.7	0.7	<0.05	
Stream	9/23/2002																				
Stream	12/12/2002	<5.	136					1830		302	1194		3199	<0.1					0.2	0.08	
Stream	9/16/2003																				
Stream	12/31/2003																				frozen
Stream	3/10/2004	9	175					1915			1663		3197	2						0.288	
Stream	6/2/2004	< 5.	206					2511		319	1404		3977	< .1					0.39	0.235	
Stream	9/24/2004																				Dry
Stream	12/16/2004																				
Stream	3/25/2005	6	158					1635		323	1381		2938	< .1					0.94	0.071	
Stream	5/16/2005	< 5.	15					137		519	211		385	20					156	3.2	
Stream	7/21/2005	30	28					577		269	521		1171	< .1					0.3	0.01	
Stream	11/15/2005	< 5.	150					1590		304	1356		2948	< .1					0.55	0.041	
Stream	3/15/2006	< 5.	161					1679		329	1655		3189	< .1					0.06	0.087	
Stream	6/22/2006																				
Stream	9/26/2006	22	145					1602		258	1368		3076	< .1					0.23	0.021	
Stream	11/15/2006	< 5.	172					1601		303	1525		3028	< .1					0.36	0.075	
	No. of Obs.:	29	80	0	13	3	19	89	1	73	80	17	89	7	1	2	48	48	81	69	
	Maximum:	40	220	–	2.1	0.06	0.46	2511	0.02	519	2380	3630	4400	20	0.25	<0.05	67.25	66.43	156	3.2	
	Minimum:	0	15	–	0.01	0.01	0	75	0.02	87	186	440	256	0.4	0.25	<0.05	4.71	4.68	0.06	0.01	
	Mean:	17.0	122.8	–	0.41	0.03	0.1	1311.8	0.0	262.8	1162.8	1792.8	2388.2	11.0	0.3	<0.05	34.0	34.4	5.8	0.23	
	Std. Dev.:	11.6	55.5	–	0.75	0.03	0.1	659.5	–	69.9	451.7	827.3	1068.0	9.1	–	–	16.1	16.8	20.2	0.49	
	Equivalent weigh	0.57	3.46					27.31													

Surface Water Quality Data

Station: 10
Description: Upper Ivie Creek

Type	Date	Wat. Temp	F-pH (units)	DO (mg/l)	Fld EC (umhos/cm	Flow (gpm)	L-pH (units)	TSS (mg/l)	O/G (mg/l)	NH3 (mg/l)	D-As (mg/l)	D-B (mg/l)	D-Cd (mg/l)	D-Ca (mg/l)	D-Cu (mg/l)	D-Fe (mg/l)	D-Pb (mg/l)	D-Mg (mg/l)	D-Mn (mg/l)	D-K (mg/l)	D-Se (mg/l)	D-Na (mg/l)	D-Zn (mg/l)	Bicarb (mg/l)	Acidity (mg/l)
Stream	5/22/1980		8		900	45757		4060	1					26		0.25		12		4		6.5		99.06	0
Stream	6/11/1980		8.5		437	4307		55	1																
Stream	7/16/1980		8		1153	99		8	1																
Stream	10/12/1980				2045	90		37	1																
Stream	11/10/1980		8.3		1336	58		4	0					155		0		97		3		200		242.78	
Stream	12/10/1980		8.4		941	449		294	1																
Stream	1/9/1981		8.2		690	449		128	1																
Stream	2/10/1981		8.2		659	673		306	0					80		0.02		51		3		30		191.54	0
Stream	3/17/1981		8.3		1072	1122		298	1																
Stream	4/13/1981						8.5	101.5	<0.5							1.14									
Stream	5/18/1981						8.1	4.5	0.8							0.09								252	
Stream	12/29/1981						8.2	51																323	
Stream	3/19/1982	5.9	8	13.1	2132	21879	7.9	88.5																263	
Stream	9/17/1982						8	4.5																175	
Stream	12/27/1982						7.3	151																305	
Stream	3/15/1983						8	262.5																452	
Stream	6/22/1983						8.15	4																	
Stream	9/8/1983						7.5																	159	
Stream	12/13/1983						8.2	170																293	
Stream	3/15/1984						8.3	396																357	
Stream	6/11/1984						7.8	81																185	
Stream	9/13/1984						7.6	39																201	
Stream	12/17/1984						7.45	77																297	
Stream	6/5/1985						7.7	133																237	
Stream	7/22/1985						7.5	441																220	
Stream	9/26/1985						7.85	15																237	
Stream	5/20/1986						7.4	992																201	
Stream	10/6/1986						7.9	154																241	
Stream	3/10/1989						8	164				0.52		235				245		11		329		263	
Stream	5/30/1989						8.4	2				0.7		257				344		16		478		198	
Stream	9/13/1989							2						255		0.03		418	0.03	10		524		234	
Stream	3/22/1990							4200	<1.	<0.05	0.001	0.11	<0.005	137	<0.01	0.03	<0.02	99	0.01	3	<0.001	98	<0.01	216	
Stream	5/21/1990							14	<1.	0.05	0.001	0.29	0.017	253	<0.01	0.08	<0.02	220	0.05	5	<0.001	244	<0.01	303	
Stream	9/21/1990							168						133		0.06		52	<0.01	5		58		165	
Stream	11/6/1990							<2.						450		<0.02		653	0.1	13		662		1360	
Stream	3/26/1991							6						315		0.13		434	0.13	12		454		368	
Stream	6/4/1991							1430						40		0.35		13	<0.01	3		11		100	
Stream	9/13/1991							148						276		<0.02		285	<0.01	10		364		184	
Stream	12/11/1991							44						135		0.24		97	0.03	4		83		260	
Stream	3/11/1992							48						250		<0.02		260	<0.01	13		230		304	
Stream	5/6/1992							8						302		<0.02		435	0.03	11		446		280	
Stream	9/3/1992							46						432		<0.02		723	0.03	18		801		372	
Stream	12/2/1992							106						567		<0.02		852	0.27	18		930		624	
Stream	6/1/1993							18						131		0.22		95	0.06	4		94		220	
Stream	9/7/1993							4						147		<0.02		102	<0.01	4		79		72	
Stream	12/6/1993							10						103		0.08		52	0.03	3		35		278	
Stream	3/7/1994	6.7	8.5		1020	22		20						120		0.03		70		3		72		208	
Stream	6/1/1994	14.2	7.7		6500	449		10						392		0.22		642	0.02	16		670		315	
Stream	12/5/1994	4.1	8.5		460			34						72		0.02				2.1		23		250	
Stream	3/1/1995	7.6	8.8		820	27		<10.						107		<0.1		60	<0.1	3		60		200	
Stream	6/5/1995	10.5	9		460	19523		770						28		0.3		8	<0.1	1		6		130	
Stream	9/5/1995	18.4	7.1		1690			<5.						136		<0.1		92	<0.1	5		92		200	
Stream	12/4/1995	5.5	7.2		4890	188		10						361		<0.1		539	<0.1	13		685		450	
Stream	3/11/1996	10.8	7.5		4400	121		13						293		<0.03		375	<0.04	9.1		389		461	<7.
Stream	6/3/1996	19.3	8.1		5790	36		<5.						274		<0.1		389	<0.1	9		460		351	
Stream	12/2/1996	3.2	8.8		710			30						88		<0.1		45	<0.1	3		32		326	
Stream	3/4/1997	2	8.2		680	718		14						91		<0.1		45	<0.1	2		40		315	
Stream	6/2/1997	21.1	8.2		1430	525		<5.						114		<0.1		64	<0.1	3		64		262	
Stream	9/10/1997	16.7	7.6		1980	251		9						206		<0.1		74	0.2	5		80		302	
Stream	12/3/1997	2	7.2		1360	696		32						105		<0.1		61	<0.1	3		45		370	
Stream	3/3/1998	2.2	7.5		1170	561		518						78		<0.1		43	<0.1	2		47		302	<10.
Stream	6/1/1998	19.3	7.9		1540	521		<4.						132		<0.1		77	<0.1	3		62		256	<10.
Stream	9/1/1998	18	7.8		1870	22		21						145		<0.1		80	<0.1	4		111		250	<10.
Stream	12/1/1998	4.1	7.3		2050	90		20						181		<0.1		98	<0.1	4		78		305	<10.
Stream	3/1/1999	7.4	7.2		1760	99		48						157		<0.1		85	<0.1	3		84		296	<10.
Stream	6/1/1999	15.5	8		1690	673		<5.						150		<0.1		87	<0.1	4		68		259	<10.

Surface Water Quality Data

Station: 10
Description: Upper Ivie Creek

Type	Date	Wat. Temp	F-pH (units)	DO (mg/l)	Fld EC (umhos/cm	Flow (gpm)	L-pH (units)	TSS (mg/l)	O/G (mg/l)	NH3 (mg/l)	D-As (mg/l)	D-B (mg/l)	D-Cd (mg/l)	D-Ca (mg/l)	D-Cu (mg/l)	D-Fe (mg/l)	D-Pb (mg/l)	D-Mg (mg/l)	D-Mn (mg/l)	D-K (mg/l)	D-Se (mg/l)	D-Na (mg/l)	D-Zn (mg/l)	Bicarb (mg/l)	Acidity (mg/l)
Stream	9/7/1999	15.9	8.1		2020	180		13						196		<0.1		92	0.2	4		77		265	<10.
Stream	12/6/1999	1	7.3		1870	0		34						105		<0.1		52	<0.1	3		41		355	<10.
Stream	3/15/2000	8.5	7.7		1690	135		<5.						140		<0.1		79	<0.1	3		83		289	<10.
Stream	6/5/2000	18.5	7.8		1880	36		<5.						177		<0.1		90	<0.1	4		96		256	<10.
Stream	3/9/2001	3.8	7		1740	269		26						133		<0.1		68	<0.1	3		119		297	<5.
Stream	6/4/2001	13.4	7.3		1710	628		<5.						153		<0.1		88	<0.1	4		79		276	<5.
Stream	9/4/2001	17.1	8		1830	224		<5.						137		<0.1		96	<0.05	4		98		196	<5.
Stream	12/10/2001	1.1	7.4		1970	0		<5.						167		<0.1		95	<0.05	3		83		347	<5.
Stream	3/6/2002	1.3	7.2		1790	0.49		30						157		<0.1		84	<0.05	3		76		312	<5.
Stream	5/23/2002	9.2	7.3		4810	0.23		<5.	<2.					217		<0.1		291	<0.05	9		562		362	<5.
Stream	6/5/2002	17	6.9		2110	0.07		18						186		<0.1		101	0.08	4		110		288	<5.
Stream	9/23/2002					0																			
Stream	12/12/2002	2.4	7.9		2060	0.33		25						135		<0.1		80	<0.05	3		78		468	<5.
Stream	9/16/2003	20.5	8.3		1640	0.01		< 5.						125		< .01		92.3	< .005	4.22		84.2		211	< 5.
Stream	12/31/2003					0																			
Stream	3/10/2004	4.8	8.4		1630	449		37						146		< .03		75.8	0.058	3.22		81.6		287	< 5.
Stream	6/2/2004	14.9	8.4		1730	0.3		< 5.						151		0.06		93.3	0.014	3.63		89.5		214	< 5.
Stream	9/24/2004					0																			
Stream	12/16/2004					0																			
Stream	3/25/2005	6.1	8.8		2050	241		< 5.						177		< .03		98.5	0.03	2.75		111		244	< 5.
Stream	5/16/2005	16	8.5		3710	1.9		22						163		< .03		209	< .002	5.51		510		353	< 5.
Stream	7/21/2005	25.2	8.2		2140	0.87		< 5.						198		< .03		104	0.003	5.09		113		210	< 5.
Stream	11/15/2005	0.2	8.6		1700	0.5		< 5.						164		< .03		96.9	0.032	4.22		77.5		254	< 5.
Stream	3/15/2006	2	8.5		1797	545		73						175		< .03		84.9	0.049	3.06		79.5		234	< 5.
Stream	6/22/2006	21.4	8.4		1804	0.21		12						151		< .03		106	0.002	4.17		93.7		168	< 5.
Stream	9/26/2006	10.2	9.2		3560	185		12						115.91		< .03		79.53	0.008	3.39		65.71		184	< 5.
Stream	11/15/2006	0.9	7.8		1890	0.39		18						156.39		< .03		83.35	0.057	3.55		118.01		276	< 5.
	No. of Obs.:	44	52	1	53	54	21	70	5	2	2	4	2	64	2	19	13	63	24	64	0	64	0	81	2
	Maximum:	25.2	9.2	13.1	6500	45757.2	8.5	4200	1	0.05	0.001	0.7	0.017	567	<0.01	1.14	0	852	0.27	18	–	930	–	1360	0
	Minimum:	0.2	6.9	13.1	437	0	7.3	2	<0.5	<0.05	0.001	0.11	<0.005	26	<0.01	0	<0.01	8	0.002	1	–	6	–	72	0
	Mean:	10.1	8.0	13.1	1939.0	1894.5	7.9	237.8	–	–	0.001	0.41	–	180.2	<0.01	0.2	–	171.6	0.1	5.6	–	191.4	–	283	0.0
	Std. Dev.:	7.2	0.6	–	1281.7	7248.0	0.3	712.3	–	–	0.000	0.26	–	100.6	–	0.3	–	186.8	0.1	4.2	–	219.5	–	149	0.0
	Equivalent weights of means:													8.99				14.12		0.14		8.33		4.63	

Surface Water Quality Data

Station: 10
Description: Upper Ivie Creek

Type	Date	Carb (mg/l)	Cl (mg/l)	Hydroxide (mg/l)	NO3 (mg/l)	NO2 (mg/l)	O-PO4 (mg/l)	SO4 (mg/l)	T-P (mg/l)	T-Alk (mg/l)	T-Hardns (mg/l)	Lab EC (umhos/cm	TDS (mg/l)	Set Solids (mg/l)	D-Al (mg/l)	D-Mb (mg/l)	T-Cats	T-Anis	T-Fe (mg/l)	T-Mn (mg/l)	COMMENTS
Stream	5/22/1980	0	16				0.08	23		82	136		160						11	0.9	
Stream	6/11/1980							66					268						1.47	0.03	
Stream	7/16/1980							387					952						0.71	0.01	
Stream	10/12/1980							1310					1620						0.6	0.07	
Stream	11/10/1980	23.04	135				0	775		239	873		1296				24.49	24.71	0.11	0.06	
Stream	12/10/1980							280					910						0.37	0.02	
Stream	1/9/1981							220					584						0.6	0.03	
Stream	2/10/1981	38.46	43				0	147		221	407		576				9.57	8.71	1.11	0.02	
Stream	3/17/1981							137					614						1.76	0.27	
Stream	4/13/1981							164.6					435						4.36	0.12	
Stream	5/18/1981	<1.	100		<0.002	<0.002		543.2	0.02	252	639.8		1068						0.36	0.08	
Stream	12/29/1981	<1.	47.7		<0.002	<0.002	0.048	346			518	810	640				12.9	14.7	0.85	0.17	
Stream	3/19/1982	<1.	142		<0.002	<0.002	0.113	325			586	1020	811				18.3	15.7	2.54	0.24	
Stream	9/17/1982	<1.	54		0.021	<0.01	0.09	600			554	1310	1030						2.00	0.17	
Stream	12/27/1982	<1.	105		<0.01	<0.01	0.07	650			673	2370	1342				22	22.6	0.76	0.0001	
Stream	3/15/1983	<1.	278		0.026	<0.01	0.03	1650			1719	6100	5647				54.6	51.3	2.25	0.34	
Stream	6/22/1983		68		0.046	0.015	0.24	240		204	519	1200	786				11.63	11.00	0.10	0.02	
Stream	9/8/1983	<1.	103		0.95	0.05	0.43	1600			1240	3500	2464				39.46	38.81	0.96	1.05	
Stream	12/13/1983	<1.	45		0.15		<0.01	220		240	475	1000	583				11.14	10.67	0.54	0.07	
Stream	3/15/1984	<1.	106		0.02		<0.01	1100		293	1130	2500	1896				30.68	31.7	1.43	0.18	
Stream	6/11/1984	<1.	43		<0.01		0.11	310		185	451	1175	716				12.19	11.37	0.30	0.03	
Stream	9/13/1984	<1.	154		<0.01		0.06	2100		201	1810	3900	3406				51.63	52.09	0.54	0.03	
Stream	12/17/1984	<1.	107		0.04		0.11	900		297	1020	2250	1792				28.49	27.7	0.11	0.05	
Stream	6/5/1985	<1.	162		0.04		0.07	1425		237	1320	3200	2466				39.02	38.98	0.73	0.09	
Stream	7/22/1985	<1.	141		0.03		0.03	1600		220	1440	3200	2484				39.52	41.69	1.50	0.12	
Stream	9/26/1985	<1.	163		0.04		0.04	2100		237	1818	4532	3580				53.91	53.06	0.07	0.09	
Stream	5/20/1986	<1.	59		0.06		0.1	510		201	608	1450	972				16.14	16.31	0.86	0.19	
Stream	10/6/1986	<1.	245		0.06		0.11	2100		241	1920	4050	3471				56.35	55.46	0.27	0.1	
Stream	3/10/1989		146					1745		263	1592	3400	3102				46.6	45.99	3.07	0.09	
Stream	5/30/1989		250					2470		198	2053	4170	4234				62.51	62.83	0.18	0.03	
Stream	9/13/1989		230					2758		234	2351		4302	0.1			70.34	69.04	0.13	0.03	
Stream	3/22/1990		82				<0.1	537		216	748		1110	<0.2	0.09	<0.05	19.36	17.89	5.45	0.1	
Stream	5/21/1990		200				<0.1	1511		303	1535		2668	<0.3	<0.05	<0.05	41.56	43.39	0.28	0.08	
Stream	9/21/1990		52					372		165	546		848	<0.2					3.7	0.08	
Stream	11/6/1990		440					2725		1360	4183		8112	<0.2					0.08	0.1	
Stream	3/26/1991		285					3046		368	2567		4644	<0.2			71.63	79.31	0.37	0.19	
Stream	6/4/1991		23					54		100	912		242	15					41.9	1.19	
Stream	9/13/1991		256					1844		184	1965		3780	<0.2			53.45	49.57	0.97	0.06	
Stream	12/11/1991	24	67					475		284	758		1058	<0.3					0.59	0.04	
Stream	3/11/1992		19					1620		304	1727		2838	<0.2			44.28	40.63	0.83	0.11	
Stream	5/6/1992	36	330					2826		316	2737		5118	<0.2			70.68	74.91	<0.02	0.03	
Stream	9/3/1992		546					4404		372	3784		8104	<0.2			116.6	115.21	0.02	0.03	
Stream	12/2/1992		592					5495		624	5061		8580	<0.2			139.6	144.45	0.89	0.26	
Stream	6/1/1993		74					615		220	706		1142	<0.2			18.58	19.39	1.34	0.06	
Stream	9/7/1993	8	99					722		80	831		1286	<0.4			19.29	19.53	0.18	<0.01	
Stream	12/6/1993		54					152		278	471		628	<0.5			11.03	10.26	0.36	0.04	
Stream	3/7/1994		88					428		208	649		1076	<0.7			14.99	15.61	0.3		
Stream	6/1/1994	30	393					4528		345	3864		7252	<0.1			102.14	112.99	0.4	0.02	
Stream	12/5/1994	10	38	<2.				140		260	400		480	<0.1					1	0.042	
Stream	3/1/1995	25	68					360		205	530		830	<0.5			13.2	13.5	0.2	<0.1	
Stream	6/5/1995	10	7					13		120	190		90	1.5			4.1	2.9	9	0.3	
Stream	9/5/1995	10	103					788		180	832		1290	<0.5			20.8	22.9	0.1	<0.1	
Stream	12/4/1995	25	64					3898		410	3623		5900	<0.1			103	91.2	0.4	<0.1	
Stream	3/11/1996	<2.	238					2414		378	2387		4380	0.5			67	64.5	0.21	<0.04	
Stream	6/3/1996	20	307					2493		322	2489		4760	<0.5			71.1	67	0.3	<0.1	
Stream	12/2/1996	<5.	48					184			451		595	<0.5			10.6	10.5	0.6	<0.1	
Stream	3/4/1997	<5.	55					201		259	454		640	<0.5			10.9	10.9	0.3	<0.1	
Stream	6/2/1997	<5.	89					476		215	605		960	<0.5			15.2	16.7	0.2	<0.1	
Stream	9/10/1997	<5.	88					837		248	901		1520	<0.5					0.2	0.3	
Stream	12/3/1997	<5.	65					324		303	513		820	<0.5			12.3	14.6	0.5	0.1	
Stream	3/3/1998	<5.	77					140		248	372		627	1.5					5.9	0.2	
Stream	6/1/1998	9	75					437		226	647		1127	<0.5					0.2	<0.1	
Stream	9/1/1998	<5.	148					345		205	692		1266	<0.5					0.3	<0.1	
Stream	12/1/1998	<5.	100					643		294	856		1411	<0.5					0.5	<0.1	
Stream	3/1/1999	<5.	80					508		243	742		1256	<0.5					0.5	<0.1	
Stream	6/1/1999	<5.	78					667		212	732		1242	<0.4					0.1	<0.1	

Surface Water Quality Data

Station: 10
Description: Upper Ivie Creek

Type	Date	Carb (mg/l)	Cl (mg/l)	Hydroxide (mg/l)	NO3 (mg/l)	NO2 (mg/l)	O-PO4 (mg/l)	SO4 (mg/l)	T-P (mg/l)	T-Alk (mg/l)	T-Hardns (mg/l)	Lab EC umhos/cm	TDS (mg/l)	Set Solids (mg/l)	D-Al (mg/l)	D-Mb (mg/l)	T-Cats	T-Anis	T-Fe (mg/l)	T-Mn (mg/l)	COMMENTS
Stream	9/7/1999	<5.	92					748		217	868		1533	<0.4					0.4	<0.1	
Stream	12/6/1999	6	56					239		302	476		726	<0.4					0.6	<0.1	
Stream	3/15/2000	<5.	88					589		237	675		1185	<0.4					0.3	<0.1	
Stream	6/5/2000	<5.	79					513		210	813		1437	<0.4					0.5	<0.1	
Stream	3/9/2001	<5.	121					553		244	612		1162	<0.4					0.7	<0.1	
Stream	6/4/2001	<5.	97					607		229	744		1208	<0.2					0.2	<0.1	
Stream	9/4/2001	7	124.8					706		173	737		1346	<0.1			12.7	13.5	0.2	<0.05	
Stream	12/10/2001	<5.	83.5					588.2		285	808		1337	<0.1			19.8	20.3	0.3	0.05	
Stream	3/6/2002	<5.	94					598		256	738		1229	<0.1					0.6	0.06	
Stream	5/23/2002	<5.	203					2388		297	1740		4130	<0.1			59.4	61.4	0.8	0.06	
Stream	6/5/2002	<5.	116					732		236	880		1571	<0.1					0.7	0.09	
Stream	9/23/2002																				
Stream	12/12/2002	<5.	90					597		225	667		1215	<0.1					0.5	<0.05	
Stream	9/16/2003	6	102					576		182	692		1156	< .1			17.6	18.5	0.089	< .005	
Stream	12/31/2003																				frozen
Stream	3/10/2004	< 5.	103					510			677		1089	< .1						0.067	
Stream	6/2/2004	< 5.	120					700		214	761		1295	< .1					0.49	0.032	
Stream	9/24/2004																				Dry
Stream	12/16/2004																				
Stream	3/25/2005	< 5.	133					742		244	848		1447	< .1					0.36	0.038	
Stream	5/16/2005	< 5.	139					1611		353	1268		2967	< .1					0.44	0.01	
Stream	7/21/2005	< 5.	153					38		215	923		1671	< .1					0.88	0.031	
Stream	11/15/2005	< 5.	90					510		254	809		1202	< .1				18.2	0.31	0.032	
Stream	3/15/2006	< 5.	96					553		234	787		1218	0.3					1.21	0.065	
Stream	6/22/2006	< 5.	101					551		168	814		1347	< .1					0.4	0.003	
Stream	9/26/2006	11	85					435		195	617		1004	< .1					0.17	0.008	
Stream	11/15/2006	< 5.	155					453		276	734		1218	< .1					0.39	0.057	
	No. of Obs.:	18	82	0	12	2	18	89	1	74	82	19	89	6	13	2	48	49	87	65	
	Maximum:	38.46	592	–	0.95	0.05	0.43	5495	0.02	1360	5061	6100	8580	15	0.09	<0.05	139.6	144.45	41.9	1.19	
	Minimum:	0	7	–	0.02	0.015	0	13	0.02	80	136	810	90	0.1	<0.05	<0.05	4.1	2.9	0.02	0.0001	
	Mean:	16.6	131.6	–	0.1	0.03	0.10	1017.5	0.02	261.4	1159	2691	1973	3.2	–	<0.05	39.0	38.7	1.50	0.13	
	Std. Dev.:	11.3	108.1	–	0.3	0.02	0.10	1091.1	–	150.5	956	1485	1856	5.8	–	–	31.2	31.4	4.72	0.22	
	Equivalent weight	0.55	3.71					21.19													

APPENDIX VI-10

Groundwater Monitoring –
Water Level Data

Emery Water Level Data - Qal

Well RDA1			Well RDA2			Well RDA3			Well RDA4			Well RDA5		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
4/29/1982	17.30	5941.2	4/29/1982	17.20	5938.5	4/29/1982	23.05	5923.5	4/29/1982			4/29/1982	19.6	5922.8
6/16/1982	16.08	5942.4	6/16/1982	20.00	5935.7	6/16/1982	22.92	5923.6	6/16/1982			6/16/1982	19.75	5922.7
7/26/1982	18.17	5940.3	7/26/1982	20.50	5935.2	7/26/1982	26.00	5920.5	7/26/1982			7/26/1982	22.5	5919.9
8/24/1982	15.58	5942.9	8/24/1982	20.67	5935.0	8/24/1982	23.60	5922.9	8/24/1982			8/13/1982	20.3	5922.1
9/21/1982	15.42	5943.1	9/21/1982	17.75	5938.0	9/21/1982	23.50	5923.0	9/21/1982			9/21/1982	20	5922.4
10/13/1982	17.42	5941.1	10/13/1982	15.67	5940.0	10/13/1982	24.67	5921.8	10/13/1982			10/13/1982	20.50	5921.9
11/19/1982	16.25	5942.3	11/19/1982	17.25	5938.5	11/19/1982	23.00	5923.5	11/19/1982			11/19/1982	20.50	5921.9
12/9/1982	16.16	5942.3	12/9/1982	16.92	5938.8	12/9/1982	22.92	5923.6	12/9/1982			12/9/1982	20.66	5921.7
1/19/1983	16.42	5942.1	1/19/1983	16.92	5938.8	1/19/1983	22.75	5923.8	1/19/1983			1/19/1983	20.42	5922.0
2/17/1983	16.67	5941.8	2/17/1983	17.00	5938.7	2/17/1983	22.92	5923.6	2/17/1983			2/17/1983	20.67	5921.7
3/8/1983	16.58	5941.9	3/8/1983	17.00	5938.7	3/8/1983	22.58	5923.9	3/8/1983			3/8/1983		
4/12/1983	16.75	5941.8	4/12/1983	16.83	5938.9	4/12/1983	22.66	5923.8	4/12/1983			4/12/1983	19.50	5922.9
5/26/1983	16.40	5942.1	5/26/1983	17.00	5938.7	5/26/1983	22.40	5924.1	5/26/1983			5/5/1983	14.75	5927.7
6/7/1983	17.50	5941.0	6/7/1983	17.00	5938.7	6/7/1983	22.50	5924.0	6/7/1983			6/17/1983	19.75	5922.7
7/19/1983	15.83	5942.7	7/19/1983	17.67	5938.0	7/19/1983	22.83	5923.7	7/19/1983			7/19/1983		
8/17/1983	15.70	5942.8	8/17/1983	18.20	5937.5	8/17/1983	22.80	5923.7	8/17/1983			8/17/1983	19.50	5922.9
9/1/1983	15.80	5942.7	9/1/1983	17.60	5938.1	9/1/1983	23.00	5923.5	9/1/1983			9/1/1983	19.75	5922.7
12/6/1983	17.00	5941.5	12/6/1983	17.40	5938.3	12/6/1983	23.00	5923.5	12/6/1983			12/6/1983	20.20	5922.2
3/7/1984	16.10	5942.4	3/17/1984	16.70	5939.0	3/17/1984	22.70	5923.8	3/17/1984			3/17/1984	20.30	5922.1
6/12/1984	15.40	5943.1	6/12/1984	17.00	5938.7	6/12/1984		5924.2	6/12/1984		5922.3	6/12/1984		5922.7
9/11/1984	15.00	5943.5	9/11/1984	16.50	5939.2	9/11/1984		5923.9	9/11/1984		5922.2	9/11/1984		5922.6
12/6/1984	15.00	5943.5	12/6/1984	15.80	5939.9	12/6/1984			12/6/1984			12/6/1984	20.00	5922.4
1/29/1985		5943.5	1/29/1985	15.90	5939.8	1/29/1985		5924.5	1/29/1985		5922.9	1/29/1985		5921.9
4/3/1985	15.40	5943.1	4/3/1985	15.60	5940.1	4/3/1985	15.20	5931.3	4/3/1985	21.8	5922.2	4/3/1985	21.00	5921.4
9/3/1985		5940.7	9/3/1985		5940.7	9/3/1985		5923.3	9/3/1985		5921.0	9/3/1985		5921.4
12/16/1985		5943.4	12/16/1985		5939.8	12/16/1985		5924.0	12/16/1985		5922.1	12/16/1985		5921.8
3/12/1986		5943.1	3/12/1986		5940.5	3/12/1986		5923.5	3/12/1986		5921.8	3/12/1986		5921.6
6/25/1986		5944.5	6/25/1986		5940.4	6/25/1986		5924.5	6/25/1986		5920.2	6/25/1986		5921.4
9/30/1986		5947.4	9/30/1986		5940.3	9/30/1986		5923.3	9/30/1986		5921.5	9/30/1986		5922.2
12/18/1986		5946.5	12/18/1986		5941.6	12/18/1986		5923.8	12/18/1986		5923.9	12/18/1986		5921.7
3/31/1987	15.60	5942.9	3/31/1987	15.50	5940.2	3/31/1987	23.10	5923.4	3/31/1987	19.30	5924.7	3/31/1987	21.90	5920.5
6/10/1987	14.00	5944.5	6/10/1987	14.40	5941.3	6/10/1987	15.30	5931.2	6/10/1987	21.80	5922.2	6/10/1987	21.20	5921.2
9/17/1987	17.20	5941.3	9/17/1987	14.60	5941.1	9/17/1987	22.30	5924.2	9/17/1987	21.60	5922.4	9/17/1987	19.80	5922.6
12/16/1987	13.20	5945.3	12/16/1987	13.70	5942.0	12/16/1987	22.40	5924.1	12/16/1987	21.30	5922.7	12/16/1987	21.00	5921.4
2/17/1988		5945.5	2/17/1988		5942.2	2/17/1988		5925.5	2/17/1988		5923.0	2/17/1988		5923.4
6/8/1988		5945.0	6/8/1988		5941.5	6/8/1988		5924.1	6/8/1988		5922.5	6/8/1988		5922.6
9/26/1988		5944.0	9/26/1988		5938.7	9/26/1988		5925.5	9/26/1988		5923.5	9/26/1988		5924.9
12/19/1988		5944.6	12/19/1988		5941.4	12/19/1988		5923.7	12/19/1988		5922.2	12/19/1988		5922.1
3/1/1989	14.70	5943.5	3/1/1989	14.50	5941.2	3/1/1989	22.90	5923.6	3/1/1989	21.9	5922.1	3/1/1989	20.70	5921.7
5/19/1989	15.00	5943.5	5/19/1989	15.00	5940.7	5/19/1989	23.30	5923.2	5/19/1989	22.0	5922.0	5/19/1989	20.40	5922.0
9/1/1989	15.20	5943.5	9/1/1989	15.00	5940.7	9/1/1989	23.40	5923.1	9/1/1989	22.5	5921.5	9/1/1989	20.60	5921.8
12/1/1989	14.80		12/1/1989	15.40	5940.3	12/1/1989	22.30	5924.2	12/1/1989	20.5	5923.5	12/1/1989	20.40	5922.0
3/1/1990	15.20	5943.3	3/1/1990	15.20	5940.5	3/1/1990	22.00	5924.5	3/1/1990	21.2	5922.8	3/1/1990	20.40	5922.0
6/4/1990	11.30	5947.2	6/4/1990	15.10	5940.6	6/4/1990	22.40	5924.1	6/4/1990	21.50	5922.5	6/4/1990	20.00	5922.4
9/1/1990	15.70	5942.8	9/1/1990	16.10	5939.6	9/1/1990	23.30	5923.2	9/1/1990	22.00	5922.0	9/1/1990	20.40	5922.0

Emery Water Level Data - Qal

Well RDA1			Well RDA2			Well RDA3			Well RDA4			Well RDA5		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
11/1/1990	15.90	5942.6	11/1/1990	16.00	5939.7	11/1/1990	22.60	5923.9	11/1/1990	21.80	5922.2	11/1/1990	20.70	5921.7
3/1/1991	15.70	5942.8	3/1/1991	15.5	5940.2	3/1/1991	21.90	5924.6	3/1/1991	21	5923.0	3/1/1991	19.9	5922.5
6/6/1991		5943.5	6/6/1991		5939.0	6/6/1991		5924.7	6/6/1991		5923.1	6/5/1991		5923.2
9/19/1991		5943.1	9/19/1991		5937.7	9/19/1991		5924.1	9/19/1991		5922.7	9/19/1991		5922.8
12/1/1991	15.50	5943.0	12/1/1991	15.7	5940.0	12/1/1991	21.30	5925.2	12/1/1991	20.6	5923.4	12/1/1991	20	5922.4
3/1/1992	15.70	5942.8	3/1/1992	15.4	5940.3	3/1/1992	21.00	5925.5	3/1/1992	20	5924.0	3/1/1992	19.1	5923.3
5/26/1992	16.00	5942.5	5/26/1992	15.90	5939.8	5/26/1992	16.20	5930.3	5/26/1992	20.1	5923.9	5/26/1992	18.80	5923.6
9/2/1992	15.20	5943.3	9/2/1992	16.10	5939.6	9/2/1992	21.50	5925.0	9/2/1992	20.50	5923.5	9/2/1992	19.00	5923.4
12/1/1992	15.20	5943.3	12/1/1992	15.50	5940.2	12/1/1992	21.00	5925.5	12/1/1992	20.2	5923.8	12/1/1992	19.50	5922.9
3/1/1993	15.20	5943.3	3/1/1993	15.20	5940.5	3/1/1993	20.50	5926.0	3/1/1993	19.5	5924.5	3/1/1993	18.50	5923.9
6/4/1993		5943.2	6/4/1993		5940.0	6/4/1993		5926.2	6/4/1993		5924.7	6/4/1993		5924.8
9/9/1993		5942.7	9/9/1993		5938.6	9/9/1993		5924.5	9/9/1993		5923.2	9/9/1993		5923.4
12/1/1993	15.00	5943.5	12/1/1993	15.30	5940.4	12/1/1993	21.00	5925.5	12/1/1993	20.0	5924.0	12/1/1993	19.00	5923.4
3/1/1994	15.00	5943.5	3/1/1994	15.10	5940.6	3/1/1994	20.30	5926.2	3/1/1994	19.6	5924.4	3/1/1994	18.50	5923.9
6/6/1994		5943.7	6/6/1994		5940.4	6/6/1994		5925.3	6/6/1994		5924.0	6/6/1994		5923.9
9/8/1994		5943.6	9/8/1994		5940.2	9/8/1994		5925.1	9/8/1994		5923.8	9/8/1994		5923.7
12/1/1994	15.30	5943.2	12/1/1994	15.80	5939.9	12/1/1994	21.20	5925.3	12/1/1994	20.0	5924.0	12/1/1994	18.60	5923.8
3/1/1995	15.40	5943.1	3/1/1995	15.60	5940.1	3/1/1995	20.80	5925.7	3/1/1995	19.8	5924.2	3/1/1995	19.60	5922.8
6/6/1995	14.30	5944.2	6/6/1995	15.60	5940.1	6/6/1995	20.60	5925.9	6/6/1995	19.7	5924.3	6/6/1995	18.40	5924.0
9/1/1995	13.80	5944.7	9/1/1995	15.50	5940.2	9/1/1995	21.50	5925.0	9/1/1995	20.2	5923.8	9/1/1995	18.40	5924.0
12/1/1995	13.10	5945.4	12/1/1995	14.60	5941.1	12/1/1995	20.50	5926.0	12/1/1995	19.6	5924.4	12/1/1995	18.70	5923.7
3/1/1996	13.90	5944.6	3/1/1996	14.40	5941.3	3/1/1996	20.70	5925.8	3/1/1996	19.7	5924.3	3/1/1996	18.20	5924.2
6/1/1996	12.70	5945.8	6/1/1996	14.30	5941.4	6/1/1996	20.80	5925.7	6/1/1996	19.7	5924.3	6/1/1996	18.00	5924.4
9/1/1996	12.70	5945.8	9/1/1996	14.70	5941.0	9/1/1996	22.50	5924.0	9/1/1996	21.4	5922.6	9/1/1996	19.30	5923.1
12/31/1996	13.20	5945.3	12/31/1996	14.30	5941.4	12/31/1996	21.10	5925.4	12/31/1996	20.0	5924.0	12/31/1996	18.80	5923.6
3/1/1997	13.60	5944.9	3/1/1997	14.00	5941.7	3/1/1997	20.60	5925.9	3/1/1997	19.5	5924.5	3/1/1997	18.30	5924.1
6/1/1997	12.40	5946.1	6/1/1997	14.30	5941.4	6/1/1997	20.30	5926.2	6/1/1997	18.9	5925.1	6/1/1997	17.20	5925.2
9/1/1997	11.10	5947.4	9/1/1997	13.30	5942.4	9/1/1997	19.40	5927.1	9/1/1997	18.3	5925.7	9/1/1997	17.00	5925.4
12/1/1997	11.70	5946.8	12/1/1997	13.10	5942.6	12/1/1997	18.90	5927.6	12/1/1997	17.9	5926.1	12/1/1997	16.50	5925.9
3/1/1998	13.70	5944.8	3/1/1998	13.20	5942.5	3/1/1998	18.80	5927.7	3/1/1998	18.0	5926.0	3/1/1998	17.00	5925.4
6/1/1998		5945.6	6/1/1998		5942.1	6/1/1998		5927.4	6/1/1998		5926.0	6/1/1998		5925.8
9/15/1998		5945.1	9/15/1998		5941.5	9/15/1998		5926.7	9/15/1998		5925.7	9/15/1998		5925.4
12/1/1998	13.30	5945.2	12/1/1998	13.70	5942.0	12/1/1998	19.30	5927.2	12/1/1998	19.4	5924.6	12/1/1998	17.10	5925.3
3/1/1999	13.60	5944.9	3/1/1999	13.50	5942.2	3/1/1999	19.10	5927.4	3/1/1999	19.0	5925.0	3/1/1999	17.20	5925.2
6/1/1999	13.20	5945.3	6/1/1999	13.10	5942.6	6/1/1999	19.30	5927.2	6/1/1999	18.0	5926.0	6/1/1999	16.90	5925.5
9/1/1999	14.80	5943.7	9/1/1999	15.30	5940.4	9/1/1999	20.50	5926.0	9/1/1999	18.8	5925.2	9/1/1999	17.40	5925.0
12/1/1999	14.90	5943.6	12/1/1999	15.30	5940.4	12/1/1999	20.60	5925.9	12/1/1999	18.7	5925.3	12/1/1999	16.40	5926.0
3/23/2000		5944.0	3/23/2000		5941.4	3/23/2000		5926.3	3/23/2000		5925.5	3/23/2000		5924.7
6/1/2000			6/1/2000			6/1/2000			6/1/2000			6/1/2000		
9/21/2000		5943.6	9/21/2000		5940.2	9/21/2000		5925.9	9/21/2000		5924.5	9/21/2000		5924.1
12/31/2000	15.0	5943.5	12/31/2000	15.3	5940.4	12/31/2000	20.5	5926.0	12/31/2000	19.1	5924.9	12/31/2000	18.2	5924.2
9/18/2003	18.0	5940.5	9/18/2003	18	5937.7	9/18/2003	21.4	5925.1	9/18/2003	20	5924.0	9/18/2003	18.5	5923.9
12/23/2003	18.0	5940.5	12/23/2003	18	5937.7	12/23/2003	22	5924.5	12/1/2003	21.2	5922.8	12/23/2003	18	5924.4

Emery Water Level Data - Qal

Well RDA1			Well RDA2			Well RDA3			Well RDA4			Well RDA5		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
3/29/2004	17.1	5941.4	3/29/2004	17.3	5938.4	3/29/2004	19.8	5926.7	3/29/2004	17.4	5926.6	3/29/2004	16.9	5925.5
6/2/2004	17.1	5941.4	6/2/2004	17	5938.7	6/2/2004	21	5925.5	6/2/2004	17.4	5926.6	6/2/2004	16.3	5926.1
9/23/2004	18.3	5940.3	9/24/2004	18.75	5937.0	9/23/2004	20.9	5925.6	9/23/2004	20.75	5923.3	9/23/2004	19.8	5922.6
12/27/2004	18.0	5940.5	12/27/2004	17.7	5938.0	12/27/2004	21	5925.5	12/27/2004	20	5924.0	12/27/2004	20.4	5922.0
3/24/2005	17.9	5940.6	3/24/2005	17.5	5938.2	3/24/2005	20.5	5926.0	3/24/2005	19.6	5924.4	3/24/2005	19.5	5922.9
5/12/2005	18.0	5940.5	5/13/2005	17.5	5938.2	5/13/2005	20.5	5926.0	5/13/2005	19.2	5924.8	5/13/2005	19	5923.4
7/9/2005	18.4	5940.1	7/9/2005	18.3	5937.4	7/9/2005	21.3	5925.2	7/9/2005	19.8	5924.2	7/9/2005	19	5923.4
11/22/2005	18.5	5940.0	11/22/2005	18.7	5937.0	11/22/2005	20.9	5925.6	11/22/2005	19.6	5924.4	11/22/2005	18.2	5924.2
3/6/2006	18.0	5940.5	3/6/2006	18.1	5937.6	3/6/2006	20.2	5926.3	3/6/2006	19.4	5924.6	3/6/2006	19.1	5923.3
6/28/2006	18.8	5939.7	6/28/2006	18.9	5936.8	6/28/2006	20	5926.5	6/28/2006	18.6	5925.4	6/28/2006	16.3	5926.1
9/28/2006	19.7	5938.8	9/28/2006	19.5	5936.2	9/28/2006	20.2	5926.3	9/28/2006	18.8	5925.2	9/28/2006	16	5926.4
11/20/2006	19.0	5939.5	11/20/2006	19	5936.7	11/20/2006	20	5926.5	11/20/2006	19	5925.0	11/20/2006	16	5926.4

Emery Water Level Data - Qal

Well RDA6			Well SM1-1			Well SM1-2			Well SM1-3			Well SM1-4		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
4/29/1982	13.80	5928.2	4/23/1982	18.10	6053.5	04/28/82	8.50	6043.3	04/30/82	19.60	6036.9	04/28/82	12.40	5929.2
6/16/1982	13.90	5928.1												
7/26/1982	14.33	5927.7												
8/24/1982	14.60	5927.4												
9/21/1982	14.40	5927.6	9/14/1982	5.75	6065.9	08/30/82	6.00	6045.8	08/30/82	11.90	6044.6	08/30/82	15.40	5926.2
10/13/1982	14.40	5927.6												
11/19/1982	14.90	5927.1	11/17/1982	8.27	6063.3	11/17/82	4.42	6047.4	11/17/82	9.67	6046.8	11/29/82	12.60	5929.0
12/9/1982	14.50	5927.5												
1/19/1983	14.50	5927.5												
2/17/1983	14.67	5927.3	2/15/1983	9.67	6061.9	02/15/83	6.42	6045.4				02/15/83	12.80	5928.8
3/8/1983														
4/12/1983	13.92	5928.1												
5/5/1983	15.08	5926.9												
6/7/1983			6/28/1983	8.30	6063.3	06/28/83	8.30	6043.5	06/28/83	1.10	6055.4	06/28/83	13.30	5928.3
7/19/1983	14.75	5927.3												
8/17/1983	14.70	5927.3	8/29/1983	8.70	6062.9	08/29/83	1.50	6050.3	08/29/83	9.20	6047.3	08/29/83	12.80	5928.8
9/1/1983	14.65	5927.4												
12/6/1983	14.80	5927.2	11/7/1983			11/07/83			11/07/83			11/07/83		
3/7/1984	15.00	5927.0	2/21/1984	10.60	6061.0	02/21/84	6.30	6045.5	02/21/84	10.10	6046.4	02/21/84	13.10	5928.5
6/12/1984		5922.5	5/3/1984	7.10	6064.5	05/03/84		6044.8	05/03/84	9.50	6047.0	05/03/84		5934.7
9/11/1984		5926.8	8/22/1984	6.80	6064.8	08/22/84		6049.0	08/02/84	8.80	6047.7	08/02/84		5929.0
12/6/1984	15.40	5926.6	11/19/1984	3.50	6068.1	11/19/84		6051.8	11/19/84	9.90	6046.6	11/19/84	14.30	5927.3
1/29/1985		5926.8	2/26/1985	4.60	6067.0	02/26/85		6044.8	02/26/85		6046.1	02/27/85		5928.7
4/3/1985	19.90	5922.1	5/8/1985	5.00	6066.6	05/08/85		6050.3	05/08/85		6047.3	05/08/85		5927.7
9/3/1985		5927.7	8/14/1985	2.00	6069.6	08/14/85	0.40	6051.4	08/14/85		6048.2	08/14/85		5930.9
12/16/1985		5926.4	11/21/1985	4.30	6067.3	11/21/85		6051.8	11/21/85		6048.1	11/21/85	13.30	5928.3
3/12/1986		5927.0	3/20/1986	3.60	6068.0	03/20/86		6048.0	03/13/86		6048.2	03/20/86		5923.0
6/25/1986		5926.8	6/30/1986		6067.1	06/30/86		6050.3	06/30/86		6048.5	06/30/86		5935.6
9/30/1986		5926.5	9/4/1986		6066.6	09/04/86		6049.8	09/04/86		6048.6	09/04/86		5928.3
12/18/1986		5926.1	12/23/1986		6067.2	12/23/86		6048.1	12/23/86		6047.8	12/23/86		5931.1
3/31/1987	16.90	5925.1	4/2/1987	4.00	6067.6	04/02/87	3.50	6048.3	04/02/87	8.70	6047.8	04/02/87	15.50	5926.1
6/10/1987	19.20	5922.8	6/1/1987	3.60	6068.0	06/01/87	1.20	6050.6	06/01/87	7.40	6049.1	06/01/87	12.70	5928.9
9/17/1987	16.00	5926.0	9/17/1987	6.60	6065.0	09/17/87	5.10	6046.7	09/17/87	7.70	6048.8	09/17/87	14.00	5927.6
12/16/1987	15.00	5927.0	12/15/1987	6.10	6065.5	12/15/87			12/12/87	8.00	6048.5	12/12/87	14.20	5927.4
2/17/1988		5930.0	3/21/1988	9.00	6062.6	03/21/88	8.00	6043.8	03/21/88	8.00	6048.5	03/21/88	13.00	5928.6
6/8/1988		5926.5	6/10/1988	3.70	6067.9	06/10/88	4.7	6047.1	06/10/88	7.30	6049.2	06/10/88	12.80	5928.8
9/26/1988		5924.5	9/22/1988	18.00	6053.6	09/22/88	5.9	6045.9	09/22/88	8.30	6048.2	09/22/88	14.30	5927.3
12/19/1988		5926.1	12/1/1988	9.80	6061.8				12/1/1988	8.60	6047.9	12/1/1988	13.10	5928.5
3/1/1989	16.00	5926.0	3/1/1989	10.30	6061.3	3/1/1989	9.00	6042.8	3/1/1989	8.50	6048.0	3/1/1989	12.80	5928.8
5/19/1989	15.80	5926.2	5/18/1989	10.50	6061.1	5/18/1989	9.80	6042.0	5/18/1989	7.3	6049.2	5/18/1989	12.80	5928.8
9/1/1989	16.00	5926.0	9/12/1989	11.20	6060.4	9/12/1989	13.90	6037.9	9/12/1989	7.30	6049.2	9/12/1989	14.50	5927.1
12/1/1989	15.90	5926.1	12/1/1989	8.70	6062.9	12/1/1989	14.40	6037.4	12/1/1989	8.00	6048.5	12/1/1989	13.60	5928.0
3/1/1990	15.10	5926.9	3/1/1990	11.40	6060.2	3/1/1990	13.80	6038.0	3/1/1990	8.30	6048.2	3/1/1990	13.00	5928.6
6/4/1990	14.10	5927.9	6/4/1990	11.80	6059.8	6/4/1990	11.8	6040.0	6/4/1990	7.60	6048.9	6/4/1990	14.30	5927.3
9/1/1990	16.20	5925.8	9/19/1990	6.50	6065.1	9/19/1990	14.3	6037.5	9/19/1990	8.30	6048.2	9/19/1990	15.8	5925.8

Emery Water Level Data - Qal

Well RDA6			Well SM1-1			Well SM1-2			Well SM1-3			Well SM1-4		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
11/1/1990	16.30	5925.7	12/1/1990	13.20	6058.4	12/1/1990	14.20	6037.6	12/1/1990	8.50	6048.0	12/1/1990	15.70	5925.9
3/1/1991	16.20	5925.8	3/1/1991	12.90	6058.7	3/1/1991	14.10	6037.7	3/1/1991	8.60	6047.9	3/1/1991	13.70	5927.9
6/5/1991		5925.9	6/1/1991	13.50	6058.1	6/1/1991	13.90	6037.9	6/1/1991	7.60	6048.9	6/1/1991	13.60	5928.0
9/19/1991		5926.2	9/24/1991	12.50	6059.1	09/24/91	14.70	6037.1	09/24/91	7.8	6048.7	09/24/91	15.9	5925.7
12/1/1991	16.00	5926.0	12/1/1991	12.50	6059.1	12/1/1991	14.10	6037.7	12/1/1991	8.30	6048.2	12/1/1991	14.40	5927.2
3/1/1992	15.90	5926.1	3/1/1992	12.90	6058.7	3/1/1992	14.00	6037.8	3/1/1992	8.80	6047.7	3/1/1992	13.10	5928.5
5/26/1992	15.50	5926.5	5/26/1992	12.80	6058.8	5/26/1992	13.60	6038.2	5/26/1992	7.20	6049.3	5/26/1992	13.90	5927.7
9/2/1992	16.00	5926.0	9/2/1992	13.50	6058.1	9/2/1992	14.60	6037.2	9/2/1992	7.50	6049.0	9/2/1992	15.10	5926.5
12/1/1992	16.20	5925.8	12/1/1992	13.70	6057.9	12/1/1992	14.00	6037.8	12/1/1992	8.00	6048.5	12/1/1992	14.60	5927.0
3/1/1993	16.00	5926.0	3/1/1993	13.30	6058.3	3/1/1993	13.90	6037.9	3/1/1993	8.50	6048.0	3/1/1993	13.20	5928.4
6/4/1993		5926.5	6/2/1993	13.50	6058.1	6/2/1993	13.20	6038.6	6/2/1993	7.00	6049.5	6/2/1993	14.20	5927.4
9/9/1993		5925.8	9/8/1993	11.00	6060.6	9/8/1993	9.50	6042.3	9/8/1993	7.90	6048.6			
12/1/1993	16.10	5925.9	12/1/1993	11.20	6060.4	12/1/1993	12.60	6039.2	12/1/1993	7.60	6048.9	12/1/1993	13.70	5927.9
3/1/1994	16.00	5926.0	3/1/1994	11.30	6060.3	3/1/1994	12.30	6039.5	3/1/1994	7.80	6048.7	3/1/1994	13.00	5928.6
6/6/1994		5926.2	6/6/1994	12.30	6059.3	6/6/1994	12.80	6039.0	6/6/1994	8.70	6047.8	6/6/1994	13.80	5927.8
9/8/1994		5925.8	9/1/1994	12.90	6058.7	9/1/1994	13.20	6038.6	9/1/1994	11.00	6045.5	9/1/1994	13.90	5927.7
12/1/1994	16.10	5925.9	12/1/1994	14.10	6057.5	12/1/1994	13.60	6038.2	12/1/1994	9.40	6047.1	12/1/1994	14.00	5927.6
3/1/1995	15.00	5927.0	3/1/1995	13.90	6057.7	3/1/1995	13.30	6038.5	3/1/1995	9.10	6047.4	3/1/1995	13.90	5927.7
6/6/1995	14.90	5927.1	6/6/1995	13.90	6057.7	6/6/1995	13.70	6038.1	6/6/1995	8.1	6048.4	6/6/1995	13.80	5927.8
9/1/1995	15.00	5927.0	9/6/1995	13.80	6057.8	9/6/1995	*		9/6/1995	8.1	6048.4	9/6/1995	15.00	5926.6
12/1/1995	14.80	5927.2	12/1/1995	13.10	6058.5	12/1/1995	8.80	6043.0	12/1/1995	8.90	6047.6	12/1/1995	13.80	5927.8
3/1/1996	15.20	5926.8	3/1/1996	13.50	6058.1	3/1/1996	9.70	6042.1	3/1/1996	9.20	6047.3	3/1/1996	13.50	5928.1
6/1/1996	14.70	5927.3	6/1/1996	12.10	6059.5	6/1/1996	8.00	6043.8	6/1/1996	8.40	6048.1	6/1/1996	13.50	5928.1
9/1/1996	15.10	5926.9	9/1/1996	11.00	6060.6	9/1/1996	9.10	6042.7	9/1/1996	8.30	6048.2	9/1/1996	16.10	5925.5
12/31/1996	14.80	5927.2	12/1/1996	11.20	6060.4	12/1/1996	9.00	6042.8	12/1/1996	9.00	6047.5	12/1/1996	14.80	5926.8
3/1/1997	14.80	5927.2	3/1/1997	11.40	6060.2	3/1/1997	9.00	6042.8	3/1/1997	8.80	6047.7	3/1/1997	13.50	5928.1
6/1/1997	15.00	5927.0	6/1/1997	11.20	6060.4	6/1/1997	9.50	6042.3	6/1/1997	7.40	6049.1	6/1/1997	13.70	5927.9
9/1/1997	13.90	5928.1	9/1/1997	10.30	6061.3	9/1/1997	2.30	6049.5	9/1/1997	6.50	6050.0	9/1/1997	13.30	5928.3
12/1/1997	14.70	5927.3	12/1/1997	9.20	6062.4	12/1/1997	8.20	6043.6	12/1/1997	7.00	6049.5	12/1/1997	13.20	5928.4
3/1/1998	14.60	5927.4	3/1/1998	10.10	6061.5	3/1/1998	9.10	6042.7	3/1/1998	8.20	6048.3	3/1/1998	13.00	5928.6
6/1/1998		5928.2	6/2/1998	8.30	6063.3	06/02/98	1.2	6050.6	06/02/98	7	6049.5	06/01/98	13.20	5928.4
9/15/1998		5928.5	9/21/1998	5.20	6066.4	09/08/98	1.8	6050.0	09/08/98	8.00	6048.5	09/08/98	14.80	5926.8
12/1/1998	13.00	5929.0	12/1/1998	4.70	6066.9	12/1/1998	5.7	6046.1	12/1/1998	7.50	6049.0	12/1/1998	13.00	5928.6
3/1/1999	13.40	5928.6	3/1/1999	10.20	6061.4	3/1/1999	9.1	6042.7	3/1/1999	8.40	6048.1	3/1/1999	13.00	5928.6
6/1/1999	13.20	5928.8	6/1/1999	3.80	6067.8	6/1/1999	1.7	6050.1	6/1/1999	6.70	6049.8	6/1/1999	12.30	5929.3
9/1/1999	13.60	5928.4	9/1/1999	4.20	6067.4	9/1/1999	1.2	6050.6	9/1/1999	8.20	6048.3	9/1/1999	13.50	5928.1
12/1/1999	13.40	5928.6	12/1/1999	6.70	6064.9	12/1/1999	6.2	6045.6	12/1/1999	7.50	6049.0	12/1/1999	13.10	5928.5
3/23/2000		5928.6	3/24/2000	6.6	6065.0	03/24/00	8.9	6042.9	03/24/00	7.70	6048.8	03/15/00	12.80	5928.8
6/1/2000														
9/21/2000		5927.9	9/22/2000	7.5	6064.1	09/18/00	12.1	6039.7	09/18/00	7.00	6049.5	09/18/00	16.5	5925.1
12/31/2000	14.2	5927.8	12/1/2000	8.00	6063.6	12/1/2000	12.7	6039.1	12/1/2000	7.80	6048.7	12/1/2000	14.4	5927.2
9/18/2003	14.58	5927.4							9/18/2003	7.5	6049.0	9/18/2003	18	5923.6
12/23/2003	15	5927.0	12/22/2003	13.2	6058.4				12/22/2003	7.5	6049.0	12/22/2003	18	5923.6

Emery Water Level Data - Qal

Well RDA6			Well SM1-1			Well SM1-2			Well SM1-3			Well SM1-4		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
3/29/2004	12.9	5929.1	3/18/2004	13	6058.6				3/18/2004	8	6048.5	3/10/2004	13.5	5928.1
6/2/2004	13.7	5928.3	6/23/2004	12.8	6058.8				6/18/2004	7.2	6049.3	6/18/2004	13.5	5928.1
9/23/2004	14.2	5927.8	9/25/2004	15	6056.6				9/25/2004	7.1	6049.4	9/25/2004	14.8	5926.8
12/27/2004	15.7	5926.3	12/27/2004	13	6058.6				12/27/2004	7	6049.5	12/28/2004	13.5	5928.1
3/24/2005	15.7	5926.3	3/25/2005	12.5	6059.1				3/25/2005	6.7	6049.8	3/25/2005	12.9	5928.7
5/13/2005	15.2	5926.8	5/12/2005	11	6060.6				5/11/2005	7	6049.5	5/23/2005	13.5	5928.1
7/9/2005	16.2	5925.8							7/20/2005	6.8	6049.7	7/20/2005	13.8	5927.8
11/22/2005	16.3	5925.7	11/17/2005	11.6	6060.0				11/17/2005	7.6	6048.9	11/17/2005	13	5928.6
3/6/2006	15.6	5926.4	3/7/2006	11.1	6060.5				3/9/2006	8.2	6048.3	3/9/2006	12.8	5928.8
6/28/2006	14.5	5927.5	6/28/2006	11.7	6059.9				6/28/2006	6.8	6049.7	6/28/2006	12.5	5929.1
9/28/2006	14	5928.0	9/28/2006	12	6059.6				9/28/2006	7	6049.5	9/28/2006	13.5	5928.1
11/20/2006	14	5928.0	11/27/2006	11	6060.6				11/27/2006	7	6049.5	11/27/2006	13	5928.6

Emery Water Level Data - Blue Gate

Well AA			Well H			Well I			Well R2		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
7/1/1979											
11/16/1979	27.50	5942.2	11/16/1979	38.5	6193.1	11/16/1979	14	6095.6	11/16/1979	55.3	5976.4
3/17/1980	33.00	5936.7	3/17/1980	35.9	6195.7	3/17/1980	12.8	6096.8	3/17/1980	50.6	5981.1
6/11/1980	34.50	5935.2	6/11/1980	34.9	6196.7	6/11/1980	13.2	6096.4	6/11/1980	50.9	5980.8
9/16/1980	37.10	5932.6	9/16/1980	33.8	6197.8	9/16/1980	12.5	6097.1	9/16/1980	47.5	5984.2
11/7/1980	38.30	5931.4	11/7/1980	34.3	6197.3	11/7/1980	11.8	6097.8	11/7/1980	46.1	5985.6
3/16/1981	38.50	5931.2	3/16/1981	35.3	6196.3	3/16/1981	12.3	6097.3	3/16/1981	51.1	5980.6
5/11/1981	36.10	5933.6	5/11/1981	35.4	6196.2	5/11/1981	12.6	6097.0	5/11/1981	50.7	5981.0
8/15/1981	52.60	5917.1	8/15/1981	33.8	6197.8	8/15/1981	12.8	6096.8	8/15/1981	52.2	5979.5
11/24/1981	52.40	5917.3	11/24/1981	33.6	6198.0	11/24/1981	12.9	6096.7	11/24/1981	53.3	5978.4
3/12/1982	52.70	5917.0	3/12/1982	31.9	6199.7	3/12/1982	14.4	6095.2	3/12/1982	51.3	5980.4
6/21/1982	52.40	5917.3	6/21/1982	34.6	6197.0	6/21/1982	16.3	6093.3	6/21/1982	52.4	5979.3
9/15/1982	59.20	5910.5	9/15/1982	34.5	6197.1	9/15/1982	15.9	6093.7	9/15/1982	54	5977.7
12/29/1982	52.40	5917.3	12/29/1982	33.7	6197.9	12/29/1982	12.5	6097.1	12/29/1982	53.3	5978.4
3/30/1983	52.80	5916.9	3/30/1983	34.4	6197.2	3/30/1983	13.4	6096.2	3/30/1983	49.5	5982.2
7/1/1983	52.10	5917.6	7/1/1983	33.2	6198.4				7/1/1983	48.8	5982.9
9/12/1983	53.10	5916.6	9/12/1983	31.9	6199.7				9/12/1983	47.8	5983.9
12/8/1983	57.50	5912.2				12/8/1983	10.7	6098.9	12/8/1983	47.6	5984.1
4/18/1984	58.50	5911.2	4/18/1984	34.3	6197.3	4/18/1984	10.6	6099.0	4/18/1984	48.6	5983.1
6/11/1984	58.30	5911.4	6/11/1984	34.6	6197.0				6/11/1984	46.5	5985.2
9/26/1984	57.50	5912.2				9/26/1984	12.5	6097.1	9/26/1984	52.3	5979.4
12/5/1984	58.10	5911.6	12/5/1984	32.9	6198.7	12/5/1984	15.0	6094.6	12/5/1984	46.1	5985.6
4/5/1985	58.20	5911.5	4/5/1985	34.0	6197.6	4/5/1985	16.8	6092.8	4/5/1985	25.3	6006.4
6/18/1985	57.90	5911.8	6/13/1985	34.9	6196.7	6/13/1985	17.7	6091.9	6/18/1985	28.4	6003.3
9/3/1985	58.30	5911.4	9/26/1985	30.6	6201.0	9/26/1985	18.8	6090.8	9/20/1985	31.6	6000.1
12/11/1985	58.60	5911.1	12/11/1985	31.9	6199.7	12/11/1985	19.6	6090.0	12/11/1985	46.2	5985.5
3/6/1986	58.80	5910.9	3/6/1986	32.5	6199.1	3/6/1986	21.0	6088.6	3/6/1986	48.3	5983.4
6/27/1986	59.00	5910.7	6/30/1986	32.6	6199.0	6/27/1986	21.8	6087.8	6/27/1986	45.0	5986.7
9/3/1986	59.50	5910.2	9/4/1986	31.8	6199.8	9/3/1986	23.4	6086.2	9/3/1986	48.2	5983.5
12/23/1986	60.00	5909.7	12/23/1986	31.7	6199.9	12/23/1986	22.4	6087.2	12/23/1986	52.2	5979.5
3/26/1987	60.50	5909.2	4/2/1987	32.1	6199.5				3/25/1987	55.6	5976.1
5/22/1987	59.50	5910.2	5/22/1987	33.0	6198.6	5/22/1987	27.0	6082.6	5/14/1987	58.5	5973.2
9/25/1987	59.80	5909.9	9/25/1987	32.0	6199.6	9/25/1987	30.5	6079.1	9/25/1987	62.8	5968.9
12/29/1987	59.50	5910.2	12/29/1987	34.2	6197.4	12/29/1987	31.9	6077.7	12/30/1987	62.2	5969.5
3/22/1988	59.50	5910.2	3/22/1988	35.1	6196.5	3/22/1988	40.1	6069.5	3/22/1988	64.3	5967.4

Emery Water Level Data - Blue Gate

Well AA			Well H			Well I			Well R2		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
6/30/1988	60.00	5909.7	6/30/1988	33.6	6198.0	6/30/1988	36.0	6073.6			
10/19/1988	59.80	5909.9	10/19/1988	33.9	6197.7	10/19/1988	26.0	6083.6	10/25/1988	74.0	5957.7
12/19/1988	57.00	5912.7				12/19/1988	38.0	6071.6	12/29/1988	76.8	5954.9
3/30/1989	60.00	5909.7	3/30/1989	35.4	6196.2	3/30/1989	40.5	6069.1	3/30/1989	82.0	5949.7
5/18/1989	60.50	5909.2	5/18/1989	35.8	6195.8	5/18/1989	40.8	6068.8	5/26/1989	83.0	5948.7
9/11/1989	59.90	5909.8	9/11/1989	36.3	6195.3	9/11/1989	42.8	6066.8	9/11/1989	85.2	5946.5
12/6/1989	61.10	5908.6	12/6/1989	36.5	6195.1	12/6/1989	44.2	6065.4	12/6/1989	86.5	5945.2
3/15/1990	60.00	5909.7	3/15/1990	36.3	6195.3	3/15/1990	45.2	6064.4	3/15/1990	84.3	5947.4
6/11/1990	60.00	5909.7	6/11/1990	36.6	6195.0	6/11/1990	45.6	6064.0	6/11/1990	85.9	5945.8
9/19/1990	58.80	5910.9	9/19/1990	36.2	6195.4	9/19/1990	45.7	6063.9	9/19/1990	85.8	5945.9
12/1/1990	60.20	5909.5	12/1/1990	36.3	6195.3	12/1/1990	47.3	6062.3	12/1/1990	85.6	5946.1
3/1/1991	60.10	5909.6	3/29/1991	37.8	6193.8	3/29/1991	48.8	6060.8	3/29/1991	85.2	5946.5
6/17/1991	60.00	5909.7	6/14/1991	38.0	6193.6	6/13/1991	49.0	6060.6	6/14/1991	84.8	5946.9
9/18/1991	59.90	5909.8	9/18/1991	36.4	6195.2	9/17/1991	50.7	6058.9	9/18/1991	84.2	5947.5
12/1/1991	59.90	5909.8	12/18/1991	35.4	6196.2	12/18/1991	50.8	6058.8	12/18/1991	88.4	5943.3
3/13/1992	59.90	5909.8	3/13/1992	34.1	6197.5	3/13/1992	48.4	6061.2	3/13/1992	84.1	5947.6
5/22/1992	60.10	5909.6	5/20/1992	35.7	6195.9	5/20/1992	52.0	6057.6	5/22/1992	84.6	5947.1
9/1/1992	59.80	5909.9	9/1/1992	35.0	6196.6	9/1/1992	53.2	6056.4	9/1/1992	85.0	5946.7
12/1/1992	59.80	5909.9	12/1/1992	35.0	6196.6	12/1/1992	55.0	6054.6	12/3/1992	84.9	5946.8
3/1/1993	60.00	5909.7	3/1/1993	35.5	6196.1	3/1/1993	56.0	6053.6	3/1/1993	84.9	5946.8
6/2/1993	59.60	5910.1	6/2/1993	36.2	6195.4	6/2/1993	57.0	6053.6	6/2/1993	82.8	5948.9
9/8/1993	60.00	5909.7	9/10/1993	33.6	6198.0	9/9/1993	56.4	6052.6	9/9/1993	85.0	5946.7
12/1/1993	58.00	5911.7	12/8/1993	32.2	6199.4	12/8/1993	56.4	6053.2	12/7/1993	67.0	5964.7
3/9/1994	60.10	5909.6	3/9/1994	34.3	6197.3	3/9/1994	56.2	6053.4	3/9/1994	64.8	5966.9
6/7/1994	59.80	5909.9	6/8/1994	34.7	6196.9	6/7/1994	53.8	6055.8	6/7/1994	82.1	5949.6
9/9/1994	60.40	5909.3	9/9/1994	34.8	6196.8	9/8/1994	60.2	6049.4	9/8/1994	84.9	5946.8
12/1/1994	58.80	5910.9	12/1/1994	33.1	6198.5	12/1/1994	60.3	6049.3	12/1/1994	85.3	5946.4
3/3/1995	59.90	5909.8	3/3/1995	32.9	6198.7	3/3/1995	61.4	6048.2	3/3/1995	85.0	5946.7
6/7/1995	59.60	5910.1	6/7/1995	35.0	6196.6	6/7/1995	62	6047.6	6/1/1995	85.0	5946.7
9/5/1995	59.90	5909.8	9/5/1995	36.8	6194.8	9/5/1995	62.5	6047.1	9/5/1995	85.1	5946.6
12/1/1995	59.30	5910.4	12/6/1995	33.5	6198.1	12/6/1995	62.7	6046.9	12/5/1995	85.1	5946.6
3/22/1996	58.80	5910.9	3/22/1996	33.3	6198.3	3/22/1996	62.1	6047.5	3/22/1996	85.3	5946.4
6/4/1996	57.40	5912.3	6/4/1996	33.3	6198.3	6/4/1996	61.4	6048.2	6/4/1996	85.2	5946.5
9/9/1996	59.70	5910.0	9/9/1996	34.3	6197.3	9/9/1996	64.4	6045.2	9/9/1996	86.1	5945.6
12/1/1996	60.00	5909.7	12/1/1996	34.1	6197.5	12/1/1996	63.5	6046.1	12/1/1996	84.3	5947.4

Emery Water Level Data - Blue Gate

Well AA			Well H			Well I			Well R2		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
3/21/1997		5909.5	3/6/1997	34.5	6197.1	3/6/1997	65.0	6044.6	3/3/1997	84.4	5947.3
6/20/1997		5909.8	6/20/1997	34.8	6196.8	6/20/1997	65.3	6044.3	6/20/1997	86.3	5945.4
9/29/1997		5910.2	9/29/1997	34.4	6197.2	9/29/1997	64.9	6044.7	9/30/1997	86.2	5945.5
12/18/1997	59.90	5909.8	12/16/1997	32.3	6199.3	12/12/1997	65.2	6044.4	12/5/1997	85.3	5946.4
3/24/1998		5909.9				3/31/1998		6041.6	3/31/1998		5946.5
6/26/1998		5910.2	6/26/1998	31.4	6200.2	6/26/1998	68.0	6041.6	6/26/1998	88.1	5943.6
9/16/1998		5909.6				9/8/1998		6041.6	9/15/1998		5946.5
12/7/1998		5909.5				12/10/1998		6043.6	12/10/1998		5946.8
3/15/1999	60.20	5909.5	3/15/1999	32.9	6198.7	3/15/1999	66.0	6043.6	3/15/1999	85.1	5946.6
6/11/1999	60.20	5909.5	6/11/1999	32.3	6199.3	6/11/1999	66.0	6043.6	6/11/1999	81.9	5949.8
9/28/1999	59.40	5910.3	9/28/1999	32.8	6198.8	9/28/1999	66.0	6043.6	9/28/1999	79.8	5951.9
12/8/1999	59.80	5909.9	12/16/1999	33.0	6198.6	12/15/1999	66.0	6043.6	12/15/1999	82.8	5948.9
3/23/2000	59.2	5910.5	3/23/2000	33.1	6198.5	3/23/2000	66.0	6043.6	3/23/1900	76.3	5955.4
6/1/2000											
9/22/2000	61.70	5908.0	9/28/2000	33.0	6198.6	9/28/2000	66.0	6043.6	9/25/1900	81.9	5949.8
12/1/2000	60.30	5909.4	12/1/2000	33.2	6198.4	12/1/2000	66.0	6043.6	12/1/2000	75.9	5955.8
3/23/2001		5910.3	3/22/2001	35.0	6196.6	3/22/2001	66.0	6043.6	3/22/1901	76.1	5955.6
6/13/2001		5909.8	6/13/2001	33.3	6198.3	6/13/2001	66.0	6043.6	6/13/1901	79.6	5952.1
9/12/2001		5908.5	9/12/2001	33.7	6197.9	9/12/2001	66.0	6043.6	9/12/1901	81.2	5950.5
12/17/2001		5908.5	12/12/2001	33.7	6197.9	12/12/2001	66.0	6043.6	12/17/1901	81.8	5949.9
3/27/2002		5909.2	3/21/2002	35.7	6195.9	3/21/2002	66.0	6043.6	3/21/1902	79.7	5952.0
6/24/2002		5908.3	6/27/2002	35.5	6196.1	6/27/2002	66.0	6043.6	6/27/1902	79.9	5951.8
9/28/2002		5908.5	9/23/2002	35.1	6196.5	9/23/2002	66.0	6043.6	9/28/1902	81.0	5950.7
12/21/2002			12/21/2002	33.0	6198.6	12/21/2002	65.5	6044.1	12/21/1902	75.8	5956.0
6/25/2003	49.2	5920.5									
9/18/2003	59.2	5910.5	9/17/2003	37.5	6194.1	9/17/2003	66.0	6043.6	9/17/2003	95.2	5936.5
12/19/2003	60.1	5909.6	12/19/2003	37.5	6194.1	12/19/2003	66.0	6043.6	12/19/2003	96.0	5935.7
3/30/2004	60.8	5908.9	3/30/2004	34.1	6197.5	3/18/2004	67.0	6042.6	3/18/2004	81.0	5950.7
6/23/2004	61.1	5908.6	6/18/2004	37.2	6194.4	6/18/2004	66.0	6043.6	6/23/2004	80.6	5951.1
9/23/2004	59.75	5910.0	9/25/2004	36.8	6194.8	9/25/2004	66.0	6043.6	9/20/2004	95.0	5936.7
12/27/2004	59.8	5909.9							12/28/2004	86.0	5945.7
3/31/2005	59.7	5910.0	3/25/2005	45.0	6186.6				3/24/2005	85.7	5946.0
5/23/2005	62.5	5907.2	5/23/2005	36.4	6195.2				5/23/2005	84.2	5947.5
7/8/2005	54	5915.7	7/11/2005	32.5	6199.1	7/20/2005	69.3	6040.3	7/11/2005	75.8	5955.9
11/28/2005	58	5911.7	11/22/2005	32.4	6199.2	11/17/2005	69.9	6039.7	11/28/2005	83.0	5948.7

Emery Water Level Data - Blue Gate

Well AA			Well H			Well I			Well R2		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
3/6/2006	56.8	5912.9	3/9/2006	34.8	6196.8	3/9/2006	70.0	6039.6	3/7/2006	83.5	5948.2
6/29/2006	59.7	5910.0	6/29/2006	36.0	6195.6	6/29/2006	68.8	6040.8	6/29/2006	83.8	5947.9
9/27/2006			9/27/2006	38.5	6193.1				9/28/2006	84.2	5947.5
11/20/2006	57	5912.7	11/27/2006	39.0	6192.6				11/20/2006	85.0	5946.7

Emery Water Level Data - Blue Gate

Well T1			Well T2			Well USGS 3-1			Well USGS 4-1		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
						7/2/1979	18.1	6029.4	7/2/1979	18.5	6029.0
						11/16/1979	18.5	6029.0	11/16/1979	18.9	6028.6
						3/17/1980	18.9	6028.6	3/17/1980	19.2	6028.3
						6/11/1980	18.4	6029.1	6/11/1980	19.4	6028.1
						9/16/1980	17.9	6029.6	9/16/1980	19.2	6028.3
						11/7/1980	17.7	6029.8	11/7/1980	19.1	6028.4
						3/16/1981	18.6	6028.9	3/16/1981	18.9	6028.6
						5/11/1981	18.6	6028.9	5/11/1981	19.0	6028.5
8/15/1981	17	5986.2	8/15/1981	15.5	5987.5	8/15/1981	18.7	6028.8	8/15/1981	18.8	6028.7
						11/24/1981	17.9	6029.6	11/24/1981	18.6	6028.9
3/12/1982	12.8	5990.4	3/12/1982	13.4	5989.6	3/12/1982	18.1	6029.4	3/12/1982	18.6	6028.9
5/14/1982	16.5	5986.7	6/21/1982	13.9	5989.1	6/21/1982	18.3	6029.2	6/21/1982	18.5	6029.0
						9/15/1982	18.4	6029.1	9/15/1982	21.1	6026.4
						12/29/1982	18.2	6029.3	12/29/1982	18.7	6028.8
						3/30/1983	18.2	6029.3	3/30/1983	17.1	6030.4
						7/1/1983	18.3	6029.2	7/1/1983	19.8	6027.7
						9/12/1983	18.5	6029.0	9/12/1983	28.2	6019.3
11/15/1983	13.8	5989.4	11/15/1983	13.3	5989.7				12/8/1983	18.2	6029.3
									4/18/1984	18.7	6028.8
									6/11/1984	18.6	6028.9
9/26/1984	12.6	5990.6	9/26/1984	13.3	5989.7				9/26/1984	18.5	6029.0
									12/5/1984	18.4	6029.1
									4/5/1985	17.9	6029.6
									6/20/1985	16.7	6030.8
9/26/1985	13	5990.2	9/26/1985	13.20	5989.8				9/20/1985	18.1	6029.4
12/11/1985	12.8	5990.4	12/19/1985	13.20	5989.8				12/19/1985	18.3	6029.2
3/6/1986	12.2	5991.0	3/6/1986	12.60	5990.4				3/12/1986	18.0	6029.5
6/27/1986	12.00	5991.2	6/30/1986	13.00	5990				6/24/1986	18.0	6029.5
9/3/1986	11.90	5991.3	9/5/1986	12.50	5990.5				9/4/1986	19.1	6028.4
12/23/1986	12.4	5990.8	12/23/1986	12.50	5990.5				12/23/1986	19.2	6028.3
4/2/1987	11.60	5991.6	4/2/1987	11.60	5991.4				3/26/1987	19.4	6028.1
5/18/1987	13.00	5990.2	5/18/1987	13.20	5989.8	5/20/1987	17.9	6027.4	5/20/1987	18.2	6029.3
10/1/1987	12.70	5990.5	10/1/1987	12.7	5990.3	10/7/1987	18.7	6027.5	10/7/1987	19.1	6028.4
12/30/1987	12.9	5990.3	12/30/1987	12.9	5990.1	12/30/1987	18.3	6029.2	12/30/1987	18.6	6028.9
3/22/1988	12.5	5990.7	3/22/1988	12.9	5990.1	3/22/1988	18.2	6028.7	3/22/1988	18.0	6029.5

Emery Water Level Data - Blue Gate

Well T1			Well T2			Well USGS 3-1			Well USGS 4-1		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
6/30/1988	13.50	5989.7	6/30/1988	13.3	5989.7	6/9/1988	18.3	6028.6	6/9/1988	18.3	6029.2
10/19/1988	13.5	5989.7	10/19/1988	13.5	5989.5	10/20/1988	20.5	6026.4	10/20/1988	18.8	6028.7
12/19/1988	13.20	5990.0	12/19/1988	13	5990.0	12/29/1988	18.7	6028.2	12/29/1988	20.6	6026.9
3/30/1989	18	5985.2	3/30/1989	18	5985.0	3/30/1989	18.1	6029.4	3/30/1989	18.1	6029.4
5/18/1989	12.80	5990.4	5/26/1989	12.80	5990.2	5/18/1989	18.5	6029.0	5/18/1989	18.5	6029.0
9/11/1989	13.20	5990.0	9/11/1989	13.60	5989.4	9/11/1989	19.2	6028.3	9/11/1989	18.7	6028.8
12/6/1989	13.00	5990.2	12/6/1989	12.5	5990.5	12/6/1989	19.6	6027.9	12/6/1989	19.6	6027.9
3/15/1990	13.8	5989.4	3/15/1990	14	5989.0	3/15/1990	18.0	6029.5	3/15/1990	16.7	6030.8
6/11/1990	14.30	5988.9	6/11/1990	11.00	5992.0	6/11/1990	19.8	6027.7	6/11/1990	19.9	6027.6
9/19/1990	15.20	5988.0	9/19/1990	15.6	5987.4	9/19/1990	20.5	6026.4	9/19/1990	20.1	6027.4
12/1/1990	15.70	5987.5	12/1/1990	13.7	5989.3	12/1/1990	20.4	6026.5	12/1/1990	19.8	6027.7
3/29/1991	18.00	5985.2	3/29/1991	15.9	5987.1	3/29/1991	19.9	6027.0	3/29/1991	20.0	6027.5
6/17/1991	7.50	5995.7	6/13/1991	16.20	5986.8	6/10/1991	20.0	6026.9	6/10/1991	20.7	6026.8
9/23/1991	14.80	5988.4	9/18/1991	15	5988.0	9/18/1991	19.8	6027.1	9/18/1991	20.2	6027.3
12/18/1991	12.70	5990.5	12/18/1991	12.7	5990.3	12/18/1991	19.9	6027.0	12/18/1991	20.8	6026.7
3/13/1992	13.20	5990.0	3/13/1992	13.2	5989.8	3/13/1992	19.9	6027.0	3/13/1992	20.2	6027.3
5/26/1992	12.30	5990.9	5/26/1992	13.6	5989.4	5/26/1992	19.9	6027.0	5/26/1992	20.8	6026.7
9/2/1992	13.10	5990.1	9/2/1992	13.1	5989.9	9/2/1992	20.0	6026.9	9/2/1992	20.6	6026.9
12/3/1992	13.00	5990.2	12/3/1992	12.5	5990.5	12/3/1992	19.8	6027.1	12/3/1992	20.6	6026.9
3/1/1993	11.80	5991.4	3/1/1993	13	5990	3/1/1993	20.0	6026.9	3/1/1993	20.9	6026.6
6/4/1993	13.20	5990.0	6/4/1993	13.20	5989.8	6/2/1993	20.8	6026.1	6/2/1993	20.7	6026.8
9/8/1993	13.2	5990.0	9/8/1993	14.00	5989	9/8/1993	20.0	6026.9	9/8/1993	20.9	6026.6
12/7/1993	12.80	5990.4	12/7/1993	12.9	5990.1	12/7/1993	20.2	6026.7	12/7/1993	20.8	6026.7
3/9/1994	15.6	5987.6	3/9/1994	14.2	5988.8	3/9/1994	20.3	6026.6	3/9/1994	20.6	6026.9
6/6/1994	15.2	5988.0	6/6/1994	14.8	5988.2	6/6/1994	20.1	6026.8	6/6/1994	20.8	6026.7
9/7/1994	11.5	5991.7	9/7/1994	15	5988	9/7/1994	20.2	6026.7	9/7/1994	20.5	6027.0
12/1/1994	11	5992.2	12/1/1994	15.1	5987.9	12/1/1994	20.1	6026.8	12/1/1994	20.8	6026.7
3/3/1995	14.40	5988.8	3/3/1995	15.5	5987.5	3/3/1995	20.0	6026.9	3/3/1995	20.3	6027.2
6/6/1995	14.80	5988.4	6/6/1995	15.3	5987.7	6/6/1995	20.2	6026.7	6/6/1995	20.6	6026.9
9/6/1995	15.20	5988.0	9/6/1995	11.5	5991.5	9/6/1995	20.0	6026.9	9/6/1995	20.7	6026.8
12/5/1995	15.3	5987.9	12/6/1995	11.3	5991.7	12/5/1995	20.0	6026.9	12/5/1995	20.7	6026.8
3/22/1996	12.2	5991.0	3/22/1996	12.2	5990.8	3/22/1996	20.1	6026.8	3/22/1996	20.8	6026.7
6/4/1996	12.2	5991.0	6/4/1996	12.1	5990.9	6/4/1996	20.0	6026.9	6/4/1996	20.5	6027.0
9/9/1996	11.8	5991.4	9/9/1996	12.1	5990.9	9/9/1996	19.8	6027.1	9/9/1996	20.5	6027.0
12/1/1996	12.5	5990.7	12/1/1996	12.3	5990.7	12/1/1996	19.8	6027.1	12/1/1996	19.9	6027.6

Emery Water Level Data - Blue Gate

Well T1			Well T2			Well USGS 3-1			Well USGS 4-1		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
3/3/1997	12.3	5990.9	3/6/1997	12.7	5990.3	3/6/1997	19.7	6027.2	3/6/1997	19.5	6028.0
6/20/1997	12.2	5991.0	6/3/1997	12.6	5990.4	6/3/1997	19.7	6027.2	6/3/1997	20.2	6027.3
9/30/1997	12.3	5990.9	9/8/1997	12.3	5990.7	9/8/1997	19.8	6027.1	9/8/1997	19.9	6027.6
12/5/1997	12	5991.2	12/5/1997	12.4	5990.6	12/16/1997	19.7	6027.2	12/16/1997	20.1	6027.4
3/31/1998	13.7	5989.5	3/24/1998	13.4	5989.6	3/10/1998	19.5	6027.4	3/10/1998	19.2	6028.3
6/1/1998	06/01/98	5989.9	6/2/1998	14	5989	6/1/1998	19.4	6027.5	6/1/1998	21.3	6026.2
9/8/1998	09/08/98	5990.2	9/8/1998		5989.8	9/8/1998	19.4	6027.5	9/8/1998	19.9	6027.6
12/10/1998	13.5	5989.7	12/7/1998	13.4	5989.6	12/8/1998	19.7	6027.2	12/8/1998	20.7	6026.8
3/15/1999	13.4	5989.8	3/8/1999	13.3	5989.7	3/17/1999	19.6	6027.3	3/17/1999	19.5	6028.0
6/11/1999	14	5989.2	6/11/1999	13.8	5989.2	6/11/1999	19.4	6027.5	6/11/1999	20.8	6026.7
9/28/1999	13.7	5989.5	9/28/1999	13.3	5989.7	9/28/1999	19.4	6027.5	9/28/1999	20.3	6027.2
12/15/1999	14.2	5989.0	12/15/1999	14	5989	12/15/1999	19.8	6027.1	12/15/1999	20.5	6027.0
3/15/2000	14.4	5988.8	3/15/2000	14.2	5988.8	3/24/2000	19.7	6027.2	3/24/2000	20.3	6027.2
9/18/2000	13.4	5989.8	9/18/2000	15.1	5987.9	9/21/2000	19.7	6027.2	9/21/2000	21.3	6026.2
12/1/2000	14.1	5989.1	12/1/2000	15.5	5987.5	12/1/2000	19.9	6027.0	12/1/2000	20.5	6027.0
			3/22/2001	15.1	5987.9	3/22/2001	19.7	6027.2	3/22/2001	20.6	6026.9
			6/4/2001	15	5988	6/5/2001	19.2	6027.7	6/5/2001	20.1	6027.4
			9/5/2001	15.2	5987.8	9/5/2001	20.0	6026.9	9/5/2001	20.5	6027.0
			12/13/2001	15.5	5987.5	12/19/2001	19.9	6027.0	12/10/2001	20.7	6026.8
			3/21/2002	15.2	5987.8	3/27/2002	19.4	6027.5	3/21/2002	20.5	6027.0
			6/24/2002	15.5	5987.5	6/24/2002	17.4	6029.5	6/24/2002	21.2	6026.3
			9/23/2002	15.3	5987.7	9/23/2002	20.1	6026.8	9/23/2002	21.2	6026.3
			12/26/2002	16.0	5987.0				12/26/2002	21.0	6026.5
						6/30/2003	34.0	6012.9			
9/17/2003	15.2	5988.0	9/17/2003	16.0	5987.0	9/17/2003	20.0	6026.9	9/17/2003	21.0	6026.5
12/22/2003	15.2	5988.0	12/22/2003	16.6	5986.4	12/22/2003	19.7	6027.2	12/22/2003	20.2	6027.3
3/18/2004	15	5988.2	3/18/2004	16.0	5987.0	3/18/2004	20.0	6026.9	3/18/2004	21.0	6026.5
6/18/2004	15.2	5988.0	6/18/2004	15.8	5987.2	6/18/2004	20.2	6026.7	6/18/2004	20.5	6027.0
9/25/2004	15	5988.2	9/25/2004	16.0	5987.0				9/24/2004	20.5	6027.0
12/28/2004	15	5988.2	12/28/2004	15.5	5987.5				12/28/2004	21.1	6026.4
3/31/2005	15.3	5987.9	3/31/2005	15.1	5987.9	3/25/2005	20.1	6026.8	3/25/2005	20.6	6026.9
5/11/2005	15.2	5988.0	5/11/2005	15.0	5988.0				5/11/2005	21.4	6026.1
			7/11/2005	15.1	5987.9				7/19/2005	21.5	6026.0
11/22/2005	15	5988.2	11/22/2005	15.0	5988.0	11/17/2005	20.3	6026.6	11/17/2005	21.6	6025.9

Emery Water Level Data - Blue Gate

Well T1			Well T2			Well USGS 3-1			Well USGS 4-1		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
3/9/2006	14.9	5988.3	3/9/2006	15.0	5988.0	3/9/2006	20.3	6026.6	3/9/2006	21.1	6026.4
6/28/2006	15	5988.2	6/28/2006	15.0	5988.0				6/28/2006	26.5	6021.0
9/28/2006	15	5988.2	9/28/2006	15.5	5987.5	9/28/2006	30.0	6016.9	9/28/2006	27.0	6020.5
11/20/2006	15	5988.2	11/20/2006	13.0	5990.0	11/27/2006	30.0	6016.9	11/27/2006	28.0	6019.5

Emery Water Level Data - Ferron Sandstone (Upper)

Well AA			Bryant Well			Well H			Well I2			Lewis Well			Well Muddy #1		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
10/7/1976			10/7/1976	0.20	6024.3	10/7/1976			10/7/1976			10/7/1976			10/7/1976		
12/1/1976																	
3/1/1977																	
6/1/1977			6/2/1977	0.20	6024.3												
9/1/1977			9/21/1977	-0.10	6024.6												
11/8/1977			11/8/1977	-0.10	6024.7												
3/1/1978																	
6/1/1978																	
9/1/1978																	
12/1/1978																	
3/1/1979																	
6/1/1979																	
9/1/1979															7/2/1979	142.8	5925.4
12/1/1979						11/15/1979	65.9	6164.5				10/18/1979	-8.6	6029.0	10/30/1979	136.4	5931.8
3/1/1980						3/14/1980	53.3	6177.1							12/1/1979		
6/1/1980						6/10/1980	59.3	6171.1							3/14/1980	131.1	5937.1
9/1/1980						9/16/1980	61.4	6169.0							6/11/1980	127.8	5940.4
12/1/1980						11/8/1980	62.7	6167.7							9/17/1980	129.1	5939.1
3/1/1981						3/16/1981	57.5	6172.9							11/9/1980	129.1	5939.1
6/1/1981						6/22/1981	55.2	6175.2							3/16/1981	128.4	5939.8
9/1/1981						9/19/1981	54.8	6175.6							6/22/1981	129	5939.2
12/1/1981						11/24/1981	56.2	6174.2							9/19/1981	129.2	5939.0
3/11/1982	53.55	5916.3				3/11/1982	61	6169.4							11/24/1981	129.2	5939.0
6/21/1982	88.00	5881.8	6/8/1982	210.00	5814.5	6/21/1982	68.5	6161.9				6/1/1982	174.2	5846.2	3/11/1982	129	5939.2
9/15/1982	97.20	5872.6	9/15/1982	217.40	5807.1	9/15/1982	69	6161.4							6/21/1982	128.7	5939.5
11/9/1982	98.50	5871.3	11/19/1982	217.67	5806.8	11/10/1982	69	6161.4							9/15/1982	131.4	5936.8
2/14/1983	101.25	5868.6	1/31/1983	217.58	5806.9	2/16/1983	71.2	6159.2							11/10/1982	128.2	5940.0
7/1/1983	104.08	5865.7				7/1/1983	70.5	6159.9							2/16/1983	127.9	5940.3
10/25/1983	106.80	5863.0				9/23/1983	72.1	6158.3							7/1/1983	128.1	5940.1
12/7/1983						10/25/1983	80	6150.4							9/23/1983	128.3	5939.9
4/18/1984	107.00	5862.8	2/16/1984	230.50	5794.0	4/24/1984	66.7	6163.7							12/7/1983	128.4	5939.8
6/11/1984	107.00	5862.8				6/11/1984	59.5	6170.9							4/24/1984	128.4	5939.8
9/26/1984	105.00	5864.8													6/11/1984	129.5	5938.7
12/5/1984						12/5/1984	57.4	6173.0							9/24/1984	129.1	5939.1
4/5/1985	106.80	5863.0				4/1/1985	57.6	6172.8							12/5/1984	129.7	5938.5
6/18/1985	107.20	5862.6				6/13/1985	57.80	6172.6							3/26/1985	129.6	5938.6
9/3/1985	107.40	5862.4				9/26/1985	57.40	6173.0							6/20/1985	129.20	5939.0
12/1/1985	108.50	5861.3				12/1/1985	57.5	6172.9							9/20/1985	128.30	5939.9
3/1/1986	109.60	5860.2				3/20/1986	57.3	6173.1							12/1/1985	128.4	5939.8
6/27/1986	108.80	5861.0	5/2/1986	301.60	5722.9	6/30/1986	57.80	6172.6				5/2/1986	259.5	5760.9	3/13/1986	127.80	5940.4
9/3/1986	108.50	5861.3	9/3/1986	310.40	5714.1	9/4/1986	57.30	6173.1				9/4/1986	265.40	5755.0	6/30/1986	129.00	5939.2
12/23/1986	109.00	5860.8	12/23/1986	318.20	5706.3	12/31/1986	57	6173.4				12/18/1986	269.20	5751.2	9/4/1986	128.60	5939.6
3/1/1987	109.10	5860.7				4/2/1987	57.40	6173.0	3/26/1987	394.00	5711.0				12/23/1986	128.4	5939.8
5/22/1987	109.00	5860.8				5/22/1987	57.50	6172.9	5/22/1987	393.50	5711.5				3/27/1987	128.70	5939.5
9/25/1987	109.30	5860.5	10/20/1987	293.50	5731.0	9/25/1987	57.60	6172.8	9/25/1987	402.50	5702.5				5/19/1987	126.70	5941.5
12/29/1987	109.00	5860.8	12/29/1987	291.30	5733.2	12/29/1987	58.00	6172.4	12/29/1987	398.20	5706.8				10/9/1987	127.00	5941.2
3/22/1988	109.00	5860.8	3/22/1988	294.10	5730.4	3/22/1988	58	6172.4	3/22/1988	397.9	5707.1				12/30/1987	128.50	5939.7
6/30/1988	108.00	5861.8	6/30/1988	318.00	5706.5	6/30/1988	57.3	6173.1	6/30/1988	397	5708.0				3/22/1988	127.50	5940.7
10/19/1988	112.50	5857.3	10/19/1988	291.10	5733.4	10/20/1988	57.7	6172.7							6/30/1988	127.7	5940.5
12/19/1988	109.00	5860.8	12/19/1988	292	5732.5	12/23/1988	56.9	6173.5							10/19/1988	128.6	5939.6
3/30/1989	113.10	5856.7	3/30/1989	289.00	5735.5	3/27/1989	47	6183.4	4/21/1989	395	5710.0				12/19/1988	128.40	5939.8
5/18/1989	112.20	5857.6	5/19/1989	298.40	5726.1	5/18/1989	56.90	6173.5	5/18/1989	400.8	5704.2	5/19/1989	261.00	5759.4	3/27/1989	128.80	5939.4
9/11/1989	111.80	5858.0	9/11/1989	290.80	5733.7	9/12/1989	57.10	6173.3	9/11/1989	399.8	5705.2	9/11/1989	257.70	5762.7	5/18/1989	128.00	5940.2
12/1/1989	111.60	5858.2	12/6/1989	290.60	5733.9	12/6/1989	56.8	6173.6				12/6/1989	258.00	5762.4	9/11/1989	128.30	5939.9
															12/6/1989	128.2	5940.0

Emery Water Level Data - Ferron Sandstone (Upper)

Well AA			Bryant Well			Well H			Well I2			Lewis Well			Well Muddy #1		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
3/15/1990	111.50	5858.3	3/15/1990	291.80	5732.7	3/1/1990	57.5	6172.9				3/12/1990	260.50	5759.9	3/12/1990	128.2	5940.0
6/11/1990	111.60	5858.2	6/8/1990	292.50	5732.0	6/11/1990	54.20	6176.2				6/8/1990	261.00	5759.4	6/8/1990	128.6	5939.6
9/19/1990	111.80	5858.0	9/17/1990	294.50	5730.0	9/17/1990	57	6173.4	9/17/1990	399	5706.0	9/17/1990	262.00	5758.4	9/18/1990	130.2	5938.0
12/1/1990	111.70	5858.1	12/1/1990	294.1	5730.4	12/1/1990	57	6173.4	12/1/1990	402	5703.0	11/8/1990	262.7	5757.7	11/7/1990	129.6	5938.6
3/29/1991	111.70	5858.1				3/29/1991	57.10	6173.3				3/20/1991	263.70	5756.7	3/29/1991	129.00	5939.2
6/17/1991	111.20	5858.6	6/17/1991	295.50	5729.0	6/14/1991	57.10	6173.3							6/10/1991	128.70	5939.5
9/18/1991	111.30	5858.5	9/30/1991	293.80	5730.7	9/18/1991	57.30	6173.1							9/23/1991	128.80	5939.4
12/18/1991	111.10	5858.7	12/18/1991	288.60	5735.9	12/18/1991	56.90	6173.5				12/11/1991	260.00	5760.4	12/18/1991	128.90	5939.3
3/13/1992	111.20	5858.6	3/1/1992	294	5730.5	3/1/1992	57	6173.4	3/1/1992	403.5	5701.5	3/13/1992	263.40	5757.0	3/12/1992	129.3	5938.9
5/22/1992	111.00	5858.8	6/15/1992	294.80	5729.7	5/20/1992	57.00	6173.4							5/20/1992	129.1	5939.1
9/1/1992	113.10	5856.7	9/2/1992	293.70	5730.8	9/1/1992	57.00	6173.4				9/2/1992	266.00	5754.4	9/1/1992	130	5938.2
12/1/1992	113.00	5856.8	12/1/1992	293.8	5730.7	12/1/1992	57	6173.4				12/1/1992	266.5	5753.9	12/3/1992	129.8	5938.4
3/1/1993	112.60	5857.2	3/3/1993	294.6	5729.9	3/3/1993	56	6174.4				3/3/1993	264.10	5756.3	3/3/1993	131.60	5936.6
6/2/1993	112.50	5857.3	6/7/1993	293.70	5730.8	6/2/1993	57.20	6173.2				6/2/1993	263.80	5756.6	6/2/1993	130.80	5937.4
9/8/1993	113.00	5856.8	9/8/1993	294.00	5730.5	9/10/1993	57.00	6173.4	9/9/1993	397.50	5707.5	9/7/1993	264.00	5756.4	9/8/1993	131.60	5936.6
12/1/1993	113.10	5856.7	12/8/1993	295.4	5729.1	12/8/1993	56.2	6174.2	12/8/1993	396.2	5708.8	12/8/1993	267	5753.4	12/7/1993	132.2	5936.0
3/9/1994	113.00	5856.8	3/9/1994	296.2	5728.3	3/9/1994	57.2	6173.2	3/8/1994	410.2	5694.8	3/8/1994	268.5	5751.9	3/7/1994	132.3	5935.9
6/7/1994	112.40	5857.4	6/7/1994	293.90	5730.6	6/7/1994	57.7	6172.7	6/7/1994	410.3	5694.7	6/7/1994	268.80	5751.6	6/7/1994	131.2	5937.0
9/9/1994	112.80	5857.0	9/9/1994	299.30	5725.2	9/9/1994	57.7	6172.7	9/9/1994	411.5	5693.5	9/9/1994	270.30	5750.1	9/8/1994	132.1	5936.1
12/1/1994	112.30	5857.5	12/1/1994	299.9	5724.6	12/1/1994	57.3	6173.1	12/1/1994	411.2	5693.8	12/1/1994	271.1	5749.3	12/1/1994	132.6	5935.6
3/3/1995	112.60	5857.2	3/6/1995	299.2	5725.3	3/1/1995	56.1	6174.3	3/1/1995	412.1	5692.9	3/1/1995	271.1	5749.3	3/1/1995	132.3	5935.9
6/7/1995	112.70	5857.1	6/1/1995	299.40	5725.1	6/1/1995	57.1	6173.3	6/1/1995	430		6/6/1995	270.80	5749.6	6/1/1995	132.50	5935.7
9/5/1995	112.80	5857.0	9/5/1995	298.90	5725.6	9/1/1995	56.2	6174.2	9/1/1995	430		9/5/1995	271.00	5749.4	9/6/1995	133.10	5935.1
12/5/1995	113.00	5856.8	12/5/1995	298.3	5726.2	12/5/1995	57.9	6172.5	12/5/1995	430		12/5/1995	270.3	5750.1	12/5/1995	132.80	5935.4
3/22/1996	112.80	5857.0	3/22/1996	300.70	5723.8	3/22/1996	56.3	6174.1				3/22/1996	272.30	5748.1	3/25/1996	133.2	5935.0
6/4/1996	113.90	5855.9	6/4/1996	303.10	5721.4	6/10/1996	57.8	6172.6				6/4/1996	275.00	5745.4	6/4/1996	133.20	5935.0
9/9/1996	111.50	5858.3	9/4/1996	305.00	5719.5	9/9/1996	57.5	6172.9				9/4/1996	270.00	5750.4	9/4/1996	133.20	5935.0
12/5/1996	110.80	5859.0	12/5/1996	307.00	5717.5	12/27/1996	57.5	6172.9				12/5/1996	278.30	5742.1	12/5/1996	133.30	5934.9
3/21/1997	111.50	5858.3	3/5/1997	308.20	5716.3	3/6/1997	57.9	6172.5				3/6/1997	278.8	5741.6	3/6/1997	133.20	5935.0
6/20/1997	112.20	5857.6	6/3/1997	308.20	5716.3	6/20/1997	56.8	6173.6				6/3/1997	280.00	5740.4	6/3/1997	133.20	5935.0
9/29/1997	111.80	5858.0	9/8/1997	301.20	5723.3	9/29/1997	56.8	6173.6				9/8/1997	280.90	5739.5	9/8/1997	134.00	5934.2
12/18/1997	112.80	5857.0	12/18/1997	300.90	5723.6	12/16/1997	58.6	6171.8				12/16/1997	280.8	5739.6	12/12/1997	134.20	5934.0
3/24/1998	113.00	5856.8	3/24/1998	308.2	5716.3	3/31/1998	57.2	6173.2				3/24/1998	281.2	5739.2	3/10/1998	133.80	5934.4
6/26/1998	112.50	5857.3	6/2/1998	305.6	5718.9	6/26/1998	57.8	6172.6				6/2/1998	281.20	5739.2	6/1/1998	133.80	5934.4
9/16/1998	112.60	5857.2	9/8/1998	302.50	5722.0	9/16/1998	57.60	6172.8				9/8/1998	281.20	5739.2	9/8/1998	131.9	5936.3
12/7/1998	112.50	5857.3	12/7/1998	301.90	5722.6	12/10/1998	57.5	6172.9				12/10/1998	281.5	5738.9	12/8/1998	135.00	5933.2
3/15/1999	112.20	5857.6	3/15/1999	308.20	5716.3	3/15/1999	57.4	6173.0				3/15/1999	281.50	5738.9	3/17/1999	133.8	5934.4
6/11/1999	112.80	5857.0	6/7/1999	309.70	5714.8	6/11/1999	57.2	6173.2				6/7/1999	275.40	5745.0	6/14/1999	133.5	5934.7
9/28/1999	112.80	5857.0	9/1/1999	310.90	5713.6	9/28/1999	57.3	6173.1				9/1/1999	285.30	5735.1	9/3/1999	133.9	5934.3
12/8/1999	112.20	5857.6	12/8/1999	309.90	5714.6	12/16/1999	57.4	6173.0				12/7/1999	282.80	5737.6	12/15/1999	134.1	5934.1
3/23/2000	112.70	5857.1	3/23/2000	310.40	5714.1	3/23/2000	57.4	6173.0				3/23/2000	274.9	5745.5	3/24/2000	132.2	5936.0
6/15/2000																	
9/22/2000	112.90	5856.9	9/22/2000	312.8	5711.7	9/28/2000	58.2	6172.2							9/18/2000	134.5	5933.7
12/7/2000	114.00	5855.8	12/7/2000	310.9	5713.6	12/7/2000	58.7	6172.2							12/7/2000	135	5933.2
3/23/2001		5857.1				3/22/2001	56.3	6174.1							3/22/1901	135.90	5932.3
6/13/2001		5856.9	6/5/2001			6/13/2001	57.1	6173.3							6/5/1901	134.50	5933.7
9/12/2001		5859.1	9/5/2001		5711.8	9/12/2001	57.8	6172.6							9/5/1901	134.50	5933.7
12/17/2001		5858.6				12/12/2001	58.2	6172.2							12/19/1901	134.70	5933.5
3/27/2002		5858.0	3/27/2002		5713.3	3/21/2002	57.3	6173.1							3/21/1902	134.70	5933.5
6/27/2002			6/24/2002		5711.7	6/27/2002	57.7	6172.7							6/24/1902	134.80	5933.4
9/28/2002		5854.9	9/24/2002		5711.8	9/23/2002	57.7	6172.7							9/24/1902	134.70	5933.5
12/21/2002		5858.0				12/21/2002	59.08	6171.3							12/26/1902	135.33	5932.9
3/15/2003																	
6/25/2003	118	5851.8													6/30/2003	133.4	5934.8

Emery Water Level Data - Ferron Sandstone (Upper)

Well AA			Bryant Well			Well H			Well I2			Lewis Well			Well Muddy #1		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
9/18/2003	111.7	5858.1	9/18/2003	313.2	5711.3	9/17/2003	61	6169.4				9/17/2003	275	5745.4	9/17/2003	133	5935.2
12/19/2003	112	5857.8	12/19/2003	315	5709.5	12/19/2003	62.5	6167.9				12/19/2003	275	5745.4	12/22/2003	133.5	5934.7
3/30/2004	112.1	5857.7	3/29/2004	309.9	5714.6	3/30/2004	59.5	6170.9				3/29/2004	215	5805.4	3/18/2004	135	5933.2
6/23/2004	112.1	5857.7	6/18/2004	312	5712.5	6/18/2004	60.6	6169.8				6/18/2004	215	5805.4	6/23/2004	135.2	5933.0
9/23/2004	111.1	5858.7	9/25/2004	311.4	5713.1	9/25/2004	61.75	6168.7				9/25/2004	215	5805.4	9/24/2004	127.5	5940.7
12/27/2004	111	5858.8				12/28/2004	53.5	6176.9							12/28/2004	133.5	5934.7
3/31/2005	111	5858.8				3/25/2005	41.4	6189.0							3/25/2005	133.8	5934.4
5/23/2005	110.7	5859.1				5/23/2005	59.7	6170.7							5/12/2005	132.5	5935.7
7/8/2005	108.8	5861.0	7/22/2005	294.6	5729.9										7/20/2005	133.8	5934.4
11/28/2005	111	5858.8	11/28/2005	294.7	5729.8										11/17/2005	137	5931.2
3/6/2006	110.4	5859.4	3/6/2006	293.1	5731.4				3/9/2006	417	5688.0				3/9/2006	136.9	5931.3
6/29/2006	110.4	5859.4	6/30/2006	296.3	5728.2				6/29/2006	418.3	5686.7				6/30/2006	139.5	5928.7
9/27/2006	91	5878.8	9/27/2006	298	5726.5				9/27/2006	405	5700.0				9/28/2006	138.5	5929.7
11/20/2006	111	5858.8	11/20/2006	298	5726.5				11/27/2006	418	5687.0				11/27/2006	137	5931.2

Emery Water Level Data - Ferron Sandstone (Upper)

Well Muddy #2			Well R2			Well T1			Well T2			Well TP			Well USGS1-2		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
10/7/1976			10/7/1976			10/7/1976			10/7/1976			10/7/1976			10/7/1976		
															12/6/1978	37.41	6008.9
7/2/1979	44.5	6002.3													3/7/1979	41.05	6005.3
10/30/1979	49.8	5997.0													7/2/1979	44.39	6001.9
															10/30/1979	54.71	5991.6
3/14/1980	64.9	5981.9	3/14/1980	-14	6045.7										2/29/1980	68.00	5978.3
6/11/1980	71.6	5975.2	6/11/1980	-9.4	6041.1										5/21/1980	76.30	5970.0
9/17/1980	59.9	5986.9	9/17/1980	-19.8	6051.5										9/15/1980	77.40	5968.9
11/9/1980	63	5983.8	11/9/1980	-24.7	6056.4										12/9/1980	80.00	5966.3
3/16/1981	81.6	5965.2	3/16/1981	-45.7	6077.4										3/16/1981	81.2	5965.1
6/22/1981	83.2	5963.6	6/22/1981	-34.4	6066.1										6/22/1981	87.50	5958.8
9/19/1981	81.2	5965.6	9/19/1981	-23	6054.7	9/17/1981	235.1	5768.1	9/17/1981	42.4	5955.3	9/17/1981	88.9	5913.8	9/19/1981	81.4	5964.9
11/24/1981	82.6	5964.2	11/24/1981	-18.4	6050.1										12/30/1981	88.72	5957.6
3/11/1982	81.4	5965.4	3/11/1982	-34.6	6066.3	3/29/1982	242.7	5760.5	3/29/1982	90.9	5906.8	3/29/1982	123.3	5879.4	3/12/1982	88.88	5957.4
7/23/1982	70	5976.8	6/21/1982	-5.7	6037.4	5/14/1982	278.5	5724.7	5/14/1982	234.6	5763.1	5/14/1982	271.7	5731.0	6/15/1982	89.00	5957.3
9/15/1982	71.1	5975.7	9/15/1982	-5.7	6037.4										8/13/1982	88.4	5957.9
11/10/1982	59.6	5987.2	11/10/1982	-10.4	6042.1										12/10/1982	88.20	5958.1
2/16/1983	71.4	5975.4	2/16/1983	-11.5	6043.2										3/22/1983	88.92	5957.4
6/30/1983	71.8	5975.0	7/1/1983	-1.6	6033.3										6/30/1983	88.50	5957.8
9/26/1983	68.4	5978.4	8/12/1983	-1.4	6033.1										9/26/1983	88.50	5957.8
12/7/1983	73.1	5973.7	12/8/1983	-4.6	6036.3	11/15/1983	334.7	5668.5	11/15/1983	279.2	5718.5	11/15/1983	295.3	5707.4	12/29/1983	87.80	5958.5
4/24/1984	89.8	5957.0	4/24/1984	-1.2	6032.9										4/23/1984		5956.7
6/11/1984	88.5	5958.3	6/11/1984	-5.8	6037.5										6/13/1984		5957.2
9/24/1984	61.6	5985.2	9/26/1984	123	5908.7	9/28/1984	340.2	5663	9/28/1984	273	5724.7				9/26/1984		5959.3
12/5/1984	78.3	5968.5	12/3/1984	125	5906.7										12/4/1984	87.7	5958.6
3/26/1985	90.4	5956.4	4/5/1985	132	5899.7	4/5/1985	340	5663.2	4/5/1985	273.8	5723.9	4/5/1985	286	5716.7	3/27/1985		5957.9
6/20/1985	78.20	5968.6	6/18/1985	139.2	5892.5	6/18/1985	340.3	5662.9	6/18/1985	275	5722.7	7/31/1985	286.30	5716.4	6/20/1985		5958.6
9/20/1985	87.40	5959.4	9/20/1985	140.8	5890.9	9/26/1985	343.1	5660.1	9/26/1985	276.7	5721.0	9/26/1985	288.7	5714.0	9/19/1985		5958.0
12/1/1985	82.1	5964.7	12/19/1985	154.70	5877.0	12/19/1985	348.1	5655.1	12/19/1985	278.6	5719.1	12/19/1985	289.5	5713.2	12/12/1985	87.9	5958.4
3/13/1986	90.60	5956.2				3/12/1986	348	5655.2	3/12/1986	313.9	5683.8	3/12/1986	333.8	5668.9	3/12/1986	88.60	5957.7
6/30/1986	91.50	5955.3	6/27/1986	210.00	5821.7	6/27/1986	348.5	5654.7	6/27/1986	327	5670.7				6/24/1986	88.40	5957.9
9/4/1986	89.00	5957.8	9/4/1986	210.5	5821.2				9/5/1986	333.3	5664.4	9/5/1986	350.00	5652.7	9/4/1986	88.30	5958.0
12/23/1986	91.2	5955.6	12/23/1986	209.8	5821.9	12/31/1986	358.2	5645	12/31/1986	340	5657.7	12/31/1986	357.2	5645.5	12/23/1986	88.30	5958.0
3/23/1987	94.30	5952.5	3/25/1987	202.60	5829.1	4/2/1987	369.9	5633.3	4/2/1987	345.9	5651.8	4/2/1987	359.2	5643.5	3/26/1987	86.90	5959.4
5/20/1987	92.20	5954.6	5/14/1987	195.90	5835.8	5/14/1987	329	5674.2	5/14/1987	336.5	5661.2	5/19/1987	346.40	5656.3	5/20/1987	88.80	5957.5
9/23/1987	93.30	5953.5	9/25/1987	197.00	5834.7				9/25/1987	326.1	5671.6	10/9/1987	337.00	5665.7	10/7/1987	88.60	5957.7
12/30/1987	93.4	5953.4	12/30/1987	197.50	5834.2				12/30/1987	326.8	5670.9				12/30/1987	89.90	5956.4
3/22/1988	93.6	5953.2	3/22/1988	198.00	5833.7				3/22/1988	325.7	5672.0	3/22/1988	333	5669.7	3/22/1988	88.80	5957.5
6/30/1988	91.1	5955.7							6/30/1988	322.7	5675.0	6/30/1988	332.90	5669.8	6/9/1988	89.60	5956.7
10/19/1988	87.7	5959.1							10/19/1988	353.3	5644.4				10/20/1988	90.50	5955.8
12/19/1988	76.5	5970.3													12/29/1988	92.70	5953.6
3/27/1989	66.3	5980.5	3/27/1989	359	5672.7				3/27/1989	352	5645.7	3/27/1989	335	5667.7	3/27/1989	95.1	5951.2
5/18/1989	95.20	5951.6													5/19/1989	96.80	5949.5
9/11/1989	96.90	5949.9	9/11/1989	483.3	5548.4	9/11/1989	337	5666.2	9/11/1989	313	5684.7	9/11/1989	343.00	5659.7	9/11/1989	98.40	5947.9
12/6/1989	97.7	5949.1	12/6/1989	482	5549.7				12/6/1989	307.2	5690.5	12/6/1989	365	5637.7	12/6/1989	100.4	5945.9

Emery Water Level Data - Ferron Sandstone (Upper)

Well Muddy #2			Well R2			Well T1			Well T2			Well TP			Well USGS1-2		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
3/12/1990	97.00	5949.8	3/1/1990	481.7	5550.0	3/1/1990	334	5669.2	3/1/1990	299.5	5698.2	3/1/1990	361	5641.7	3/1/1990	101	5945.3
6/4/1990	98.50	5948.3				6/1/1990	349	5654.2				6/8/1990	366.70	5636.0	6/1/1990	102.2	5944.1
9/18/1990	105.00	5941.8				9/18/1990	369	5634.2				9/18/1990	372.00	5630.7	9/18/1990	103.40	5942.9
11/7/1990	99.50	5947.3	12/1/1990	483	5548.7	12/1/1990	398	5605.2				12/1/1990	371	5631.7	12/1/1990	103.80	5942.5
3/29/1991	99.50	5947.3				3/20/1991	348.3	5654.9	3/20/1991	324.1	5673.6				3/20/1991	104.2	5942.1
6/10/1991	99.50	5947.3										6/17/1991	375.30	5627.4	6/17/1991	104.80	5941.5
9/18/1991	99.50	5947.3										9/23/1991	378.80	5623.9	9/24/1991	104.90	5941.4
12/18/1991	99.60	5947.2				12/4/1991	353.6	5649.6	12/4/1991	286.7	5711.0	12/4/1991	385	5617.7	12/4/1991	105.3	5941.0
3/12/1992	99.50	5947.3							3/12/1992	275.1	5722.6	3/1/1992	383.8	5618.9	3/1/1992	105.2	5941.1
5/20/1992	99.50	5947.3				5/20/1992	348	5655.2	5/20/1992	277.6	5720.1	5/26/1992	386.60	5616.1	6/24/1992	105.80	5940.5
9/1/1992	99.80	5947.0				9/1/1992	350	5653.2	9/1/1992	277	5720.7	9/2/1992	390.00	5612.7	9/2/1992	106.00	5940.3
12/9/1992	100.00	5946.8										12/1/1992	394	5608.7	12/1/1992	106.4	5939.9
3/3/1993	100.1	5946.7							3/3/1993	250	5747.7	3/10/1993	395.4	5604.7	3/10/1993	106.8	5939.5
6/2/1993	100.30	5946.5										6/4/1993	398.00	5604.7	6/7/1993	106.90	5939.4
9/8/1993	100.20	5946.6							9/8/1993	286.00	5711.7	9/8/1993	389.00	5613.7	9/8/1993	106.20	5940.1
12/7/1993	100.2	5946.6							12/7/1993	282	5715.7	12/7/1993	396.4	5606.3	12/7/1993	105.4	5940.9
3/7/1994	100.1	5946.7							3/9/1994	255	5742.7	3/9/1994	399	5603.7	3/9/1994	105.8	5940.5
6/7/1994	100	5946.8							6/7/1994	249.9	5747.8	6/6/1994	401.30	5601.4	6/6/1994	106.60	5939.7
9/8/1994	100.3	5946.5							9/8/1994	257.3	5740.4	9/7/1994	402.70	5600.0	9/7/1994	105.60	5940.7
12/1/1994	100.3	5946.5							12/1/1994	256.1	5741.6	12/1/1994	403.5	5599.2	12/1/1994	107	5939.3
3/1/1995	100	5946.8							3/1/1995	256	5741.7	3/1/1995	402.3	5600.4	3/1/1995	107.3	5939.0
6/1/1995	100.1	5946.7							6/1/1995	251.2	5746.5	6/1/1995	402.3	5600.4	6/1/1995	107.20	5939.1
9/18/1995	96.3	5950.5							9/1/1995	235.5	5762.2	9/1/1995	406	5596.7	9/1/1995	106.00	5940.3
12/5/1995	65.7	5981.1							12/5/1995	285	5712.7	12/5/1995	405.8	5596.9	12/5/1995	104.5	5941.8
3/8/1996	99.5	5947.3							3/8/1996	286.3	5711.4	3/25/1996	406.2	5596.5	3/25/1996	103.3	5943.0
6/10/1996	96.90	5949.9							6/10/1996	286.8	5710.9	6/4/1996	406	5596.7	6/4/1996	103	5943.3
9/4/1996	99.10	5947.7							9/4/1996	286.3	5711.4	9/4/1996	406	5596.7	9/4/1996	101.3	5945.0
12/5/1996	99.5	5947.3							12/5/1996	290	5707.7	12/26/1996	405.2	5597.5	12/26/1996	100.8	5945.5
3/6/1997	99.50	5947.3							3/6/1997	290	5707.7	3/6/1997	405	5597.7	3/6/1997	102	5944.3
6/20/1997	99.30	5947.5							6/3/1997	290	5707.7	6/3/1997	405	5597.7	6/3/1997	102.2	5944.1
9/29/1997	99.10	5947.7							9/8/1997	291	5706.7	9/8/1997	405.9	5596.8	9/8/1997	101.6	5944.7
12/16/1997	98.10	5948.7							12/5/1997	291	5706.7	12/5/1997	406.2	5596.5	12/5/1997	97.3	5949.0
3/10/1998	99.50	5947.3							3/24/1998	290	5707.7	3/24/1998	405.8	5596.9	3/10/1998	97.8	5948.5
6/26/1998	98.70	5948.1							6/2/1998	290	5707.7	6/2/1998	405.9	5596.8	6/1/1998	97.50	5948.8
9/16/1998	97.8	5949.0							9/8/1998	290.00	5707.7	9/8/1998	405.8	5596.9	9/28/1998	96.80	5949.5
12/8/1998	98.20	5948.6							12/7/1998	290	5707.7	12/7/1998	405.9	5596.8	12/8/1998	96.7	5949.6
3/17/1999	99.5	5947.3							3/8/1999	290	5707.7	3/17/1999	405.8	5596.9	3/17/1999	96.4	5949.9
6/14/1999	98	5948.8							6/11/1999	274	5723.7	6/11/1999	405	5597.7	6/17/1999	92.3	5954.0
9/30/1999	99.3	5947.5							9/3/1999	274	5723.7	9/3/1999	405.8	5596.9	9/3/1999	94.4	5951.9
12/15/1999	99.7	5947.1							12/15/1999	274	5723.7	12/15/1999	405	5597.7	12/15/1999	86.9	5959.4
3/24/2000	99.2	5947.6							3/15/2000	274	5723.7	3/15/2000	405	5597.7	3/24/2000	91.2	5955.1
9/18/2000	100.2	5946.6							9/18/2000	274	5723.7	9/18/2000	405	5597.7	9/18/2000	90.3	5956.0
12/20/2000	98.2	5948.6							12/4/2000	274	5723.7	12/4/2000	405	5597.7	12/20/2000	89.1	5957.2
3/22/1901	97.60	5949.2							3/22/2001	274	5723.7						
6/12/1901	98.20	5948.6							6/4/2001	275	5722.7						
9/5/1901	99.80	5947.0							9/5/2001	275	5722.7						
12/19/1901	99.00	5947.8							12/17/2001	275	5722.7						
3/21/1902	97.80	5949.0										3/21/2002	405	5597.7			
6/24/1902	99.20	5947.6							6/24/2002	275	5722.7						
9/24/1902	99.75	5947.1							9/23/2002	275	5722.7						
12/26/1902	97.75	5949.1							12/26/2002	273	5724.7						
6/30/2003	99.4	5947.4															

Emery Water Level Data - Ferron Sandstone (Upper)

Well Muddy #2			Well R2			Well T1			Well T2			Well TP			Well USGS1-2		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
9/19/2003	128.2	5918.6	9/17/2003	488	5543.7	9/17/2003	350	5653.2	9/17/2003	273	5724.7				9/17/2003	105	5941.3
12/22/2003	129	5917.8	12/19/2003	488	5543.7							12/22/2003	405	5597.7	12/22/2003	105	5941.3
3/29/2004	131	5915.8				3/29/2004	295	5708.2	3/29/2004	285	5712.7	3/29/2004	405	5597.7	3/18/2004	107	5939.3
6/23/2004	99.2	5947.6	6/23/2004	488	5543.7	6/18/2004	360	5643.2	6/18/2004	275	5722.7	6/18/2004	405	5597.7	6/18/2004	107	5939.3
9/24/2004	119	5927.8										9/23/2004	405	5597.7	9/24/2004	103.6	5942.7
						12/28/2004									12/28/2004	103.5	5942.8
						3/31/2005									3/25/2005	104.9	5941.4
						5/11/2005	255	5748.2	5/11/2005	47.4	5950.3				5/11/2005	119.8	5926.5
			7/11/2005	602.6	5429.1	7/11/2005	382	5621.2	7/11/2005	47.4	5950.3				7/19/2005	119.7	5926.6
			11/28/2005	550.7	5481.0	11/22/2005			11/22/2005	52	5945.7				11/17/2005	119.6	5926.7
			3/7/2006	531	5500.7										3/9/2006	119.9	5926.4
															6/28/2006	120	5926.3
9/28/2006	62.5	5984.3	9/28/2006	488	5543.7	9/28/2006	383	5620.2	9/28/2006	145	5852.7	9/28/2006	406	5596.7	9/28/2006	109.5	5936.8
11/27/2006	61	5985.8	11/20/2006	488	5543.7	11/20/2006	383	5620.2	11/20/2006	152	5845.7	11/20/2006	406	5596.7	11/27/2006	129	5917.3

Emery Water Level Data - Ferron Sandstone (Middle)

Well AA			Well H			Well I			Well R2		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
11/16/1979	-1.41	5968.7									
3/17/1980	-20.93	5988.2									
6/11/1980	-16.30	5983.6									
9/16/1980	-20.77	5988.1									
12/9/1980	-19.85	5987.2									
3/16/1981	-21.00	5988.3									
7/17/1981	-19.82	5987.1									
9/1/1981											
11/1/1981											
3/12/1982	-80.73	6048.0									
6/21/1982	-71.40	6038.7									
9/15/1982	-16.00	5983.3									
11/9/1982	-8.07	5975.4									
3/30/1983	-4.61	5971.9									
7/1/1983	-5.78	5973.1									
10/25/1983	-5.50	5972.8									
12/1/1993											
4/18/1984	63.40	5905.8									
6/11/1984	63.20	5906.0									
9/26/1984	63.50	5905.7									
12/1/1984											
4/5/1985	66.10	5903.1	4/5/1985	53.8	6176.6	4/5/1985	159.9	5949.0	4/5/1985	-131.7	6162.8
6/18/1985	66.20	5903.0	6/18/1985	55.2	6175.2	6/18/1985	162.4	5946.5	6/18/1985	-130.50	6161.6
9/3/1985	67.30	5901.9	9/3/1985	57.6	6172.8	9/3/1985	168.2	5940.7	9/3/1985	-110.90	6142.0
12/1/1985	66.80	5901.9	12/1/1985	61.6	6168.8	12/1/1985	167.2	5940.7	12/1/1985	-109.30	6140.4
3/31/1986	69.00	5896.7	3/31/1986	62.5	6167.9	3/31/1986	205.3	5903.6	3/31/1986	-107.40	6138.5
6/27/1986	72.50	5896.7	6/27/1986	61.8	6168.6	6/27/1986	204.6	5904.3	6/27/1986	-87.80	6118.9
9/3/1986	72.60	5896.6	9/3/1986			9/3/1986	216.1	5892.8	9/3/1986	-70.50	6101.6
12/23/1986	91.50	5877.7	12/23/1986	73.4	6157.0	12/23/1986	222.4	5886.5	12/23/1986	-67.00	6098.1
3/1/1987			3/1/1987	72.40	6158.0	3/1/1987	222.40	5886.5	3/1/1987		
5/22/1987	89.20	5880.0	5/22/1987	80.00	6150.4	5/22/1987	219.70	5889.2	5/14/1987	-71.50	6102.6
9/25/1987	82.00	5887.2	9/25/1987	80.00	6150.4	9/25/1987	221.00	5887.9	9/25/1987	-73.80	6104.9
12/29/1987	85.60	5883.6	12/29/1987	94.60	6135.8	12/29/1987	223.30	5885.6	12/30/1987	-73.80	6104.9
3/22/1988	86.00	5883.2	3/22/1988	94.60	6135.8	3/22/1988	223.3	5885.6	3/22/1988	-69.20	6100.3
6/30/1988	83.50	5885.7	6/30/1988	183.10	6047.3	6/30/1988	223.3	5885.6	6/30/1988		
10/19/1988	85.00	5884.2	10/19/1988	220	6010.4	10/19/1988	223.8	5885.1	10/19/1988		
12/19/1988	84.00	5885.2	12/19/1988			12/19/1988	223.5	5885.4	12/19/1988		
3/30/1989	86.00	5883.2	3/30/1989	212.8	6017.6	3/30/1989	224	5884.9	3/30/1989		

Emery Water Level Data - Ferron Sandstone (Middle)

Well AA			Well H			Well I			Well R2		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
5/18/1989	85.20	5884.0	5/18/1989	298	5932.4	5/18/1989	225.4	5883.5	5/18/1989	410.10	5621.0
9/11/1989	84.50	5884.7	9/11/1989	308	5922.4	9/11/1989	227.3	5881.6	9/11/1989	408.00	5623.1
12/1/1989	80.70	5884.7	12/1/1989	331	5899.4	12/1/1989	229.3	5879.6	12/1/1989		
3/15/1990	85.40	5883.8	3/15/1990	348.7	5881.7	3/15/1990	228.5	5880.4	3/15/1990	400.80	5630.3
6/11/1990	86.00	5883.2	6/11/1990	367.00	5863.4	6/11/1990	231.80	5877.1	6/11/1990	403.90	5627.2
9/19/1990	84.50	5884.7	9/19/1990	367.00	5863.4	9/19/1990	233.4	5875.5	9/19/1990	405.80	5625.3
12/1/1990	84.50	5884.7	11/8/1990	375.00	5855.4	11/8/1990	235.5	5873.4	11/8/1990	405.00	5626.1
4/1/1991	89.00	5879.7	4/1/1991			4/1/1991			4/1/1991		
6/17/1991	89.50	5879.7	6/17/1991	385.10	5845.3	6/17/1991	236.1	5872.8	6/17/1991	409.00	5622.1
9/18/1991	89.20	5879.7	9/18/1991	389.80	5840.6	9/18/1991	236.5	5872.8	9/18/1991	407.00	5624.1
12/1/1991	89.10	5879.7	12/1/1991	389.30	5841.1	12/1/1991	236.9	5872.8	12/1/1991	407.50	5623.6
3/13/1992	89.00	5880.2	3/13/1992	392.8	5837.6	3/13/1992	233.1	5875.8	3/13/1992	403.7	5627.4
5/22/1992	90.70	5878.5	5/22/1992	390.00	5840.4	5/22/1992	236.30	5872.6	5/22/1992	402	5629.1
9/1/1992	93.70	5875.5	9/1/1992	404.00	5826.4	9/1/1992	237.00	5871.9	9/1/1992	402	5629.1
12/3/1992	91.20	5878.0	12/3/1992	402	5828.4	12/3/1992	237	5871.9	12/3/1992	385.7	5645.4
3/1/1993	85.30	5883.9	3/1/1993	400	5830.4	3/1/1993	237.2	5871.7	3/1/1993	402	5629.1
6/2/1993	87.60	5881.6	6/2/1993	399.2	5831.2	6/2/1993	238.4	5870.5	6/2/1993	401.20	5629.9
9/8/1993	90.00	5879.2	9/8/1993	405.3	5825.1	9/8/1993	237.5	5871.4	9/8/1993	403.20	5627.9
12/1/1993	87.20	5882.0	12/1/1993	402.1	5828.3	12/1/1993	236.8	5872.1	12/1/1993	409.20	5621.9
3/9/1994	91.10	5878.1	12/8/1993	402.1	5828.3	12/8/1993	236.8	5872.1	12/7/1993	409.2	5621.9
6/7/1994	90.30	5878.9	6/8/1994	410.2	5820.2	6/7/1994	243.4	5865.5	6/7/1994	410	5621.1
9/9/1994	92.20	5877.0	9/9/1994	405.2	5825.2	9/8/1994	244.1	5864.8	9/8/1994	408.3	5622.8
12/1/1994	91.30	5877.9	12/1/1994	406.2	5824.2	12/1/1994	243.8	5865.1	12/1/1994	406	5625.1
3/3/1995	92.80	5876.4	3/3/1995	406	5824.4	3/3/1995	242.8	5866.1	3/3/1995	392.3	5638.8
6/7/1995	92.50	5876.7	6/7/1995	411.2	5819.2	6/7/1995	242.3	5866.6	6/7/1995	412	5619.1
9/5/1995	92.70	5876.5	9/5/1995	415.2	5815.2	9/5/1995	242.2	5866.7	9/5/1995	411.9	5619.2
12/5/1995	90.50	5878.7	12/5/1995	414.9	5815.5	12/5/1995	242.2	5866.7	12/5/1995	407	5624.1
3/22/1996	88.90	5880.3	3/22/1996	418.3	5812.1	3/22/1996	241.5	5867.4	3/22/1996	402.8	5628.3
6/4/1996	88.90	5880.3	6/4/1996	412.8	5817.6	6/4/1996	241.3	5867.6	6/4/1996	410.9	5620.2
9/9/1996	89.90	5879.3	9/9/1996	408.5	5821.9	9/9/1996	240.7	5868.2	9/9/1996	412.7	5618.4
12/1/1996	90.20		12/1/1996	410.4	5820.0	12/1/1996	241.2	5867.7	12/1/1996	412.1	5619.0
3/21/1997		5878.5	3/6/1997	409.9	5820.5	3/6/1997		5868.4	3/3/1997	412.80	5618.3
6/20/1997		5879.0	6/20/1997	410.1	5820.3	6/20/1997		5869.4	6/20/1997	412.73	5618.4
9/29/1997	89.80	5879.4	9/29/1997	409.9	5820.5	9/29/1997		5868.9	9/30/1997	412.70	5618.4
12/18/1997		5876.5	12/16/1997		5816.2	12/12/1997		5869.7	12/5/1997		5619.3
3/24/1998		5880.7	3/31/1998		5816.7	3/31/1998		5871.1	3/31/1998		5619.6
6/26/1998		5881.4	6/26/1998	413.5	5816.9	6/26/1998		5869.4	6/26/1998	409.80	5621.3
9/16/1998		5880.7	9/16/1998		5813.4	9/8/1998		5870.7	9/15/1998		5625.9

Emery Water Level Data - Ferron Sandstone (Middle)

Well AA			Well H			Well I			Well R2		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
12/7/1998		5880.4	12/10/1998		5813.9	12/10/1998		5871.2	12/10/1998		5627.2
3/15/1999	88.50	5880.7	3/15/1999	413.2	5817.2	3/17/1999	238.2	5870.7	3/15/1999	411.10	5620.0
6/11/1999	88.90	5880.3	6/11/1999	416	5814.4	6/11/1999	238.3	5870.6	6/11/1999	409.5	5621.6
9/28/1999	90.00	5879.2	9/28/1999	414.6	5815.8	9/28/1999	238.5	5870.4	9/28/1999	408.6	5622.5
12/8/1999	89.80	5879.4	12/16/1999	415.9	5814.5	12/15/1999	238	5870.9	12/15/1999	407.7	5623.4
3/23/2000		5879.2	3/23/2000		5815.2	3/23/2000		5870.2	3/23/2000		5621.7
6/1/2000											
9/22/2000		5879.2	9/28/2000		5815.5	9/28/2000		5870.3	9/25/2000		5619.9
12/1/2000											
3/23/2001		5883.0	3/22/2001	404	5826.4	3/22/2001	237.3	5871.6	3/22/2001	408.20	5622.9
6/13/2001		5881.4	6/13/2001	412.7	5817.7	6/13/2001	237.6	5871.3	6/13/2001	408.90	5622.2
9/12/2001		5879.2	9/12/2001	414.8	5815.6	9/12/2001	238.9	5870.0	9/12/2001	410.80	5620.3
12/17/2001			12/12/2001	415.1	5815.3	12/12/2001	238.8	5870.1	12/17/2001	410.80	5620.3
3/27/2002		5878.0	3/21/2002	409.9	5820.5	3/21/2002	238.1	5870.8	3/21/2002	409.40	5621.7
6/24/2002		5878.9	6/27/2002	412.3	5818.1	6/27/2002	238	5870.9	6/27/2002	409.30	5621.8
9/28/2002		5878.2	9/23/2002	412.2	5818.2	9/23/2002	238.8	5870.1	9/28/2002	410.70	5620.4
12/21/2002			12/21/2002	414.83	5815.6	12/21/2002	239.33	5869.6	12/21/2002	407.50	5623.6
3/15/2003											
6/25/2003	89.5	5879.7									
9/18/2003	84.75	5884.5	9/17/2003	414	5816.4	9/17/2003	263	5845.9	9/17/2003	380	5651.1
12/19/2003	86	5883.2	12/19/2003	415	5815.4	12/19/2003	262	5846.9	12/19/2003	380	5651.1
3/30/2004	89.6	5879.6	3/30/2004	414.8	5815.6	3/30/2004	249.3	5859.6	3/18/2004	391	5640.1
6/23/2004	89.3	5879.9	6/18/2004	416	5814.4	6/18/2004	240.2	5868.7	6/23/2004	395.2	5635.9
9/23/2004	96.75	5872.5	9/25/2004			9/25/2004	262.9	5846.0	9/20/2004	379.5	5651.6
12/27/2004	96.9	5872.3	12/28/2004			12/28/2004	262	5846.9	12/28/2004	391	5640.1
3/31/2005	97.5	5871.7	3/25/2005			3/25/2005	234.6	5874.3	3/24/2005	392.5	5638.6
5/23/2005	97.3	5871.9	5/23/2005			5/23/2005	233.8	5875.1	5/23/2005	391.5	5639.6
7/8/2005	97.3	5871.9	7/11/2005			7/20/2005	237.8	5871.1	7/11/2005	376.4	5654.7
11/28/2005	97.1	5872.1	11/22/2005			11/22/2005	389	5719.9	11/28/2005	346.2	5684.9
3/6/2006	96.9	5872.3				3/9/2006	390.9	5718.0	3/7/2006	333.6	5697.5
6/29/2006	100	5869.2				6/29/2006	393.6	5715.3	6/29/2006	341.8	5689.3
9/27/2006						9/27/2006	395	5713.9	9/28/2006	343.8	5687.3
11/20/2006						11/27/2006	395	5713.9	11/20/2006	351	5680.1

Emery Water Level Data - Ferron Sandstone (Lower)

Well AA			Well H			Well I			Well Kemmerer			Well R1			Well WW1			Well ZZ		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
2/1/1973									02/01/73	72.03	6358.7									
9/10/1975									09/10/75	46.03	6332.7									
12/30/1975									12/30/75	46	6332.7									
3/18/1976									03/18/76	47	6333.7									
11/15/1976									11/15/76	45	6331.7									
2/15/1977									02/15/77	43.5	6330.2									
3/30/1977									03/30/77	43.5	6330.2									
5/6/1977									05/06/77	44.5	6331.2									
6/2/1977									06/02/77	45	6331.7									
9/21/1977									09/21/77	44	6330.7									
10/21/1977									10/21/77	43	6329.7									
1/8/1978									01/08/78	46	6332.7									
5/3/1978									05/03/78	44	6330.7									
7/5/1978									07/05/78	44	6330.7									
9/29/1978									09/29/78	42.3	6329.0									
12/9/1978									12/09/78	42.9	6329.6									
2/5/1979									02/05/79	42.5	6329.2									
3/5/1979									03/05/79	42	6328.7									
6/4/1979									06/04/79	41	6327.7									
9/6/1979									09/06/79	41	6327.7									
10/30/1979									10/30/79	40	6326.7									
11/16/1979	74.55	5894.1																10/30/79	145.79	5922.9
3/17/1980	74.57	5894.0							03/14/80	43.7	6330.4									
6/11/1980	74.74	5893.9																		
9/16/1980	74.68	5893.9																		
12/9/1980	75.42	5893.2																		
3/16/1981	75.23	5893.4							03/16/81	40.03	6326.7									
5/11/1981	75.87	5892.7							05/11/81	39.03	6325.7									
7/17/1981	76.92	5891.7																06/22/81	146.73	5922.0
11/1/1981																		11/24/81	146.00	5922.7
3/12/1982	76.12	5892.5							03/11/82	38.03	6324.7							03/12/82	144.67	5924.0
6/15/1982																		06/15/82	144.60	5924.1
8/24/1982	79.20	5889.4																09/20/82	145.00	5923.7
11/9/1982	77.50	5891.1																12/28/82	145.75	5923.0
3/30/1983	76.75	5891.9							03/22/83	32.00	6318.7							03/22/83	145.66	5923.0
7/1/1983	76.58	5892.0							07/01/83	32.00	6318.7							06/30/83	145.58	5923.1
10/25/1983	79.90	5888.7																09/26/83	145.70	5923.0
12/1/1983									12/29/83	32.00	6318.7									
4/18/1984	81.50	5887.1	04/23/84	11	6219.4	04/23/84	12.9	6095.9	04/23/84	31.00	6317.7							04/23/84	145.50	5923.2
6/11/1984	80.60	5888.0	06/11/84	14	6216.4				06/13/84	31.00	6317.7							06/12/84	144.20	5924.5
9/26/1984	80.30	5888.3				09/26/84	13.5	6094.8	09/24/84	32.00	6318.7							09/24/84	145.40	5923.3
12/1/1984																				
4/5/1985	81.20	5887.4	04/05/85	19.10	6211.3		14		04/05/85	30.00	6316.7	04/05/85	-198.7	6232.9				03/06/85	145.70	5923.0
6/18/1985	81.40	5887.2	06/18/85	19.80	6210.6	06/18/85	13.30	6095.5	06/18/85	30.00	6316.7	06/18/85	-198.70	6232.9				06/20/85	145.80	5922.9
9/3/1985	81.90	5886.7	09/26/85	21.10	6209.3	09/26/85	13.30	6095.4	09/25/85	30.00	6316.7	09/20/85	-189.40	6223.6				09/19/85	146.10	5922.6
12/1/1985	83.00	5885.6	12/11/85	23.5	6206.9	12/11/85	12.5	6096.3	12/11/85	35.00	6321.7	12/11/85	-188.6	6222.8	12/1/1985	65.70	5854.3	12/11/85	145.5	5923.2
3/20/1986	84.60	5884.0	03/20/86	23.9	6206.5	03/20/86	13.4	6095.4	03/12/86	30.00	6316.7	03/12/86	-295.7	6329.9	3/20/1986	64.70	5855.3	03/12/86	145.8	5922.9
6/27/1986	82.90	5885.7	06/30/86	24.20	6206.2	06/30/86	13.60	6095.2	06/24/86	30.00	6316.7	06/27/86	-272.60	6306.8	6/27/1986	64.90	5855.1	06/30/86	146.50	5922.2
9/3/1986	83.10	5885.5				09/04/86	13.00	6095.8	09/04/86	30.00	6316.7	09/04/86	-272.60	6306.8	9/3/1986	66.30	5853.7	09/05/86	146.30	5922.4
12/23/1986	87.80	5880.8	12/31/86	30.00	6200.4	12/31/86	12.60	6096.2	12/23/86	27	6313.7	12/23/86	-263.3	6297.5	12/23/1986	65.7	5854.3	12/23/86	152.30	5916.4
4/1/1987	88.30	5880.3	04/02/87	30.00	6200.4	03/26/87	12.40	6096.4	03/26/87	27.00	6313.7	03/25/87	-253.80	6288.0				03/23/87	147.90	5920.8
5/22/1987	89.20	5879.4	05/22/87	35.70	6194.7	05/22/87	14.80	6094.0	05/18/87	26.00	6312.7	05/14/87	-253.80	6288.0				05/19/87	148.90	5919.8
9/25/1987	88.60	5880.0	09/25/87	37.50	6192.9	09/25/87	13.50	6095.3	09/25/87	26	6312.7	09/25/87	-258.40	6292.6				09/25/87	148.40	5920.3
12/29/1987	88.60	5880.0	12/29/87	40.20	6190.2	12/29/87	13.50	6095.3	12/29/87	24.00	6310.7	12/30/87	-258.40	6292.6				12/30/87	148.50	5920.2
3/22/1988	87.30	5881.3	03/22/88	40.4	6190.0	03/22/88	13.5	6095.3	03/22/88	24.00	6310.7	03/22/88	-258.40	6292.6				03/22/88	147.60	5921.1
6/30/1988	86.50	5882.1	06/30/88	44	6186.4	06/30/88	14.6	6094.2	06/09/88	24.00	6310.7	06/30/88	-263.00	6297.2	6/30/1988	66.2	5853.8	06/09/88	148.00	5920.7
10/19/1988	88.00	5880.6	10/19/88	43.9	6186.5	10/19/88	13.8	6095.0	10/20/88	24.00	6310.7	10/25/88	-267.70	6301.9	10/19/1988	67.9	5852.1	10/25/88	148	5920.7
12/19/1988	86.40	5882.2				12/19/88	13.8	6095.0	12/20/88	23.00	6309.7	12/29/88	-226.10	6260.3				12/21/88	148.30	5920.4
3/30/1989	86.00	5882.6	03/27/89	48.5	6181.9	03/27/89	15.1	6093.7	03/27/89	25.00	6311.7	03/27/89	-235.3	6269.5	3/30/1989	67.8	5852.2	03/27/89	148.5	5920.2
5/18/1989		5870.4	05/18/89		6177.3	05/19/89		6094.5	05/18/89	25.00	6311.7	05/26/89		6269.5	5/18/1989		5852.0	05/26/89	148.8	5919.9
9/11/1989		5881.8	09/12/89		6176.0	09/12/89		6092.4	09/11/89	25.00	6311.7	09/11/89		6281.1	9/11/1989		5851.7	09/11/89	149.80	5918.9
12/1/1989	87.40	5881.2	12/01/89	53.6	6176.8	12/01/89	17	6091.8	12/01/89	21	6307.7	12/01/89	-242.2	6276.4	12/1/1989	67.7	5852.3	12/01/89	149.6	5919.1
3/15/1990	87.30	5881.3	03/15/90	54.6	6175.8	03/15/90	17	6091.8	03/12/90	20.00	6306.7	03/12/90	-235.3	6269.5	3/15/1990	67.30	5852.7	03/12/90	149.5	5919.2

Emery Water Level Data - Ferron Sandstone (Lower)

Well AA			Well H			Well I			Well Kemmerer			Well R1			Well WW1			Well ZZ		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
6/11/1990	87.30	5881.3	06/11/90	56.50	6173.9	06/01/90	17.80	6091.0	06/04/90	20.00	6306.7	06/04/90	-235.3	6269.5	6/11/1990	68.00	5852.0	06/08/90	149.90	5918.8
9/19/1990	88.70	5879.9	09/19/90	58.8	6171.6	09/19/90	16.8	6092.0	09/17/90	17.00	6303.7	09/17/90	-235.3	6269.5	9/19/1990	68.50	5851.5	09/18/90	150.60	5918.1
11/7/1990	88.50	5880.1	11/07/90	67.2	6163.2	11/07/90	18	6090.8	11/07/90	17.00	6303.7	11/07/90	-235.3	6269.5	11/7/1990	68.00	5852.0	11/07/90	149.8	5918.9
3/1/1991	88.10	5880.5	03/29/91	63.10	6167.3	03/29/91	18.00	6090.8	03/01/91	17	6303.7	03/01/91	-228.4	6262.6	3/1/1991	67.5	5852.5	03/01/91	149.8	5918.9
6/17/1991	87.90	5880.7	06/14/91	64.60	6165.8	06/13/91	18.20	6090.5	06/10/91	17.00	6303.7	06/14/91	-226.10	6260.3	6/17/1991	67.10	5852.9	06/17/91	152.00	5916.7
9/18/1991	88.20	5880.4	09/18/91	66.30	6164.1	09/17/91	18.50	6090.2	09/24/91	10.00	6296.7	09/18/91	-226.10	6260.3	9/18/1991	67.80	5852.2	09/23/91	149.50	5919.2
12/1/1991	88.50	5880.1	12/18/91	68.20	6162.2	12/18/91	16.30	6092.5	12/11/91	11.00	6297.7	12/11/91	-226.6	6260.8	12/1/1991	67.3	5852.7	12/11/91	149.80	5918.9
3/13/1992	87.30	5881.3	03/13/92	71.5	6158.9	03/13/92	13.4	6095.4	03/13/92	11.00	6297.7	03/13/92	-216.90	6251.1	3/13/1992	66.50	5853.5	03/12/92	149.3	5919.4
5/22/1992	88.10	5880.5	05/20/92	73.70	6156.7	05/20/92	16.10	6092.7	05/26/92	9.00	6295.7	05/22/92	-136.10	6170.3	5/22/1992	67.00	5853.0	05/26/92	149.4	5919.3
9/1/1992	87.70	5880.9	09/01/92	78.00	6152.4	09/01/92	16.10	6092.7	09/02/92	9.00	6295.7	09/01/92	-126.90	6161.1	9/1/1992	68.10	5851.9	09/02/92	154.10	5914.6
12/1/1992	88.50	5880.1	12/03/92	76	6154.4	12/03/92	16.3	6092.5	12/03/92	9	6295.7	12/03/92	-57.70	6091.9	12/1/1992	66.80	5853.2	12/03/92	149.2	5919.5
3/1/1993	87.90	5880.7	03/03/93	75.1	6155.3	03/03/93	16.8	6092.0	03/03/93	9.00	6295.7	03/03/93	-126.9	6161.1	3/1/1993	66.9	5853.1	03/03/93	148.9	5919.8
6/2/1993	89.30	5879.3	06/02/93		6154.6	06/02/93	16.90	6091.8	06/07/93	9.50	6296.2	06/02/93	-120.00	6154.2	6/2/1993		5852.5			5920.5
9/8/1993	89.00	5879.6	09/10/93		6151.9	09/09/93	16.50	6092.2	09/07/93	9.00	6295.7	09/08/93	-117.70	6151.9	9/8/1993		5851.8	09/08/93	150.10	5918.6
12/1/1993	88.90	5879.7	12/08/93	77.5	6152.9	12/08/93	16.1	6092.7	12/07/93	11.00	6297.7	12/07/93	-122.3	6156.5	12/1/1993	67.8	5852.2	12/07/93	150.30	5918.4
3/9/1994	88.50	5880.1	03/08/94	80	6150.4	03/08/94	16.7	6092.1	03/08/94	10.00	6296.7	03/08/94	-52	6086.2	3/9/1994	67.70	5852.3	03/07/94	150.2	5918.3
6/7/1994	88.30	5880.3	06/08/94	81.2	6149.2	06/07/94	16.8	6092.0	06/06/94	3.00	6289.7	06/07/94	-60	6094.2	6/7/1994	67.20	5852.8	06/06/94	149.90	5918.8
9/9/1994	88.80	5879.8	09/09/94	80.3	6150.1	09/08/94	16.2	6092.6	09/07/94	3.00	6289.7	09/08/94	-60	6094.2	9/9/1994	68.30	5851.7	09/07/94	150.40	5918.3
12/1/1994	88.60	5880.0	12/01/94	81.8	6148.6	12/01/94	17.3	6091.5	12/01/94	3.00	6289.7	12/01/94	-60	6094.2	12/1/1994	67.80	5852.2	12/01/94	150.5	5918.3
3/3/1995	88.30	5880.3	03/03/95	80.8	6149.6	03/03/95	17	6091.8	03/02/95	2.00	6288.7	03/02/95	-60	6094.2	3/3/1995	67.2	5852.8	03/02/95	150.3	5918.1
6/7/1995	87.80	5880.8	06/07/95	81	6149.4	06/07/95	17.1	6091.7	06/06/95	2.00	6288.7	06/01/95	-60	6094.2	6/7/1995	66.70	5853.3	06/06/95	150.40	5918.3
9/5/1995	88.40	5880.2	09/05/95	91	6139.4	09/05/95	17.1	6091.7	09/05/95	0.00	6286.7	09/05/95	-60	6094.2	9/5/1995	67.5	5852.5	09/06/95	150.60	5918.1
12/5/1995	88.10	5880.5	12/06/95	84.7	6145.7	12/06/95	15.8	6093.0	12/04/95	0.00	6286.7	12/05/95	-60	6094.2	12/5/1995	67.5	5852.5	12/05/95	150.2	5918.1
3/22/1996	88.00	5880.6	03/22/96	83.3	6147.1	03/22/96	15.3	6093.5	03/22/96	0.00	6286.7	03/22/96	-75	6109.2	3/22/1996	66.7	5853.3	03/25/96	150.30	5918.4
6/4/1996	88.40	5880.2	06/04/96	83.1	6147.3	06/04/96	15.5	6093.3	06/04/96	0.00	6286.7	06/04/96	-75	6109.2	6/4/1996	66.8	5853.2	06/04/96	150.50	5918.2
9/9/1996	89.50	5879.1	09/09/96	83.4	6147.0	09/09/96	15	6093.8	09/09/96	0	6286.7	09/09/96	-72	6106.2	9/9/1996	68.2	5851.8	09/04/96	150.70	5918.0
12/1/1996	90.00	5878.6	12/01/96	83.7	6146.7	12/01/96	15.8	6093.0	12/01/96	0	6286.7	12/01/96	-71.00	6105.2	12/1/1996	67.4	5852.6	12/05/96	150.50	5918.2
3/21/1997	91.10	5877.5	03/06/97	83.6	6146.8	03/06/97	15.5	6093.2	03/21/97	0	6286.7	03/21/97	-60.00	6094.2	3/21/1997	67	5853.0	03/06/97	151.10	5917.6
6/20/1997	88.80	5879.8	06/20/97	84.4	6146.0	06/20/97	15.5	6093.3	06/20/97	0	6286.7	06/20/97	-53.00	6087.2	6/20/1997	67.5	5852.5	06/03/97	151.40	5917.3
9/29/1997	88.30	5880.3	09/29/97	84.2	6146.2	09/29/97	15.4	6093.3	09/29/97	0	6286.7	09/29/97	-55.00	6089.2	9/29/1997	65.1	5854.9	09/08/97	151.80	5916.9
12/18/1997	89.70	5879.1	12/16/97	83.5	6146.9	12/12/97	14.2	6094.5	12/18/97	0	6286.7	12/18/97	-60.00	6094.2	12/18/1997	66.3	5853.7	12/12/97	151.90	5916.8
3/24/1998	88.80	5879.8	03/31/98	82.9	6147.5	03/31/98	14	6094.7	03/24/98	0	6286.7	03/31/98	-60.00	6094.2	3/24/1998	65.2	5854.8	03/31/98	151.40	5917.3
6/26/1998	88.80	5879.8	06/26/98	83.9	6146.5	06/26/98	15.1	6093.6	06/15/98	3	6283.7	06/26/98	-55.00	6089.2	6/26/1998	66.7	5853.3	06/26/98	151.30	5917.4
9/16/1998	89.10	5879.5	09/16/98	83.40	6147.0	09/08/98	14.00	6094.7	09/08/98	5	6281.7	09/16/98	-60.00	6094.2	9/16/1998	66.10	5853.9	09/16/98	148.60	5920.1
12/7/1998	89.90	5875.7	12/10/98	84	6146.4	12/10/98	15	6093.7	12/07/98	5	6281.7	12/07/98	-60.00	6094.2	12/7/1998	66	5854.0	12/07/98	148.5	5920.2
3/15/1999		5879.7	03/15/99	82.8	6147.6	03/15/99	15.1	6093.7	03/15/99	5	6281.7	03/15/99	-60	6094.2	3/15/1999	65.2	5854.8	03/29/99	151.50	5917.2
6/11/1999	88.80	5879.8	06/11/99	85.3	6145.1	06/11/99	14.9	6093.9	06/11/99	7	6279.7	06/11/99	-50	6084.2	6/11/1999	66.2	5853.8	06/07/99	148.50	5920.2
9/28/1999	89.10	5879.5	09/28/99	83	6147.4	09/28/99	15.2	6093.6	09/28/99	6	6280.7	09/28/99	-50	6084.2	9/28/1999	66	5853.8	09/03/99	148.20	5920.5
12/8/1999	89.30	5879.3	12/16/99	84	6146.4	12/15/99	14.7	6094.1	12/08/99	6	6280.7	12/15/99	-50	6084.2	12/8/1999	66.1	5853.8	12/15/99	148.30	5920.4
3/23/2000		5879.3	03/23/00		6146.6	03/23/00		6093.9	03/23/00			03/23/00	-60	6094.2	3/23/2000	66.2	5853.8			
6/1/2000																				
9/22/2000		5879.3	09/28/00		6146.1	09/28/00		6093.5				09/25/00	-60	6094.2	9/22/2000		5853.1	09/18/00		5908.5
12/1/2000	91.2	5877.4	12/01/00	84.1	6146.3	12/01/00	15.7	6093.1	12/01/00	11	6275.7	12/01/00	-60	6094.2	12/1/2000	66.2	5853.8	12/01/00	148.1	5920.6
3/23/2001		5881.0	03/22/01	80.8	6149.6	03/22/01	17.9	6090.9				03/23/01	-60.00	6094.2	3/23/2001	65.2	5854.8			
6/13/2001		5880.4	06/13/01	83.8	6146.6	06/13/01	15.2	6093.6				06/13/01	-50.00	6084.2	6/13/2001	66.2	5853.8			
9/12/2001		5878.7	09/12/01	84.2	6146.2	09/12/01	15.5	6093.3							9/12/2001	66.7	5853.3			
12/1/2001			12/12/01	84.3	6146.1	12/12/01	15.8	6093.0							12/1/2001	66.7	5853.3			
3/27/2002		5877.8	03/21/02	82	6148.4	03/21/02	18	6090.8				03/21/02	-60.00	6094.2	3/27/2002	66.2	5853.8			
6/24/2002		5878.6	06/27/02	83.9	6146.5	06/27/02	17.8	6091.0				06/24/02	-50.00	6084.2	6/24/2002	66.8	5853.2			
9/28/2002		5878.3	09/23/02	83.75	6146.7	09/23/02	16.75	6092.1							9/28/2002	66.9	5853.1			
12/21/2002			12/21/02	84.33	6146.1	12/21/02	16	6092.8							12/21/2002	66.4	5853.6			
3/15/2003																				
6/25/2003	89	5879.6																		
9/18/2003	91.75	5876.9				9/17/2003	19.7	6089.1	9/18/2003	8	6278.7	9/17/2003	-55	6089.2	9/18/2003	68	5852.0			
12/19/2003	92.4	5876.2	12/19/2003	79.7	6150.7	12/19/2003	21.2	6087.6	12/19/2003	8	6278.7	12/19/2003	-55	6089.2	12/23/2003	68.4	5851.6			
3/30/2004	90.9	5877.7	3/30/2004	84.3	6146.1	3/18/2004	21	6087.8	3/29/2004	10	6276.7	3/18/2004	-60	6094.2	3/18/2004	65	5855.0			
6/23/2004	90	5878.6	6/18/2004	80.3	6150.1	6/18/2004	18.5	6090.3	6/18/2004	10	6276.7	6/23/2004	-60	6094.2	6/23/2004	65.3	5854.7			
9/23/2004	89.9	5878.7				9/26/2004	19	6089.8				9/26/2004	-55	6089.2	9/24/2004	68	5852.0			
12/27/2004	87.6	5881.0				12/28/2004	18.6	6090.2							12/28/2004	60	5860.0			
3/31/2005	90	5878.6				3/25/2005	19.1	6089.7	3/31/2005	6	6280.7	3/31/2005	-50	6084.2	3/31/2005	65.7	5854.3			
5/23/2005	89	5879.6				5/23/2005	18.3	6090.5				5/23/2005	-60	6094.2	5/23/2005	65.1	5854.9			
7/8/2005	89.3	5879.3	7/11/2005	80.5	6149.9	7/20/2005	18.8	6090.0							7/11/2005	66.2	5853.8			
11/28/2005	89.9	5878.7	11/22/2005	80.8	6149.6	11/17/2005	18	6090.8							11/17/2005	67	5853.0			

Emery Water Level Data - Ferron Sandstone (Lower)

Well AA			Well H			Well I			Well Kemmerer			Well R1			Well WW1			Well ZZ		
Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation	Date	Depth	Elevation
3/6/2006	89.1	5879.5	3/9/2006	80.2	6150.2	3/9/2006	17.6	6091.2							3/9/2006	65.8	5854.2			
6/29/2006	90	5878.6	6/29/2006	81	6149.4	6/29/2006	18.3	6090.5							6/30/2006	65.2	5854.8			
9/27/2006	110.5	5858.1				9/27/2006	17.5	6091.3	9/27/2006	10	6276.7	9/28/2006	-50	6084.2	9/28/2006	68	5852.0			
11/20/2006	90.5	5878.1				11/27/2006	17	6091.8	11/20/2006	10	6276.7	11/20/2006	-35	6069.2	11/27/2006	67.5	5852.5			

APPENDIX VI-11

USGS Streamflow Data

Water Resources

National Water Information System: Web Interface

Data Category: Surface Water | Geographic Area: United States | GO

USGS Surface-Water Monthly Statistics for the Nation

The statistics generated from this site are based on approved daily-mean data and may not match those published by the USGS in official publications. The user is responsible for assessment and use of statistics from this site. For more details on why the statistics may not match, click here.

USGS 09331900 QUITCHUPAH CREEK NEAR EMERY, UTAH

Available data for this site Time-series: Monthly statistics | GO

Emery County, Utah
Hydrologic Unit Code 14070002
Latitude 38°51'33", Longitude 111°15'41" NAD27
Drainage area 104.00 square miles

Output formats
HTML table of all data
Tab-separated data
Reselect output format

00060, Discharge, cubic feet per second,												
YEAR	Monthly mean in cfs (Calculation Period: 1978-07-01 -> 1981-09-30)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1978							3.24	1.13	1.35	1.34	4.71	3.73
1979	6.30	6.43	9.94	12.0	18.8	9.20	3.98	2.41	1.96	1.31	1.32	4.38
1980	6.15	8.47	10.0	15.5	27.8	17.3	11.4	4.09	21.7	5.07	6.96	4.91
1981	3.92	4.77	8.40	4.57	3.38	6.61	1.89	2.68	40.6			
Mean of monthly Discharge	5.5	6.6	9.4	11	17	11	5.1	2.6	16	2.6	4.3	4.3

** No Incomplete Data is used for Statistical Calculation

Questions about sites/data?
Feedback on this web site
Surface Water data for USA: USGS Surface-Water Monthly Statistics
http://waterdata.usgs.gov/nwis/monthly?

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Explanation of terms

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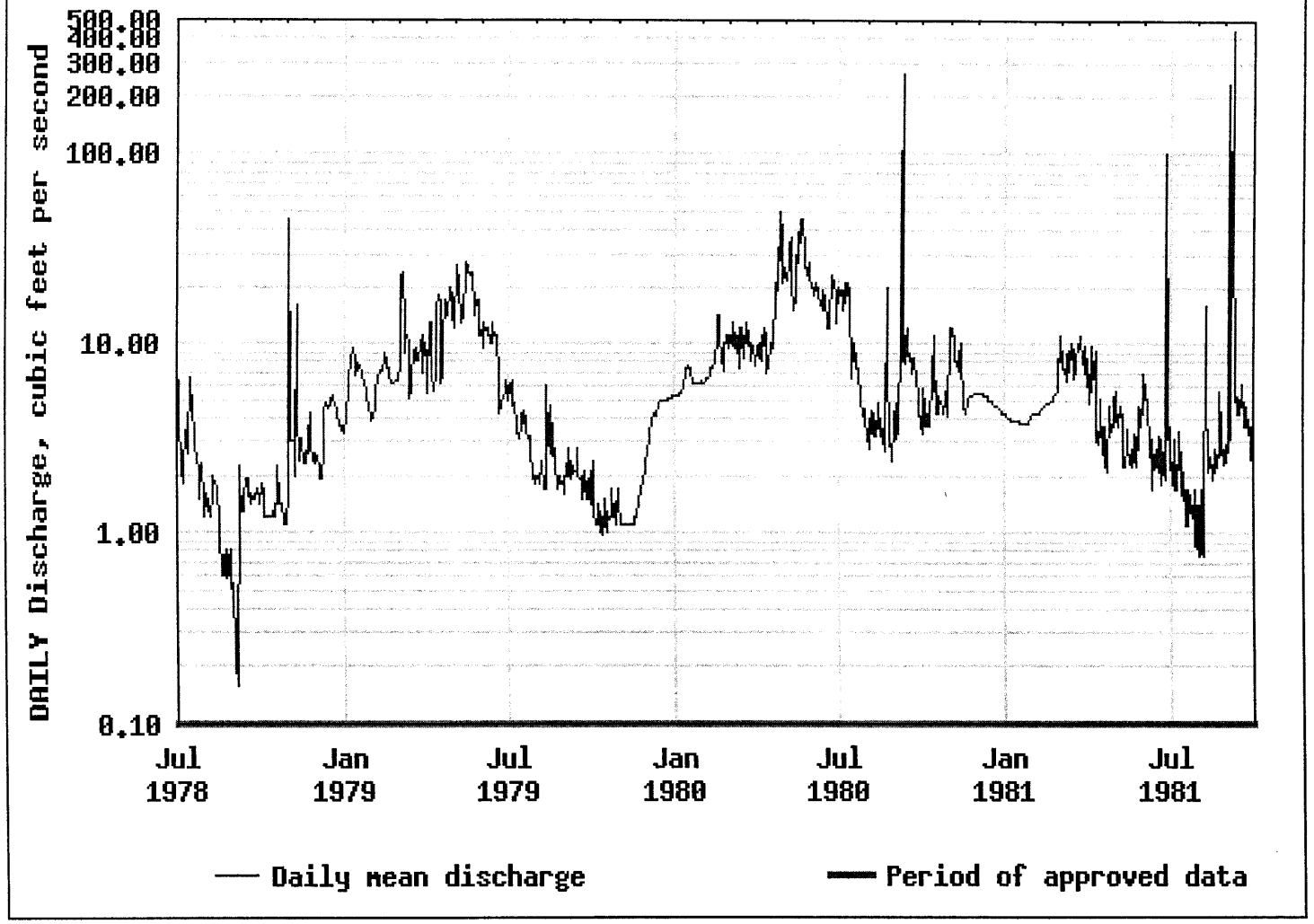
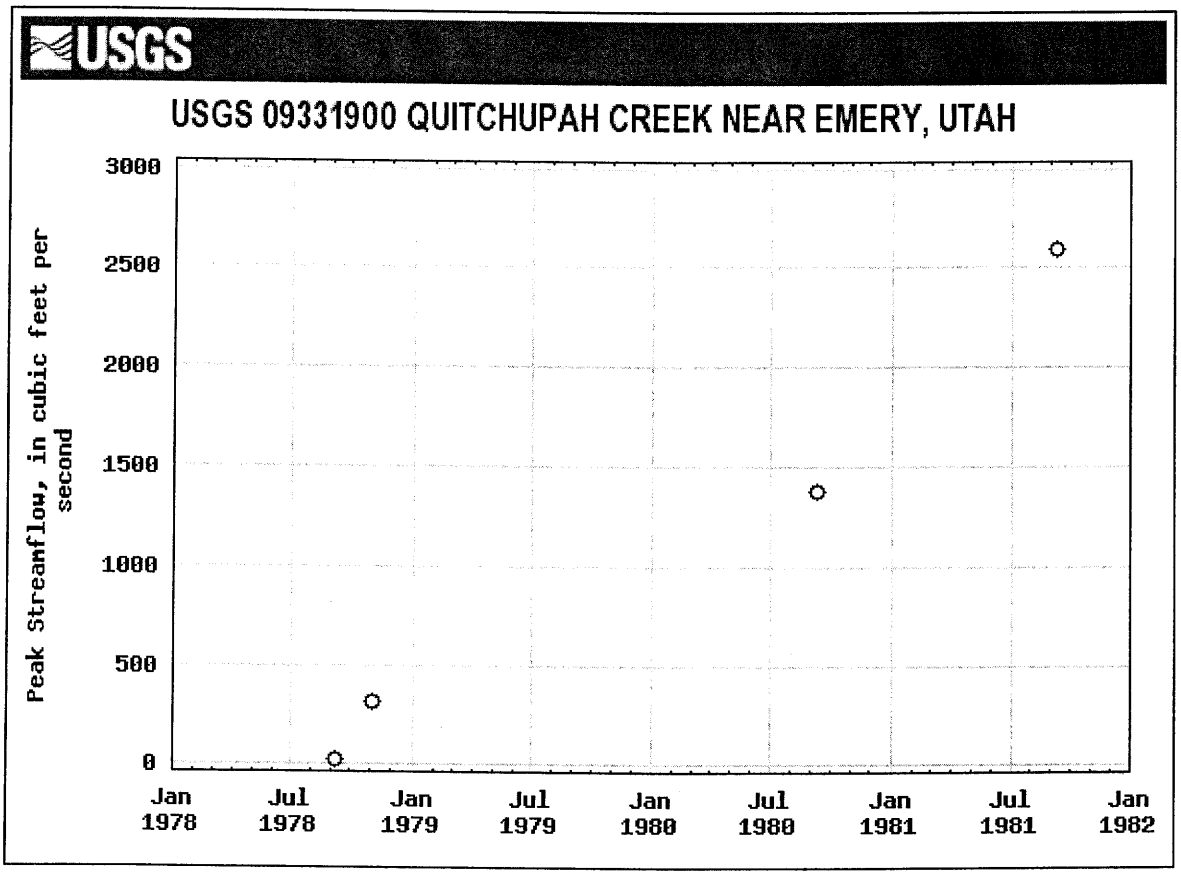
Department of the Interior, U.S. Geological Survey

USGS

USGS 09331900 QUITCHUPAH CREEK NEAR EMERY, UTAH




USGS
USGS 09331900 QUITCHUPAH CREEK NEAR EMERY, UTAH
Peak Streamflow, in cubic feet per second
3000
2500
2000
1500
1000
500
0
Jan 1978
Jul 1978
Jan 1979
Jul 1979
Jan 1980
Jul 1980
Jan 1981
Jul 1981
Jan 1982

USGS

Water Resources

National Water Information System: Web Interface

Data Category: Surface Water

Geographic Area: United States

GO

USGS Surface-Water Annual Statistics for the Nation

The statistics generated from this site are based on approved daily-mean data and may not match those published by the USGS in official publications. The user is responsible for assessment and use of statistics from this site. For more details on why the statistics may not match, click here.

USGS 09331900 QUITCHUPAH CREEK NEAR EMERY, UTAH

Available data for this site Time-series: Annual statistics GO

Emery County, Utah Hydrologic Unit Code 14070002 Latitude 38°51'33", Longitude 111°15'41" NAD27 Drainage area 104.00 square miles	**Output formats** HTML table of all data Tab-separated data Reselect output format

Water Year	00060, Discharge, cubic feet per second (Calculation Period: 1979-10-01 -> 1981-09-30) Calculation period restricted by USGS staff due to special conditions at/near site
1979	6.73
1980	10.8
1981	7.76
** No Incomplete Data is used for Statistical Calculation	

Questions about sites/data?
Feedback on this web site
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Explanation of terms

Surface Water data for USA: USGS Surface-Water Annual Statistics
http://waterdata.usgs.gov/nwis/annual?

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Department of the Interior, U.S. Geological Survey
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1.19 1.07 ca02

Water Resources

National Water Information System: Web Interface

Data Category: Surface Water | Geographic Area: United States | GO

USGS Surface-Water Monthly Statistics for the Nation

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USGS 09331950 CHRISTIANSEN WASH NEAR EMERY, UTAH

Available data for this site Time-series: Monthly statistics | GO

Emery County, Utah
Hydrologic Unit Code 14070002
Latitude 38°51'41", Longitude 111°15'07" NAD27
Drainage area 13.60 square miles

Output formats
HTML table of all data
Tab-separated data
Reselect output format

00060, Discharge, cubic feet per second,												
YEAR	Monthly mean in cfs (Calculation Period: 1978-08-01 -> 1984-09-30)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1978								1.03	0.594	0.727	1.88	0.844
1979	0.606	0.815	2.87	7.17	5.96	5.32	3.23	1.53	0.908	0.824	0.693	0.762
1980	0.715	0.980	1.12	4.49	7.36	6.28	9.25	1.92	5.45	5.35	2.11	0.884
1981	0.571	0.989	1.63	1.51	1.38	3.05	0.460	0.525	6.62	2.33	2.47	1.62
1982	2.12	3.70	3.41	3.10	4.52	7.39	4.69	4.11	3.12	6.40	3.11	1.35
1983	3.66	5.50	5.16	2.50	4.88	7.80	9.72	16.2	3.07	9.56	3.43	1.79
1984	1.09	0.762	1.81	4.60	4.97	11.6	13.8	15.2	8.05			
Mean of monthly Discharge	1.5	2.1	2.7	3.9	4.8	6.9	6.9	5.8	4.0	4.2	2.3	1.2

** No Incomplete Data is used for Statistical Calculation

Questions about sites/data?
Feedback on this web site
Surface Water data for USA: USGS Surface-Water Monthly Statistics

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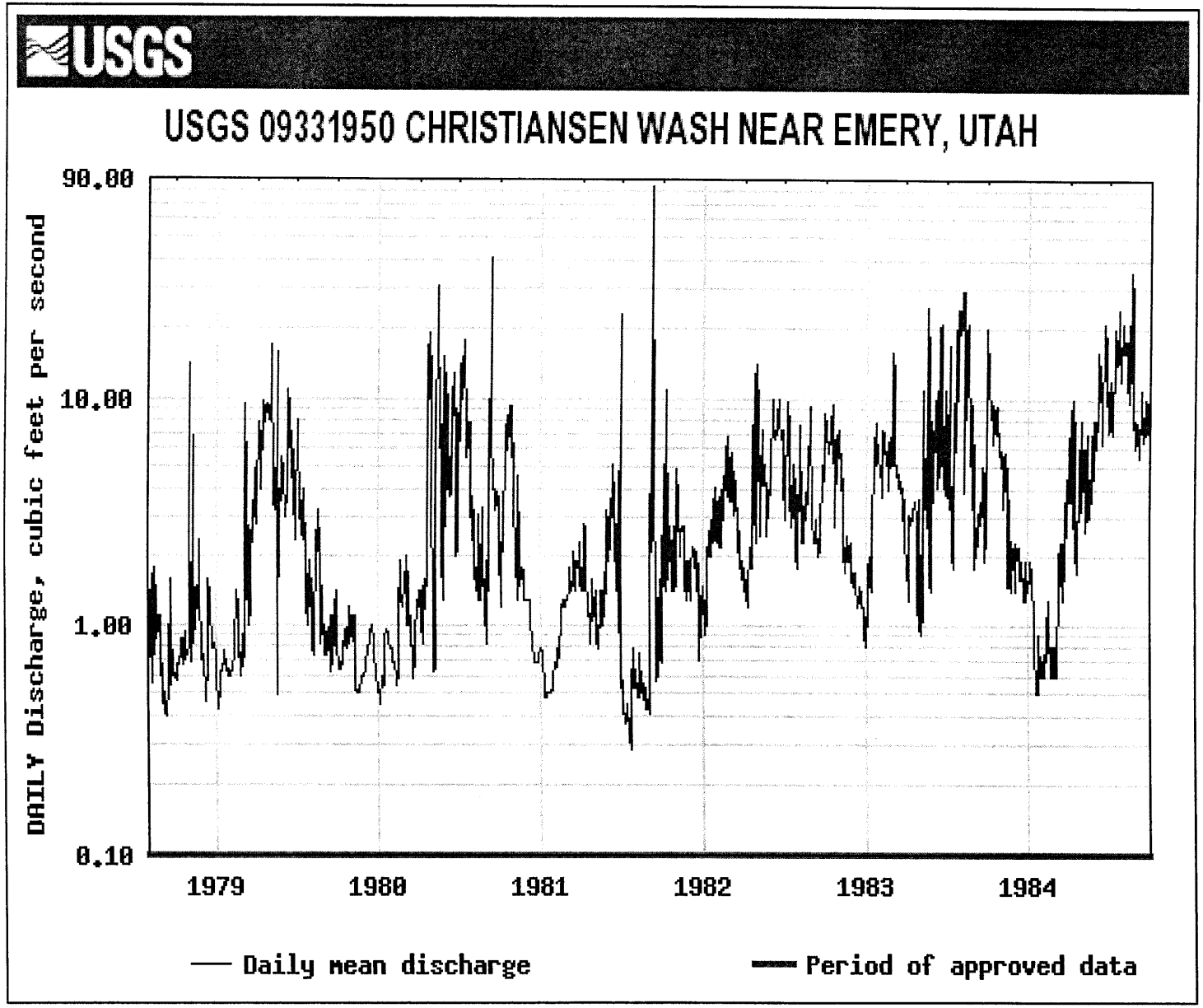
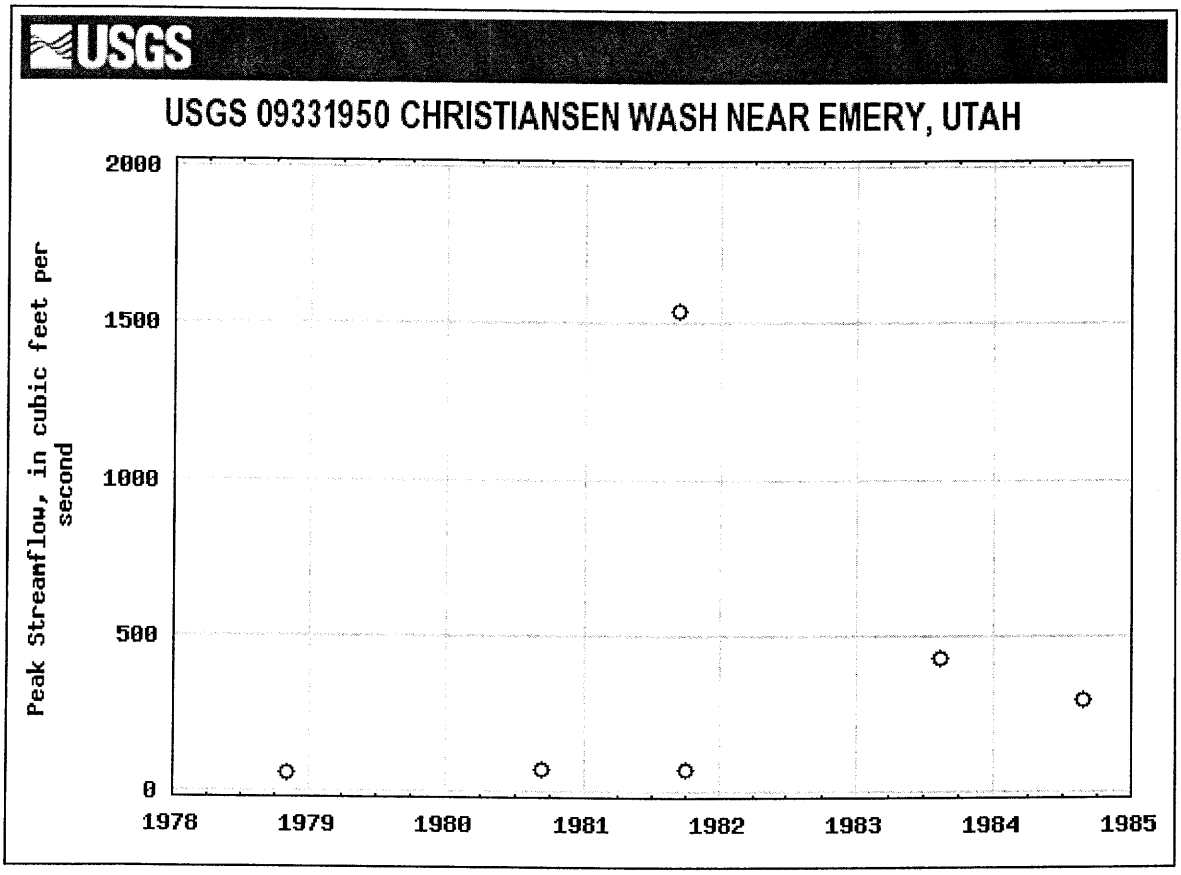
Explanation of terms


USGS
USGS 09331950 CHRISTIANSEN WASH NEAR EMERY, UTAH
DAILY Discharge, cubic feet per second
90.00
10.00
1.00
0.10
1979
1980
1981
1982
1983
1984
Daily mean discharge
Period of approved data


USGS
USGS 09331950 CHRISTIANSEN WASH NEAR EMERY, UTAH
Peak Streamflow, in cubic feet per second
2000
1500
1000
500
0
1978
1979
1980
1981
1982
1983
1984
1985

Water Resources

National Water Information System: Web Interface

Data Category: Surface Water | Geographic Area: United States | GO

USGS Surface-Water Annual Statistics for the Nation

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USGS 09331950 CHRISTIANSEN WASH NEAR EMERY, UTAH

Available data for this site Time-series: Annual statistics | GO

Emery County, Utah
Hydrologic Unit Code 14070002
Latitude 38°51'41", Longitude 111°15'07" NAD27
Drainage area 13.60 square miles

Output formats

HTML table of all data
Tab-separated data
Reselect output format

Water Year	00060, Discharge, cubic feet per second (Calculation Period: 1979-10-01 -> 1984-09-30) Calculation period restricted by USGS staff due to special conditions at/near site
1979	2.66
1980	3.32
1981	2.09
1982	3.54
1983	5.80
1984	6.42

** No Incomplete Data is used for Statistical Calculation

Questions about sites/data?
Feedback on this web site
Surface Water data for USA: USGS Surface-Water Annual Statistics
http://waterdata.usgs.gov/nwis/annual?

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Water Resources

National Water Information System: Web Interface

Data Category: Surface Water | Geographic Area: United States | GO

USGS Surface-Water Monthly Statistics for the Nation

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USGS 09331500 IVIE CREEK ABOVE DIVERSIONS NR EMERY, UTAH

Available data for this site Time-series: Monthly statistics | GO

Sevier County, Utah
Hydrologic Unit Code 14070002
Latitude 38°45'30", Longitude 111°25'15" NAD27
Drainage area 50.00 square miles
Gage datum 7,100.00 feet above sea level NGVD29

Output formats

HTML table of all data | Tab-separated data | Reselect output format

00060, Discharge, cubic feet per second,												
YEAR	Monthly mean in cfs (Calculation Period: 1950-09-01 -> 1961-09-30)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1950									2.93	2.40	2.92	2.47
1951	1.98	2.57	3.27	1.97	2.23	2.65	3.62	7.23	2.57	2.37	1.75	1.60
1952	1.75	1.89	3.31	16.8	39.6	13.6	5.49	7.62	3.16	4.12	4.80	3.50
1953	3.00	3.50	4.50	5.50	4.63	6.44	5.88	4.95	1.32	2.15	2.15	1.85
1954	2.34	4.00	4.18	4.71	3.58	3.36	3.33	2.72	1.72	1.73	2.33	2.14
1955	1.80	1.97	2.73	3.90	3.14	4.77	2.51	2.75	1.82	1.49	1.49	1.78
1956	1.81	1.82	2.39	3.11	3.08	2.74	3.77	1.58	0.730	1.38	1.30	1.05
1957	1.10	1.58	2.60	3.51	9.03	18.9	4.31	3.87	3.64	3.30	2.02	2.36
1958	2.10	2.60	3.02	6.24	28.5	6.97	7.18	5.89	2.24	2.01	1.92	2.17
1959	1.90	2.39	2.46	2.91	3.10	2.82	3.22	3.04	0.973	1.67	3.08	2.01
1960	1.60	1.80	3.22	4.46	7.22	2.42	4.48	4.59	3.58	2.12	1.95	1.91
1961	1.07	1.30	2.73	4.92	4.28	3.72	4.89	5.53	5.72			
Mean of monthly	1.9	2.3	3.1	5.3	9.9	6.2	4.4	4.5	2.5	2.2	2.3	2.1

Water Resources

National Water Information System: Web Interface

Data Category: Surface Water | Geographic Area: United States | GO

USGS Surface-Water Annual Statistics for the Nation

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USGS 09331500 IVIE CREEK ABOVE DIVERSIONS NR EMERY, UTAH

Available data for this site Time-series: Annual statistics | GO

Sevier County, Utah
Hydrologic Unit Code 14070002
Latitude 38°45'30", Longitude 111°25'15" NAD27
Drainage area 50.00 square miles
Gage datum 7,100.00 feet above sea level NGVD29

Output formats

HTML table of all data
Tab-separated data
Reselect output format

Water Year	00060, Discharge, cubic feet per second (Calculation Period: 1951-10-01 -> 1961-09-30) Calculation period restricted by USGS staff due to special conditions at/near site
1951	3.00
1952	8.28
1953	4.35
1954	3.00
1955	2.63
1956	2.15
1957	4.35
1958	6.08
1959	2.41
1960	3.35
1961	3.35

** No Incomplete Data is used for Statistical Calculation

Avg = 3.90 cfs

Water Resources

National Water Information System: Web Interface

Data Category: Surface Water | Geographic Area: United States | GO

USGS Surface-Water Monthly Statistics for the Nation

The statistics generated from this site are based on approved daily-mean data and may not match those published by the USGS in official publications. The user is responsible for assessment and use of statistics from this site. For more details on why the statistics may not match, click here.

USGS 09330500 MUDDY CREEK NEAR EMERY, UT

Available data for this site Time-series: Monthly statistics GO

Emery County, Utah
Hydrologic Unit Code 14070002
Latitude 38°58'55", Longitude 111°14'55" NAD27
Drainage area 105 square miles
Gage datum 6,400.00 feet above sea level NGVD29

Output formats

HTML table of all data
Tab-separated data
Reselect output format

00060, Discharge, cubic feet per second,												
YEAR	Monthly mean in cfs (Calculation Period: 1910-10-01 -> 2006-09-30)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1910										26.0	18.0	10.0
1911	2.00	3.09	37.7	58.3	172.5	130.9	108.5	64.6	19.7	13.9	3.73	2.00
1912	3.00	5.00	9.06	52.9	138.5	190.9	108.9	52.8	40.5	25.3	10.0	5.00
1913	7.00	8.00	16.8	52.8	169.3	131.9	80.6	51.0	27.3	13.7	9.32	
1914			14.4	41.9	271.2	218.6						
1949							73.8	40.8	24.6	11.3	14.0	9.97
1950	8.21	10.4	12.7	36.4	66.4	76.5	44.2	22.8	16.1	12.4	13.9	12.0
1951	9.90	9.18	11.7	33.1	90.2	107.7	59.6	35.9	19.4	15.7	10.8	9.97
1952	9.00	8.52	11.5	85.6	306.5	301.9	115.3	68.3	31.8	23.0	17.2	14.6
1953	14.3	13.3	14.5	14.1	43.4	106.0	69.3	42.6	21.7	14.6	10.2	9.61
1954	9.05	9.45	9.41	22.0	53.0	40.9	28.2	16.5	15.9	9.56	7.80	6.97
1955	6.00	6.25	5.85	9.63	49.5	66.0	35.7	23.2	12.9	10.4	9.56	9.52
1956	8.52	8.72	11.7	18.4	71.3	76.5	44.4	22.6	14.7	12.5	6.74	6.11
1957	6.74	7.52	7.73	13.0	72.6	224.2	136.5	66.7	28.9	26.5	21.7	15.6

1958	14.0	16.1	13.5	106.5	266.9	209.1	75.8	44.5	28.2	16.6	9.62	8.03
1959	6.68	9.21	10.7	17.4	30.5	41.9	27.5	15.3	11.7	9.66	6.61	6.00
1960	5.47	5.61	12.9	30.8	80.2	85.0	47.0	19.8	17.2	14.5	8.49	8.40
1961	7.74	7.50	11.2	22.4	41.9	44.0	28.0	22.7	18.1	10.9	12.0	9.58
1962	7.68	8.06	8.18	79.5	132.0	145.3	90.5	54.5	24.3	16.5	9.93	6.51
1963	6.06	7.50	12.4	17.1	68.7	63.5	45.5	31.2	18.3	12.1	9.23	8.97
1964	7.00	7.52	7.45	16.6	69.0	95.6	59.5	42.1	17.7	13.7	7.55	7.00
1965	7.00	6.00	9.15	21.7	89.1	184.6	125.5	57.2	40.2	29.3	14.5	11.1
1966	10.7	11.1	18.7	34.1	53.6	39.8	30.6	28.0	12.3	9.35	5.79	7.89
1967	7.08	8.00	10.1	7.84	47.6	89.0	68.8	45.7	27.0	14.8	8.06	6.68
1968	6.03	6.50	7.95	13.0	77.9	154.9	71.6	42.5	23.7	18.2	10.8	9.00
1969	9.00	9.40	11.4	39.6	164.5	156.2	81.8	39.7	29.3	30.6	14.9	8.32
1970	7.73	8.92	10.1	19.3	127.1	149.4	84.5	57.5	28.5	12.7	13.3	11.8
1971	11.0	10.7	16.0	39.4	71.5	103.6	57.2	52.4	23.5	15.3	13.1	10.7
1972	9.58	9.17	14.5	22.4	46.5	54.3	30.7	28.6	13.7	13.7	10.4	9.32
1973	8.16	8.00	9.50	31.8	137.4	160.6	76.4	49.1	29.9	18.3	12.2	10.0
1974	9.00	9.46	12.7	27.8	146.1	124.3	54.9	39.1	24.2	17.5	13.0	9.32
1975	9.00	8.11	9.45	22.5	86.7	197.7	101.8	41.3	35.8	23.8	11.5	10.7
1976	8.00	6.54	5.97	14.3	53.8	51.4	35.5	18.6	12.7	10.7	5.51	5.00
1977	5.00	5.00	5.72	11.5	14.2	15.7	17.1	7.55	9.58	4.78	5.97	4.46
1978	4.49	4.36	7.60	20.6	78.2	171.0	83.7	37.5	23.7	18.7	11.7	8.42
1979	6.16	7.11	13.4	36.8	138.0	166.2	90.5	38.8	29.6	16.9	14.7	12.6
1980	13.1	13.7	10.9	48.8	192.8	203.7	109.9	44.5	35.5	31.4	9.88	9.94
1981	6.61	7.75	8.62	27.1	41.2	51.5	26.5	39.9	46.1	21.8	11.3	9.06
1982	5.84	8.14	9.91	29.7	135.2	178.6	92.8	49.5	37.2	39.5	21.4	12.9
1983	8.58	10.5	15.1	21.9	166.0	330.1	239.0	103.7	59.7	28.7	19.7	16.9
1984	11.7	13.1	15.1	36.1	240.1	270.0	160.3	100.2	58.3	60.9	34.8	22.6
1985	14.6	13.7	21.8	111.7	174.1	160.6	76.0	39.3	46.7	23.2	12.2	8.05
1986	8.74	12.9	28.6	52.8	112.4	162.0	79.0	39.5	37.1	22.8	17.3	13.1
1987	10.5	10.1	14.1	50.0	67.7	57.9	34.9	23.2	15.2	12.8	10.9	4.21
1988	4.16	4.98	16.0	25.8	70.2	75.2	37.7	32.0	16.7	13.7	8.69	8.29
1989	8.02	9.91	13.7	22.6	29.3	29.0	22.1	23.6	12.3	9.06	8.09	6.86
1990	6.41	6.19	9.22	17.0	27.1	32.9	24.8	19.7	12.8	9.85	8.75	6.19
1991	5.30	5.83	6.49	14.4	56.2	103.1	46.6	32.5	29.3	13.9	8.76	6.37
1992	6.55	7.27	9.41	28.4	70.1	56.2	30.9	25.8	20.9	12.2	9.84	8.61
1993	8.57	7.83	15.1	33.3	161.5	148.2	68.9	43.0	35.4	21.9	12.6	10.3

1994	6.65	6.76	9.16	15.3	43.8	47.5	31.6	23.5	12.5	9.66	5.45	7.00
1995	7.74	4.61	4.15	18.9	96.5	201.9	152.7	86.8	43.1	28.8	18.7	13.9
1996	12.5	13.3	13.4	29.5	142.5	110.5	47.3	34.5	19.2	15.2	12.6	10.5
1997	10.0	10.6	16.7	31.6	146.9	160.2	79.8	41.6	41.3	24.9	18.8	14.7
1998	22.0	24.6	19.4	25.6	93.9	172.5	126.2	56.9	48.5	23.5	19.3	13.2
1999	11.8	11.3	17.2	24.3	79.6	140.5	65.5	48.2	31.3	21.1	11.1	9.57
2000	10.6	10.5	11.9	34.8	78.9	51.3	34.4	25.1	19.7	15.7	9.99	7.09
2001	7.42	8.32	23.0	26.8	111.4	88.2	46.6	34.6	16.9	12.2	8.90	6.19
2002	5.24	6.85	8.39	20.0	47.9	39.1	34.0	18.2	13.7	11.5	10.2	5.83
2003	4.65	3.93	16.4	20.7	82.4	113.9	49.4	39.9	21.7	14.0	9.85	5.27
2004	6.11	7.17	17.6	40.9	109.2	102.8	49.4	38.0	19.6	14.2	11.0	9.06
2005	9.14	9.75	11.7	33.1	187.7	364.9	127.3	55.9	38.2	21.8	14.3	6.37
2006	6.13	10.7	11.5	55.2	195.1	150.6	63.4	46.1	29.5			
Mean of monthly Discharge	8.2	8.8	13	33	106	128	70.	41	26	18	12	9.2

** No Incomplete Data is used for Statistical Calculation

Questions about sites/data? Top
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Surface Water data for USA: USGS Surface-Water Monthly Statistics
http://waterdata.usgs.gov/nwis/monthly?

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6.6 4.52 va02

Water Resources

National Water Information System: Web Interface

Data Category: Surface Water

Geographic Area: United States

GO

USGS Surface-Water Annual Statistics for the Nation

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USGS 09330500 MUDDY CREEK NEAR EMERY, UT

Available data for this site Time-series: Annual statistics GO

Emery County, Utah
Hydrologic Unit Code 14070002
Latitude 38°58'55", Longitude 111°14'55" NAD27
Drainage area 105 square miles
Gage datum 6,400.00 feet above sea level NGVD29

Output formats

HTML table of all data

Tab-separated data

Reselect output format

Water Year	00060, Discharge, cubic feet per second (Calculation Period: 1911-10-01 -> 2006-09-30) Calculation period restricted by USGS staff due to special conditions at/near site
1911	54.7
1912	51.8
1913	49.0
1950	27.5
1951	34.7
1952	81.3
1953	32.9
1954	20.0
1955	20.0
1956	25.6
1957	49.2
1958	70.1
1959	17.1
1960	27.2

Water Year	00060, Discharge, cubic feet per second (Calculation Period: 1911-10-01 -> 2006-09-30) Calculation period restricted by USGS staff due to special conditions at/near site
1961	19.6
1962	48.7
1963	25.4
1964	29.5
1965	47.6
1966	24.6
1967	28.0
1968	36.2
1969	48.5
1970	45.8
1971	35.4
1972	22.4
1973	45.5
1974	40.8
1975	46.1
1976	21.1
1977	9.40
1978	37.3
1979	47.3
1980	59.8
1981	25.6
1982	49.3
1983	86.1
1984	81.1
1985	64.9
1986	48.1
1987	28.1
1988	25.9
1989	16.8
1990	15.1
1991	27.1
1992	23.7

Water Year	00060, Discharge, cubic feet per second (Calculation Period: 1911-10-01 -> 2006-09-30) Calculation period restricted by USGS staff due to special conditions at/near site
1993	46.2
1994	20.2
1995	53.5
1996	40.4
1997	48.2
1998	54.1
1999	40.6
2000	26.6
2001	33.2
2002	18.5
2003	31.8
2004	35.0
2005	72.7
2006	51.1
** No Incomplete Data is used for Statistical Calculation	

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5.49 2.98 ca02

Avg = 39.1 cfs

USGS

Water Resources

National Water Information System: Web Interface

Data Category: Surface Water | Geographic Area: United States | GO

USGS Surface-Water Monthly Statistics for the Nation

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USGS 09332100 MUDDY CREEK BL I-70 NR EMERY, UTAH

Available data for this site Time-series: Monthly statistics GO

Emery County, Utah
Hydrologic Unit Code 14070002
Latitude 38°48'45.3", Longitude 111°12'00.9" NAD83
Drainage area 418 square miles
Gage datum 5,630 feet above sea level NGVD29

Output formats

HTML table of all data
Tab-separated data
Reselect output format

00060, Discharge, cubic feet per second,												
YEAR	Monthly mean in cfs (Calculation Period: 1973-10-01 -> 2006-09-30)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1973										5.34	8.09	11.0
1974	10.5	13.3	19.1	14.8	44.4	16.5	16.4	2.99	3.10	5.85	12.2	10.2
1975	10.7	14.2	33.6	23.8	63.5	103.7	48.6	4.40	3.95	5.01	9.26	14.3
1976	11.0	10.1	8.55	6.61	12.6	2.74	3.56	1.17	2.35	1.40	2.30	3.15
1977	3.50	6.41	4.34	2.55	2.55	1.64	6.36	8.22	3.66	1.55	1.55	6.91
1978	7.00	7.43	15.6	16.8	32.2	64.6	8.32	1.23	2.07	2.05	2.95	3.22
1979	5.83	12.5	17.6	29.5	142.1	50.6	6.86	2.91	1.64	1.81	3.07	3.53
1980	13.4	20.4	15.8	46.9	163.7	161.0	37.4	6.41	28.0	11.1	14.3	13.0
1981	10.4	3.02	10.4	8.65	4.83	7.57	4.07	7.56	41.5	26.0	8.22	6.22
1982	7.66	22.4	17.1	23.2	92.8	92.7	28.5	17.5	11.0	29.2	24.6	15.6
1983	14.9	23.6	30.1	40.4	210.4	306.6	158.0	80.1	19.9	37.9	23.4	23.5
1984	21.7	26.7	28.4	56.0	264.6	279.0	125.5	66.2	24.8	92.3	44.3	27.9
1985	21.6	21.9	39.2	131.3	112.0	63.3	17.5	3.91	12.0	18.5	21.1	19.7
1986	21.5	32.1	36.2	35.6	61.5	87.5	23.1	7.98	7.36			

2004										9.61	19.3	13.0
2005	21.3	20.1	20.5	28.7	91.0	175.2	22.7	7.50	5.55	13.3	22.1	21.4
2006	20.3	19.7	23.5	42.5	134.8	47.8	11.0	14.4	7.74			
Mean of monthly Discharge	13	17	21	34	96	97	35	15	12	17	14	13

** No Incomplete Data is used for Statistical Calculation

00095, Specific conductance, water, unfiltered, microsiemens per centimeter at 25 degrees Celsius,

YEAR	Monthly mean in uS/cm @25C (Calculation Period: 2004-12-01 -> 2006-07-30)											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
2004												1,548
2005			1,567	859.9	637.4	716.9			2,118			
2006			1,727	1,220.		940.4	1,651					
Mean of monthly Specific cond at 25C			1,650	1,040	637	829	1,650		2,120			1,550

** No Incomplete Data is used for Statistical Calculation

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Surface Water data for USA: USGS Surface-Water Monthly Statistics
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Water Resources

National Water Information System: Web Interface

Data Category: Surface Water | Geographic Area: United States | GO

USGS Surface-Water Annual Statistics for the Nation

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USGS 09332100 MUDDY CREEK BL I-70 NR EMERY, UTAH

Available data for this site Time-series: Annual statistics GO

Emery County, Utah
Hydrologic Unit Code 14070002
Latitude 38°48'45.3", Longitude 111°12'00.9" NAD83
Drainage area 418 square miles
Gage datum 5,630 feet above sea level NGVD29

Output formats

HTML table of all data
Tab-separated data
Reselect output format

Water Year	00060, Discharge, cubic feet per second (Calculation Period: 1974-10-01 -> 2006-09-30) Calculation period restricted by USGS staff due to special conditions at/near site
1974	13.8
1975	27.9
1976	7.28
1977	3.83
1978	13.7
1979	23.3
1980	41.7
1981	11.4
1982	29.5
1983	79.7
1984	81.6
1985	49.0
1986	30.9
2005	36.1

Water Year	00060, Discharge, cubic feet per second (Calculation Period: 1974-10-01 -> 2006-09-30) Calculation period restricted by USGS staff due to special conditions at/near site
2006	31.7
** No Incomplete Data is used for Statistical Calculation	

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Surface Water data for USA: USGS Surface-Water Annual Statistics
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1.9 1.14 sd03

APPENDIX VI-12

UPDES Monitoring Data

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-001	4/13/1981						8.5	6	<0.5							0.01													
UPDES	UT0022616-001	5/18/1981						8.4	35	1.6							<0.03								403.2		12.6	195		<0.002
UPDES	UT0022616-001	6/23/1981						8.2	212.5	3.8																				
UPDES	UT0022616-001	6/23/1981						8.2	127	0.6																				
UPDES	UT0022616-001	7/1/1981								<0.5							7.5								272.6		6.9	184		0.065
UPDES	UT0022616-001	7/1/1981								1							9.35								280.6		<1.	175		0.055
UPDES	UT0022616-001	7/17/1981						8.4	1	<0.5																				
UPDES	UT0022616-001	8/20/1981								<0.5							0.23								422		<1.	154		0.047
UPDES	UT0022616-001	9/28/1981						8.3	9	1.4																				
UPDES	UT0022616-001	10/30/1981						8.4	195	<0.5																				
UPDES	UT0022616-001	11/30/1981						8.5	10	<0.5																				
UPDES	UT0022616-001	12/29/1981						8.2	4																490		<1.	196		<0.002
UPDES	UT0022616-001	1/30/1982						8.1	6	<0.5																				
UPDES	UT0022616-001	2/23/1982						8.1	17	2.6																				
UPDES	UT0022616-001	3/16/1982	8.3	7.6	11.3	459	40	8.1	5.5																410		<1.	186		<0.002
UPDES	UT0022616-001	4/30/1982						8.0	256	<0.5																				
UPDES	UT0022616-001	5/28/1982						7.8	220	<0.5																				
UPDES	UT0022616-001	6/17/1982						8.2	20																368		<1.	184		<0.002
UPDES	UT0022616-001	7/28/1982						8.0	11	<0.5																				
UPDES	UT0022616-001	8/24/1982						8.1	10	<0.5																				
UPDES	UT0022616-001	9/17/1982						8.1	21																344		<1.	73.8		0.1
UPDES	UT0022616-001	11/16/1982						7.7	4.5	<0.5																				
UPDES	UT0022616-001	12/28/1982						7.5	4.5	<0.5															351		<1.	133		<0.01
UPDES	UT0022616-001	1/14/1983						7.6	5	<0.5																				
UPDES	UT0022616-001	2/17/1983						7.6	4	<0.5																				
UPDES	UT0022616-001	3/15/1983						8.1	3	<0.5															314		<1.	104		0.099
UPDES	UT0022616-001	4/26/1983						8.0	2.5	<0.5																				
UPDES	UT0022616-001	5/26/1983						8.0	2	1.2																				
UPDES	UT0022616-001	6/22/1983						8.3	5																			170		0.042
UPDES	UT0022616-001	7/21/1983						8.15	3.5	0.5																				
UPDES	UT0022616-001	8/17/1983						8.2	0.5	<0.5																				
UPDES	UT0022616-001	9/19/1983						8.3	3	<0.5																				
UPDES	UT0022616-001	10/20/1983						8.35	1	<0.5																				
UPDES	UT0022616-001	11/21/1983						8.4	10	<0.5																				
UPDES	UT0022616-001	12/13/1983						8.4	<0.5	<0.5															440		<1.	97		0.56
UPDES	UT0022616-001	3/12/1984						8.4	4	1.2																				
UPDES	UT0022616-001	3/16/1984						8.2	4																415		<1.	109		0.16
UPDES	UT0022616-001	6/13/1984						7.6	16	<0.5																				
UPDES	UT0022616-001	8/28/1984						7.8	5	<0.5																				
UPDES	UT0022616-001	8/28/1984						8.4	6																					
UPDES	UT0022616-001	9/3/1984						8.25	6																					
UPDES	UT0022616-001	9/19/1984						8.3	6	<0.5																				
UPDES	UT0022616-001	10/10/1984						7.7	11	0.5																				
UPDES	UT0022616-001	10/10/1984						8.2	4																					
UPDES	UT0022616-001	11/29/1984						7.7	8	0.7																				
UPDES	UT0022616-001	12/3/1984						8.25	1																					
UPDES	UT0022616-001	12/18/1984						7.6	1	<0.5																				
UPDES	UT0022616-001	12/18/1984						8.2	1																					
UPDES	UT0022616-001	1/7/1985						8.3	7																					
UPDES	UT0022616-001	1/17/1985						8.3	2																					
UPDES	UT0022616-001	1/17/1985						7.8	3	<0.5							<0.05													
UPDES	UT0022616-001	2/25/1985						7.25	15	<0.5																				
UPDES	UT0022616-001	3/25/1985						8.2	6	<0.5																				
UPDES	UT0022616-001	4/30/1985						7.95	5	<0.5																				
UPDES	UT0022616-001	5/28/1985						7.5	5	<0.5																				
UPDES	UT0022616-001	6/24/1985						7.9	6.5	0.9																				
UPDES	UT0022616-001	7/31/1985						7.8	1	3																				
UPDES	UT0022616-001	8/26/1985						8.2	7	<0.5																				
UPDES	UT0022616-001	9/19/1985						7.9	<0.5	<0.5																				
UPDES	UT0022616-001	10/24/1985							6	<0.5																				
UPDES	UT0022616-001	11/30/1985						8.3	6																					
UPDES	UT0022616-001	1/15/1986						8.1	18	<0.5																				
UPDES	UT0022616-001	2/26/1986						8.0	15	<0.5																				
UPDES	UT0022616-001	3/12/1986						7.6	15	<0.5																				
UPDES	UT0022616-001	4/10/1986						7.75	19	<0.5																				
UPDES	UT0022616-001	5/28/1986						7.2	17	<0.5																				
UPDES	UT0022616-001	6/19/1986						7.8	<0.5	<0.5																				
UPDES	UT0022616-001	6/26/1986						8.08	18																					
UPDES	UT0022616-001	6/27/1986						7.94	10																					
UPDES	UT0022616-001	6/30/1986						7.95	8																					
UPDES	UT0022616-001	9/30/1986						7.95	7	1.2																				
UPDES	UT0022616-001	2/1/1987					0																							

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-001	4/13/1981			1975					4149						0.03	0.02		
UPDES	UT0022616-001	5/18/1981	<0.002		2222.1	0.031	415.8	575.9		4304						0.3	0.28	46.8	
UPDES	UT0022616-001	6/23/1981			1646					3555						0.33	0.02		
UPDES	UT0022616-001	6/23/1981			1909.4					3963						0.53	0.03		
UPDES	UT0022616-001	7/1/1981	0.01			<0.002	279.5	771.2										101.5	
UPDES	UT0022616-001	7/1/1981	0.01			0.027	280.6	861.1										102	
UPDES	UT0022616-001	7/17/1981			1810					3804						0.1	0.11		
UPDES	UT0022616-001	8/20/1981	0.017			0.094	422	838						28.1	16.5			72	
UPDES	UT0022616-001	9/28/1981			1563					2783						0.48	0.11		
UPDES	UT0022616-001	10/30/1981			2111					3507						0.57	0.07		
UPDES	UT0022616-001	11/30/1981			2259					3546						0.3	0.08		
UPDES	UT0022616-001	12/29/1981	<0.002	0.002	2022			1729	4800	3762				46.4	57.2	0.07	0.08	127	
UPDES	UT0022616-001	1/30/1982			2140				5000	3770						0.44	0.15		
UPDES	UT0022616-001	2/23/1982			2000				5100	3734						0.3	0.1		
UPDES	UT0022616-001	3/16/1982	<0.002	0.008	2066			874	4780	3764				49.4	56.2	0.24	0.08	99	
UPDES	UT0022616-001	4/30/1982			1662				3460	2719						0.44	0.14		
UPDES	UT0022616-001	5/28/1982			1494				4000	2683						0.47	0.1		
UPDES	UT0022616-001	6/17/1982	<0.002	<0.002	1646			936	4490	2822				45.1	46.8	0.22	0.06	100	
UPDES	UT0022616-001	7/28/1982			1363				4000	3036						0.43	0.07		
UPDES	UT0022616-001	8/24/1982			1000				2100	1393						0.41	0.06		
UPDES	UT0022616-001	9/17/1982	<0.01	<0.01	2000			1152	4320	3138						0.21	0.06	110	
UPDES	UT0022616-001	11/16/1982			1500				4140	2891						0.21	0.07		
UPDES	UT0022616-001	12/28/1982	<0.01	<0.01	1550			882	4290	2942				39.5	43.1	0.23	0.05	93	
UPDES	UT0022616-001	1/14/1983			1200				4100	2380						0.2	0.06		
UPDES	UT0022616-001	2/17/1983			2200				4610	3031						0.31	0.09		
UPDES	UT0022616-001	3/15/1983	<0.01	0.01	1770			681	4150	3074				47.3	46.1	0.3	0.12	100	
UPDES	UT0022616-001	4/26/1983			2600				4850	3552						0.07	0.03		
UPDES	UT0022616-001	5/26/1983			400				4300	3085						0.1	0.01		
UPDES	UT0022616-001	6/22/1983	0.018	0.07	1800		344	794	4600	3330				47.75	49.15	0.06	0.01	119	
UPDES	UT0022616-001	7/21/1983			2400				4550	3156						0.12	<0.01		
UPDES	UT0022616-001	8/17/1983			1050				4900	3231						0.08	<0.01		
UPDES	UT0022616-001	9/19/1983			2100				4600	3034						0.08	0.02		
UPDES	UT0022616-001	10/20/1983			2400				4500	3129						0.05	0.01		
UPDES	UT0022616-001	11/21/1983			1950				3800	2738						<0.05	0.03		
UPDES	UT0022616-001	12/13/1983		<0.01	1650		361	785	4200	3059				43.77	44.31	<0.05	0.01	113	
UPDES	UT0022616-001	3/12/1984			1800				4000	3152						0.05	<0.01		
UPDES	UT0022616-001	3/16/1984		<0.01	1650		340	755	3800	3136				45.73	45.74	<0.05	<0.01	117	
UPDES	UT0022616-001	6/13/1984							4300	3065						<0.05			
UPDES	UT0022616-001	8/28/1984							4100	3003						0.1			
UPDES	UT0022616-001	8/28/1984								3136						<0.2			
UPDES	UT0022616-001	9/3/1984								3150						<0.2			
UPDES	UT0022616-001	9/19/1984							4050	3052						<0.05			
UPDES	UT0022616-001	10/10/1984							4000	3016						<0.05	<0.01		
UPDES	UT0022616-001	10/10/1984								3010						<0.2	<0.2		
UPDES	UT0022616-001	11/29/1984							3900	3159						0.15	0.02		
UPDES	UT0022616-001	12/3/1984								3106						<0.2	<0.2		
UPDES	UT0022616-001	12/18/1984							4000	3000						0.06	<0.01		
UPDES	UT0022616-001	12/18/1984								3084						<0.2	<0.2		
UPDES	UT0022616-001	1/7/1985								3200						<0.2	<0.2		
UPDES	UT0022616-001	1/17/1985								3000						<0.2	<0.2		
UPDES	UT0022616-001	1/17/1985							4000	2932						4.44	<0.01		
UPDES	UT0022616-001	2/25/1985							3650	3063						0.08	0.02		
UPDES	UT0022616-001	3/25/1985							5150	3070						0.2	<0.01		
UPDES	UT0022616-001	4/30/1985							3900	2917						<0.05	<0.01		
UPDES	UT0022616-001	5/28/1985							4100	3051						0.08	0.03		
UPDES	UT0022616-001	6/24/1985							4100	2942						0.07	<0.01		
UPDES	UT0022616-001	7/31/1985							3750	2438						0.09	0.1		
UPDES	UT0022616-001	8/26/1985							3980	2947						0.16	<0.01		
UPDES	UT0022616-001	9/19/1985							3650	2913						0.05	0.01		
UPDES	UT0022616-001	10/24/1985								2988						0.05	<0.01		
UPDES	UT0022616-001	11/30/1985								3062						<0.2	<0.2		
UPDES	UT0022616-001	1/15/1986							4000	2828						0.18	0.02		
UPDES	UT0022616-001	2/26/1986							3500	2557						0.21	0.02		
UPDES	UT0022616-001	3/12/1986							3920	2534						0.14	0.01		
UPDES	UT0022616-001	4/10/1986							3625	2546						0.06	<0.01		
UPDES	UT0022616-001	5/28/1986							3980	2808						0.13	0.02		
UPDES	UT0022616-001	6/19/1986							3800	2738						0.11	0.02		
UPDES	UT0022616-001	6/26/1986								2796						<0.2	<0.2		
UPDES	UT0022616-001	6/27/1986								2836						<0.2	<0.2		
UPDES	UT0022616-001	6/30/1986								2836						<0.2	<0.2		
UPDES	UT0022616-001	9/30/1986							5050	3756						0.05	0.02		
UPDES	UT0022616-001	2/1/1987																	

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-001	2/26/1987					13	7.91	34	<2.																				
UPDES	UT0022616-001	3/10/1989						7.6	8	<1.																				
UPDES	UT0022616-001	4/17/1989						7.6	<2.	<1.																				
UPDES	UT0022616-001	7/31/1989						7.88	3																					
UPDES	UT0022616-001	9/6/1989						7.86	7																					
UPDES	UT0022616-001	9/11/1989		7.7				8.6	10	1																				
UPDES	UT0022616-001	10/4/1989						8.29	5																					
UPDES	UT0022616-001	10/31/1989						7.8	<2.	<1.																				
UPDES	UT0022616-001	11/21/1989						8.1	4	<1.																				
UPDES	UT0022616-001	12/4/1989						7.87	13																					
UPDES	UT0022616-001	12/13/1989						7.9	12	<1.																				
UPDES	UT0022616-001	1/2/1990						7.79	12																					
UPDES	UT0022616-001	1/10/1990						7.6	6	<1.																				
UPDES	UT0022616-001	2/7/1990						8.02	1																					
UPDES	UT0022616-001	2/22/1990						8.4	8	1																				
UPDES	UT0022616-001	3/5/1990						8.06	1																					
UPDES	UT0022616-001	3/12/1990						8.1	12	<1.																				
UPDES	UT0022616-001	3/22/1990							8	<1.	0.45	0.004	0.78	<0.005	152	<0.01	0.47	<0.02	141	0.04	8	<0.001	902	<0.01	430			114		
UPDES	UT0022616-001	4/6/1990						8.12	4																					
UPDES	UT0022616-001	4/18/1990						8.2	<2.	1																				
UPDES	UT0022616-001	5/21/1990						8.1	2	<1.	0.42	0.003	0.74	<0.01	186	<0.01	0.07	<0.02	163	<0.01	7	<0.001	774	<0.01	436		16	120		
UPDES	UT0022616-001	6/1/1990						8.12	11																					
UPDES	UT0022616-001	6/14/1990						8.3	8	<1.																				
UPDES	UT0022616-001	7/12/1990						8.01	5																					
UPDES	UT0022616-001	7/20/1990						8.1	28	2																				
UPDES	UT0022616-001	8/1/1990						8.0	7																					
UPDES	UT0022616-001	8/13/1990						8.1	12	<1.																				
UPDES	UT0022616-001	9/20/1990						8.0	6	1																				
UPDES	UT0022616-001	10/1/1990					341	8.04	10																					
UPDES	UT0022616-001	10/17/1990					664	8.0	<2.	<1.																				
UPDES	UT0022616-001	11/6/1990						7.7	4	1																				
UPDES	UT0022616-001	12/19/1990						8.3	<2.	<1.																				
UPDES	UT0022616-001	1/2/1991						8.14	8																					
UPDES	UT0022616-001	1/14/1991						7.5	<2.	<1.																				
UPDES	UT0022616-001	2/1/1991						7.88	6																					
UPDES	UT0022616-001	2/27/1991						7.9	4	<1.																				
UPDES	UT0022616-001	3/6/1991						8.13	7																					
UPDES	UT0022616-001	3/20/1991						7.9	<2.	2																				
UPDES	UT0022616-001	4/4/1991					247	8.37	10																					
UPDES	UT0022616-001	4/18/1991					247	8.3	12	<1.																				
UPDES	UT0022616-001	5/1/1991					404	8.06	11																					
UPDES	UT0022616-001	5/14/1991						8.1	<2.	2603																				
UPDES	UT0022616-001	6/3/1991					135	8.24	4																					
UPDES	UT0022616-001	6/17/1991					377	8.0	8	1																				
UPDES	UT0022616-001	7/1/1991	18.9	7.6		5340	314	8.0	<2.																					
UPDES	UT0022616-001	7/10/1991						8.18	7																					
UPDES	UT0022616-001	8/5/1991						8.1	13																					
UPDES	UT0022616-001	8/14/1991						8.3	24	<1.																				
UPDES	UT0022616-001	9/5/1991						8.11	10																					
UPDES	UT0022616-001	9/30/1991						8.1	2	117																				
UPDES	UT0022616-001	10/1/1991					220	8.24	8																			122		
UPDES	UT0022616-001	10/14/1991	16.1	7.5		4730	76	8.0	2	2																				
UPDES	UT0022616-001	11/1/1991					0																							
UPDES	UT0022616-001	12/30/1991					157	8.1	13																			90		
UPDES	UT0022616-001	12/31/1991	8.2	6.7		3860	117	7.6	<2.	1																				
UPDES	UT0022616-001	1/2/1992					220	8.05	10																			100		
UPDES	UT0022616-001	1/24/1992					404	7.9	10	9																				
UPDES	UT0022616-001	2/3/1992					732	7.8	6																					
UPDES	UT0022616-001	2/18/1992					40	8.1	8	9																				
UPDES	UT0022616-001	3/2/1992					99	8.1	4																					
UPDES	UT0022616-001	3/31/1992					341	7.9	18	<1.																				
UPDES	UT0022616-001	4/7/1992	13.7	7.2		4510	229	8.2	16																					
UPDES	UT0022616-001	4/28/1992	19.8	7.5		5360	678	8.0	4	<1.																				
UPDES	UT0022616-001	7/15/1992	21.3	7.1		5490	714	8.2	10	<1.																				
UPDES	UT0022616-001	8/3/1992	25.3	7.7		4800	117	8.3	38																					
UPDES	UT0022616-001	8/18/1992	22.5	6.9		4600	350	8.3	18	<1.																				
UPDES	UT0022616-001	9/2/1992	18.2	7.1		4760	799	8.1	2																					
UPDES	UT0022616-001	9/16/1992	20	7.2		4100	633	8.1	14	2																				
UPDES	UT0022616-001	10/5/1992	14.5	7.2		4370	889	8.2	16																					
UPDES	UT0022616-001	11/1/1992					0																							
UPDES	UT0022616-001	12/8/1992	4	7.2		3260	1073	7.5	20																					
UPDES	UT0022616-001	12/14/1992	6.6	6.5		4500	835	7.9	20	<1.																				

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-001	2/26/1987							4490	3380						0.1	0.02		
UPDES	UT0022616-001	3/10/1989							3830	2880						0.73	0.05		
UPDES	UT0022616-001	4/17/1989							3630	3004						0.36	0.05		
UPDES	UT0022616-001	7/31/1989								3262						<0.2	<0.2		
UPDES	UT0022616-001	9/6/1989			1907					3150						0.7	<0.2		
UPDES	UT0022616-001	9/11/1989							4400	3326						0.43	0.02		
UPDES	UT0022616-001	10/4/1989			956					3378						<0.2	<0.2		
UPDES	UT0022616-001	10/31/1989							3710	3376						0.65	0.03		
UPDES	UT0022616-001	11/21/1989							4020	3518						0.78	0.03		
UPDES	UT0022616-001	12/4/1989			1984					3466						0.45	<0.2		
UPDES	UT0022616-001	12/13/1989							4340	3408						0.14	0.01		
UPDES	UT0022616-001	1/2/1990			1952					3306						0.5	<0.2		
UPDES	UT0022616-001	1/10/1990							4330	3492						0.66	0.06		
UPDES	UT0022616-001	2/7/1990			1987					3506						<0.2	<0.2		
UPDES	UT0022616-001	2/22/1990							4230	3524						0.55	0.02		
UPDES	UT0022616-001	3/5/1990			2101					3462						0.28	<0.2		
UPDES	UT0022616-001	3/12/1990							4350	3566						0.57	0.05		
UPDES	UT0022616-001	3/22/1990		<0.1	2140		430	958		3624		<0.2	<0.05	<0.05	59.06	56.73	0.48	0.05	142
UPDES	UT0022616-001	4/6/1990			2056					3510							0.23	<0.2	
UPDES	UT0022616-001	4/18/1990							4250	3604							0.31	0.04	
UPDES	UT0022616-001	5/21/1990			2256		452	1133	4810	3722		<0.3	<0.05	<0.05	56.9	59.78	0.43	0.03	
UPDES	UT0022616-001	6/1/1990			2014					3602							0.22	<0.2	
UPDES	UT0022616-001	6/14/1990							4570	3820							0.41	0.01	
UPDES	UT0022616-001	7/12/1990			2207					3948							0.28	<0.2	
UPDES	UT0022616-001	7/20/1990							4730	3912							0.52	0.02	
UPDES	UT0022616-001	8/1/1990			2309					4022							0.29	<0.2	
UPDES	UT0022616-001	8/13/1990							4690	3988							0.25	<0.01	
UPDES	UT0022616-001	9/20/1990							4740	3920							0.24	<0.01	
UPDES	UT0022616-001	10/1/1990			2218					3854							<0.2	<0.2	
UPDES	UT0022616-001	10/17/1990							4720	3988							0.91	0.02	
UPDES	UT0022616-001	11/6/1990							4880	4044							0.62	0.02	
UPDES	UT0022616-001	12/19/1990							5111	3850							0.71	0.06	
UPDES	UT0022616-001	1/2/1991								3878							0.56	<0.2	
UPDES	UT0022616-001	1/14/1991							4590	3788							0.69	0.09	
UPDES	UT0022616-001	2/1/1991			2148					3724							<0.2	<0.2	
UPDES	UT0022616-001	2/27/1991							4120	3916							0.5	0.02	
UPDES	UT0022616-001	3/6/1991			2278					3878							0.28	<0.2	
UPDES	UT0022616-001	3/20/1991							4520	3866							0.47	0.01	
UPDES	UT0022616-001	4/4/1991			2208					3882							<0.2	<0.2	
UPDES	UT0022616-001	4/18/1991							4900	4170							0.54	<0.01	
UPDES	UT0022616-001	5/1/1991								3856							<0.2	<0.2	
UPDES	UT0022616-001	5/14/1991							5220	3754							0.35	0.01	
UPDES	UT0022616-001	6/3/1991			2209					3822							0.35	<0.2	
UPDES	UT0022616-001	6/17/1991							4540	3932							0.4	<0.01	
UPDES	UT0022616-001	7/1/1991							4830	4072							0.74	0.04	
UPDES	UT0022616-001	7/10/1991			2201					3922							0.46	<0.2	
UPDES	UT0022616-001	8/5/1991			2229				4604	3852							0.5	<0.2	
UPDES	UT0022616-001	8/14/1991							3870	3874							0.52	0.03	
UPDES	UT0022616-001	9/5/1991			2169					3938							0.61	<0.2	
UPDES	UT0022616-001	9/30/1991							4600	3712							0.62	<0.01	
UPDES	UT0022616-001	10/1/1991			2176		440		4400	3666							<0.2	<0.2	141
UPDES	UT0022616-001	10/14/1991							4820	3758							0.51	<0.01	
UPDES	UT0022616-001	11/1/1991																	
UPDES	UT0022616-001	12/30/1991			2166		341			4004							1.04	<0.2	143
UPDES	UT0022616-001	12/31/1991							4740	3902							1.81	0.13	
UPDES	UT0022616-001	1/2/1992			2177		393			3962							0.81	<0.2	144
UPDES	UT0022616-001	1/24/1992							5710	3972							1.39	0.14	
UPDES	UT0022616-001	2/3/1992							4930	3822							1.48	0.11	
UPDES	UT0022616-001	2/18/1992							5230	3860							0.72	0.03	
UPDES	UT0022616-001	3/2/1992							4860	3950							0.88	0.03	
UPDES	UT0022616-001	3/31/1992							4850	3820							1.03	0.07	
UPDES	UT0022616-001	4/7/1992							4670	3790							0.82	0.04	
UPDES	UT0022616-001	4/28/1992							4500	3930							0.53	0.03	
UPDES	UT0022616-001	7/15/1992							4090	3246							0.64	0.02	
UPDES	UT0022616-001	8/3/1992							4580	4012							0.64	0.03	
UPDES	UT0022616-001	8/18/1992							4470	4080							0.6	0.02	
UPDES	UT0022616-001	9/2/1992							5110	3960							0.78	<0.01	
UPDES	UT0022616-001	9/16/1992							4240	3802							0.38	<0.01	
UPDES	UT0022616-001	10/5/1992							4820	3910							0.58	<0.01	
UPDES	UT0022616-001	11/1/1992																	
UPDES	UT0022616-001	12/8/1992							5350	3950							1.5	0.13	
UPDES	UT0022616-001	12/14/1992							4510	4126							1.66	0.12	

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-001	1/11/1993	6.5	6.6		4200	633	7.2	8																					
UPDES	UT0022616-001	1/18/1993	9.7	7.5		4400	539	7.8	16	<1.																				
UPDES	UT0022616-001	2/1/1993	9.4	7.1		4200	633	8.0	8	1																				
UPDES	UT0022616-001	2/16/1993	8.1	7.7		3800	404	8.0	<2.																					
UPDES	UT0022616-001	3/2/1993	11.6	6.9		4700	278	8.1	14	3																				
UPDES	UT0022616-001	3/15/1993	12.5	7		4800	664	8.0	4																					
UPDES	UT0022616-001	4/5/1993	13.3	7		4450	507	8.6	6	1																				
UPDES	UT0022616-001	4/19/1993	10.8	7		4800	404	8.2	4																					
UPDES	UT0022616-001	5/3/1993	17.4	8.3		5000	341	8.1	2	<1.																				
UPDES	UT0022616-001	6/1/1993					0																							
UPDES	UT0022616-001	7/12/1993	19.5	8.7		5630	539	8.1	4	1																				
UPDES	UT0022616-001	7/19/1993	22.9	8.7		5920	633	8.2	24																					
UPDES	UT0022616-001	8/9/1993	21.3	10.2		5650	476	8.2	8	3																				
UPDES	UT0022616-001	8/16/1993	20.2	8.3		5450	565	8.3	14																					
UPDES	UT0022616-001	9/1/1993					0																							
UPDES	UT0022616-001	10/11/1993	12.2	8.8		4800	476	7.9	12	<1.																				
UPDES	UT0022616-001	10/20/1993	13	9.1		4300	696	8.2	10																					
UPDES	UT0022616-001	11/1/1993	8.7	8.6		4000	696	8.3	4	2																				
UPDES	UT0022616-001	11/22/1993	6.3	8.8		3900	449	8.2	2																					
UPDES	UT0022616-001	12/7/1993	6.9	7.7		4200	476	8.0	2	<1.																				
UPDES	UT0022616-001	12/20/1993	6.3	8.4		3800	633	7.9	<2.																					
UPDES	UT0022616-001	1/3/1994	7.5	8.3		4200	732	7.7	<2.	<1.																				
UPDES	UT0022616-001	1/17/1994	8.2	8.3		4200	552	8.1	<2.																					
UPDES	UT0022616-001	2/2/1994	4.8	8.4		4100	404	8.1	14	1																				
UPDES	UT0022616-001	2/14/1994	6	8.3		4200	220	8.1	20																					
UPDES	UT0022616-001	3/1/1994	9.7	8.2		4300	462	8.3	<2.	<1.																				
UPDES	UT0022616-001	3/21/1994	14.4	8.1		4480	714	8.4	<2.																					
UPDES	UT0022616-001	4/4/1994	11.4	7.3		4420	664	8.0	<2.	<1.																				
UPDES	UT0022616-001	4/18/1994	18.1	8		5020	184	8.3	<2.																					
UPDES	UT0022616-001	5/4/1994	16.5	7.8		4450	633	8.1	24	<1.																				
UPDES	UT0022616-001	5/16/1994	19.1	8.1		4880	278	8.3	8																					
UPDES	UT0022616-001	6/1/1994	22.3	7.8		5610	476	8.2	2	<1.																				
UPDES	UT0022616-001	6/20/1994	22	7.9		5640	220	8.3	18																					
UPDES	UT0022616-001	8/1/1994	20.1	8.2		5520	220	8.3	6	<1.																				
UPDES	UT0022616-001	8/15/1994	22.9	7.9		5740	278	8.4	4																					
UPDES	UT0022616-001	9/6/1994	20.2	7.6		5400	242	8.4	10	38																				
UPDES	UT0022616-001	9/19/1994	19.7	8.1		5160	341	8.3	<2.																					
UPDES	UT0022616-001	10/3/1994	16	7.9		4720	364	8.1	4	<1.																				
UPDES	UT0022616-001	10/17/1994	13.6	8.2		4540	278	8.3	16																					
UPDES	UT0022616-001	11/1/1994						8.3	<5.	32																				
UPDES	UT0022616-001	11/14/1994	8	7.7		3910	341	7.8	<5.																					
UPDES	UT0022616-001	1/3/1995	6.1	8.2		3850	341	7.9	<5.																					
UPDES	UT0022616-001	2/1/1995					0																							
UPDES	UT0022616-001	3/7/1995	10.1	7.5		4200	422		<10.								<0.1													
UPDES	UT0022616-001	3/20/1995	14.8	7.3		4840	422		<5.																					
UPDES	UT0022616-001	4/3/1995	13.5	7.2		4510	390		5																					
UPDES	UT0022616-001	4/24/1995	14.1	7.1		4740	364		<5.																					
UPDES	UT0022616-001	5/1/1995	17.4	7.4		4900	364		10																					
UPDES	UT0022616-001	5/15/1995	16.6	7.5		4900	341		<5.																					
UPDES	UT0022616-001	6/5/1995	20.7	7.8			341		10																					
UPDES	UT0022616-001	6/19/1995	17.7	7.4		5460	3007		<5.																					
UPDES	UT0022616-001	7/11/1995	22	7.5		5850	197		5																					
UPDES	UT0022616-001	7/25/1995	23.2	7.6		6100	220		10																					
UPDES	UT0022616-001	8/1/1995	23.5	7.8		6280	197		<5.																					
UPDES	UT0022616-001	8/3/1995	25.3	7.7		4800	117	8.3	38																					
UPDES	UT0022616-001	8/15/1995	23.6	7.7		6310	220		5																					
UPDES	UT0022616-001	9/5/1995	21.5	7		5650	197		10																					
UPDES	UT0022616-001	9/18/1995	19	7.3		5630	197		<5.																					
UPDES	UT0022616-001	10/2/1995	16.1	7.5		5060	206		5																					
UPDES	UT0022616-001	10/24/1995	8.9	7.3		4310	8976		<5.																					
UPDES	UT0022616-001	11/6/1995	10.8	8		5090	76		10																					
UPDES	UT0022616-001	11/15/1995	10.3	8.1		5430	117		<5.																					
UPDES	UT0022616-001	12/6/1995	8.3	7.7		4830	9.0																							
UPDES	UT0022616-001	1/1/1996					0																							
UPDES	UT0022616-001	2/27/1996	6.9	8.1		4450	1055		8																					
UPDES	UT0022616-001	2/29/1996	8.5	8.1		4720	978		<5.																					
UPDES	UT0022616-001	3/4/1996	9.5	8.1		4690	197		<5.																					
UPDES	UT0022616-001	3/28/1996	11.4	7.6		5150	633		<5.																					
UPDES	UT0022616-001	4/2/1996	11.4	8.1		5130	678		5																					
UPDES	UT0022616-001	4/22/1996	14.1	8		5250	732		5																					
UPDES	UT0022616-001	5/1/1996	17.5	8.1		5650	678		7																					
UPDES	UT0022616-001	5/20/1996	17.5	7.6		5850	696		9																					

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-001	1/11/1993							4550	3958						0.93	0.12		
UPDES	UT0022616-001	1/18/1993							4570	3944						0.67	0.1		
UPDES	UT0022616-001	2/1/1993							4270	3908						0.58	0.04		
UPDES	UT0022616-001	2/16/1993							4830	4162						0.44	0.03		
UPDES	UT0022616-001	3/2/1993							5380	4068						0.34	0.02		
UPDES	UT0022616-001	3/15/1993							4650	4040						0.44	0.05		
UPDES	UT0022616-001	4/5/1993							4410	4074						0.73	0.04		
UPDES	UT0022616-001	4/19/1993							4570	4100						0.77	0.04		
UPDES	UT0022616-001	5/3/1993							4490	4172						0.53	0.03		
UPDES	UT0022616-001	6/1/1993																	
UPDES	UT0022616-001	7/12/1993							5900	4212						0.49	0.02		
UPDES	UT0022616-001	7/19/1993							5100	4140						0.46	0.02		
UPDES	UT0022616-001	8/9/1993							6020	4030						0.38	0.00012		
UPDES	UT0022616-001	8/16/1993							5420	4118						0.69	0.1		
UPDES	UT0022616-001	9/1/1993																	
UPDES	UT0022616-001	10/11/1993							5030	4006						0.84	0.06		
UPDES	UT0022616-001	10/20/1993							4830	3834						0.76	0.04		
UPDES	UT0022616-001	11/1/1993							4960	4058						0.57	<0.01		
UPDES	UT0022616-001	11/22/1993							4880	4242						0.58	0.02		
UPDES	UT0022616-001	12/7/1993							5030	4090						0.66	0.05		
UPDES	UT0022616-001	12/20/1993							5090	4092						0.68	0.05		
UPDES	UT0022616-001	1/3/1994							4990	3970						0.77	0.09		
UPDES	UT0022616-001	1/17/1994							5030	4076						0.41	0.04		
UPDES	UT0022616-001	2/2/1994							5040	4024						0.38	0.02		
UPDES	UT0022616-001	2/14/1994							4830	3996						0.24	<0.01		
UPDES	UT0022616-001	3/1/1994							5040	4012						0.35	0.02		
UPDES	UT0022616-001	3/21/1994							5070	4020						0.22	<0.01		
UPDES	UT0022616-001	4/4/1994							4940	4174						0.48	0.01		
UPDES	UT0022616-001	4/18/1994							5150	4114						0.52	0.01		
UPDES	UT0022616-001	5/4/1994							5090	4028						0.58	0.03		
UPDES	UT0022616-001	5/16/1994							5200	2100						0.2	<0.01		
UPDES	UT0022616-001	6/1/1994							5250	4166						0.15	<0.01		
UPDES	UT0022616-001	6/20/1994							5300	4328						0.16	<0.01		
UPDES	UT0022616-001	8/1/1994							5360	4422						0.13	0.02		
UPDES	UT0022616-001	8/15/1994							5260	4366						0.1	<0.01		
UPDES	UT0022616-001	9/6/1994							5330	4226						0.25	<0.01		
UPDES	UT0022616-001	9/19/1994							5310	4314						0.24	<0.01		
UPDES	UT0022616-001	10/3/1994							5200	4140						0.13	<0.01		
UPDES	UT0022616-001	10/17/1994							5140	4170						<0.01	<0.01		
UPDES	UT0022616-001	11/1/1994							5160	4320						0.1	<0.005		
UPDES	UT0022616-001	11/14/1994							5210	4240						0.21	<0.005		
UPDES	UT0022616-001	1/3/1995							3300	2350						0.32	0.011		
UPDES	UT0022616-001	2/1/1995																	
UPDES	UT0022616-001	3/7/1995								4280									
UPDES	UT0022616-001	3/20/1995								4210						0.4			
UPDES	UT0022616-001	4/3/1995								4220						0.3			
UPDES	UT0022616-001	4/24/1995								4200						<0.1			
UPDES	UT0022616-001	5/1/1995								4190						0.2			
UPDES	UT0022616-001	5/15/1995								4180						0.6			
UPDES	UT0022616-001	6/5/1995								4370						<0.1			
UPDES	UT0022616-001	6/19/1995								4330						0.1			
UPDES	UT0022616-001	7/11/1995								4520						<0.1			
UPDES	UT0022616-001	7/25/1995								4470						<0.1			
UPDES	UT0022616-001	8/1/1995								4610						<0.1			
UPDES	UT0022616-001	8/3/1995							4580	4012						0.64	0.03		
UPDES	UT0022616-001	8/15/1995								4540						<0.1			
UPDES	UT0022616-001	9/5/1995								4560						0.1			
UPDES	UT0022616-001	9/18/1995								580						0.2			
UPDES	UT0022616-001	10/2/1995								4560						0.1			
UPDES	UT0022616-001	10/24/1995								4630						<0.1			
UPDES	UT0022616-001	11/6/1995								4590						<0.1			
UPDES	UT0022616-001	11/15/1995								4470						<0.1			
UPDES	UT0022616-001	12/6/1995																	
UPDES	UT0022616-001	1/1/1996																	
UPDES	UT0022616-001	2/27/1996								4514						1.4			
UPDES	UT0022616-001	2/29/1996								4496						1.6			
UPDES	UT0022616-001	3/4/1996								4484						1.2			
UPDES	UT0022616-001	3/28/1996								4470						0.69			
UPDES	UT0022616-001	4/2/1996								4485						0.63			
UPDES	UT0022616-001	4/22/1996								4347						0.81			
UPDES	UT0022616-001	5/1/1996								4325						0.73			
UPDES	UT0022616-001	5/20/1996								4400						0.38			

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-001	6/3/1996	21.5	7.9		6390	462		<5.																					
UPDES	UT0022616-001	6/18/1996	21.1	8.2		6560	301		<5.																					
UPDES	UT0022616-001	7/1/1996	22.6	8.2		6240	763		9																					
UPDES	UT0022616-001	7/16/1996	21.5	8.1		6190	476		<5.																					
UPDES	UT0022616-001	8/1/1996	21.6	7.8		6360	583		7																					
UPDES	UT0022616-001	8/19/1996	21	7.9		6250	364		<5.																					
UPDES	UT0022616-001	9/3/1996	21	8.1		6340	507		<5.																					
UPDES	UT0022616-001	9/16/1996	16.1	7.7		5530	301		8																					
UPDES	UT0022616-001	10/2/1996	15.9	7.7		5370	521		<5.																					
UPDES	UT0022616-001	10/15/1996	14.8	7.5		5350	66422		<5.																					
UPDES	UT0022616-001	11/5/1996	9.5	7.9		4900	404		<5.																					
UPDES	UT0022616-001	11/19/1996	7.3	8		4700	422		<5.																					
UPDES	UT0022616-001	12/2/1996	5.9	8		4000	40392		<5.																					
UPDES	UT0022616-001	12/16/1996	4.6	7.8		3950	404		<5.																					
UPDES	UT0022616-001	1/2/1997	6.5	7.9		4040	422		<5.																					
UPDES	UT0022616-001	1/16/1997	4.5	7.7		3850	597		<5.																					
UPDES	UT0022616-001	2/3/1997	6	7.5		3860	565		<5.																					
UPDES	UT0022616-001	2/19/1997	7.5	7.9		3910	220		5																					
UPDES	UT0022616-001	3/3/1997	8.1	7.6		4010	664		<5.																					
UPDES	UT0022616-001	3/3/1997	8.1	7.6		4010	664																							
UPDES	UT0022616-001	3/17/1997	13.2	8		4680	1.1		<5.																					
UPDES	UT0022616-001	4/1/1997	11.6	7.9		4560	242		<5.																					
UPDES	UT0022616-001	4/15/1997	13.1	7.5		4620	565		<5.																					
UPDES	UT0022616-001	5/1/1997	13.1	8		4660	664		5																					
UPDES	UT0022616-001	5/15/1997	18.3	8		4470	449		<5.																					
UPDES	UT0022616-001	6/2/1997	19.6	8.1		4930	229		<5.																					
UPDES	UT0022616-001	6/16/1997	17.9	7.9		4820	664		<5.																					
UPDES	UT0022616-001	7/1/1997	17.4	7.4		4790	76		5																					
UPDES	UT0022616-001	7/15/1997	20.6	7.7		4710	476		<5.																					
UPDES	UT0022616-001	8/1/1997	21.6	7.8		4650	435		<5.																					
UPDES	UT0022616-001	8/15/1997	20.4	7.6		4730	507		<5.																					
UPDES	UT0022616-001	9/3/1997	19.3	7.6		4740	646		<5.																					
UPDES	UT0022616-001	9/16/1997	18.1	7.6		4660	494		5																					
UPDES	UT0022616-001	10/1/1997	15.6	8		4790	521		<5.																					
UPDES	UT0022616-001	10/15/1997	9.3	7.7		4880	462		<5.																					
UPDES	UT0022616-001	11/3/1997	8.5	7.6		4910	422		5																					
UPDES	UT0022616-001	11/17/1997	5.5	7.5		4960	404		<5.																					
UPDES	UT0022616-001	12/1/1997	6.1	7.6		5050	597		8																					
UPDES	UT0022616-001	12/15/1997	4.8	7.8		5750	449		<5.																					
UPDES	UT0022616-001	1/2/1998	5.1	8		5110	633		<5.																					
UPDES	UT0022616-001	1/16/1998	5	8.2		4830	449		<5.																					
UPDES	UT0022616-001	2/2/1998	5.1	8.4		4890	422		<5.																					
UPDES	UT0022616-001	2/17/1998	6.4	8.3		4740	341		<4.																					
UPDES	UT0022616-001	3/2/1998	6.7	8.1		4790	265		<4.																					
UPDES	UT0022616-001	3/16/1998	10.5	8.2		4670	507		<4.																					
UPDES	UT0022616-001	4/2/1998	10.2	8.2		4690	1.3		<4.																					
UPDES	UT0022616-001	4/15/1998	9.7	8.3		4720	287		<4.																					
UPDES	UT0022616-001	5/1/1998	15.3	7.6		4660	301																							
UPDES	UT0022616-001	5/18/1998	14.3	8.2		4740	314		<4.																					
UPDES	UT0022616-001	5/27/1998	15.5	7.8		4740	390		<4.																					
UPDES	UT0022616-001	6/1/1998	17.4	7.6		4630	377		<4.																					
UPDES	UT0022616-001	6/15/1998	16	7.8		4970	22		<5.																					
UPDES	UT0022616-001	7/1/1998	21.4	7.7		4940	265		<5.																					
UPDES	UT0022616-001	7/17/1998	23.1	7.9		4880	278		<5.																					
UPDES	UT0022616-001	8/3/1998	21.1	7.7		4860	364		<5.																					
UPDES	UT0022616-001	8/17/1998	21.2	7.5		4930	377		6																					
UPDES	UT0022616-001	9/1/1998	20.7	7.6		4820	220		6																					
UPDES	UT0022616-001	9/1/1998	20.7	7.6		4820	220																							
UPDES	UT0022616-001	9/9/1998	20.4	7.7		4670	350		6																					
UPDES	UT0022616-001	10/23/1998	8.2	7.5		4760	364		<5.																					
UPDES	UT0022616-001	10/29/1998	10.2	7.6		4810	714		<5.																					
UPDES	UT0022616-001	11/9/1998	7.8	7.6		4790	364		<5.																					
UPDES	UT0022616-001	11/23/1998	7.1	7.3		4900	476		<5.																					
UPDES	UT0022616-001	12/1/1998	5.6	7.2		4910	664		12																					
UPDES	UT0022616-001	12/15/1998	4.9	7.9		5070	507		5																					
UPDES	UT0022616-001	1/4/1999	5.3	7.9		5050	287		<5.																					
UPDES	UT0022616-001	1/19/1999	5.8	8		5240	390		<5.																					
UPDES	UT0022616-001	2/1/1999	5.2	8.2		5210	507		<5.																					
UPDES	UT0022616-001	2/15/1999	6.3	7.9		5190	565		<5.																					
UPDES	UT0022616-001	3/1/1999	8.2	7.4		5130	664		<5.																					
UPDES	UT0022616-001	3/15/1999	8.2	8.4		4980	476		<5.																					
UPDES	UT0022616-001	4/5/1999	7.2	8.1		5050	422		<5.																					

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-001	6/3/1996								4329						0.2			
UPDES	UT0022616-001	6/18/1996								4310						0.2			
UPDES	UT0022616-001	7/1/1996								4316						0.3			
UPDES	UT0022616-001	7/16/1996								4322						0.3			
UPDES	UT0022616-001	8/1/1996								4281						0.2			
UPDES	UT0022616-001	8/19/1996								4297						0.4			
UPDES	UT0022616-001	9/3/1996								4260						0.4			
UPDES	UT0022616-001	9/16/1996								4138						0.5			
UPDES	UT0022616-001	10/2/1996								4096						0.3			
UPDES	UT0022616-001	10/15/1996								4163						0.2			
UPDES	UT0022616-001	11/5/1996								4168						0.3			
UPDES	UT0022616-001	11/19/1996								4037						0.3			
UPDES	UT0022616-001	12/2/1996								4037						0.3			
UPDES	UT0022616-001	12/16/1996								4076						0.4			
UPDES	UT0022616-001	1/2/1997								3942						0.7			
UPDES	UT0022616-001	1/16/1997								3975						0.5			
UPDES	UT0022616-001	2/3/1997								3810						0.8			
UPDES	UT0022616-001	2/19/1997								3864						0.6			
UPDES	UT0022616-001	3/3/1997								3960						0.7			
UPDES	UT0022616-001	3/3/1997																	
UPDES	UT0022616-001	3/17/1997								3990						0.3			
UPDES	UT0022616-001	4/1/1997								4080						0.6			
UPDES	UT0022616-001	4/15/1997								4030						0.9			
UPDES	UT0022616-001	5/1/1997								4060						0.6			
UPDES	UT0022616-001	5/15/1997								4060						0.3			
UPDES	UT0022616-001	6/2/1997								4040						0.4			
UPDES	UT0022616-001	6/16/1997								4040						0.2			
UPDES	UT0022616-001	7/1/1997								3990						0.5			
UPDES	UT0022616-001	7/15/1997								3960						0.2			
UPDES	UT0022616-001	8/1/1997								3820						0.2			
UPDES	UT0022616-001	8/15/1997								3930						0.3			
UPDES	UT0022616-001	9/3/1997								3870						0.3			
UPDES	UT0022616-001	9/16/1997								3930						0.3			
UPDES	UT0022616-001	10/1/1997								4010						0.4			
UPDES	UT0022616-001	10/15/1997								4140						0.2			
UPDES	UT0022616-001	11/3/1997								3920						0.3			
UPDES	UT0022616-001	11/17/1997								4000						0.3			
UPDES	UT0022616-001	12/1/1997								4100						0.4			
UPDES	UT0022616-001	12/15/1997								4090						0.6			
UPDES	UT0022616-001	1/2/1998								4010						0.4			
UPDES	UT0022616-001	1/16/1998								3920						0.6			
UPDES	UT0022616-001	2/2/1998								3870						0.4			
UPDES	UT0022616-001	2/17/1998								3790						0.4			
UPDES	UT0022616-001	3/2/1998								3780						0.4			
UPDES	UT0022616-001	3/16/1998								3732						0.3			
UPDES	UT0022616-001	4/2/1998								2886						0.4			
UPDES	UT0022616-001	4/15/1998								3805						0.5			
UPDES	UT0022616-001	5/1/1998								3768						0.4			
UPDES	UT0022616-001	5/18/1998								3837						0.4			
UPDES	UT0022616-001	5/27/1998								3905						0.3			
UPDES	UT0022616-001	6/1/1998								3861						0.2			
UPDES	UT0022616-001	6/15/1998								3841						0.2			
UPDES	UT0022616-001	7/1/1998								3844						0.1			
UPDES	UT0022616-001	7/17/1998								3785						0.1			
UPDES	UT0022616-001	8/3/1998								4787						0.2			
UPDES	UT0022616-001	8/17/1998								3899						0.1			
UPDES	UT0022616-001	9/1/1998								3767						0.2			
UPDES	UT0022616-001	9/1/1998																	
UPDES	UT0022616-001	9/9/1998								3729						0.2			
UPDES	UT0022616-001	10/23/1998								3840						0.6			
UPDES	UT0022616-001	10/29/1998								3860						0.3			
UPDES	UT0022616-001	11/9/1998								3819						0.3			
UPDES	UT0022616-001	11/23/1998								3847						0.2			
UPDES	UT0022616-001	12/1/1998								3821						0.3			
UPDES	UT0022616-001	12/15/1998								3891						0.4			
UPDES	UT0022616-001	1/4/1999								4015						0.7			
UPDES	UT0022616-001	1/19/1999								3996						0.6			
UPDES	UT0022616-001	2/1/1999								4088						0.4			
UPDES	UT0022616-001	2/15/1999								4110						0.3			
UPDES	UT0022616-001	3/1/1999								4146						0.3			
UPDES	UT0022616-001	3/15/1999								4158						0.3			
UPDES	UT0022616-001	4/5/1999								4066						0.4			

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-001	4/16/1999	10.5	7.5		5130	265		<5.																					
UPDES	UT0022616-001	5/3/1999	12.7	8.3		4920	494		<5.																					
UPDES	UT0022616-001	5/17/1999	13.9	8.3		5100	220																							
UPDES	UT0022616-001	6/1/1999	17	7.7		4850	449		<5.																					
UPDES	UT0022616-001	6/15/1999	20.5	8.4		4850	287		<5.																					
UPDES	UT0022616-001	7/1/1999	21.4	8.2		4890	449		<5.																					
UPDES	UT0022616-001	10/4/1999	13.1	7.8		4970	341		<5.																					
UPDES	UT0022616-001	12/3/1999	4.2	7.6		5020	565		<5.																					
UPDES	UT0022616-001	1/4/2000	4	7.3		5120	476		<5.																					
UPDES	UT0022616-001	2/2/2000	5.2	8		5130	539		<5.																					
UPDES	UT0022616-001	4/3/2000	11	8.1		4760	341		6																					
UPDES	UT0024040-001	6/8/2001	19.2	7.5		5310	404		<5.																					
UPDES	UT0022616-001	7/10/2001	23.2	7.3		5250			<5.																					
UPDES	UT0024040-001	10/3/2001	15.5	7.4		5120	462		<5.																					
UPDES	UT0024040-001	12/10/2001	3.4	7.1		5220	565		<5.																	<5.				
UPDES	UT0022616-001	4/11/2002	13.9	7.1		5530	745		6																					
UPDES	UT0022616-001	5/7/2002	15.3	6.9		5420	597		<5.	0																				
UPDES	UT0022616-001	6/19/2002	19.8	7.8			341		<5.																					
UPDES	UT0022616-001	7/15/2002	21.6	7		5980	422		<5.	0																				
UPDES	UT0022616-001	8/8/2002	19.4	7.3		6080	198		9																					
UPDES	UT0022616-001	9/16/2002	16.6	7.1		3320	22440		<3.8																					
UPDES	UT0024040-001	10/22/2002	11.7	7.6		5830	449		<5.																					
UPDES	UT0022616-001	7/31/2003					0																							
UPDES	UT0022616-001	8/29/2003					0																							
UPDES	UT0022616-001	9/16/2003	17.9	8		5.6	566		< 5.																					
UPDES	UT0022616-001	10/28/2003					0																							
UPDES	UT0022616-001	11/24/2003					0																							
UPDES	UT0022616-001	12/31/2003					0																							
UPDES	UT0022616-001	1/27/2004					0																							
UPDES	UT0022616-001	2/25/2004					0																							
UPDES	UT0022616-001	3/10/2004					0																							
UPDES	UT0022616-001	4/6/2004	12.8	8		5.31	202		< 5.																					
UPDES	UT0022616-001	5/10/2004					0																							
UPDES	UT0022616-001	6/2/2004					0																							
UPDES	UT0022616-001	7/8/2004	21.3	8.3		5620	202		< 5.																					
UPDES	UT0022616-001	8/8/2004					0																							
UPDES	UT0022616-001	9/8/2004					0																							
UPDES	UT0022616-001	10/1/2004					0																							
UPDES	UT0022616-001	11/1/2004					0																							
UPDES	UT0022616-001	12/1/2004					0																							
UPDES	UT0022616-001	1/5/2005					0																							
UPDES	UT0022616-001	2/1/2005					0																							
UPDES	UT0022616-001	3/1/2005	13.3	8.6			337		5																					
UPDES	UT0022616-001	4/1/2005	11	8.5		5930	229		< 5.																					
UPDES	UT0022616-001	5/2/2005					0																							
UPDES	UT0022616-001	6/1/2005					0																							
UPDES	UT0022616-001	7/15/2005					0																							
UPDES	UT0022616-001	8/18/2005					0																							
UPDES	UT0022616-001	9/16/2005					0																							
UPDES	UT0022616-001	10/3/2005					0																							
UPDES	UT0022616-001	11/1/2005	11.7	8		5660	189		7																					
UPDES	UT0022616-001	11/15/2005	7.7	8.1		5610	90		< 5.																					
UPDES	UT0022616-001	12/1/2005	1.4	8.7		5920	4.5		< 5.																					
UPDES	UT0022616-001	1/3/2006					0																							
UPDES	UT0022616-001	2/1/2006					0																							
UPDES	UT0022616-001	3/1/2006					0																							
UPDES	UT0022616-001	4/3/2006	13.7	7.6		5430	94		5	0																				
UPDES	UT0022616-001	4/17/2006	12.3	8.2		5430	94		5	0																				
UPDES	UT0022616-001	5/1/2006	15.2	8.1		5470	105	8.13	< 5.	0																< 5.		144		
UPDES	UT0022616-001	5/15/2006	18	8		5350	105		< 5.	0																				
UPDES	UT0022616-001	6/1/2006	18.7	8.3		5510	86		< 5.	0																				
UPDES	UT0022616-001	6/15/2006	18.7	8.2		5410	86		< 5.	0																				
UPDES	UT0022616-001	6/30/2006	24.1	8.2		5250	43		< 5.	< 2.																				
UPDES	UT0022616-001	7/14/2006	21.1	8.4		5270	43		8	0																				
UPDES	UT0022616-001	8/1/2006	21.7	8.4		5170	43		< 5.	0																				
UPDES	UT0022616-001	8/15/2006	20.1	8.3		5230	70		< 5.	0																				
UPDES	UT0022616-001	9/1/2006	21.6	8.1		5210	70		6	0																				
UPDES	UT0022616-001	9/15/2006	16.1	8.6		5130	14		5	0																				
UPDES	UT0022616-001	10/2/2006	13.9	8.6		5210	25		15	0																				
UPDES	UT0022616-001	10/16/2006	14	8.9		5050	1.3		5	0																				
UPDES	UT0022616-001	11/1/2006					0																							
UPDES	UT0022616-001	12/1/2006					0																							

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-001	4/16/1999								3954						0.3			
UPDES	UT0022616-001	5/3/1999								3865						0.2			
UPDES	UT0022616-001	5/17/1999								3925						0.2			
UPDES	UT0022616-001	6/1/1999								4037						0.2			
UPDES	UT0022616-001	6/15/1999								3976						0.1			
UPDES	UT0022616-001	7/1/1999								4011						0.1			
UPDES	UT0022616-001	10/4/1999								3913						0.2			
UPDES	UT0022616-001	12/3/1999								3908						0.4			
UPDES	UT0022616-001	1/4/2000								3853						0.4			
UPDES	UT0022616-001	2/2/2000								3745						0.3			
UPDES	UT0022616-001	4/3/2000								3755						0.2			
UPDES	UT0024040-001	6/8/2001								4179						<0.1			
UPDES	UT0022616-001	7/10/2001								4256						0.1			
UPDES	UT0024040-001	10/3/2001								4201						<0.1			
UPDES	UT0024040-001	12/10/2001								4069						0.1			
UPDES	UT0022616-001	4/11/2002																	
UPDES	UT0022616-001	5/7/2002								4465						0.2			
UPDES	UT0022616-001	6/19/2002								4590						<0.1			
UPDES	UT0022616-001	7/15/2002								4774						0.2			
UPDES	UT0022616-001	8/8/2002								5048						0.3			
UPDES	UT0022616-001	9/16/2002								4658						0.2			
UPDES	UT0024040-001	10/22/2002								4774						<0.1			
UPDES	UT0022616-001	7/31/2003																	
UPDES	UT0022616-001	8/29/2003																	
UPDES	UT0022616-001	9/16/2003								4625						0.233			
UPDES	UT0022616-001	10/28/2003																	
UPDES	UT0022616-001	11/24/2003																	
UPDES	UT0022616-001	12/31/2003																	pump off
UPDES	UT0022616-001	1/27/2004																	
UPDES	UT0022616-001	2/25/2004																	
UPDES	UT0022616-001	3/10/2004																	
UPDES	UT0022616-001	4/6/2004								4267						0.527	0.05		
UPDES	UT0022616-001	5/10/2004																	
UPDES	UT0022616-001	6/2/2004																	
UPDES	UT0022616-001	7/8/2004								4490						0.19			
UPDES	UT0022616-001	8/8/2004																	
UPDES	UT0022616-001	9/8/2004																	
UPDES	UT0022616-001	10/1/2004																	Site was dry
UPDES	UT0022616-001	11/1/2004																	Site was dry
UPDES	UT0022616-001	12/1/2004																	Site was dry
UPDES	UT0022616-001	1/5/2005																	No Oil of Froth
UPDES	UT0022616-001	2/1/2005																	No Oil or Froth
UPDES	UT0022616-001	3/1/2005								4549						0.73			
UPDES	UT0022616-001	4/1/2005								4804						0.24			
UPDES	UT0022616-001	5/2/2005																	No discharge in May
UPDES	UT0022616-001	6/1/2005																	No Discharge in June
UPDES	UT0022616-001	7/15/2005																	
UPDES	UT0022616-001	8/18/2005																	Did not Discharge in August
UPDES	UT0022616-001	9/16/2005																	Did not Discharge in September
UPDES	UT0022616-001	10/3/2005																	No Discharge for the month of October
UPDES	UT0022616-001	11/1/2005								4751						0.37			
UPDES	UT0022616-001	11/15/2005								4675						0.22			
UPDES	UT0022616-001	12/1/2005								4709						0.27			
UPDES	UT0022616-001	1/3/2006																	No Discharge in 1st. Quarter.
UPDES	UT0022616-001	2/1/2006																	No Discharge in February.
UPDES	UT0022616-001	3/1/2006																	No Discharge in March.
UPDES	UT0022616-001	4/3/2006								4436						0.84			
UPDES	UT0022616-001	4/17/2006								4590						0.4			
UPDES	UT0022616-001	5/1/2006			2603		476			4524						0.18	0.099	181	
UPDES	UT0022616-001	5/15/2006								4487						0.19			
UPDES	UT0022616-001	6/1/2006								4453						0.23			
UPDES	UT0022616-001	6/15/2006								4448						0.23			
UPDES	UT0022616-001	6/30/2006								4403						0.23	0.015		
UPDES	UT0022616-001	7/14/2006								4330						0.17			
UPDES	UT0022616-001	8/1/2006								4335						0.23			
UPDES	UT0022616-001	8/15/2006								4324						0.17			
UPDES	UT0022616-001	9/1/2006								4243						0.13			
UPDES	UT0022616-001	9/15/2006								4223						0.11			
UPDES	UT0022616-001	10/2/2006								4195						0.1			DIS.METALS FILTERED @ LAB
UPDES	UT0022616-001	10/16/2006								4122						0.12			
UPDES	UT0022616-001	11/1/2006																	
UPDES	UT0022616-001	12/1/2006																	

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
		No. of Obs.:	197	198	1	194	247	178	194	53	2	2	2	0	2	0	6	0	2	1	2	0	2	0	14	0	3	19	0	8
		Maximum:	25.3	10.2	11.3	6560	66422.4	8.6	256	2603	0.45	0.004	0.78	0	186	0	9.35	0	163	0.04	8	0	902	0	490	0	16	196	0	0.56
		Minimum:	1.4	6.5	11.3	5.31	0	7.2	0.5	0	0.42	0.003	0.74	0	152	0	0.01	0	141	0.04	7	0	774	0	272.6	0	6.9	73.8	0	0.042
		Mean:	14.0	7.8	11.3	4882.9	898.0	8.1	13.8	53.9	0.4	0.0	0.8	--	169	--	2.9	--	152.0	0.0	7.5	--	838.0	--	384.0	--	11.8	139.5	--	0.1
		Std. Dev.:	6.0	0.5	--	850.7	5131.9	0.3	32.1	357.3	0.0	0.0	0.0	--	24.0	--	4.3	--	15.6	--	0.7	--	90.5	--	64.2	--	4.6	39.8	--	0.2
		Equivalent weights of means:													8.43				12.51		0.19		36.45		6.29		0.39	3.94		

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
		No. of Obs.:	4	4	58	3	13	15	136	318	0	0	0	11	11	277	109	18	
		Maximum:	0.018	0.07	2603	0.094	476	1729	6020	5048	0	0	0	59.06	59.78	4.44	0.28	181	
		Minimum:	0.01	0.002	400	0.027	279.5	575.9	2100	580	0	0	0	28.1	16.5	0.03	0.00012	46.8	
		Mean:	0.0	0.0	1923.4	0.1	382.7	915.0	4560.4	3812	--	--	--	46.3	47.4	0.4	0.0	114.0	
		Std. Dev.:	0.0	0.0	416.5	0.0	63.5	270.9	574.8	575.7	--	--	--	8.2	11.9	0.4	0.0	30.3	
		Equivalent wei			40.05														

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-002	10/1/1979					0																							
UPDES	UT0022616-002	11/1/1979					0																							
UPDES	UT0022616-002	12/1/1979					0																							
UPDES	UT0022616-002	1/1/1980					0																							
UPDES	UT0022616-002	2/1/1980					0																							
UPDES	UT0022616-002	3/1/1980					0																							
UPDES	UT0022616-002	4/1/1980					0																							
UPDES	UT0022616-002	5/1/1980					0																							
UPDES	UT0022616-002	6/1/1980					0																							
UPDES	UT0022616-002	9/1/1980					0																							
UPDES	UT0022616-002	12/1/1980					0																							
UPDES	UT0022616-002	1/1/1981					0																							
UPDES	UT0022616-002	2/1/1981					0																							
UPDES	UT0022616-002	3/1/1981					0																							
UPDES	UT0022616-002	4/1/1981					0																							
UPDES	UT0022616-002	5/1/1981					0																							
UPDES	UT0022616-002	6/1/1981					0																							
UPDES	UT0022616-002	9/1/1981					0																							
UPDES	UT0022616-002	10/1/1981					0																							
UPDES	UT0022616-002	11/1/1981					0																							
UPDES	UT0022616-002	12/1/1981					0																							
UPDES	UT0022616-002	3/1/1982					0																							
UPDES	UT0022616-002	4/1/1982					0																							
UPDES	UT0022616-002	5/1/1982					0																							
UPDES	UT0022616-002	6/1/1982					0																							
UPDES	UT0022616-002	7/1/1982					0																							
UPDES	UT0022616-002	8/1/1982					0																							
UPDES	UT0022616-002	9/1/1982					0																							
UPDES	UT0022616-002	10/1/1982					0																							
UPDES	UT0022616-002	11/1/1982					0																							
UPDES	UT0022616-002	12/1/1982					0																							
UPDES	UT0022616-002	1/1/1983					0																							
UPDES	UT0022616-002	2/1/1983					0																							
UPDES	UT0022616-002	3/1/1983					0																							
UPDES	UT0022616-002	4/1/1983					0																							
UPDES	UT0022616-002	6/1/1983					0																							
UPDES	UT0022616-002	7/1/1983					0																							
UPDES	UT0022616-002	8/1/1983					0																							
UPDES	UT0022616-002	9/1/1983					0																							
UPDES	UT0022616-002	10/1/1983					0																							
UPDES	UT0022616-002	11/1/1983					0																							
UPDES	UT0022616-002	12/1/1983					0																							
UPDES	UT0022616-002	1/1/1984					0																							
UPDES	UT0022616-002	2/1/1984					0																							
UPDES	UT0022616-002	4/1/1984					0																							
UPDES	UT0022616-002	7/1/1984					0																							
UPDES	UT0022616-002	8/1/1984					0																							
UPDES	UT0022616-002	9/1/1984					0																							
UPDES	UT0022616-002	10/1/1984					0																							
UPDES	UT0022616-002	11/1/1984					0																							
UPDES	UT0022616-002	12/1/1984					0																							
UPDES	UT0022616-002	1/1/1985					0																							
UPDES	UT0022616-002	2/1/1985					0																							
UPDES	UT0022616-002	3/1/1985					0																							
UPDES	UT0022616-002	4/1/1985					0																							
UPDES	UT0022616-002	5/1/1985					0																							
UPDES	UT0022616-002	7/1/1985					0																							
UPDES	UT0022616-002	8/1/1985					0																							
UPDES	UT0022616-002	9/1/1985					0																							
UPDES	UT0022616-002	10/1/1985					0																							
UPDES	UT0022616-002	11/1/1985					0																							
UPDES	UT0022616-002	1/1/1986					0																							
UPDES	UT0022616-002	2/1/1986					0																							
UPDES	UT0022616-002	3/1/1986					0																							
UPDES	UT0022616-002	4/1/1986					0																							
UPDES	UT0022616-002	5/1/1986					0																							
UPDES	UT0022616-002	6/1/1986					0																							
UPDES	UT0022616-002	9/1/1986					0																							
UPDES	UT0022616-002	10/1/1986					0																							
UPDES	UT0022616-002	2/1/1987					0																							
UPDES	UT0022616-002	1/1/1989					0																							
UPDES	UT0022616-002	2/1/1989					0																							

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-002	10/1/1979																	
UPDES	UT0022616-002	11/1/1979																	
UPDES	UT0022616-002	12/1/1979																	
UPDES	UT0022616-002	1/1/1980																	
UPDES	UT0022616-002	2/1/1980																	
UPDES	UT0022616-002	3/1/1980																	
UPDES	UT0022616-002	4/1/1980																	
UPDES	UT0022616-002	5/1/1980																	
UPDES	UT0022616-002	6/1/1980																	
UPDES	UT0022616-002	9/1/1980																	
UPDES	UT0022616-002	12/1/1980																	
UPDES	UT0022616-002	1/1/1981																	
UPDES	UT0022616-002	2/1/1981																	
UPDES	UT0022616-002	3/1/1981																	
UPDES	UT0022616-002	4/1/1981																	
UPDES	UT0022616-002	5/1/1981																	
UPDES	UT0022616-002	6/1/1981																	
UPDES	UT0022616-002	9/1/1981																	
UPDES	UT0022616-002	10/1/1981																	
UPDES	UT0022616-002	11/1/1981																	
UPDES	UT0022616-002	12/1/1981																	
UPDES	UT0022616-002	3/1/1982																	
UPDES	UT0022616-002	4/1/1982																	
UPDES	UT0022616-002	5/1/1982																	
UPDES	UT0022616-002	6/1/1982																	
UPDES	UT0022616-002	7/1/1982																	
UPDES	UT0022616-002	8/1/1982																	
UPDES	UT0022616-002	9/1/1982																	
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UPDES	UT0022616-002	3/1/1983																	
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UPDES	UT0022616-002	7/1/1983																	
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UPDES	UT0022616-002	10/1/1983																	
UPDES	UT0022616-002	11/1/1983																	
UPDES	UT0022616-002	12/1/1983																	
UPDES	UT0022616-002	1/1/1984																	
UPDES	UT0022616-002	2/1/1984																	
UPDES	UT0022616-002	4/1/1984																	
UPDES	UT0022616-002	7/1/1984																	
UPDES	UT0022616-002	8/1/1984																	
UPDES	UT0022616-002	9/1/1984																	
UPDES	UT0022616-002	10/1/1984																	
UPDES	UT0022616-002	11/1/1984																	
UPDES	UT0022616-002	12/1/1984																	
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UPDES	UT0022616-002	3/1/1985																	
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UPDES	UT0022616-002	7/1/1985																	
UPDES	UT0022616-002	8/1/1985																	
UPDES	UT0022616-002	9/1/1985																	
UPDES	UT0022616-002	10/1/1985																	
UPDES	UT0022616-002	11/1/1985																	
UPDES	UT0022616-002	1/1/1986																	
UPDES	UT0022616-002	2/1/1986																	
UPDES	UT0022616-002	3/1/1986																	
UPDES	UT0022616-002	4/1/1986																	
UPDES	UT0022616-002	5/1/1986																	
UPDES	UT0022616-002	6/1/1986																	
UPDES	UT0022616-002	9/1/1986																	
UPDES	UT0022616-002	10/1/1986																	
UPDES	UT0022616-002	2/1/1987																	
UPDES	UT0022616-002	1/1/1989																	
UPDES	UT0022616-002	2/1/1989																	

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-002	3/1/1989					0																							
UPDES	UT0022616-002	4/1/1989					0																							
UPDES	UT0022616-002	5/1/1989					0																							
UPDES	UT0022616-002	6/1/1989					0																							
UPDES	UT0022616-002	7/1/1989					0																							
UPDES	UT0022616-002	8/1/1989					0																							
UPDES	UT0022616-002	9/1/1989					0																							
UPDES	UT0022616-002	10/1/1989					0																							
UPDES	UT0022616-002	11/1/1989					0																							
UPDES	UT0022616-002	12/1/1989					0																							
UPDES	UT0022616-002	1/1/1990					0																							
UPDES	UT0022616-002	2/1/1990					0																							
UPDES	UT0022616-002	3/1/1990					0																							
UPDES	UT0022616-002	4/1/1990					0																							
UPDES	UT0022616-002	5/1/1990					0																							
UPDES	UT0022616-002	6/1/1990					0																							
UPDES	UT0022616-002	7/1/1990					0																							
UPDES	UT0022616-002	8/1/1990					0																							
UPDES	UT0022616-002	9/1/1990					0																							
UPDES	UT0022616-002	10/1/1990					0																							
UPDES	UT0022616-002	11/1/1990					0																							
UPDES	UT0022616-002	12/1/1990					0																							
UPDES	UT0022616-002	1/1/1991					0																							
UPDES	UT0022616-002	2/1/1991					0																							
UPDES	UT0022616-002	3/1/1991					0																							
UPDES	UT0022616-002	4/1/1991					0																							
UPDES	UT0022616-002	5/1/1991					0																							
UPDES	UT0022616-002	6/1/1991					0																							
UPDES	UT0022616-002	7/1/1991					0																							
UPDES	UT0022616-002	8/1/1991					0																							
UPDES	UT0022616-002	9/1/1991					0																							
UPDES	UT0022616-002	10/1/1991					0																							
UPDES	UT0022616-002	11/1/1991					0																							
UPDES	UT0022616-002	12/1/1991					0																							
UPDES	UT0022616-002	1/1/1992					0																							
UPDES	UT0022616-002	2/1/1992					0																							
UPDES	UT0022616-002	3/1/1992					0																							
UPDES	UT0022616-002	4/1/1992					0																							
UPDES	UT0022616-002	5/1/1992					0																							
UPDES	UT0022616-002	6/1/1992					0																							
UPDES	UT0022616-002	7/1/1992					0																							
UPDES	UT0022616-002	8/1/1992					0																							
UPDES	UT0022616-002	9/1/1992					0																							
UPDES	UT0022616-002	10/1/1992					0																							
UPDES	UT0022616-002	11/1/1992					0																							
UPDES	UT0022616-002	12/1/1992					0																							
UPDES	UT0022616-002	1/1/1993					0																							
UPDES	UT0022616-002	2/1/1993					0																							
UPDES	UT0022616-002	3/1/1993					0																							
UPDES	UT0022616-002	4/1/1993					0																							
UPDES	UT0022616-002	5/1/1993					0																							
UPDES	UT0022616-002	6/1/1993					0																							
UPDES	UT0022616-002	7/1/1993					0																							
UPDES	UT0022616-002	8/1/1993					0																							
UPDES	UT0022616-002	9/1/1993					0																							
UPDES	UT0022616-002	10/1/1993					0																							
UPDES	UT0022616-002	11/1/1993					0																							
UPDES	UT0022616-002	12/1/1993					0																							
UPDES	UT0022616-002	1/1/1994					0																							
UPDES	UT0022616-002	2/1/1994					0																							
UPDES	UT0022616-002	3/1/1994					0																							
UPDES	UT0022616-002	4/1/1994					0																							
UPDES	UT0022616-002	5/1/1994					0																							
UPDES	UT0022616-002	6/1/1994					0																							
UPDES	UT0022616-002	8/1/1994					0																							
UPDES	UT0022616-002	9/1/1994					0																							
UPDES	UT0022616-002	10/1/1994					0																							
UPDES	UT0022616-002	11/1/1994					0																							
UPDES	UT0022616-002	12/1/1994					0																							
UPDES	UT0022616-002	1/1/1995					0																							
UPDES	UT0022616-002	2/1/1995					0																							
UPDES	UT0022616-002	3/1/1995					0																							

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-002	3/1/1989																	
UPDES	UT0022616-002	4/1/1989																	
UPDES	UT0022616-002	5/1/1989																	
UPDES	UT0022616-002	6/1/1989																	
UPDES	UT0022616-002	7/1/1989																	
UPDES	UT0022616-002	8/1/1989																	
UPDES	UT0022616-002	9/1/1989																	
UPDES	UT0022616-002	10/1/1989																	
UPDES	UT0022616-002	11/1/1989																	
UPDES	UT0022616-002	12/1/1989																	
UPDES	UT0022616-002	1/1/1990																	
UPDES	UT0022616-002	2/1/1990																	
UPDES	UT0022616-002	3/1/1990																	
UPDES	UT0022616-002	4/1/1990																	
UPDES	UT0022616-002	5/1/1990																	
UPDES	UT0022616-002	6/1/1990																	
UPDES	UT0022616-002	7/1/1990																	
UPDES	UT0022616-002	8/1/1990																	
UPDES	UT0022616-002	9/1/1990																	
UPDES	UT0022616-002	10/1/1990																	
UPDES	UT0022616-002	11/1/1990																	
UPDES	UT0022616-002	12/1/1990																	
UPDES	UT0022616-002	1/1/1991																	
UPDES	UT0022616-002	2/1/1991																	
UPDES	UT0022616-002	3/1/1991																	
UPDES	UT0022616-002	4/1/1991																	
UPDES	UT0022616-002	5/1/1991																	
UPDES	UT0022616-002	6/1/1991																	
UPDES	UT0022616-002	7/1/1991																	
UPDES	UT0022616-002	8/1/1991																	
UPDES	UT0022616-002	9/1/1991																	
UPDES	UT0022616-002	10/1/1991																	
UPDES	UT0022616-002	11/1/1991																	
UPDES	UT0022616-002	12/1/1991																	
UPDES	UT0022616-002	1/1/1992																	
UPDES	UT0022616-002	2/1/1992																	
UPDES	UT0022616-002	3/1/1992																	
UPDES	UT0022616-002	4/1/1992																	
UPDES	UT0022616-002	5/1/1992																	
UPDES	UT0022616-002	6/1/1992																	
UPDES	UT0022616-002	7/1/1992																	
UPDES	UT0022616-002	8/1/1992																	
UPDES	UT0022616-002	9/1/1992																	
UPDES	UT0022616-002	10/1/1992																	
UPDES	UT0022616-002	11/1/1992																	
UPDES	UT0022616-002	12/1/1992																	
UPDES	UT0022616-002	1/1/1993																	
UPDES	UT0022616-002	2/1/1993																	
UPDES	UT0022616-002	3/1/1993																	
UPDES	UT0022616-002	4/1/1993																	
UPDES	UT0022616-002	5/1/1993																	
UPDES	UT0022616-002	6/1/1993																	
UPDES	UT0022616-002	7/1/1993																	
UPDES	UT0022616-002	8/1/1993																	
UPDES	UT0022616-002	9/1/1993																	
UPDES	UT0022616-002	10/1/1993																	
UPDES	UT0022616-002	11/1/1993																	
UPDES	UT0022616-002	12/1/1993																	
UPDES	UT0022616-002	1/1/1994																	
UPDES	UT0022616-002	2/1/1994																	
UPDES	UT0022616-002	3/1/1994																	
UPDES	UT0022616-002	4/1/1994																	
UPDES	UT0022616-002	5/1/1994																	
UPDES	UT0022616-002	6/1/1994																	
UPDES	UT0022616-002	8/1/1994																	
UPDES	UT0022616-002	9/1/1994																	
UPDES	UT0022616-002	10/1/1994																	
UPDES	UT0022616-002	11/1/1994																	
UPDES	UT0022616-002	12/1/1994																	
UPDES	UT0022616-002	1/1/1995																	
UPDES	UT0022616-002	2/1/1995																	
UPDES	UT0022616-002	3/1/1995																	

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-002	4/1/1995					0																							
UPDES	UT0022616-002	5/1/1995					0																							
UPDES	UT0022616-002	6/1/1995					0																							
UPDES	UT0022616-002	7/1/1995					0																							
UPDES	UT0022616-002	8/1/1995					0																							
UPDES	UT0022616-002	9/1/1995					0																							
UPDES	UT0022616-002	10/1/1995					0																							
UPDES	UT0022616-002	11/1/1995					0																							
UPDES	UT0022616-002	12/6/1995					0																							
UPDES	UT0022616-002	1/1/1996					0																							
UPDES	UT0022616-002	2/1/1996					0																							
UPDES	UT0022616-002	3/1/1996					0																							
UPDES	UT0022616-002	4/1/1996					0																							
UPDES	UT0022616-002	5/1/1996					0																							
UPDES	UT0022616-002	6/1/1996					0																							
UPDES	UT0022616-002	7/1/1996					0																							
UPDES	UT0022616-002	8/1/1996					0																							
UPDES	UT0022616-002	9/1/1996					0																							
UPDES	UT0022616-002	10/1/1996					0																							
UPDES	UT0022616-002	11/1/1996					0																							
UPDES	UT0022616-002	12/1/1996					0																							
UPDES	UT0022616-002	1/1/1997					0																							
UPDES	UT0022616-002	2/1/1997					0																							
UPDES	UT0022616-002	3/1/1997					0																							
UPDES	UT0022616-002	3/4/1997					0																							
UPDES	UT0022616-002	4/1/1997					0																							
UPDES	UT0022616-002	5/1/1997					0																							
UPDES	UT0022616-002	6/1/1997					0																							
UPDES	UT0022616-002	7/1/1997					0																							
UPDES	UT0022616-002	8/15/1997					0																							
UPDES	UT0022616-002	9/15/1997					0																							
UPDES	UT0022616-002	10/15/1997					0																							
UPDES	UT0022616-002	11/15/1997					0																							
UPDES	UT0022616-002	12/15/1997					0																							
UPDES	UT0022616-002	1/15/1998					0																							
UPDES	UT0022616-002	2/15/1998					0																							
UPDES	UT0022616-002	3/16/1998					0																							
UPDES	UT0022616-002	4/15/1998					0																							
UPDES	UT0022616-002	5/15/1998					0																							
UPDES	UT0022616-002	6/15/1998					0																							
UPDES	UT0022616-002	7/15/1998					0																							
UPDES	UT0022616-002	8/15/1998					0																							
UPDES	UT0022616-002	9/1/1998					0																							
UPDES	UT0022616-002	10/15/1998					0																							
UPDES	UT0022616-002	11/15/1998					0																							
UPDES	UT0022616-002	12/1/1998					0																							
UPDES	UT0022616-002	1/15/1999					0																							
UPDES	UT0022616-002	2/15/1999					0																							
UPDES	UT0022616-002	3/15/1999					0																							
UPDES	UT0022616-002	4/15/1999					0																							
UPDES	UT0022616-002	9/15/1999					0																							
UPDES	UT0022616-002	10/15/1999					0																							
UPDES	UT0022616-002	11/15/1999					0																							
UPDES	UT0022616-002	2/15/2002					0																							
UPDES	UT0022616-002	4/15/2002					0																							
UPDES	UT0022616-002	5/15/2002					0																							
UPDES	UT0022616-002	6/15/2002					0																							
UPDES	UT0022616-002	6/30/2003					0																							
UPDES	UT0022616-002	7/31/2003					0																							
UPDES	UT0022616-002	8/29/2003					0																							
UPDES	UT0022616-002	9/16/2003					0																							
UPDES	UT0022616-002	10/28/2003					0																							
UPDES	UT0022616-002	11/24/2003					0																							
UPDES	UT0022616-002	12/31/2003					0																							
UPDES	UT0022616-002	1/27/2004					0																							
UPDES	UT0022616-002	2/25/2004					0																							
UPDES	UT0022616-002	3/10/2004					0																							
UPDES	UT0022616-002	4/6/2004					0																							
UPDES	UT0022616-002	5/10/2004					0																							
UPDES	UT0022616-002	6/2/2004					0																							
UPDES	UT0022616-002	7/8/2004					0																							
UPDES	UT0022616-002	8/8/2004					0																							

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-002	4/1/1995																	
UPDES	UT0022616-002	5/1/1995																	
UPDES	UT0022616-002	6/1/1995																	
UPDES	UT0022616-002	7/1/1995																	
UPDES	UT0022616-002	8/1/1995																	
UPDES	UT0022616-002	9/1/1995																	
UPDES	UT0022616-002	10/1/1995																	
UPDES	UT0022616-002	11/1/1995																	
UPDES	UT0022616-002	12/6/1995																	
UPDES	UT0022616-002	1/1/1996																	
UPDES	UT0022616-002	2/1/1996																	
UPDES	UT0022616-002	3/1/1996																	
UPDES	UT0022616-002	4/1/1996																	
UPDES	UT0022616-002	5/1/1996																	
UPDES	UT0022616-002	6/1/1996																	
UPDES	UT0022616-002	7/1/1996																	
UPDES	UT0022616-002	8/1/1996																	
UPDES	UT0022616-002	9/1/1996																	
UPDES	UT0022616-002	10/1/1996																	
UPDES	UT0022616-002	11/1/1996																	
UPDES	UT0022616-002	12/1/1996																	
UPDES	UT0022616-002	1/1/1997																	
UPDES	UT0022616-002	2/1/1997																	
UPDES	UT0022616-002	3/1/1997																	
UPDES	UT0022616-002	3/4/1997																	
UPDES	UT0022616-002	4/1/1997																	
UPDES	UT0022616-002	5/1/1997																	
UPDES	UT0022616-002	6/1/1997																	
UPDES	UT0022616-002	7/1/1997																	
UPDES	UT0022616-002	8/15/1997																	
UPDES	UT0022616-002	9/15/1997																	
UPDES	UT0022616-002	10/15/1997																	
UPDES	UT0022616-002	11/15/1997																	
UPDES	UT0022616-002	12/15/1997																	
UPDES	UT0022616-002	1/15/1998																	
UPDES	UT0022616-002	2/15/1998																	
UPDES	UT0022616-002	3/16/1998																	
UPDES	UT0022616-002	4/15/1998																	
UPDES	UT0022616-002	5/15/1998																	
UPDES	UT0022616-002	6/15/1998																	
UPDES	UT0022616-002	7/15/1998																	
UPDES	UT0022616-002	8/15/1998																	
UPDES	UT0022616-002	9/1/1998																	
UPDES	UT0022616-002	10/15/1998																	
UPDES	UT0022616-002	11/15/1998																	
UPDES	UT0022616-002	12/1/1998																	
UPDES	UT0022616-002	1/15/1999																	
UPDES	UT0022616-002	2/15/1999																	
UPDES	UT0022616-002	3/15/1999																	
UPDES	UT0022616-002	4/15/1999																	
UPDES	UT0022616-002	9/15/1999																	
UPDES	UT0022616-002	10/15/1999																	
UPDES	UT0022616-002	11/15/1999																	
UPDES	UT0022616-002	2/15/2002																	
UPDES	UT0022616-002	4/15/2002																	
UPDES	UT0022616-002	5/15/2002																	
UPDES	UT0022616-002	6/15/2002																	
UPDES	UT0022616-002	6/30/2003																	Did Not Discharge
UPDES	UT0022616-002	7/31/2003																	
UPDES	UT0022616-002	8/29/2003																	
UPDES	UT0022616-002	9/16/2003																	
UPDES	UT0022616-002	10/28/2003																	
UPDES	UT0022616-002	11/24/2003																	
UPDES	UT0022616-002	12/31/2003																	
UPDES	UT0022616-002	1/27/2004																	
UPDES	UT0022616-002	2/25/2004																	
UPDES	UT0022616-002	3/10/2004																	
UPDES	UT0022616-002	4/6/2004																	
UPDES	UT0022616-002	5/10/2004																	
UPDES	UT0022616-002	6/2/2004																	
UPDES	UT0022616-002	7/8/2004																	
UPDES	UT0022616-002	8/8/2004																	

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-002	9/8/2004					0																							
UPDES	UT0022616-002	10/1/2004					0																							
UPDES	UT0022616-002	11/1/2004					0																							
UPDES	UT0022616-002	12/1/2004					0																							
UPDES	UT0022616-002	1/16/2005					0																							
UPDES	UT0022616-002	2/16/2005					0																							
UPDES	UT0022616-002	3/16/2005					0																							
UPDES	UT0022616-002	4/1/2005					0																							
UPDES	UT0022616-002	5/2/2005					0																							
UPDES	UT0022616-002	6/1/2005					0																							
UPDES	UT0022616-002	7/15/2005					0																							
UPDES	UT0022616-002	8/18/2005					0																							
UPDES	UT0022616-002	9/16/2005					0																							
UPDES	UT0022616-002	10/14/2005					0																							
UPDES	UT0022616-002	11/15/2005					0																							
UPDES	UT0022616-002	12/15/2005					0																							
UPDES	UT0022616-002	1/3/2006					0																							
UPDES	UT0022616-002	2/1/2006					0																							
UPDES	UT0022616-002	3/1/2006					0																							
UPDES	UT0022616-002	4/3/2006					0																							
UPDES	UT0022616-002	5/1/2006					0																							
UPDES	UT0022616-002	6/1/2006					0																							
UPDES	UT0022616-002	7/14/2006					0																							
UPDES	UT0022616-002	8/15/2006					0																							
UPDES	UT0022616-002	9/15/2006					0																							
UPDES	UT0022616-002	10/2/2006					0																							
UPDES	UT0022616-002	11/1/2006					0																							
UPDES	UT0022616-002	12/1/2006					0																							
		No. of Obs.:					244																							
		Maximum:					0																							
		Minimum:					0																							
		Mean:					0.0																							
		Std. Dev.:					--																							

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-002	9/8/2004																	
UPDES	UT0022616-002	10/1/2004																	Site was dry
UPDES	UT0022616-002	11/1/2004																	Site was dry
UPDES	UT0022616-002	12/1/2004																	Site was dry
UPDES	UT0022616-002	1/16/2005																	
UPDES	UT0022616-002	2/16/2005																	
UPDES	UT0022616-002	3/16/2005																	
UPDES	UT0022616-002	4/1/2005																	All Sites did not discharge during April
UPDES	UT0022616-002	5/2/2005																	No discharge in May
UPDES	UT0022616-002	6/1/2005																	No Discharge in June
UPDES	UT0022616-002	7/15/2005																	No Discharge for July
UPDES	UT0022616-002	8/18/2005																	No Discharge for August
UPDES	UT0022616-002	9/16/2005																	No Discharge for 3rd Quarter
UPDES	UT0022616-002	10/14/2005																	
UPDES	UT0022616-002	11/15/2005																	
UPDES	UT0022616-002	12/15/2005																	
UPDES	UT0022616-002	1/3/2006																	No Discharge in 1st. Quarter.
UPDES	UT0022616-002	2/1/2006																	No Discharge in February.
UPDES	UT0022616-002	3/1/2006																	No Discharge in March.
UPDES	UT0022616-002	4/3/2006																	No Discharge for the month of April
UPDES	UT0022616-002	5/1/2006																	No Discharge for the month of May
UPDES	UT0022616-002	6/1/2006																	No Discharge for the month of June
UPDES	UT0022616-002	7/14/2006																	
UPDES	UT0022616-002	8/15/2006																	
UPDES	UT0022616-002	9/15/2006																	
UPDES	UT0022616-002	10/2/2006																	
UPDES	UT0022616-002	11/1/2006																	
UPDES	UT0022616-002	12/1/2006																	
		No. of Obs.:																	
		Maximum:																	
		Minimum:																	
		Mean:																	
		Std. Dev.:																	

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-003	10/1/1979					0																							
UPDES	UT0022616-003	11/1/1979					0																							
UPDES	UT0022616-003	12/1/1979					0																							
UPDES	UT0022616-003	1/1/1980					0																							
UPDES	UT0022616-003	2/1/1980					0																							
UPDES	UT0022616-003	3/1/1980					0																							
UPDES	UT0022616-003	4/1/1980					0																							
UPDES	UT0022616-003	5/1/1980					0																							
UPDES	UT0022616-003	6/1/1980					0																							
UPDES	UT0022616-003	7/1/1980					0																							
UPDES	UT0022616-003	8/1/1980					0																							
UPDES	UT0022616-003	9/1/1980					0																							
UPDES	UT0022616-003	10/1/1980					0																							
UPDES	UT0022616-003	11/1/1980					0																							
UPDES	UT0022616-003	12/1/1980					0																							
UPDES	UT0022616-003	1/1/1981					0																							
UPDES	UT0022616-003	2/1/1981					0																							
UPDES	UT0022616-003	3/1/1981					0																							
UPDES	UT0022616-003	4/1/1981					0																							
UPDES	UT0022616-003	5/1/1981					0																							
UPDES	UT0022616-003	6/1/1981					0																							
UPDES	UT0022616-003	7/1/1981					0																							
UPDES	UT0022616-003	8/1/1981					0																							
UPDES	UT0022616-003	9/1/1981					0																							
UPDES	UT0022616-003	10/1/1981					0																							
UPDES	UT0022616-003	11/1/1981					0																							
UPDES	UT0022616-003	12/1/1981					0																							
UPDES	UT0022616-003	1/1/1982					0																							
UPDES	UT0022616-003	2/1/1982					0																							
UPDES	UT0022616-003	3/1/1982					0																							
UPDES	UT0022616-003	5/1/1989					0																							
UPDES	UT0022616-003	6/1/1989					0																							
UPDES	UT0022616-003	7/28/1989						8.4	18	<1.																				
UPDES	UT0022616-003	7/31/1989						8.32	10																					
UPDES	UT0022616-003	9/6/1989		8.4				8.39	11																					
UPDES	UT0022616-003	9/11/1989		8.2				9	12	1																				
UPDES	UT0022616-003	10/4/1989						8.09	14																					
UPDES	UT0022616-003	10/31/1989						8.3	10	<1.																				
UPDES	UT0022616-003	11/21/1989					108	8.7	8	<1.																				
UPDES	UT0022616-003	12/4/1989						8.6	5																					
UPDES	UT0022616-003	12/13/1989						8.5	18	2																				
UPDES	UT0022616-003	1/2/1990						8.6	22																					
UPDES	UT0022616-003	1/10/1990						8.6	12	<1.																				
UPDES	UT0022616-003	2/7/1990						8.69	37																					
UPDES	UT0022616-003	2/22/1990						8.7	18	1																				
UPDES	UT0022616-003	3/5/1990						8.64	16																					
UPDES	UT0022616-003	3/13/1990						8.7	20	1																				
UPDES	UT0022616-003	3/22/1990							10	<1.	0.08	<0.001	0.56	<0.005	26	<0.01	0.1	<0.02	20	<0.01	3	<0.001	471	<0.01	296		32	54		
UPDES	UT0022616-003	4/6/1990						8.64	7																					
UPDES	UT0022616-003	4/18/1990						8.6	2	<1.																				
UPDES	UT0022616-003	5/21/1990						8.3	10	<1.	0.2	0.001	0.55	<0.01	51	<0.01	<0.02	<0.02	43	<0.01	4	<0.001	455	<0.01	352		32	64		
UPDES	UT0022616-003	6/1/1990						8.35	8																					
UPDES	UT0022616-003	6/14/1990						8.4	10	<1.																				
UPDES	UT0022616-003	7/12/1990						8.18	5																					
UPDES	UT0022616-003	7/20/1990						8.4	14	1																				
UPDES	UT0022616-003	8/1/1990						8.22	6																					
UPDES	UT0022616-003	9/20/1990						8.3	4	6																				
UPDES	UT0022616-003	10/1/1990					476	8.12	7																					
UPDES	UT0022616-003	10/17/1990					646	8.1	14	<1.																				
UPDES	UT0022616-003	11/6/1990						8	4	2																				
UPDES	UT0022616-003	12/19/1990						8.6	<2.	<1.																				
UPDES	UT0022616-003	1/2/1991						8.46	7																					
UPDES	UT0022616-003	1/14/1991						8.1	4	<1.																				
UPDES	UT0022616-003	2/1/1991						8.02	4																					
UPDES	UT0022616-003	2/27/1991						8.2	10	<1.																				
UPDES	UT0022616-003	3/6/1991						8.25	10																					
UPDES	UT0022616-003	3/20/1991						8.1	2	2																				
UPDES	UT0022616-003	4/4/1991					251	8.47	10																					
UPDES	UT0022616-003	4/18/1991					251	8.5	10	<1.																				
UPDES	UT0022616-003	5/1/1991					889	8.05	6																					
UPDES	UT0022616-003	5/14/1991						8.1	<2.	1																				
UPDES	UT0022616-003	6/3/1991					925	8.33	15																					

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-003	10/1/1979																	
UPDES	UT0022616-003	11/1/1979																	
UPDES	UT0022616-003	12/1/1979																	
UPDES	UT0022616-003	1/1/1980																	
UPDES	UT0022616-003	2/1/1980																	
UPDES	UT0022616-003	3/1/1980																	
UPDES	UT0022616-003	4/1/1980																	
UPDES	UT0022616-003	5/1/1980																	
UPDES	UT0022616-003	6/1/1980																	
UPDES	UT0022616-003	7/1/1980																	
UPDES	UT0022616-003	8/1/1980																	
UPDES	UT0022616-003	9/1/1980																	
UPDES	UT0022616-003	10/1/1980																	
UPDES	UT0022616-003	11/1/1980																	
UPDES	UT0022616-003	12/1/1980																	
UPDES	UT0022616-003	1/1/1981																	
UPDES	UT0022616-003	2/1/1981																	
UPDES	UT0022616-003	3/1/1981																	
UPDES	UT0022616-003	4/1/1981																	
UPDES	UT0022616-003	5/1/1981																	
UPDES	UT0022616-003	6/1/1981																	
UPDES	UT0022616-003	7/1/1981																	
UPDES	UT0022616-003	8/1/1981																	
UPDES	UT0022616-003	9/1/1981																	
UPDES	UT0022616-003	10/1/1981																	
UPDES	UT0022616-003	11/1/1981																	
UPDES	UT0022616-003	12/1/1981																	
UPDES	UT0022616-003	1/1/1982																	
UPDES	UT0022616-003	2/1/1982																	
UPDES	UT0022616-003	3/1/1982																	
UPDES	UT0022616-003	5/1/1989																	
UPDES	UT0022616-003	6/1/1989																	
UPDES	UT0022616-003	7/28/1989							2050	1364						0.19	<0.01		
UPDES	UT0022616-003	7/31/1989								1328						0.23	<0.05		
UPDES	UT0022616-003	9/6/1989			819					1532						0.39	<0.2		
UPDES	UT0022616-003	9/11/1989							2520	1682						0.21	<0.01		
UPDES	UT0022616-003	10/4/1989			1830					1908						0.36	<0.2		
UPDES	UT0022616-003	10/31/1989							2580	2122						0.15	<0.01		
UPDES	UT0022616-003	11/21/1989							2060	1468						0.28	<0.01		
UPDES	UT0022616-003	12/4/1989			685					1440						0.23	<0.05		
UPDES	UT0022616-003	12/13/1989							2260	1522						0.25	<0.01		
UPDES	UT0022616-003	1/2/1990			715					1414						0.3	<0.05		
UPDES	UT0022616-003	1/10/1990							2140	1446						0.53	<0.01		
UPDES	UT0022616-003	2/7/1990			657					1364						0.27	<0.05		
UPDES	UT0022616-003	2/22/1990							1980	1386						0.45	0.01		
UPDES	UT0022616-003	3/5/1990			582					1364						0.3	<0.05		
UPDES	UT0022616-003	3/13/1990							2080	1448						0.48	<0.01		
UPDES	UT0022616-003	3/22/1990		<0.1	708		328	147		1434	<0.2	0.46	<0.05	23.74	22.94	0.33	<0.01		22
UPDES	UT0022616-003	4/6/1990			658					1376						0.06	<0.05		
UPDES	UT0022616-003	4/18/1990							1890	1316						0.11	0.01		
UPDES	UT0022616-003	5/21/1990			840		384	304	2610	1742	<0.3	<0.05	<0.05	26.2	27.11	0.24	<0.01		
UPDES	UT0022616-003	6/1/1990			875					1732						<0.05	<0.05		
UPDES	UT0022616-003	6/14/1990							3030	2308						0.13	0.01		
UPDES	UT0022616-003	7/12/1990			1132					2218						<0.2	<0.2		
UPDES	UT0022616-003	7/20/1990							3030	2264						0.07	0.01		
UPDES	UT0022616-003	8/1/1990			1196					2306						<0.2	<0.2		
UPDES	UT0022616-003	9/20/1990							2920	2222						0.07	<0.01		
UPDES	UT0022616-003	10/1/1990			1318					2306						0.08	<0.05		
UPDES	UT0022616-003	10/17/1990							3090	2350						0.33	0.02		
UPDES	UT0022616-003	11/6/1990							2640	1854						0.12	<0.01		
UPDES	UT0022616-003	12/19/1990							3400	2372						0.1	0.01		
UPDES	UT0022616-003	1/2/1991								2284						0.16	<0.05		
UPDES	UT0022616-003	1/14/1991							3070	2270						0.42	0.02		
UPDES	UT0022616-003	2/1/1991			1204					2302						<0.05	<0.05		
UPDES	UT0022616-003	2/27/1991							2780	2304						0.09	0.01		
UPDES	UT0022616-003	3/6/1991			1313					2380						<0.05	<0.05		
UPDES	UT0022616-003	3/20/1991							2970	2226						0.06	<0.01		
UPDES	UT0022616-003	4/4/1991			1247					2420						<0.05	<0.05		
UPDES	UT0022616-003	4/18/1991							2710	1876						0.1	<0.01		
UPDES	UT0022616-003	5/1/1991								2268						<0.05	<0.05		
UPDES	UT0022616-003	5/14/1991							3445	2276						0.06	<0.01		
UPDES	UT0022616-003	6/3/1991			1267					2354						<0.05	<0.05		

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-003	6/17/1991						7.8	14	<1.																				
UPDES	UT0022616-003	7/1/1991	18.3	7.1		3320	651	8	8																					
UPDES	UT0022616-003	7/10/1991						8.16	2																					
UPDES	UT0022616-003	8/5/1991						8.67	10																					
UPDES	UT0022616-003	8/14/1991						8.7	14	1																				
UPDES	UT0022616-003	9/6/1991						8.78	5																					
UPDES	UT0022616-003	10/1/1991					588	8.43	5																			74		
UPDES	UT0022616-003	10/14/1991	17	7.8		3200	359	8.2	<2.	1																				
UPDES	UT0022616-003	11/1/1991					184	8.11	4																			50		
UPDES	UT0022616-003	11/20/1991	9.4	7.8		2650	588	8.1	<2.	<1.																				
UPDES	UT0022616-003	12/2/1991					435	8.26	<1.																			90		
UPDES	UT0022616-003	12/30/1991					390	8.27	6																			15		
UPDES	UT0022616-003	12/31/1991	7.4	7.3		2400	310	8	2	1																				
UPDES	UT0022616-003	1/2/1992					13	8.41	8																			10		
UPDES	UT0022616-003	1/24/1992					700	8	8	1																				
UPDES	UT0022616-003	2/3/1992					678	7.9	<2.																					
UPDES	UT0022616-003	2/18/1992					687	8.1	4	4																				
UPDES	UT0022616-003	3/2/1992					350	8	4																					
UPDES	UT0022616-003	3/31/1992					525	8	<2.	<1.																				
UPDES	UT0022616-003	7/15/1992	19.7	7.5		3510	588	8	2	1																				
UPDES	UT0022616-003	8/3/1992	24.1	6.9		3000	139	8.1	26																					
UPDES	UT0022616-003	8/18/1992	19.7	7.5		3000	588	7.9	10	<1.																				
UPDES	UT0022616-003	9/2/1992	18.3	7.4		3240	610	8	<2.																					
UPDES	UT0022616-003	9/16/1992	18.8	7		3050	651	8.1	4	2																				
UPDES	UT0022616-003	10/5/1992	15.5	6.9		3000	651	7.9	10																					
UPDES	UT0022616-003	11/1/1992					0																							
UPDES	UT0022616-003	12/8/1992	10.7			2670	22	7.6	14																					
UPDES	UT0022616-003	12/14/1992	5.3	6.7		2800	651	7.9	12	<1.																				
UPDES	UT0022616-003	1/11/1993	12.5	5.9		2800	651	7.7	4																					
UPDES	UT0022616-003	1/18/1993	11.5	6.9		2800	359	7.8	6	<1.																				
UPDES	UT0022616-003	2/1/1993	13.2	7		2800	525	7.9	12	<1.																				
UPDES	UT0022616-003	2/16/1993	9.5	7.1		2600	588	7.9	<2.																					
UPDES	UT0022616-003	3/2/1993	12.4	7.2		3000	588	8.1	10	3																				
UPDES	UT0022616-003	3/15/1993	12.6	7.3		2700	139	8.3	<2.																					
UPDES	UT0022616-003	4/5/1993	15	7.5		2990	561	8.4	2	2																				
UPDES	UT0022616-003	4/19/1993	12.8	6.9		2790	503	8.1	4																					
UPDES	UT0022616-003	5/3/1993	17.8	8.5		3240	94	8.1	<2.	<1.																				
UPDES	UT0022616-003	6/1/1993					0																							
UPDES	UT0022616-003	7/12/1993	17.6	8.7		3070	678	7.8	<8.	1																				
UPDES	UT0022616-003	7/19/1993	21.5	8.3		3400	714	7.9	20																					
UPDES	UT0022616-003	8/9/1993	20	8.9		3350	781	7.9	10	2																				
UPDES	UT0022616-003	8/16/1993	18.9	9.2		3310	714	8.5	<2.																					
UPDES	UT0022616-003	9/1/1993					0																							
UPDES	UT0022616-003	10/11/1993	13.3	8.5		2800	588	7.8	6	<1.																				
UPDES	UT0022616-003	10/20/1993	13.7	8.5		2600	767	8.2	<2.																					
UPDES	UT0022616-003	11/1/1993	12.9	9.5		2700	525	8	2	2																				
UPDES	UT0022616-003	11/22/1993	10.4	8.4		2500	525	7.9	<2.																					
UPDES	UT0022616-003	12/7/1993	9.5	7.7		2500	651	7.9	<2.	<1.																				
UPDES	UT0022616-003	12/20/1993	6.1	8		2320	651	7.9	<2.																					
UPDES	UT0022616-003	1/3/1994	9.8	7.5			539	7.9	<2.	<1.																				
UPDES	UT0022616-003	1/17/1994	7	8.3		2410	651	8	<2.																					
UPDES	UT0022616-003	2/2/1994	7.3	7.1		2470	525	7.8	6	1																				
UPDES	UT0022616-003	2/14/1994	7.7	7.9		2400	525	7.7	8																					
UPDES	UT0022616-003	3/1/1994	10.3	7.7		2660	812	8.2	<2.	1																				
UPDES	UT0022616-003	3/21/1994	14.3	7.5		2880	588	8.1	2																					
UPDES	UT0022616-003	4/4/1994	11.4	8.1		2730	413	7.7	<2.	<1.																				
UPDES	UT0022616-003	4/18/1994	16.1	8.1		3190	503	8.1	<2.																					
UPDES	UT0022616-003	5/4/1994	17	8.6		2540	467	8	22	3																				
UPDES	UT0022616-003	5/16/1994	19.8	7.9		3360	139	8.2	12																					
UPDES	UT0022616-003	6/1/1994	21.6	7.5		3430	467	8.1	<2.																					
UPDES	UT0022616-003	6/20/1994	19.9	8.3		3210	467	8.2	6																					
UPDES	UT0022616-003	8/1/1994	19.5	7.9		3230	368	8.1	<2.	<1.																				
UPDES	UT0022616-003	8/15/1994	20.5	7.6		3380	413	8.1	4																					
UPDES	UT0022616-003	9/6/1994	19.8	7.3		3090	350	8.4	4	33																				
UPDES	UT0022616-003	9/19/1994	17.7	7.8		3140	444	8.1	<2.																					
UPDES	UT0022616-003	10/3/1994	16.4	8.2		2860	435	8	<2.	<1.																				
UPDES	UT0022616-003	10/17/1994	12.8	8		2770	413	8.1	14																					
UPDES	UT0022616-003	11/1/1994						8.1	<5.	18																				
UPDES	UT0022616-003	11/14/1994	9.2	7.8		2480	467	8	<5.																					
UPDES	UT0022616-003	1/3/1995	8.1	8		2570	435	7.9	<5.																					
UPDES	UT0022616-003	2/1/1995					0																							
UPDES	UT0022616-003	3/7/1995	12	7.7		2700	714		<10.								<0.1													

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-003	6/17/1991							3000	2326						0.04	<0.01		
UPDES	UT0022616-003	7/1/1991							3100	2318						0.07	<0.01		
UPDES	UT0022616-003	7/10/1991			1272					2448						0.06	<0.05		
UPDES	UT0022616-003	8/5/1991			988				2544	1896						<0.05	<0.05		
UPDES	UT0022616-003	8/14/1991							2280	1982						0.04	<0.01		
UPDES	UT0022616-003	9/6/1991			1133					1980						<0.05	<0.05		
UPDES	UT0022616-003	10/1/1991			1229		420		3057	2274						<0.05	<0.05	65.3	
UPDES	UT0022616-003	10/14/1991							3190	2300						0.03	<0.01		
UPDES	UT0022616-003	11/1/1991			1251		366		3078	2316						<0.05	<0.05	68.6	
UPDES	UT0022616-003	11/20/1991							3120	2274						0.03	0.01		
UPDES	UT0022616-003	12/2/1991			1252		414			2394						0.19	<0.05	68.3	
UPDES	UT0022616-003	12/30/1991			1212		369			2318						<0.2	<0.2	62.6	
UPDES	UT0022616-003	12/31/1991							3060	2308						0.1	0.02		
UPDES	UT0022616-003	1/2/1992			1217		318			2282						<0.2	<0.2	63.1	
UPDES	UT0022616-003	1/24/1992							3720	2340						0.11	0.06		
UPDES	UT0022616-003	2/3/1992							3220	2340						0.19	0.03		
UPDES	UT0022616-003	2/18/1992							3460	2372						0.14	0.02		
UPDES	UT0022616-003	3/2/1992							3150	2248						0.04	0.01		
UPDES	UT0022616-003	3/31/1992							3210	2174						0.12	<0.01		
UPDES	UT0022616-003	7/15/1992							2760	2252						0.04	<0.01		
UPDES	UT0022616-003	8/3/1992							2950	2328						0.07	<0.01		
UPDES	UT0022616-003	8/18/1992							2900	2274						0.1	0.01		
UPDES	UT0022616-003	9/2/1992							3470	2386						0.05	<0.01		
UPDES	UT0022616-003	9/16/1992							2800	2258						0.03	<0.01		
UPDES	UT0022616-003	10/5/1992							3180	2290						0.08	<0.01		
UPDES	UT0022616-003	11/1/1992																	
UPDES	UT0022616-003	12/8/1992							3310	2308						2.4	0.03		
UPDES	UT0022616-003	12/14/1992							2830	2270						1.08	0.1		
UPDES	UT0022616-003	1/11/1993							2920	2258						0.56	0.06		
UPDES	UT0022616-003	1/18/1993							3020	2256						0.5	0.04		
UPDES	UT0022616-003	2/1/1993							2820	2276						0.69	0.03		
UPDES	UT0022616-003	2/16/1993							3160	2316						0.49	0.03		
UPDES	UT0022616-003	3/2/1993							3550	2348						0.24	0.03		
UPDES	UT0022616-003	3/15/1993							3000	2242						0.1	0.03		
UPDES	UT0022616-003	4/5/1993							2380	2220						0.21	0.02		
UPDES	UT0022616-003	4/19/1993							2450	2280						0.14	0.01		
UPDES	UT0022616-003	5/3/1993							3310	2292						0.02	<0.01		
UPDES	UT0022616-003	6/1/1993																	
UPDES	UT0022616-003	7/12/1993							3280	2022						0.83	0.03		
UPDES	UT0022616-003	7/19/1993							2970	2112						0.68	0.02		
UPDES	UT0022616-003	8/9/1993							3970	2190						0.16	0.01		
UPDES	UT0022616-003	8/16/1993							3410	2196						0.13	<0.01		
UPDES	UT0022616-003	9/1/1993																	
UPDES	UT0022616-003	10/11/1993							3080	2172						0.75	0.03		
UPDES	UT0022616-003	10/20/1993							3160	2212						1.03	0.04		
UPDES	UT0022616-003	11/1/1993							3180	2292						0.26	<0.01		
UPDES	UT0022616-003	11/22/1993							3060	2130						0.25	<0.01		
UPDES	UT0022616-003	12/7/1993							3090	2214						0.21	<0.01		
UPDES	UT0022616-003	12/20/1993							3200	2338						0.2	0.01		
UPDES	UT0022616-003	1/3/1994							3150	2206						0.2	0.01		
UPDES	UT0022616-003	1/17/1994							3210	2246						0.17	<0.01		
UPDES	UT0022616-003	2/2/1994							3200	2270						0.14	0.01		
UPDES	UT0022616-003	2/14/1994							3136	2228						0.14	<0.01		
UPDES	UT0022616-003	3/1/1994							3160	2298						0.18	0.01		
UPDES	UT0022616-003	3/21/1994							3100	2236						0.19	0.02		
UPDES	UT0022616-003	4/4/1994							3120	2226						0.13	<0.01		
UPDES	UT0022616-003	4/18/1994							3280	2346						0.15	0.02		
UPDES	UT0022616-003	5/4/1994							3180	2264						0.12	<0.01		
UPDES	UT0022616-003	5/16/1994							3300	2378						0.15	<0.01		
UPDES	UT0022616-003	6/1/1994							3220	2314						0.1	0.02		
UPDES	UT0022616-003	6/20/1994							3180	2218						0.28	<0.01		
UPDES	UT0022616-003	8/1/1994							3190	2282						0.15	0.02		
UPDES	UT0022616-003	8/15/1994							3220	2380						0.13	<0.1		
UPDES	UT0022616-003	9/6/1994							2970	2090						0.09	<0.01		
UPDES	UT0022616-003	9/19/1994							3220	2350						0.14	<0.01		
UPDES	UT0022616-003	10/3/1994							3130	2198						0.11	<0.01		
UPDES	UT0022616-003	10/17/1994							3200	2240						0.14	0.01		
UPDES	UT0022616-003	11/1/1994							3190	2340						0.14	<0.005		
UPDES	UT0022616-003	11/14/1994							3210	2330						0.2	<0.005		
UPDES	UT0022616-003	1/3/1995							5220	4250						0.49	0.05		
UPDES	UT0022616-003	2/1/1995																	
UPDES	UT0022616-003	3/7/1995								2360									

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-003	3/20/1995	14.1	7.3		2930	714		<5.																					
UPDES	UT0022616-003	4/3/1995	12.9	7.5		2810	624		<5.																					
UPDES	UT0022616-003	4/24/1995	15.1	7.3		3190	781		<5.																					
UPDES	UT0022616-003	5/1/1995	16.9	7.5		3200	781		10																					
UPDES	UT0022616-003	5/15/1995	17	7.3		2850	714		<5.																					
UPDES	UT0022616-003	6/5/1995	20.9	7.7		3410	588		20																					
UPDES	UT0022616-003	6/19/1995	17.9	7.3		3390	422		<5.																					
UPDES	UT0022616-003	7/11/1995	21.9	7.3		3550	525		<5.																					
UPDES	UT0022616-003	7/25/1995	21.7	7.4		3400	193		<5.																					
UPDES	UT0022616-003	8/1/1995	23.2	7.7		3110	310		<5.																					
UPDES	UT0022616-003	8/15/1995	23.1	7.4		3280	390		<5.																					
UPDES	UT0022616-003	9/5/1995	20.9	7.2		3150	359		5																					
UPDES	UT0022616-003	9/18/1995	19.3	7.8		2950	539		25																					
UPDES	UT0022616-003	10/2/1995	15.2	7.2		3100	539		5																					
UPDES	UT0022616-003	10/24/1995	9.3	7.5		2840	260		<5.																					
UPDES	UT0022616-003	11/6/1995	10.6	7.9		3290	525		<5.																					
UPDES	UT0022616-003	11/15/1995	14.2	7.9		3580	525		<5.																					
UPDES	UT0022616-003	12/6/1995	9.6	7.9		3350	458																							
UPDES	UT0022616-003	1/2/1996	12.7	7.8		3010	90		10																					
UPDES	UT0022616-003	1/30/1996	10.2	8.1		3540	826		<5.																					
UPDES	UT0022616-003	2/5/1996	10.5	8		3550	812		5																					
UPDES	UT0022616-003	2/27/1996	8.9	7.9		3280	714		5																					
UPDES	UT0022616-003	3/4/1996	12.3	8		3680	480		<5.																					
UPDES	UT0022616-003	3/28/1996	13.5	7.4		3.55	781		<5.																					
UPDES	UT0022616-003	4/2/1996	13.2	7.9		3480	664		<5.																					
UPDES	UT0022616-003	4/22/1996	14.4	8.2		3450	193		<5.																					
UPDES	UT0022616-003	5/1/1996	16.4	7.9		3640	610		<5.																					
UPDES	UT0022616-003	5/20/1996	18.5	8.1		3830	601		<5.																					
UPDES	UT0022616-003	6/3/1996	21.8	8		3980	651		<5.																					
UPDES	UT0022616-003	6/18/1996	19.6	8.1		3920	624		<5.																					
UPDES	UT0022616-003	7/1/1996	21.9	7.9		3990	588		7																					
UPDES	UT0022616-003	7/16/1996	21.3	7.9		3670	552		<5.																					
UPDES	UT0022616-003	8/1/1996	20.8	7.9		3860	561		<5.																					
UPDES	UT0022616-003	8/19/1996	21	7.7		3900	610		<5.																					
UPDES	UT0022616-003	9/3/1996	21.5	8.3		3960	601		<5.																					
UPDES	UT0022616-003	9/16/1996	15.4	7.9		2420	574		6																					
UPDES	UT0022616-003	10/2/1996	17.3	7.5		3520	574		<5.																					
UPDES	UT0022616-003	10/15/1996	15.2	7.8		3430	525		<5.																					
UPDES	UT0022616-003	11/5/1996	10.9	7.8		3190	664		<5.																					
UPDES	UT0022616-003	11/19/1996	10.9	8.1		3140	610		<5.																					
UPDES	UT0022616-003	12/2/1996	6.9	8.2		2770	503		<5.																					
UPDES	UT0022616-003	12/16/1996	9.8	7.9		2760	525		<5.																					
UPDES	UT0022616-003	1/2/1997	9.1	8.2		2860	503		<5.																					
UPDES	UT0022616-003	1/16/1997	8.1	7.9		2830	624		<5.																					
UPDES	UT0022616-003	2/3/1997	7.6	7.6		2870	525		<5.																					
UPDES	UT0022616-003	2/19/1997	9	7.7		2900	399		<5.																					
UPDES	UT0022616-003	3/3/1997	10.2	7.7		2950	574		<5.																					
UPDES	UT0022616-003	3/3/1997	10.2	7.7		2950	574																							
UPDES	UT0022616-003	3/17/1997	13.6	7.7		3300	467		<5.																					
UPDES	UT0022616-003	4/1/1997	12	7.9		3150	413		<5.																					
UPDES	UT0022616-003	4/15/1997	14.2	8		3270	435		<5.																					
UPDES	UT0022616-003	5/1/1997	13.2	7.9		3170	422		<5.																					
UPDES	UT0022616-003	5/15/1997	18.5	8		2950	435		<5.																					
UPDES	UT0022616-003	6/2/1997	19.4	7.9		3260	435		<5.																					
UPDES	UT0022616-003	6/16/1997	17.8	7.8		3250	552		<5.																					
UPDES	UT0022616-003	7/1/1997	17.6	7.7		3200	328		<5.																					
UPDES	UT0022616-003	7/15/1997	20.5	7.8		3190	435		<5.																					
UPDES	UT0022616-003	8/1/1997	20.5	7.7		3210	467		<5.																					
UPDES	UT0022616-003	8/15/1997	20.6	7.6		3250	467		<5.																					
UPDES	UT0022616-003	9/3/1997	19.5	7.6		3200	588		<5.																					
UPDES	UT0022616-003	9/16/1997	17.9	7.5		3220	458		5																					
UPDES	UT0022616-003	10/1/1997	16.5	7.6		3210	458		<5.																					
UPDES	UT0022616-003	10/15/1997	11.1	7.4		3250	435		<5.																					
UPDES	UT0022616-003	11/3/1997	11.4	7.5		3250	552		5																					
UPDES	UT0022616-003	11/17/1997	8.4	7.4		3360	539		<5.																					
UPDES	UT0022616-003	12/1/1997	9.6	7.6		3420	503		<5.																					
UPDES	UT0022616-003	12/15/1997	6.6	7.4		3530	435		<5.																					
UPDES	UT0022616-003	1/2/1998	7.6	7.4		3450	525		8																					
UPDES	UT0022616-003	1/16/1998	7.7	7.5		3450	422		<5.																					
UPDES	UT0022616-003	2/2/1998	8.9	7.7		3410	413		<5.																					
UPDES	UT0022616-003	2/17/1998	9.5	8.1		3400	525		<4.																					
UPDES	UT0022616-003	3/2/1998	8.2	8.2		3390	310		<4.																					

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-003	3/20/1995								2290						0.8			
UPDES	UT0022616-003	4/3/1995								2360						0.5			
UPDES	UT0022616-003	4/24/1995								2450						0.6			
UPDES	UT0022616-003	5/1/1995								2330						0.2			
UPDES	UT0022616-003	5/15/1995								2350						0.6			
UPDES	UT0022616-003	6/5/1995								2400						0.1			
UPDES	UT0022616-003	6/19/1995								2400						0.3			
UPDES	UT0022616-003	7/11/1995								2370						<0.1			
UPDES	UT0022616-003	7/25/1995								2150						0.2			
UPDES	UT0022616-003	8/1/1995								1860						<0.1			
UPDES	UT0022616-003	8/15/1995								2040						0.3			
UPDES	UT0022616-003	9/5/1995								2080						0.1			
UPDES	UT0022616-003	9/18/1995								2080						0.4			
UPDES	UT0022616-003	10/2/1995								2390						0.3			
UPDES	UT0022616-003	10/24/1995								2550						0.1			
UPDES	UT0022616-003	11/6/1995								2590						0.6			
UPDES	UT0022616-003	11/15/1995								2590						<0.1			
UPDES	UT0022616-003	12/6/1995																	
UPDES	UT0022616-003	1/2/1996								2710						0.1			
UPDES	UT0022616-003	1/30/1996								2790						0.5			
UPDES	UT0022616-003	2/5/1996								2930						0.9			
UPDES	UT0022616-003	2/27/1996								2725						1			
UPDES	UT0022616-003	3/4/1996								2680						0.8			
UPDES	UT0022616-003	3/28/1996								2523						0.65			
UPDES	UT0022616-003	4/2/1996								2539						0.71			
UPDES	UT0022616-003	4/22/1996								2414						0.52			
UPDES	UT0022616-003	5/1/1996								2398						0.32			
UPDES	UT0022616-003	5/20/1996								2490						0.33			
UPDES	UT0022616-003	6/3/1996								2377						0.3			
UPDES	UT0022616-003	6/18/1996								2333						0.3			
UPDES	UT0022616-003	7/1/1996								2365						0.1			
UPDES	UT0022616-003	7/16/1996								2350						0.2			
UPDES	UT0022616-003	8/1/1996								2410						0.1			
UPDES	UT0022616-003	8/19/1996								2388						0.2			
UPDES	UT0022616-003	9/3/1996								2445						0.3			
UPDES	UT0022616-003	9/16/1996								2368						0.2			
UPDES	UT0022616-003	10/2/1996								2406						0.2			
UPDES	UT0022616-003	10/15/1996								2403						0.2			
UPDES	UT0022616-003	11/5/1996								2397						0.1			
UPDES	UT0022616-003	11/19/1996								2382						0.1			
UPDES	UT0022616-003	12/2/1996								2380						<0.1			
UPDES	UT0022616-003	12/16/1996								2487						0.1			
UPDES	UT0022616-003	1/2/1997								2432						<0.1			
UPDES	UT0022616-003	1/16/1997								2416						0.1			
UPDES	UT0022616-003	2/3/1997								2370						0.2			
UPDES	UT0022616-003	2/19/1997								2418						0.2			
UPDES	UT0022616-003	3/3/1997								2370						0.2			
UPDES	UT0022616-003	3/3/1997																	
UPDES	UT0022616-003	3/17/1997								2360						<0.1			
UPDES	UT0022616-003	4/1/1997								2400						0.1			
UPDES	UT0022616-003	4/15/1997								2360						0.1			
UPDES	UT0022616-003	5/1/1997								2330						0.1			
UPDES	UT0022616-003	5/15/1997								2320						0.1			
UPDES	UT0022616-003	6/2/1997								2300						0.1			
UPDES	UT0022616-003	6/16/1997								2300						0.5			
UPDES	UT0022616-003	7/1/1997								2320						0.2			
UPDES	UT0022616-003	7/15/1997								2280						0.1			
UPDES	UT0022616-003	8/1/1997								2260						0.3			
UPDES	UT0022616-003	8/15/1997								2340						0.1			
UPDES	UT0022616-003	9/3/1997								2290						0.1			
UPDES	UT0022616-003	9/16/1997								2320						0.2			
UPDES	UT0022616-003	10/1/1997								2410						0.2			
UPDES	UT0022616-003	10/15/1997								2420						0.8			
UPDES	UT0022616-003	11/3/1997								2430						0.1			
UPDES	UT0022616-003	11/17/1997								2340						0.1			
UPDES	UT0022616-003	12/1/1997								2380						<0.1			
UPDES	UT0022616-003	12/15/1997								2410						0.1			
UPDES	UT0022616-003	1/2/1998								2440						<0.1			
UPDES	UT0022616-003	1/16/1998								2440						0.1			
UPDES	UT0022616-003	2/2/1998								2440						<0.1			
UPDES	UT0022616-003	2/17/1998								2410						0.1			
UPDES	UT0022616-003	3/2/1998								2420						<0.1			

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-003	3/16/1998	12.7	7.7		3370	458		<4.																					
UPDES	UT0022616-003	4/2/1998	10.5	8.1		3350	444		<4.																					
UPDES	UT0022616-003	4/15/1998	10.6	8		3400	350		<4.																					
UPDES	UT0022616-003	5/1/1998	16.2	7.5		3360	381																							
UPDES	UT0022616-003	5/18/1998	15.1	7.7		3390	328		<4.																					
UPDES	UT0022616-003	5/27/1998	15.7	7.6		3350	359		<4.																					
UPDES	UT0022616-003	6/1/1998	18.3	7.8		3400	399		<4.																					
UPDES	UT0022616-003	6/15/1998	16.5	7.7		3440	278		8																					
UPDES	UT0022616-003	7/1/1998	20.1	7.6		3400	310		<5.																					
UPDES	UT0022616-003	7/17/1998	21.6	8		3480	301		<5.																					
UPDES	UT0022616-003	8/3/1998	19.8	7.6		3450	278		<5.																					
UPDES	UT0022616-003	8/17/1998	20.7	7.6		3520	251		<5.																					
UPDES	UT0022616-003	9/1/1998	19	7.4		3400	310		<5.																					
UPDES	UT0022616-003	9/1/1998	19	7.4		3400	310																							
UPDES	UT0022616-003	9/9/1998	19.8	7.5		3340	310		<5.																					
UPDES	UT0022616-003	10/23/1998	11.1	7.6		3670	139		<5.																					
UPDES	UT0022616-003	10/29/1998	13	7.5		3620	503		8																					
UPDES	UT0022616-003	11/9/1998	9.5	7.7		3630	359		<5.																					
UPDES	UT0022616-003	11/23/1998	10.3	7.4		3590	480		<5.																					
UPDES	UT0022616-003	12/1/1998	10.8	7.4		3460	525		5																					
UPDES	UT0022616-003	12/15/1998	8.1	7.3		3460	444		<5.																					
UPDES	UT0022616-003	1/4/1999	6.2	7.4		3510	588		7																					
UPDES	UT0022616-003	1/19/1999	8	7.4		3590	32762		<5.																					
UPDES	UT0022616-003	2/1/1999	7.4	7.3		3550	458		5																					
UPDES	UT0022616-003	2/15/1999	8.3	7.2		3570	435		<5.																					
UPDES	UT0022616-003	3/1/1999	11.2	7.2		3460	467		<5.																					
UPDES	UT0022616-003	3/15/1999	11.2	7.2		3460	467																							
UPDES	UT0022616-003	4/5/1999	10.5	7.4		3450	310		<5.																					
UPDES	UT0022616-003	4/16/1999	11.4	7.3		3500	310		<5.																					
UPDES	UT0022616-003	5/3/1999	13.1	7.7		3390	359		<5.																					
UPDES	UT0022616-003	5/17/1999	14.1	7.6		3410	310		<5.																					
UPDES	UT0022616-003	6/1/1999	17.3	7.3		3340	310		<5.																					
UPDES	UT0022616-003	6/15/1999	20.1	8		3370	390		<5.																					
UPDES	UT0022616-003	7/1/1999	21	8.3		3440	310		<5.																					
UPDES	UT0022616-003	10/4/1999	14.5	7.5		3690	184		<5.																					
UPDES	UT0022616-003	12/3/1999	6.6	7.1		3660	588		<5.																					
UPDES	UT0022616-003	1/4/2000	6	7		3540	489		<5.																					
UPDES	UT0022616-003	2/2/2000	6.8	7.7		3540	444		<5.																					
UPDES	UT0022616-003	4/3/2000	12.7	7.6		3520	368		<5.																					
UPDES	UT0022616-003	5/24/2000	17.9	7.7		3510	552		6																					
UPDES	UT0022616-003	6/14/2000	17.4	7.7		3790	449		<5.																					
UPDES	UT0022616-003	6/8/2001	19.7	7.4		3380	467		<5.																					
UPDES	UT0022616-003	7/10/2001	22.1	7.4		3410	162		<5.																					
UPDES	UT0022616-003	12/10/2001	7.2	7		3430	435		5																					
UPDES	UT0022616-003	4/11/2002	14.5	7.1		3420	503		5																					
UPDES	UT0022616-003	5/7/2002	16.1	7		3370	413		<5.																					
UPDES	UT0022616-003	6/19/2002	19.5	7.3		3390	162		5																					
UPDES	UT0022616-003	7/15/2002	20.6	7.1		3530	175		<5.																					
UPDES	UT0022616-003	8/8/2002	19.3	7.2		3360	112		5																					
UPDES	UT0022616-003	9/16/2002	18.7	7.2		3340	435		<3.8																					
UPDES	UT0022616-003	10/22/2002	13	7		3390	413		<5.																					
UPDES	UT0022616-003	7/1/2003																												
UPDES	UT0022616-003	8/29/2003	26	8.5		3560	144		< 5.																					
UPDES	UT0022616-003	9/16/2003	17.7	7.7		3610	310		< 5.																					
UPDES	UT0022616-003	10/28/2003																												
UPDES	UT0022616-003	11/24/2003																												
UPDES	UT0022616-003	12/31/2003					0																							
UPDES	UT0022616-003	1/27/2004																												
UPDES	UT0022616-003	2/25/2004																												
UPDES	UT0022616-003	3/10/2004																												
UPDES	UT0022616-003	4/6/2004																												
UPDES	UT0022616-003	5/10/2004																												
UPDES	UT0022616-003	6/2/2004	16.5	8.2		3500	67		34																					
UPDES	UT0022616-003	7/8/2004	21.1	8.2		3490	225		< 5.																					
UPDES	UT0022616-003	8/8/2004					0																							
UPDES	UT0022616-003	9/8/2004					0																							
UPDES	UT0022616-003	10/28/2004	12.7	8		3570	337		< 5.																					
UPDES	UT0022616-003	11/1/2004	12	8.2		3460	382		< 5.																					
UPDES	UT0022616-003	12/1/2004	4.3	8.3		3360	382		< 5.																					
UPDES	UT0022616-003	1/3/2005	11	8		3950	247		5																					
UPDES	UT0022616-003	2/1/2005	9	8.5			265		0																					
UPDES	UT0022616-003	3/1/2005	11	8.5		5680	224		5																					

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-003	3/16/1998								2418						<0.1			
UPDES	UT0022616-003	4/2/1998								2451						<0.1			
UPDES	UT0022616-003	4/15/1998								2453						0.1			
UPDES	UT0022616-003	5/1/1998								2407						<0.1			
UPDES	UT0022616-003	5/18/1998								2425						<0.1			
UPDES	UT0022616-003	5/27/1998								2483						0.1			
UPDES	UT0022616-003	6/1/1998								2440						0.1			
UPDES	UT0022616-003	6/15/1998								2404						0.1			
UPDES	UT0022616-003	7/1/1998								2336						<0.1			
UPDES	UT0022616-003	7/17/1998								996						<0.1			
UPDES	UT0022616-003	8/3/1998								2450						0.1			
UPDES	UT0022616-003	8/17/1998								2463						<0.1			
UPDES	UT0022616-003	9/1/1998								2446						0.1			
UPDES	UT0022616-003	9/1/1998																	
UPDES	UT0022616-003	9/9/1998								2426						<0.1			
UPDES	UT0022616-003	10/23/1998								2550						1			
UPDES	UT0022616-003	10/29/1998								2588						1			
UPDES	UT0022616-003	11/9/1998								2518						0.6			
UPDES	UT0022616-003	11/23/1998								2545						0.6			
UPDES	UT0022616-003	12/1/1998								2553						0.5			
UPDES	UT0022616-003	12/15/1998								2445						0.3			
UPDES	UT0022616-003	1/4/1999								2505						0.2			
UPDES	UT0022616-003	1/19/1999								2527						0.2			
UPDES	UT0022616-003	2/1/1999								2516						0.3			
UPDES	UT0022616-003	2/15/1999								2523						0.2			
UPDES	UT0022616-003	3/1/1999								2500						<0.1			
UPDES	UT0022616-003	3/15/1999																	
UPDES	UT0022616-003	4/5/1999								2476						0.1			
UPDES	UT0022616-003	4/16/1999								2407						<0.1			
UPDES	UT0022616-003	5/3/1999								2358						<0.1			
UPDES	UT0022616-003	5/17/1999								2408						<0.1			
UPDES	UT0022616-003	6/1/1999								2440						0.2			
UPDES	UT0022616-003	6/15/1999								2433						0.1			
UPDES	UT0022616-003	7/1/1999								2473						0.1			
UPDES	UT0022616-003	10/4/1999								2543						0.2			
UPDES	UT0022616-003	12/3/1999								2582						0.5			
UPDES	UT0022616-003	1/4/2000								2511						0.1			
UPDES	UT0022616-003	2/2/2000								2496						0.1			
UPDES	UT0022616-003	4/3/2000								2519						<0.1			
UPDES	UT0022616-003	5/24/2000								2527						<0.1			
UPDES	UT0022616-003	6/14/2000								2495						<0.1			
UPDES	UT0022616-003	6/8/2001								2417						<0.1			
UPDES	UT0022616-003	7/10/2001								2459						<0.1			
UPDES	UT0022616-003	12/10/2001								2450						<0.1			
UPDES	UT0022616-003	4/11/2002								2383						0.1			
UPDES	UT0022616-003	5/7/2002								2411						<0.1			
UPDES	UT0022616-003	6/19/2002								2406						<0.1			
UPDES	UT0022616-003	7/15/2002								2370						<0.1			
UPDES	UT0022616-003	8/8/2002								2390						0.1			
UPDES	UT0022616-003	9/16/2002								2325						<0.1			
UPDES	UT0022616-003	10/22/2002								2334						<0.1			
UPDES	UT0022616-003	7/1/2003																	
UPDES	UT0022616-003	8/29/2003								2375						0.129			
UPDES	UT0022616-003	9/16/2003								2512						0.511			
UPDES	UT0022616-003	10/28/2003																	
UPDES	UT0022616-003	11/24/2003																	
UPDES	UT0022616-003	12/31/2003																	pump down could not sample
UPDES	UT0022616-003	1/27/2004																	
UPDES	UT0022616-003	2/25/2004																	
UPDES	UT0022616-003	3/10/2004																	
UPDES	UT0022616-003	4/6/2004																	
UPDES	UT0022616-003	5/10/2004																	
UPDES	UT0022616-003	6/2/2004								2456						0.36			
UPDES	UT0022616-003	7/8/2004								2428						0.36			
UPDES	UT0022616-003	8/8/2004																	
UPDES	UT0022616-003	9/8/2004																	
UPDES	UT0022616-003	10/28/2004								2481						0.92			
UPDES	UT0022616-003	11/1/2004								2483						0.92			
UPDES	UT0022616-003	12/1/2004								2590						0.77			
UPDES	UT0022616-003	1/3/2005								2834						0.23			
UPDES	UT0022616-003	2/1/2005								2889						0.23			
UPDES	UT0022616-003	3/1/2005								2995						0.12			

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-003	4/1/2005	13.3	8.6		3990	337		< 5.																					
UPDES	UT0022616-003	5/2/2005					0																							
UPDES	UT0022616-003	6/1/2005					0																							
UPDES	UT0022616-003	7/15/2005					0																							
UPDES	UT0022616-003	8/18/2005					0																							
UPDES	UT0022616-003	9/2/2005	18.3	7.8		4360	314		10																					
UPDES	UT0022616-003	10/3/2005	13.7	8.2		4430	202		< 5.																					
UPDES	UT0022616-003	11/1/2005	15	8.2		4500	382		10																					
UPDES	UT0022616-003	11/15/2005	10.5	7.8		4430	359		< 5.																					
UPDES	UT0022616-003	12/1/2005	7.3	8		4410	314		< 5.																					
UPDES	UT0022616-003	12/15/2005							< 5.																					
UPDES	UT0022616-003	1/3/2006	8.1	8.4		4260	314		< 5.																					
UPDES	UT0022616-003	1/16/2006	4.6	8.6		4360			< 5.																					
UPDES	UT0022616-003	2/1/2006		8.4			395		7																					
UPDES	UT0022616-003	2/15/2006	9.9	7.8		4310			< 5.																					
UPDES	UT0022616-003	3/1/2006	11.5	8.2		4320			< 5.																					
UPDES	UT0022616-003	3/15/2006	11.4	8		4280			< 5.																					
UPDES	UT0022616-003	4/3/2006	13.8	8.1		4310	422		< 5.	0																				
UPDES	UT0022616-003	4/17/2006	13.3	8.2		4350	422		6	0																				
UPDES	UT0022616-003	5/1/2006	13.8	8		4350	391	7.9	< 5.	0																< 5.		126		
UPDES	UT0022616-003	5/15/2006	17.9	7.2		4340	391		< 5.	0																				
UPDES	UT0022616-003	6/1/2006	20	8.1		4330	382		5	0																				
UPDES	UT0022616-003	6/15/2006	17.3	8.2		4310	382		< 5.	0																				
UPDES	UT0022616-003	6/30/2006	21.4	8		4320	408		< 5.	0																				
UPDES	UT0022616-003	7/14/2006	17.9	8.1		4240	402		5	0																				
UPDES	UT0022616-003	8/1/2006	21	7.9		4390	412		< 5.	0																				
UPDES	UT0022616-003	8/15/2006	18.3	8.1		4490	70		< 5.	0																				
UPDES	UT0022616-003	9/1/2006	20	8.1		4390	486		< 5.	0																				
UPDES	UT0022616-003	9/15/2006	15.1	8.6		4300	497		< 5.	0																				
UPDES	UT0022616-003	10/2/2006	13.9	8.4		4360	433		43	0																				
UPDES	UT0022616-003	10/16/2006	13.4	8.8		4300	678		< 5.	0																				
UPDES	UT0022616-003	11/1/2006	12.7	8.1		4400	648		< 5.	0																				
UPDES	UT0022616-003	11/16/2006	9.5	7.6		4350	670		< 5.	0																				
UPDES	UT0022616-003	12/1/2006	7.6	7.4		4280	608		6	0																				
UPDES	UT0022616-003	12/15/2006	10	8		4350	645		12	0																				
	No. of Obs.:		214	216	0	212	271	107	114	44	2	1	2	0	2	0	1	0	2	0	2	0	2	0	2	0	2	8	0	0
	Maximum:		26	9.5	0	5680	32762.4	9	43	33	0.2	0.001	0.56	0	51	0	0.1	0	43	0	4	0	471	0	352	0	32	126	0	0
	Minimum:		4.3	5.9	0	3.55	0	7.6	0	0	0.08	0.001	0.55	0	26	0	0.1	0	20	0	3	0	455	0	296	0	32	10	0	0
	Mean:		14.3	7.8	--	3386.1	505.3	8.2	9.3	2.1	0.1	0.0	0.6	--	38.5	--	0.1	--	31.5	--	3.5	--	463.0	--	324.0	--	32.0	60.4	--	--
	Std. Dev.:		4.8	0.5	--	577.0	1980.1	0.3	7.0	5.5	0.1	--	0.0	--	17.7	--	--	--	16.3	--	0.7	--	11.3	--	39.6	--	0.0	38.0	--	--
	Equivalent weights of means:														1.92				2.59		0.09		20.14		5.31		1.07	1.70		

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-003	4/1/2005								2774						0.24			
UPDES	UT0022616-003	5/2/2005																	
UPDES	UT0022616-003	6/1/2005																	No Discharge in June
UPDES	UT0022616-003	7/15/2005																	No Flow
UPDES	UT0022616-003	8/18/2005																	Did not Discharge in August
UPDES	UT0022616-003	9/2/2005								3300						0.36			
UPDES	UT0022616-003	10/3/2005								3508						0.25			
UPDES	UT0022616-003	11/1/2005								3361						1.55			
UPDES	UT0022616-003	11/15/2005								3378						1.29			
UPDES	UT0022616-003	12/1/2005								3390						0.45			
UPDES	UT0022616-003	12/15/2005								3391						0.53			
UPDES	UT0022616-003	1/3/2006								3311						0.29			
UPDES	UT0022616-003	1/16/2006								3277						0.31			
UPDES	UT0022616-003	2/1/2006								3326						0.38			
UPDES	UT0022616-003	2/15/2006								3199						0.7			
UPDES	UT0022616-003	3/1/2006								3261						0.54			
UPDES	UT0022616-003	3/15/2006								3258						0.4			
UPDES	UT0022616-003	4/3/2006								3231						0.57			
UPDES	UT0022616-003	4/17/2006								3263						0.57			
UPDES	UT0022616-003	5/1/2006			1837		423			3282						0.53	0.022	110	
UPDES	UT0022616-003	5/15/2006								3267						0.38			
UPDES	UT0022616-003	6/1/2006								3239						0.66	0.025		
UPDES	UT0022616-003	6/15/2006								3258						0.55			BH
UPDES	UT0022616-003	6/30/2006								3213						0.32	0.077		
UPDES	UT0022616-003	7/14/2006								3244						0.26			
UPDES	UT0022616-003	8/1/2006								3297						0.34			
UPDES	UT0022616-003	8/15/2006								3359						0.2			
UPDES	UT0022616-003	9/1/2006								3359						0.17			
UPDES	UT0022616-003	9/15/2006								3327						0.15			
UPDES	UT0022616-003	10/2/2006								3424						0.13			DIS.METALS FILTERED @ LAB
UPDES	UT0022616-003	10/16/2006								3333						0.18			
UPDES	UT0022616-003	11/1/2006								3407						0.4			
UPDES	UT0022616-003	11/16/2006								3289						0.75			
UPDES	UT0022616-003	12/1/2006								3296						0.53			
UPDES	UT0022616-003	12/15/2006								3234						0.48			
		No. of Obs.:	0	0	26	0	8	2	83	268	0	1	0	2	2	220	43	7	
		Maximum:	0	0	1837	0	423	304	5220	4250	0	0.46	0	26.2	27.11	2.4	0.1	110	
		Minimum:	0	0	582	0	318	147	1890	996	0	0.46	0	23.74	22.94	0.02	0.01	22	
		Mean:	--	--	1093.7	--	377.8	225.5	3017.3	2410	--	0.5	--	25.0	25.0	0.3	0.0	65.7	
		Std. Dev.:	--	--	328.7	--	40.4	111.0	463.4	443.5	--	--	--	1.7	2.9	0.3	0.0	25.5	
		Equivalent wei			22.77														

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-004	1/1/1991					0																							
UPDES	UT0022616-004	2/1/1991					0																							
UPDES	UT0022616-004	3/1/1991					0																							
UPDES	UT0022616-004	4/1/1991					0																							
UPDES	UT0022616-004	5/1/1991					0																							
UPDES	UT0022616-004	6/1/1991					0																							
UPDES	UT0022616-004	7/1/1991					0																							
UPDES	UT0022616-004	8/1/1991					0																							
UPDES	UT0022616-004	9/1/1991					0																							
UPDES	UT0022616-004	10/1/1991					0																							
UPDES	UT0022616-004	11/1/1991					0																							
UPDES	UT0022616-004	12/1/1991					0																							
UPDES	UT0022616-004	1/1/1992					0																							
UPDES	UT0022616-004	2/1/1992					0																							
UPDES	UT0022616-004	3/1/1992					0																							
UPDES	UT0022616-004	4/1/1992					0																							
UPDES	UT0022616-004	5/1/1992					0																							
UPDES	UT0022616-004	6/1/1992					0																							
UPDES	UT0022616-004	7/1/1992					0																							
UPDES	UT0022616-004	8/1/1992					0																							
UPDES	UT0022616-004	9/1/1992					0																							
UPDES	UT0022616-004	10/1/1992					0																							
UPDES	UT0022616-004	11/1/1992					0																							
UPDES	UT0022616-004	12/1/1992					0																							
UPDES	UT0022616-004	1/1/1993					0																							
UPDES	UT0022616-004	2/1/1993					0																							
UPDES	UT0022616-004	3/1/1993					0																							
UPDES	UT0022616-004	4/1/1993					0																							
UPDES	UT0022616-004	5/1/1993					0																							
UPDES	UT0022616-004	6/1/1993					0																							
UPDES	UT0022616-004	7/1/1993					0																							
UPDES	UT0022616-004	8/1/1993					0																							
UPDES	UT0022616-004	9/1/1993					0																							
UPDES	UT0022616-004	10/1/1993					0																							
UPDES	UT0022616-004	11/1/1993					0																							
UPDES	UT0022616-004	12/1/1993					0																							
UPDES	UT0022616-004	1/1/1994					0																							
UPDES	UT0022616-004	2/1/1994					0																							
UPDES	UT0022616-004	3/1/1994					0																							
UPDES	UT0022616-004	4/1/1994					0																							
UPDES	UT0022616-004	5/1/1994					0																							
UPDES	UT0022616-004	6/1/1994					0																							
UPDES	UT0022616-004	8/1/1994					0																							
UPDES	UT0022616-004	9/1/1994					0																							
UPDES	UT0022616-004	10/1/1994					0																							
UPDES	UT0022616-004	11/1/1994					0																							
UPDES	UT0022616-004	12/1/1994					0																							
UPDES	UT0022616-004	1/1/1995					0																							
UPDES	UT0022616-004	2/1/1995					0																							
UPDES	UT0022616-004	3/1/1995					0																							
UPDES	UT0022616-004	4/1/1995					0																							
UPDES	UT0022616-004	5/1/1995					0																							
UPDES	UT0022616-004	6/1/1995					0																							
UPDES	UT0022616-004	7/1/1995					0																							
UPDES	UT0022616-004	8/1/1995					0																							
UPDES	UT0022616-004	9/1/1995					0																							
UPDES	UT0022616-004	10/1/1995					0																							
UPDES	UT0022616-004	11/1/1995					0																							
UPDES	UT0022616-004	1/1/1996					0																							
UPDES	UT0022616-004	2/1/1996					0																							
UPDES	UT0022616-004	3/1/1996					0																							
UPDES	UT0022616-004	4/1/1996					0																							
UPDES	UT0022616-004	5/1/1996					0																							
UPDES	UT0022616-004	6/1/1996					0																							
UPDES	UT0022616-004	7/1/1996					0																							
UPDES	UT0022616-004	8/1/1996					0																							
UPDES	UT0022616-004	9/1/1996					0																							
UPDES	UT0022616-004	10/1/1996					0																							
UPDES	UT0022616-004	11/1/1996					0																							
UPDES	UT0022616-004	12/1/1996					0																							
UPDES	UT0022616-004	1/1/1997					0																							
UPDES	UT0022616-004	2/1/1997					0																							

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-004	1/1/1991																	
UPDES	UT0022616-004	2/1/1991																	
UPDES	UT0022616-004	3/1/1991																	
UPDES	UT0022616-004	4/1/1991																	
UPDES	UT0022616-004	5/1/1991																	
UPDES	UT0022616-004	6/1/1991																	
UPDES	UT0022616-004	7/1/1991																	
UPDES	UT0022616-004	8/1/1991																	
UPDES	UT0022616-004	9/1/1991																	
UPDES	UT0022616-004	10/1/1991																	
UPDES	UT0022616-004	11/1/1991																	
UPDES	UT0022616-004	12/1/1991																	
UPDES	UT0022616-004	1/1/1992																	
UPDES	UT0022616-004	2/1/1992																	
UPDES	UT0022616-004	3/1/1992																	
UPDES	UT0022616-004	4/1/1992																	
UPDES	UT0022616-004	5/1/1992																	
UPDES	UT0022616-004	6/1/1992																	
UPDES	UT0022616-004	7/1/1992																	
UPDES	UT0022616-004	8/1/1992																	
UPDES	UT0022616-004	9/1/1992																	
UPDES	UT0022616-004	10/1/1992																	
UPDES	UT0022616-004	11/1/1992																	
UPDES	UT0022616-004	12/1/1992																	
UPDES	UT0022616-004	1/1/1993																	
UPDES	UT0022616-004	2/1/1993																	
UPDES	UT0022616-004	3/1/1993																	
UPDES	UT0022616-004	4/1/1993																	
UPDES	UT0022616-004	5/1/1993																	
UPDES	UT0022616-004	6/1/1993																	
UPDES	UT0022616-004	7/1/1993																	
UPDES	UT0022616-004	8/1/1993																	
UPDES	UT0022616-004	9/1/1993																	
UPDES	UT0022616-004	10/1/1993																	
UPDES	UT0022616-004	11/1/1993																	
UPDES	UT0022616-004	12/1/1993																	
UPDES	UT0022616-004	1/1/1994																	
UPDES	UT0022616-004	2/1/1994																	
UPDES	UT0022616-004	3/1/1994																	
UPDES	UT0022616-004	4/1/1994																	
UPDES	UT0022616-004	5/1/1994																	
UPDES	UT0022616-004	6/1/1994																	
UPDES	UT0022616-004	8/1/1994																	
UPDES	UT0022616-004	9/1/1994																	
UPDES	UT0022616-004	10/1/1994																	
UPDES	UT0022616-004	11/1/1994																	
UPDES	UT0022616-004	12/1/1994																	
UPDES	UT0022616-004	1/1/1995																	
UPDES	UT0022616-004	2/1/1995																	
UPDES	UT0022616-004	3/1/1995																	
UPDES	UT0022616-004	4/1/1995																	
UPDES	UT0022616-004	5/1/1995																	
UPDES	UT0022616-004	6/1/1995																	
UPDES	UT0022616-004	7/1/1995																	
UPDES	UT0022616-004	8/1/1995																	
UPDES	UT0022616-004	9/1/1995																	
UPDES	UT0022616-004	10/1/1995																	
UPDES	UT0022616-004	11/1/1995																	
UPDES	UT0022616-004	1/1/1996																	
UPDES	UT0022616-004	2/1/1996																	
UPDES	UT0022616-004	3/1/1996																	
UPDES	UT0022616-004	4/1/1996																	
UPDES	UT0022616-004	5/1/1996																	
UPDES	UT0022616-004	6/1/1996																	
UPDES	UT0022616-004	7/1/1996																	
UPDES	UT0022616-004	8/1/1996																	
UPDES	UT0022616-004	9/1/1996																	
UPDES	UT0022616-004	10/1/1996																	
UPDES	UT0022616-004	11/1/1996																	
UPDES	UT0022616-004	12/1/1996																	
UPDES	UT0022616-004	1/1/1997																	
UPDES	UT0022616-004	2/1/1997																	

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-004	3/1/1997					0																							
UPDES	UT0022616-004	4/1/1997					0																							
UPDES	UT0022616-004	5/1/1997					0																							
UPDES	UT0022616-004	6/1/1997					0																							
UPDES	UT0022616-004	7/1/1997					0																							
UPDES	UT0022616-004	8/15/1997					0																							
UPDES	UT0022616-004	9/15/1997					0																							
UPDES	UT0022616-004	10/15/1997					0																							
UPDES	UT0022616-004	11/15/1997					0																							
UPDES	UT0022616-004	12/15/1997					0																							
UPDES	UT0022616-004	1/15/1998					0																							
UPDES	UT0022616-004	2/15/1998					0																							
UPDES	UT0022616-004	3/15/1998					0																							
UPDES	UT0022616-004	4/15/1998					0																							
UPDES	UT0022616-004	5/15/1998					0																							
UPDES	UT0022616-004	6/15/1998					0																							
UPDES	UT0022616-004	7/15/1998					0																							
UPDES	UT0022616-004	8/15/1998					0																							
UPDES	UT0022616-004	9/15/1998					0																							
UPDES	UT0022616-004	10/15/1998					0																							
UPDES	UT0022616-004	11/15/1998					0																							
UPDES	UT0022616-004	12/15/1998					0																							
UPDES	UT0022616-004	1/15/1999					0																							
UPDES	UT0022616-004	2/15/1999					0																							
UPDES	UT0022616-004	3/15/1999					0																							
UPDES	UT0022616-004	4/15/1999					0																							
UPDES	UT0022616-004	9/15/1999					0																							
UPDES	UT0022616-004	10/15/1999					0																							
UPDES	UT0022616-004	11/15/1999					0																							
UPDES	UT0022616-004	7/10/2001	17.7	7.3		3420	365		<5.																					
UPDES	UT0022616-004	10/3/2001	16.1	7.6		3440	103.224		<5.																					
UPDES	UT0022616-004	2/15/2002					0																							
UPDES	UT0022616-004	4/15/2002					0																							
UPDES	UT0022616-004	5/15/2002					0																							
UPDES	UT0022616-004	6/19/2002	16.3	7.3		3400	310		<5.																					
UPDES	UT0022616-004	7/15/2002	16.6	7		3450	275		26																					
UPDES	UT0022616-004	8/8/2002	15.9	7.1		3360	305		5																					
UPDES	UT0022616-004	9/16/2002	18.5	7.5		5700	632.808		<5.																					
UPDES	UT0022616-004	6/30/2003					0																							
UPDES	UT0022616-004	7/31/2003					0																							
UPDES	UT0022616-004	8/29/2003					0																							
UPDES	UT0022616-004	9/16/2003	18.2	7.6		3.61	300		< 5.																					
UPDES	UT0022616-004	10/28/2003					0																							
UPDES	UT0022616-004	11/24/2003					0																							
UPDES	UT0022616-004	12/31/2003					0																							
UPDES	UT0022616-004	1/27/2004					0																							
UPDES	UT0022616-004	2/25/2004					0																							
UPDES	UT0022616-004	3/10/2004					0																							
UPDES	UT0022616-004	4/6/2004					0																							
UPDES	UT0022616-004	5/10/2004					0																							
UPDES	UT0022616-004	6/2/2004					0																							
UPDES	UT0022616-004	7/8/2004	19.6	7.5		3420	256		< 5.																					
UPDES	UT0022616-004	8/8/2004					0																							
UPDES	UT0022616-004	9/8/2004					0																							
UPDES	UT0022616-004	10/1/2004					0																							
UPDES	UT0022616-004	11/1/2004					0																							
UPDES	UT0022616-004	12/1/2004					0																							
UPDES	UT0022616-004	1/16/2005					0																							
UPDES	UT0022616-004	2/16/2005					0																							
UPDES	UT0022616-004	3/16/2005					0																							
UPDES	UT0022616-004	4/1/2005					0																							
UPDES	UT0022616-004	5/2/2005					0																							
UPDES	UT0022616-004	6/1/2005					0																							
UPDES	UT0022616-004	7/15/2005					0																							
UPDES	UT0022616-004	8/18/2005					0																							
UPDES	UT0022616-004	9/16/2005					0																							
UPDES	UT0022616-004	10/14/2005					0																							
UPDES	UT0022616-004	11/15/2005					0																							
UPDES	UT0022616-004	12/15/2005					0																							
UPDES	UT0022616-004	1/3/2006					0																							
UPDES	UT0022616-004	2/1/2006					0																							
UPDES	UT0022616-004	3/1/2006					0																							

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-004	3/1/1997																	
UPDES	UT0022616-004	4/1/1997																	
UPDES	UT0022616-004	5/1/1997																	
UPDES	UT0022616-004	6/1/1997																	
UPDES	UT0022616-004	7/1/1997																	
UPDES	UT0022616-004	8/15/1997																	
UPDES	UT0022616-004	9/15/1997																	
UPDES	UT0022616-004	10/15/1997																	
UPDES	UT0022616-004	11/15/1997																	
UPDES	UT0022616-004	12/15/1997																	
UPDES	UT0022616-004	1/15/1998																	
UPDES	UT0022616-004	2/15/1998																	
UPDES	UT0022616-004	3/15/1998																	
UPDES	UT0022616-004	4/15/1998																	
UPDES	UT0022616-004	5/15/1998																	
UPDES	UT0022616-004	6/15/1998																	
UPDES	UT0022616-004	7/15/1998																	
UPDES	UT0022616-004	8/15/1998																	
UPDES	UT0022616-004	9/15/1998																	
UPDES	UT0022616-004	10/15/1998																	
UPDES	UT0022616-004	11/15/1998																	
UPDES	UT0022616-004	12/15/1998																	
UPDES	UT0022616-004	1/15/1999																	
UPDES	UT0022616-004	2/15/1999																	
UPDES	UT0022616-004	3/15/1999																	
UPDES	UT0022616-004	4/15/1999																	
UPDES	UT0022616-004	9/15/1999																	
UPDES	UT0022616-004	10/15/1999																	
UPDES	UT0022616-004	11/15/1999																	
UPDES	UT0022616-004	7/10/2001								2451						<0.1			
UPDES	UT0022616-004	10/3/2001								2517						<0.1			
UPDES	UT0022616-004	2/15/2002																	
UPDES	UT0022616-004	4/15/2002																	
UPDES	UT0022616-004	5/15/2002																	
UPDES	UT0022616-004	6/19/2002								2414						<0.1			
UPDES	UT0022616-004	7/15/2002								2391						<0.1			
UPDES	UT0022616-004	8/8/2002								2369						0.1			
UPDES	UT0022616-004	9/16/2002								5936						<0.1			
UPDES	UT0022616-004	6/30/2003																	No Discharge
UPDES	UT0022616-004	7/31/2003																	
UPDES	UT0022616-004	8/29/2003																	
UPDES	UT0022616-004	9/16/2003								2475						1.44			
UPDES	UT0022616-004	10/28/2003																	
UPDES	UT0022616-004	11/24/2003																	
UPDES	UT0022616-004	12/31/2003																	
UPDES	UT0022616-004	1/27/2004																	
UPDES	UT0022616-004	2/25/2004																	
UPDES	UT0022616-004	3/10/2004																	
UPDES	UT0022616-004	4/6/2004																	
UPDES	UT0022616-004	5/10/2004																	
UPDES	UT0022616-004	6/2/2004																	
UPDES	UT0022616-004	7/8/2004								2413						0.63			
UPDES	UT0022616-004	8/8/2004																	
UPDES	UT0022616-004	9/8/2004																	
UPDES	UT0022616-004	10/1/2004																	Site was dry
UPDES	UT0022616-004	11/1/2004																	Site was dry
UPDES	UT0022616-004	12/1/2004																	Site was dry
UPDES	UT0022616-004	1/16/2005																	
UPDES	UT0022616-004	2/16/2005																	
UPDES	UT0022616-004	3/16/2005																	
UPDES	UT0022616-004	4/1/2005																	All Sites did not discharge during April
UPDES	UT0022616-004	5/2/2005																	No discharge in May
UPDES	UT0022616-004	6/1/2005																	No Discharge in June
UPDES	UT0022616-004	7/15/2005																	No Discharge for July
UPDES	UT0022616-004	8/18/2005																	No Discharge for August
UPDES	UT0022616-004	9/16/2005																	No Discharge for 3rd Quarter
UPDES	UT0022616-004	10/14/2005																	
UPDES	UT0022616-004	11/15/2005																	
UPDES	UT0022616-004	12/15/2005																	
UPDES	UT0022616-004	1/3/2006																	No Discharge in 1st. Quarter.
UPDES	UT0022616-004	2/1/2006																	No Discharge in February.
UPDES	UT0022616-004	3/1/2006																	No Discharge in March.

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-004	4/3/2006					0																							
UPDES	UT0022616-004	5/1/2006					0																							
UPDES	UT0022616-004	6/1/2006					0																							
UPDES	UT0022616-004	7/14/2006					0																							
UPDES	UT0022616-004	8/15/2006					0																							
UPDES	UT0022616-004	9/15/2006					0																							
UPDES	UT0022616-004	10/2/2006					0																							
UPDES	UT0022616-004	11/1/2006					0																							
UPDES	UT0022616-004	12/1/2006					0																							
		No. of Obs.:	8	8	0	8	152	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Maximum:	19.6	7.6	0	5700	632.808	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Minimum:	15.9	7	0	3.61	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Mean:	17.4	7.4	--	3274.2	16.6	--	15.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Std. Dev.:	1.3	0.2	--	1544.8	77.9	--	14.8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-004	4/3/2006																	No Discharge for the month of April
UPDES	UT0022616-004	5/1/2006																	No Discharge for the month of May
UPDES	UT0022616-004	6/1/2006																	No Discharge for the month of June
UPDES	UT0022616-004	7/14/2006																	
UPDES	UT0022616-004	8/15/2006																	
UPDES	UT0022616-004	9/15/2006																	
UPDES	UT0022616-004	10/2/2006																	
UPDES	UT0022616-004	11/1/2006																	
UPDES	UT0022616-004	12/1/2006																	
		No. of Obs.:	0	0	0	0	0	0	0	8	0	0	0	0	0	3	0	0	
		Maximum:	0	0	0	0	0	0	0	5936	0	0	0	0	0	1.44	0	0	
		Minimum:	0	0	0	0	0	0	0	2369	0	0	0	0	0	0.1	0	0	
		Mean:	--	--	--	--	--	--	--	2871	--	--	--	--	--	0.7	--	--	
		Std. Dev.:	--	--	--	--	--	--	--	1239	--	--	--	--	--	0.7	--	--	

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-005	9/1/1994					0																							
UPDES	UT0022616-005	10/1/1994					0																							
UPDES	UT0022616-005	11/1/1994					0																							
UPDES	UT0022616-005	12/1/1994					0																							
UPDES	UT0022616-005	1/1/1995					0																							
UPDES	UT0022616-005	2/1/1995					0																							
UPDES	UT0022616-005	3/1/1995					0																							
UPDES	UT0022616-005	4/1/1995					0																							
UPDES	UT0022616-005	5/1/1995					0																							
UPDES	UT0022616-005	6/1/1995					0																							
UPDES	UT0022616-005	7/1/1995					0																							
UPDES	UT0022616-005	8/1/1995					0																							
UPDES	UT0022616-005	9/1/1995					0																							
UPDES	UT0022616-005	10/1/1995					0																							
UPDES	UT0022616-005	11/1/1995					0																							
UPDES	UT0022616-005	1/1/1996					0																							
UPDES	UT0022616-005	2/1/1996					0																							
UPDES	UT0022616-005	3/1/1996					0																							
UPDES	UT0022616-005	4/1/1996					0																							
UPDES	UT0022616-005	5/1/1996					0																							
UPDES	UT0022616-005	6/1/1996					0																							
UPDES	UT0022616-005	7/1/1996					0																							
UPDES	UT0022616-005	8/1/1996					0																							
UPDES	UT0022616-005	9/1/1996					0																							
UPDES	UT0022616-005	10/1/1996					0																							
UPDES	UT0022616-005	11/1/1996					0																							
UPDES	UT0022616-005	12/1/1996					0																							
UPDES	UT0022616-005	1/1/1997					0																							
UPDES	UT0022616-005	2/1/1997					0																							
UPDES	UT0022616-005	3/1/1997					0																							
UPDES	UT0022616-005	4/1/1997					0																							
UPDES	UT0022616-005	5/1/1997					0																							
UPDES	UT0022616-005	6/1/1997					0																							
UPDES	UT0022616-005	7/1/1997					0																							
UPDES	UT0022616-005	8/15/1997					0																							
UPDES	UT0022616-005	9/15/1997					0																							
UPDES	UT0022616-005	10/15/1997					0																							
UPDES	UT0022616-005	11/15/1997					0																							
UPDES	UT0022616-005	12/15/1997					0																							
UPDES	UT0022616-005	1/15/1998					0																							
UPDES	UT0022616-005	2/15/1998					0																							
UPDES	UT0022616-005	3/15/1998					0																							
UPDES	UT0022616-005	4/15/1998					0																							
UPDES	UT0022616-005	5/15/1998					0																							
UPDES	UT0022616-005	6/15/1998					0																							
UPDES	UT0022616-005	7/15/1998					0																							
UPDES	UT0022616-005	8/15/1998					0																							
UPDES	UT0022616-005	9/15/1998					0																							
UPDES	UT0022616-005	10/15/1998					0																							
UPDES	UT0022616-005	11/15/1998					0																							
UPDES	UT0022616-005	12/15/1998					0																							
UPDES	UT0022616-005	1/15/1999					0																							
UPDES	UT0022616-005	2/15/1999					0																							
UPDES	UT0022616-005	3/15/1999					0																							
UPDES	UT0022616-005	4/15/1999					0																							
UPDES	UT0022616-005	9/15/1999					0																							
UPDES	UT0022616-005	10/15/1999					0																							
UPDES	UT0022616-005	11/15/1999					0																							
UPDES	UT0022616-005	2/15/2002					0																							
UPDES	UT0022616-005	4/15/2002					0																							
UPDES	UT0022616-005	5/15/2002					0																							
UPDES	UT0022616-005	6/15/2002					0																							
UPDES	UT0022616-005	6/30/2003					0																							
UPDES	UT0022616-005	8/29/2003					0																							
UPDES	UT0022616-005	9/3/2003					0																							
UPDES	UT0022616-005	9/16/2003					0																							
UPDES	UT0022616-005	10/28/2003					0																							
UPDES	UT0022616-005	11/24/2003					0																							
UPDES	UT0022616-005	12/31/2003					0																							
UPDES	UT0022616-005	1/27/2004					0																							
UPDES	UT0022616-005	2/25/2004					0																							
UPDES	UT0022616-005	3/10/2004					0																							

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-005	9/1/1994																	
UPDES	UT0022616-005	10/1/1994																	
UPDES	UT0022616-005	11/1/1994																	
UPDES	UT0022616-005	12/1/1994																	
UPDES	UT0022616-005	1/1/1995																	
UPDES	UT0022616-005	2/1/1995																	
UPDES	UT0022616-005	3/1/1995																	
UPDES	UT0022616-005	4/1/1995																	
UPDES	UT0022616-005	5/1/1995																	
UPDES	UT0022616-005	6/1/1995																	
UPDES	UT0022616-005	7/1/1995																	
UPDES	UT0022616-005	8/1/1995																	
UPDES	UT0022616-005	9/1/1995																	
UPDES	UT0022616-005	10/1/1995																	
UPDES	UT0022616-005	11/1/1995																	
UPDES	UT0022616-005	1/1/1996																	
UPDES	UT0022616-005	2/1/1996																	
UPDES	UT0022616-005	3/1/1996																	
UPDES	UT0022616-005	4/1/1996																	
UPDES	UT0022616-005	5/1/1996																	
UPDES	UT0022616-005	6/1/1996																	
UPDES	UT0022616-005	7/1/1996																	
UPDES	UT0022616-005	8/1/1996																	
UPDES	UT0022616-005	9/1/1996																	
UPDES	UT0022616-005	10/1/1996																	
UPDES	UT0022616-005	11/1/1996																	
UPDES	UT0022616-005	12/1/1996																	
UPDES	UT0022616-005	1/1/1997																	
UPDES	UT0022616-005	2/1/1997																	
UPDES	UT0022616-005	3/1/1997																	
UPDES	UT0022616-005	4/1/1997																	
UPDES	UT0022616-005	5/1/1997																	
UPDES	UT0022616-005	6/1/1997																	
UPDES	UT0022616-005	7/1/1997																	
UPDES	UT0022616-005	8/15/1997																	
UPDES	UT0022616-005	9/15/1997																	
UPDES	UT0022616-005	10/15/1997																	
UPDES	UT0022616-005	11/15/1997																	
UPDES	UT0022616-005	12/15/1997																	
UPDES	UT0022616-005	1/15/1998																	
UPDES	UT0022616-005	2/15/1998																	
UPDES	UT0022616-005	3/15/1998																	
UPDES	UT0022616-005	4/15/1998																	
UPDES	UT0022616-005	5/15/1998																	
UPDES	UT0022616-005	6/15/1998																	
UPDES	UT0022616-005	7/15/1998																	
UPDES	UT0022616-005	8/15/1998																	
UPDES	UT0022616-005	9/15/1998																	
UPDES	UT0022616-005	10/15/1998																	
UPDES	UT0022616-005	11/15/1998																	
UPDES	UT0022616-005	12/15/1998																	
UPDES	UT0022616-005	1/15/1999																	
UPDES	UT0022616-005	2/15/1999																	
UPDES	UT0022616-005	3/15/1999																	
UPDES	UT0022616-005	4/15/1999																	
UPDES	UT0022616-005	9/15/1999																	
UPDES	UT0022616-005	10/15/1999																	
UPDES	UT0022616-005	11/15/1999																	
UPDES	UT0022616-005	2/15/2002																	
UPDES	UT0022616-005	4/15/2002																	
UPDES	UT0022616-005	5/15/2002																	
UPDES	UT0022616-005	6/15/2002																	
UPDES	UT0022616-005	6/30/2003																	No Discharge
UPDES	UT0022616-005	8/29/2003																	
UPDES	UT0022616-005	9/3/2003																	
UPDES	UT0022616-005	9/16/2003																	
UPDES	UT0022616-005	10/28/2003																	
UPDES	UT0022616-005	11/24/2003																	
UPDES	UT0022616-005	12/31/2003																	
UPDES	UT0022616-005	1/27/2004																	
UPDES	UT0022616-005	2/25/2004																	
UPDES	UT0022616-005	3/10/2004																	

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-005	4/6/2004					0																							
UPDES	UT0022616-005	5/10/2004					0																							
UPDES	UT0022616-005	6/2/2004					0																							
UPDES	UT0022616-005	7/8/2004					0																							
UPDES	UT0022616-005	8/8/2004					0																							
UPDES	UT0022616-005	9/8/2004					0																							
UPDES	UT0022616-005	10/1/2004					0																							
UPDES	UT0022616-005	11/1/2004					0																							
UPDES	UT0022616-005	12/1/2004					0																							
UPDES	UT0022616-005	1/16/2005					0																							
UPDES	UT0022616-005	2/16/2005					0																							
UPDES	UT0022616-005	3/16/2005					0																							
UPDES	UT0022616-005	4/1/2005					0																							
UPDES	UT0022616-005	5/2/2005					0																							
UPDES	UT0022616-005	6/1/2005					0																							
UPDES	UT0022616-005	7/15/2005					0																							
UPDES	UT0022616-005	8/18/2005					0																							
UPDES	UT0022616-005	9/16/2005					0																							
UPDES	UT0022616-005	10/14/2005					0																							
UPDES	UT0022616-005	11/15/2005					0																							
UPDES	UT0022616-005	12/15/2005					0																							
UPDES	UT0022616-005	1/3/2006					0																							
UPDES	UT0022616-005	2/1/2006					0																							
UPDES	UT0022616-005	3/1/2006					0																							
UPDES	UT0022616-005	4/3/2006					0																							
UPDES	UT0022616-005	5/1/2006					0																							
UPDES	UT0022616-005	6/1/2006					0																							
UPDES	UT0022616-005	7/14/2006					0																							
UPDES	UT0022616-005	8/15/2006					0																							
UPDES	UT0022616-005	9/15/2006					0																							
UPDES	UT0022616-005	10/2/2006					0																							
UPDES	UT0022616-005	11/1/2006					0																							
UPDES	UT0022616-005	12/1/2006					0																							
		No. of Obs.:					105																							
		Maximum:					0																							
		Minimum:					0																							
		Mean:					0																							
		Std. Dev.:					--																							

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-005	4/6/2004																	
UPDES	UT0022616-005	5/10/2004																	
UPDES	UT0022616-005	6/2/2004																	
UPDES	UT0022616-005	7/8/2004																	
UPDES	UT0022616-005	8/8/2004																	
UPDES	UT0022616-005	9/8/2004																	
UPDES	UT0022616-005	10/1/2004																	Site was dry
UPDES	UT0022616-005	11/1/2004																	Site was dry
UPDES	UT0022616-005	12/1/2004																	Site was dry
UPDES	UT0022616-005	1/16/2005																	
UPDES	UT0022616-005	2/16/2005																	
UPDES	UT0022616-005	3/16/2005																	
UPDES	UT0022616-005	4/1/2005																	All Sites did not discharge during April
UPDES	UT0022616-005	5/2/2005																	No discharge in May
UPDES	UT0022616-005	6/1/2005																	No Discharge in June
UPDES	UT0022616-005	7/15/2005																	No Discharge for July
UPDES	UT0022616-005	8/18/2005																	No Discharge for August
UPDES	UT0022616-005	9/16/2005																	No Discharge for 3rd Quarter
UPDES	UT0022616-005	10/14/2005																	
UPDES	UT0022616-005	11/15/2005																	
UPDES	UT0022616-005	12/15/2005																	
UPDES	UT0022616-005	1/3/2006																	No Discharge in 1st. Quarter.
UPDES	UT0022616-005	2/1/2006																	No Discharge in February.
UPDES	UT0022616-005	3/1/2006																	No Discharge in March.
UPDES	UT0022616-005	4/3/2006																	No Discharge for the month of April
UPDES	UT0022616-005	5/1/2006																	No Discharge for the month of May
UPDES	UT0022616-005	6/1/2006																	No Discharge for the month of June
UPDES	UT0022616-005	7/14/2006																	
UPDES	UT0022616-005	8/15/2006																	
UPDES	UT0022616-005	9/15/2006																	
UPDES	UT0022616-005	10/2/2006																	
UPDES	UT0022616-005	11/1/2006																	
UPDES	UT0022616-005	12/1/2006																	
		No. of Obs.:																	
		Maximum:																	
		Minimum:																	
		Mean:																	
		Std. Dev.:																	

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-006	9/1/1994					0																							
UPDES	UT0022616-006	10/1/1994					0																							
UPDES	UT0022616-006	11/1/1994					0																							
UPDES	UT0022616-006	12/1/1994					0																							
UPDES	UT0022616-006	1/1/1995					0																							
UPDES	UT0022616-006	2/1/1995					0																							
UPDES	UT0022616-006	3/1/1995					0																							
UPDES	UT0022616-006	4/1/1995					0																							
UPDES	UT0022616-006	5/1/1995					0																							
UPDES	UT0022616-006	6/1/1995					0																							
UPDES	UT0022616-006	7/1/1995					0																							
UPDES	UT0022616-006	8/1/1995					0																							
UPDES	UT0022616-006	9/1/1995					0																							
UPDES	UT0022616-006	10/1/1995					0																							
UPDES	UT0022616-006	11/1/1995					0																							
UPDES	UT0022616-006	1/1/1996					0																							
UPDES	UT0022616-006	2/1/1996					0																							
UPDES	UT0022616-006	3/1/1996					0																							
UPDES	UT0022616-006	4/1/1996					0																							
UPDES	UT0022616-006	5/1/1996					0																							
UPDES	UT0022616-006	6/1/1996					0																							
UPDES	UT0022616-006	7/1/1996					0																							
UPDES	UT0022616-006	8/1/1996					0																							
UPDES	UT0022616-006	9/1/1996					0																							
UPDES	UT0022616-006	10/1/1996					0																							
UPDES	UT0022616-006	11/1/1996					0																							
UPDES	UT0022616-006	12/1/1996					0																							
UPDES	UT0022616-006	1/1/1997					0																							
UPDES	UT0022616-006	2/1/1997					0																							
UPDES	UT0022616-006	3/1/1997					0																							
UPDES	UT0022616-006	4/1/1997					0																							
UPDES	UT0022616-006	5/1/1997					0																							
UPDES	UT0022616-006	6/1/1997					0																							
UPDES	UT0022616-006	7/1/1997					0																							
UPDES	UT0022616-006	8/15/1997					0																							
UPDES	UT0022616-006	9/15/1997					0																							
UPDES	UT0022616-006	10/15/1997					0																							
UPDES	UT0022616-006	11/15/1997					0																							
UPDES	UT0022616-006	12/15/1997					0																							
UPDES	UT0022616-006	1/15/1998					0																							
UPDES	UT0022616-006	2/15/1998					0																							
UPDES	UT0022616-006	3/15/1998					0																							
UPDES	UT0022616-006	4/15/1998					0																							
UPDES	UT0022616-006	5/15/1998					0																							
UPDES	UT0022616-006	6/15/1998					0																							
UPDES	UT0022616-006	7/15/1998					0																							
UPDES	UT0022616-006	8/15/1998					0																							
UPDES	UT0022616-006	9/15/1998					0																							
UPDES	UT0022616-006	10/15/1998					0																							
UPDES	UT0022616-006	11/15/1998					0																							
UPDES	UT0022616-006	12/15/1998					0																							
UPDES	UT0022616-006	1/15/1999					0																							
UPDES	UT0022616-006	2/15/1999					0																							
UPDES	UT0022616-006	3/15/1999					0																							
UPDES	UT0022616-006	4/15/1999					0																							
UPDES	UT0022616-006	9/15/1999					0																							
UPDES	UT0022616-006	10/15/1999					0																							
UPDES	UT0022616-006	11/15/1999					0																							
UPDES	UT0022616-006	2/15/2002					0																							
UPDES	UT0022616-006	4/15/2002					0																							
UPDES	UT0022616-006	5/15/2002					0																							
UPDES	UT0022616-006	6/15/2002					0																							
UPDES	UT0022616-006	6/30/2003					0																							
UPDES	UT0022616-006	7/31/2003					0																							
UPDES	UT0022616-006	8/29/2003					0																							
UPDES	UT0022616-006	9/16/2003					0																							
UPDES	UT0022616-006	10/28/2003					0																							
UPDES	UT0022616-006	11/24/2003					0																							
UPDES	UT0022616-006	12/31/2003					0																							
UPDES	UT0022616-006	1/27/2004					0																							
UPDES	UT0022616-006	2/25/2004					0																							
UPDES	UT0022616-006	3/10/2004					0																							

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-006	9/1/1994																	
UPDES	UT0022616-006	10/1/1994																	
UPDES	UT0022616-006	11/1/1994																	
UPDES	UT0022616-006	12/1/1994																	
UPDES	UT0022616-006	1/1/1995																	
UPDES	UT0022616-006	2/1/1995																	
UPDES	UT0022616-006	3/1/1995																	
UPDES	UT0022616-006	4/1/1995																	
UPDES	UT0022616-006	5/1/1995																	
UPDES	UT0022616-006	6/1/1995																	
UPDES	UT0022616-006	7/1/1995																	
UPDES	UT0022616-006	8/1/1995																	
UPDES	UT0022616-006	9/1/1995																	
UPDES	UT0022616-006	10/1/1995																	
UPDES	UT0022616-006	11/1/1995																	
UPDES	UT0022616-006	1/1/1996																	
UPDES	UT0022616-006	2/1/1996																	
UPDES	UT0022616-006	3/1/1996																	
UPDES	UT0022616-006	4/1/1996																	
UPDES	UT0022616-006	5/1/1996																	
UPDES	UT0022616-006	6/1/1996																	
UPDES	UT0022616-006	7/1/1996																	
UPDES	UT0022616-006	8/1/1996																	
UPDES	UT0022616-006	9/1/1996																	
UPDES	UT0022616-006	10/1/1996																	
UPDES	UT0022616-006	11/1/1996																	
UPDES	UT0022616-006	12/1/1996																	
UPDES	UT0022616-006	1/1/1997																	
UPDES	UT0022616-006	2/1/1997																	
UPDES	UT0022616-006	3/1/1997																	
UPDES	UT0022616-006	4/1/1997																	
UPDES	UT0022616-006	5/1/1997																	
UPDES	UT0022616-006	6/1/1997																	
UPDES	UT0022616-006	7/1/1997																	
UPDES	UT0022616-006	8/15/1997																	
UPDES	UT0022616-006	9/15/1997																	
UPDES	UT0022616-006	10/15/1997																	
UPDES	UT0022616-006	11/15/1997																	
UPDES	UT0022616-006	12/15/1997																	
UPDES	UT0022616-006	1/15/1998																	
UPDES	UT0022616-006	2/15/1998																	
UPDES	UT0022616-006	3/15/1998																	
UPDES	UT0022616-006	4/15/1998																	
UPDES	UT0022616-006	5/15/1998																	
UPDES	UT0022616-006	6/15/1998																	
UPDES	UT0022616-006	7/15/1998																	
UPDES	UT0022616-006	8/15/1998																	
UPDES	UT0022616-006	9/15/1998																	
UPDES	UT0022616-006	10/15/1998																	
UPDES	UT0022616-006	11/15/1998																	
UPDES	UT0022616-006	12/15/1998																	
UPDES	UT0022616-006	1/15/1999																	
UPDES	UT0022616-006	2/15/1999																	
UPDES	UT0022616-006	3/15/1999																	
UPDES	UT0022616-006	4/15/1999																	
UPDES	UT0022616-006	9/15/1999																	
UPDES	UT0022616-006	10/15/1999																	
UPDES	UT0022616-006	11/15/1999																	
UPDES	UT0022616-006	2/15/2002																	
UPDES	UT0022616-006	4/15/2002																	
UPDES	UT0022616-006	5/15/2002																	
UPDES	UT0022616-006	6/15/2002																	
UPDES	UT0022616-006	6/30/2003																	No Discharge
UPDES	UT0022616-006	7/31/2003																	
UPDES	UT0022616-006	8/29/2003																	
UPDES	UT0022616-006	9/16/2003																	
UPDES	UT0022616-006	10/28/2003																	
UPDES	UT0022616-006	11/24/2003																	
UPDES	UT0022616-006	12/31/2003																	
UPDES	UT0022616-006	1/27/2004																	
UPDES	UT0022616-006	2/25/2004																	
UPDES	UT0022616-006	3/10/2004																	

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-006	4/6/2004					0																							
UPDES	UT0022616-006	5/10/2004					0																							
UPDES	UT0022616-006	6/2/2004					0																							
UPDES	UT0022616-006	7/8/2004					0																							
UPDES	UT0022616-006	8/8/2004					0																							
UPDES	UT0022616-006	9/8/2004					0																							
UPDES	UT0022616-006	10/1/2004					0																							
UPDES	UT0022616-006	11/1/2004					0																							
UPDES	UT0022616-006	12/1/2004					0																							
UPDES	UT0022616-006	1/16/2005					0																							
UPDES	UT0022616-006	2/16/2005					0																							
UPDES	UT0022616-006	3/16/2005					0																							
UPDES	UT0022616-006	4/1/2005					0																							
UPDES	UT0022616-006	5/2/2005					0																							
UPDES	UT0022616-006	6/1/2005					0																							
UPDES	UT0022616-006	7/15/2005					0																							
UPDES	UT0022616-006	8/18/2005					0																							
UPDES	UT0022616-006	9/16/2005					0																							
UPDES	UT0022616-006	10/14/2005					0																							
UPDES	UT0022616-006	11/15/2005					0																							
UPDES	UT0022616-006	12/15/2005					0																							
UPDES	UT0022616-006	1/3/2006					0																							
UPDES	UT0022616-006	2/1/2006					0																							
UPDES	UT0022616-006	3/1/2006					0																							
UPDES	UT0022616-006	4/3/2006					0																							
UPDES	UT0022616-006	5/1/2006					0																							
UPDES	UT0022616-006	6/1/2006					0																							
UPDES	UT0022616-006	7/14/2006					0																							
UPDES	UT0022616-006	8/15/2006					0																							
UPDES	UT0022616-006	9/15/2006					0																							
UPDES	UT0022616-006	10/2/2006					0																							
UPDES	UT0022616-006	11/1/2006					0																							
UPDES	UT0022616-006	12/1/2006					0																							
		No. of Obs.:					105																							
		Maximum:					0																							
		Minimum:					0																							
		Mean:					0																							
		Std. Dev.:					--																							

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-006	4/6/2004																	
UPDES	UT0022616-006	5/10/2004																	
UPDES	UT0022616-006	6/2/2004																	
UPDES	UT0022616-006	7/8/2004																	
UPDES	UT0022616-006	8/8/2004																	
UPDES	UT0022616-006	9/8/2004																	
UPDES	UT0022616-006	10/1/2004																	Site was dry
UPDES	UT0022616-006	11/1/2004																	Site was dry
UPDES	UT0022616-006	12/1/2004																	Site was dry
UPDES	UT0022616-006	1/16/2005																	
UPDES	UT0022616-006	2/16/2005																	
UPDES	UT0022616-006	3/16/2005																	
UPDES	UT0022616-006	4/1/2005																	All Sites did not discharge during April
UPDES	UT0022616-006	5/2/2005																	No discharge in May
UPDES	UT0022616-006	6/1/2005																	No Discharge in June
UPDES	UT0022616-006	7/15/2005																	No Discharge for July
UPDES	UT0022616-006	8/18/2005																	No Discharge for August
UPDES	UT0022616-006	9/16/2005																	No Discharge for 3rd Quarter
UPDES	UT0022616-006	10/14/2005																	
UPDES	UT0022616-006	11/15/2005																	
UPDES	UT0022616-006	12/15/2005																	
UPDES	UT0022616-006	1/3/2006																	No Discharge in 1st. Quarter.
UPDES	UT0022616-006	2/1/2006																	No Discharge in February.
UPDES	UT0022616-006	3/1/2006																	No Discharge in March.
UPDES	UT0022616-006	4/3/2006																	No Discharge for the month of April
UPDES	UT0022616-006	5/1/2006																	No Discharge for the month of May
UPDES	UT0022616-006	6/1/2006																	No Discharge for the month of June
UPDES	UT0022616-006	7/14/2006																	
UPDES	UT0022616-006	8/15/2006																	
UPDES	UT0022616-006	9/15/2006																	
UPDES	UT0022616-006	10/2/2006																	
UPDES	UT0022616-006	11/1/2006																	
UPDES	UT0022616-006	12/1/2006																	
		No. of Obs.:																	
		Maximum:																	
		Minimum:																	
		Mean:																	
		Std. Dev.:																	

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM	L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-007	6/1/1994					0																							
UPDES	UT0022616-007	8/1/1994					0																							
UPDES	UT0022616-007	9/1/1994					0																							
UPDES	UT0022616-007	10/1/1994					0																							
UPDES	UT0022616-007	11/1/1994					0																							
UPDES	UT0022616-007	12/1/1994					0																							
UPDES	UT0022616-007	1/1/1995					0																							
UPDES	UT0022616-007	2/1/1995					0																							
UPDES	UT0022616-007	3/1/1995					0																							
UPDES	UT0022616-007	4/1/1995					0																							
UPDES	UT0022616-007	5/1/1995					0																							
UPDES	UT0022616-007	6/1/1995					0																							
UPDES	UT0022616-007	7/1/1995					0																							
UPDES	UT0022616-007	8/1/1995					0																							
UPDES	UT0022616-007	9/1/1995					0																							
UPDES	UT0022616-007	10/1/1995					0																							
UPDES	UT0022616-007	11/1/1995					0																							
UPDES	UT0022616-007	1/1/1996					0																							
UPDES	UT0022616-007	2/1/1996					0																							
UPDES	UT0022616-007	3/1/1996					0																							
UPDES	UT0022616-007	4/1/1996					0																							
UPDES	UT0022616-007	5/1/1996					0																							
UPDES	UT0022616-007	6/1/1996					0																							
UPDES	UT0022616-007	7/1/1996					0																							
UPDES	UT0022616-007	8/1/1996					0																							
UPDES	UT0022616-007	9/1/1996					0																							
UPDES	UT0022616-007	10/1/1996					0																							
UPDES	UT0022616-007	11/1/1996					0																							
UPDES	UT0022616-007	12/1/1996					0																							
UPDES	UT0022616-007	1/1/1997					0																							
UPDES	UT0022616-007	2/1/1997					0																							
UPDES	UT0022616-007	3/1/1997					0																							
UPDES	UT0022616-007	4/1/1997					0																							
UPDES	UT0022616-007	4/21/1997					0																							
UPDES	UT0022616-007	5/1/1997					0																							
UPDES	UT0022616-007	6/1/1997					0																							
UPDES	UT0022616-007	7/29/1997	18.1	8.1		990	112		49																					
UPDES	UT0022616-007	8/15/1997					0																							
UPDES	UT0022616-007	9/15/1997					0																							
UPDES	UT0022616-007	10/15/1997					0																							
UPDES	UT0022616-007	11/15/1997					0																							
UPDES	UT0022616-007	12/15/1997					0																							
UPDES	UT0022616-007	1/15/1998					0																							
UPDES	UT0022616-007	2/15/1998					0																							
UPDES	UT0022616-007	3/15/1998					0																							
UPDES	UT0022616-007	4/15/1998					0																							
UPDES	UT0022616-007	5/15/1998					0																							
UPDES	UT0022616-007	6/15/1998					0																							
UPDES	UT0022616-007	7/15/1998					0																							
UPDES	UT0022616-007	8/15/1998					0																							
UPDES	UT0022616-007	9/15/1998					0																							
UPDES	UT0022616-007	10/15/1998					0																							
UPDES	UT0022616-007	11/15/1998					0																							
UPDES	UT0022616-007	12/15/1998					0																							
UPDES	UT0022616-007	1/15/1999					0																							
UPDES	UT0022616-007	2/15/1999					0																							
UPDES	UT0022616-007	3/15/1999					0																							
UPDES	UT0022616-007	4/15/1999					0																							
UPDES	UT0022616-007	9/15/1999					0																							
UPDES	UT0022616-007	10/15/1999					0																							
UPDES	UT0022616-007	11/15/1999					0																							
UPDES	UT0022616-007	1/15/2002					0																							
UPDES	UT0022616-007	2/15/2002					0																							
UPDES	UT0022616-007	4/15/2002					0																							
UPDES	UT0022616-007	5/15/2002					0																							
UPDES	UT0022616-007	6/15/2002					0																							
UPDES	UT0022616-007	7/15/2002					0																							
UPDES	UT0022616-007	8/8/2002					0																							
UPDES	UT0022616-007	9/16/2002					0																							
UPDES	UT0022616-007	6/30/2003					0																							
UPDES	UT0022616-007	7/31/2003					0																							
UPDES	UT0022616-007	9/16/2003					0																							

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-007	6/1/1994																	
UPDES	UT0022616-007	8/1/1994																	
UPDES	UT0022616-007	9/1/1994																	
UPDES	UT0022616-007	10/1/1994																	
UPDES	UT0022616-007	11/1/1994																	
UPDES	UT0022616-007	12/1/1994																	
UPDES	UT0022616-007	1/1/1995																	
UPDES	UT0022616-007	2/1/1995																	
UPDES	UT0022616-007	3/1/1995																	
UPDES	UT0022616-007	4/1/1995																	
UPDES	UT0022616-007	5/1/1995																	
UPDES	UT0022616-007	6/1/1995																	
UPDES	UT0022616-007	7/1/1995																	
UPDES	UT0022616-007	8/1/1995																	
UPDES	UT0022616-007	9/1/1995																	
UPDES	UT0022616-007	10/1/1995																	
UPDES	UT0022616-007	11/1/1995																	
UPDES	UT0022616-007	1/1/1996																	
UPDES	UT0022616-007	2/1/1996																	
UPDES	UT0022616-007	3/1/1996																	
UPDES	UT0022616-007	4/1/1996																	
UPDES	UT0022616-007	5/1/1996																	
UPDES	UT0022616-007	6/1/1996																	
UPDES	UT0022616-007	7/1/1996																	
UPDES	UT0022616-007	8/1/1996																	
UPDES	UT0022616-007	9/1/1996																	
UPDES	UT0022616-007	10/1/1996																	
UPDES	UT0022616-007	11/1/1996																	
UPDES	UT0022616-007	12/1/1996																	
UPDES	UT0022616-007	1/1/1997																	
UPDES	UT0022616-007	2/1/1997																	
UPDES	UT0022616-007	3/1/1997																	
UPDES	UT0022616-007	4/1/1997																	
UPDES	UT0022616-007	4/21/1997																	
UPDES	UT0022616-007	5/1/1997																	
UPDES	UT0022616-007	6/1/1997																	
UPDES	UT0022616-007	7/29/1997								720	<0.5					0.4			
UPDES	UT0022616-007	8/15/1997																	
UPDES	UT0022616-007	9/15/1997																	
UPDES	UT0022616-007	10/15/1997																	
UPDES	UT0022616-007	11/15/1997																	
UPDES	UT0022616-007	12/15/1997																	
UPDES	UT0022616-007	1/15/1998																	
UPDES	UT0022616-007	2/15/1998																	
UPDES	UT0022616-007	3/15/1998																	
UPDES	UT0022616-007	4/15/1998																	
UPDES	UT0022616-007	5/15/1998																	
UPDES	UT0022616-007	6/15/1998																	
UPDES	UT0022616-007	7/15/1998																	
UPDES	UT0022616-007	8/15/1998																	
UPDES	UT0022616-007	9/15/1998																	
UPDES	UT0022616-007	10/15/1998																	
UPDES	UT0022616-007	11/15/1998																	
UPDES	UT0022616-007	12/15/1998																	
UPDES	UT0022616-007	1/15/1999																	
UPDES	UT0022616-007	2/15/1999																	
UPDES	UT0022616-007	3/15/1999																	
UPDES	UT0022616-007	4/15/1999																	
UPDES	UT0022616-007	9/15/1999																	
UPDES	UT0022616-007	10/15/1999																	
UPDES	UT0022616-007	11/15/1999																	
UPDES	UT0022616-007	1/15/2002																	
UPDES	UT0022616-007	2/15/2002																	
UPDES	UT0022616-007	4/15/2002																	
UPDES	UT0022616-007	5/15/2002																	
UPDES	UT0022616-007	6/15/2002																	
UPDES	UT0022616-007	7/15/2002																	
UPDES	UT0022616-007	8/8/2002																	
UPDES	UT0022616-007	9/16/2002																	
UPDES	UT0022616-007	6/30/2003																	No Discharge
UPDES	UT0022616-007	7/31/2003																	
UPDES	UT0022616-007	9/16/2003																	

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	Wat. Temp Deg. C	F-pH pH units	F-D.O. mg/l	Cond(FLD) umhos/cm	Flow GPM		L-pH pH units	TSS mg/l	O/G mg/l	NH3 mg/l	D-As mg/l	D-B mg/l	D-Cd mg/l	D-Ca mg/l	D-Cu mg/l	D-Fe mg/l	D-Pb mg/l	D-Mg mg/l	D-Mn mg/l	D-K mg/l	D-Se mg/l	D-Na mg/l	D-Zn mg/l	Bicarb mg/l	Acidity mg/l	Carb mg/l	Cl mg/l	Hydroxide mg/l	NO3 mg/l
UPDES	UT0022616-007	10/28/2003					0																								
UPDES	UT0022616-007	11/24/2003					0																								
UPDES	UT0022616-007	12/31/2003					0																								
UPDES	UT0022616-007	1/27/2004					0																								
UPDES	UT0022616-007	2/25/2004					0																								
UPDES	UT0022616-007	3/10/2004					0																								
UPDES	UT0022616-007	4/6/2004					0																								
UPDES	UT0022616-007	5/10/2004					0																								
UPDES	UT0022616-007	6/2/2004					0																								
UPDES	UT0022616-007	7/8/2004					0																								
UPDES	UT0022616-007	8/8/2004					0																								
UPDES	UT0022616-007	9/8/2004					0																								
UPDES	UT0022616-007	10/1/2004					0																								
UPDES	UT0022616-007	11/1/2004					0																								
UPDES	UT0022616-007	12/1/2004					0																								
UPDES	UT0022616-007	1/16/2005					0																								
UPDES	UT0022616-007	2/16/2005					0																								
UPDES	UT0022616-007	3/16/2005					0																								
UPDES	UT0022616-007	4/1/2005					0																								
UPDES	UT0022616-007	5/2/2005					0																								
UPDES	UT0022616-007	6/1/2005					0																								
UPDES	UT0022616-007	7/15/2005					0																								
UPDES	UT0022616-007	8/18/2005					0																								
UPDES	UT0022616-007	9/16/2005					0																								
UPDES	UT0022616-007	10/14/2005					0																								
UPDES	UT0022616-007	11/15/2005					0																								
UPDES	UT0022616-007	12/15/2005					0																								
UPDES	UT0022616-007	1/3/2006					0																								
UPDES	UT0022616-007	2/1/2006					0																								
UPDES	UT0022616-007	3/1/2006					0																								
UPDES	UT0022616-007	4/3/2006					0																								
UPDES	UT0022616-007	5/1/2006					0																								
UPDES	UT0022616-007	6/1/2006					0																								
UPDES	UT0022616-007	7/14/2006					0																								
UPDES	UT0022616-007	8/15/2006					0																								
UPDES	UT0022616-007	9/15/2006					0																								
UPDES	UT0022616-007	10/17/2006	5.4	9.1		263	20			387	0																				
UPDES	UT0022616-007	11/1/2006					0																								
UPDES	UT0022616-007	12/1/2006					0																								
		No. of Obs.:	2	2	0	2	111		0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Maximum:	18.1	9.1	0	990	112.2		0	387	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Minimum:	5.4	8.1	0	263	0		0	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Mean:	11.8	8.6	--	626.5	1.2		--	218.0	0.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
		Std. Dev.:	9.0	0.7	--	514.1	10.8		--	239.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Emery Mine UPDES Data

SITE TYPE	SITE NAME	DATE	NO2 mg/l	O-PO4 mg/l	SO4 mg/l	T-P mg/l	T-Alk mg/l	T-Hardns mg/l	L-Sp. Cond umhos/cm	TDS mg/l	Set Solids ml/l	D-Al mg/l	D-Mb mg/l	T-Cats meq/l	T-Anis meq/l	T-Fe mg/l	T-Mn mg/l	T-Mg mg/l	COMMENTS
UPDES	UT0022616-007	10/28/2003																	
UPDES	UT0022616-007	11/24/2003																	
UPDES	UT0022616-007	12/31/2003																	
UPDES	UT0022616-007	1/27/2004																	
UPDES	UT0022616-007	2/25/2004																	
UPDES	UT0022616-007	3/10/2004																	
UPDES	UT0022616-007	4/6/2004																	
UPDES	UT0022616-007	5/10/2004																	
UPDES	UT0022616-007	6/2/2004																	
UPDES	UT0022616-007	7/8/2004																	
UPDES	UT0022616-007	8/8/2004																	
UPDES	UT0022616-007	9/8/2004																	
UPDES	UT0022616-007	10/1/2004																	
UPDES	UT0022616-007	11/1/2004																	Site was dry
UPDES	UT0022616-007	12/1/2004																	Site was dry
UPDES	UT0022616-007	1/16/2005																	Site was dry
UPDES	UT0022616-007	2/16/2005																	
UPDES	UT0022616-007	3/16/2005																	
UPDES	UT0022616-007	4/1/2005																	
UPDES	UT0022616-007	5/2/2005																	All Sites did not discharge during April
UPDES	UT0022616-007	6/1/2005																	No discharge in May
UPDES	UT0022616-007	7/15/2005																	No Discharge in June
UPDES	UT0022616-007	8/18/2005																	No Discharge for July
UPDES	UT0022616-007	9/16/2005																	No Discharge for August
UPDES	UT0022616-007	10/14/2005																	No Discharge for 3rd Quarter
UPDES	UT0022616-007	11/15/2005																	
UPDES	UT0022616-007	12/15/2005																	
UPDES	UT0022616-007	1/3/2006																	
UPDES	UT0022616-007	2/1/2006																	No Discharge in 1st. Quarter.
UPDES	UT0022616-007	3/1/2006																	No Discharge in February.
UPDES	UT0022616-007	4/3/2006																	No Discharge in March.
UPDES	UT0022616-007	5/1/2006																	No Discharge for the month of April
UPDES	UT0022616-007	6/1/2006																	No Discharge for the month of May
UPDES	UT0022616-007	7/14/2006																	No Discharge for the month of June
UPDES	UT0022616-007	8/15/2006																	
UPDES	UT0022616-007	9/15/2006																	
UPDES	UT0022616-007	10/17/2006								186	0.1					6.04			
UPDES	UT0022616-007	11/1/2006																	
UPDES	UT0022616-007	12/1/2006																	
		No. of Obs.:	0	0	0	0	0	0	0	2	1	0	0	0	0	2	0	0	
		Maximum:	0	0	0	0	0	0	0	720	0.1	0	0	0	0	6.04	0	0	
		Minimum:	0	0	0	0	0	0	0	186	0.1	0	0	0	0	0.4	0	0	
		Mean:	--	--	--	--	--	--	--	453.0	0.1	--	--	--	--	3.2	--	--	
		Std. Dev.:	--	--	--	--	--	--	--	377.6	--	--	--	--	--	4.0	--	--	

Emery Mine TDS Discharge Summary

		NPDES 001					NPDES 003					Monthly Summary					
Date	Days In Month	Flow cfs	TSS mg/L	Iron mg/L	TDS mg/L	TDS-Saltload Tons/day	Flow cfs	TSS mg/L	Iron mg/L	TDS mg/L	TDS-Saltload Tons/day	Flow cfs	TSS mg/L	Iron mg/L	TDS mg/L	TDS-Saltload Tons/day	Comments
Jan-00	31	0.330	5	0.40	3853	3.40	0.700	5	0.10	2511	4.70	1.030	5	0.20	2941	8.10	
Feb-00	29	0.330	5	0.30	3853	3.30	0.720	5	0.10	2496	4.80	1.050	5	0.16	2922	8.10	
Mar-00	31	0.320	5	0.30	3697	3.20	0.740	5	0.10	2551	5.10	1.060	5	0.16	2897	8.30	
Apr-00	30	0.310	6	0.20	3697	3.10	0.740	5	0.10	2519	5.00	1.050	5	0.13	2867	8.10	
May-00	31	0.280	5	0.10	3876	4.20	0.640	7	0.10	2616	4.60	0.920	6	0.10	2999	8.80	
Jun-00	30	0.290	5	0.10	4087	2.90	0.450	6	0.10	2549	1.20	0.740	6	0.10	3152	4.10	
Jul-00	31	0.280	5	0.10	3860	2.90	0.370	5	0.10	2661	1.40	0.650	5	0.10	3177	4.30	
Aug-00	31	0.240	6	0.10	4032	2.90	0.310	8	0.10	2512	1.80	0.550	7	0.10	3175	4.70	
Sep-00	30	0.510	5	0.10	4153	5.70	0.670	5	1.30	2549	4.30	1.180	5	0.78	3242	10.00	Pump 3 restarted
Oct-00	31	0.470	5	0.10	3626	5.10	0.620	8	0.70	2590	4.10	1.090	7	0.44	3037	9.20	
Nov-00	30	0.280	5	0.10	3938	3.00	0.650	5	0.30	2433	4.30	0.930	5	0.24	2886	7.30	
Dec-00	31	0.270	8	0.10	3949	2.90	0.640	5	0.10	2524	4.40	0.910	6	0.10	2947	7.30	
2000 Summary		**0.326**	**6**	**0.17**	**3883**	**1299.30**	**0.606**	**6**	**0.28**	**2538**	**1392.30**	**0.931**	**6**	**0.24**	**3009**	**2691.60**	
Jan-01	31	0.300	5	0.20	4056	3.30	0.640	5	0.10	2493	4.30	0.940	5	0.13	2992	7.60	
Feb-01	28	0.300	5	0.30	4024	3.30	0.680	5	0.10	2502	4.60	0.980	5	0.16	2968	7.90	
Mar-01	31	0.300	5	0.40	3982	3.20	0.570	5	0.10	2460	3.80	0.870	5	0.20	2985	7.00	
Apr-01	30	0.300	5	0.20	4071	3.30	0.670	5	0.10	2460	4.40	0.970	5	0.13	2958	7.70	
May-01	31	0.320	5	0.10	4054	3.20	0.600	5	0.10	2399	3.80	0.920	5	0.10	2975	7.00	
Jun-01	30	0.330	5	0.10	4179	3.70	0.600	5	0.10	2417	3.80	0.930	5	0.10	3042	7.50	
Jul-01	31	0.330	5	0.10	4256	3.80	0.370	5	0.10	2459	1.50	0.700	5	0.10	3306	5.30	
Aug-01	31	0.330	13	0.10	4118	3.70	0.390	5	0.10	2436	2.00	0.720	9	0.10	3207	5.70	
Sep-01	30	0.340	5	0.10	4140	3.70	0.280	5	0.10	2464	1.40	0.620	5	0.10	3383	5.10	
Oct-01	31	0.340	5	0.10	4201	3.90	0.330	5	0.10	2517	2.40	0.670	5	0.10	3372	6.30	
Nov-01	30	0.280	5	0.10	4044	3.10	0.530	5	0.10	2458	3.50	0.810	5	0.10	3006	6.60	
Dec-01	31	0.340	5	0.10	4069	3.70	0.530	5	0.10	2450	3.50	0.870	5	0.10	3083	7.20	
2001 Summary		**0.318**	**6**	**0.16**	**4103**	**1275.20**	**0.514**	**5**	**0.10**	**2459**	**1182.10**	**0.832**	**5**	**0.12**	**3085**	**2457.30**	
Jan-02	31	0.380	5	0.30	4020	4.10	0.530	5	0.10	2459	3.50	0.910	5	0.18	3111	7.60	
Feb-02	28	0.250	5	0.30	4139	2.80	0.530	5	0.20	2389	3.40	0.780	5	0.23	2950	6.20	
Mar-02	31	0.320	5	0.50	4283	3.70	0.520	5	0.20	2392	3.40	0.840	5	0.31	3112	7.10	
Apr-02	30	0.330	6	0.40	4529	4.00	0.530	5	0.10	2383	3.40	0.860	5	0.22	3206	7.40	
May-02	31	0.340	5	0.20	4465	4.10	0.540	5	0.10	2411	3.50	0.880	5	0.14	3205	7.60	
Jun-02	30	0.250	5	0.10	4590	3.10	0.300	5	0.10	2414	2.00	0.550	5	0.10	3403	5.10	Reported 003 as 004
Jul-02	31	0.190	5	0.20	4774	2.40	0.240	26	0.10	2391	1.60	0.430	17	0.14	3444	4.00	Reported 003 as 004
Aug-02	31	0.100	9	0.30	5048	1.10	0.210	5	0.10	2369	1.80	0.310	6	0.16	3233	2.90	Reported 003 as 004
Sep-02	30	0.240	5	0.20	4658	2.60	0.320	5	0.10	2325	2.20	0.560	5	0.14	3325	4.80	
Oct-02	31	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	
Nov-02	30	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	
Dec-02	31	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	
2002 Summary		**0.200**	**5**	**0.29**	**4426**	**846.80**	**0.308**	**6**	**0.13**	**2397**	**751.00**	**0.508**	**6**	**0.19**	**3193**	**1597.80**	
Jan-03	31	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	
Feb-03	28	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	
Mar-03	31	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	
Apr-03	30	0.300	9	1.30	4880	2.60	0.670	5	0.10	2625	2.20	0.970	6	0.47	3322	4.80	001 Exceed Iron
May-03	31	0.230	7	0.40	4751	3.00	0.400	5	0.10	2438	2.60	0.630	6	0.21	3282	5.60	
Jun-03	30	0.200	5	0.20	4617	2.50	1.300	21	0.20	2425	8.50	1.500	19	0.20	2717	11.00	
Jul-03	31	0.240	5	0.20	4587	3.00	0.430	5	0.10	2396	2.80	0.670	5	0.14	3181	5.80	
Aug-03	31	0.260	5	0.20	4470	3.10	0.670	5	0.10	2375	4.30	0.930	5	0.13	2961	7.40	
Sep-03	30	0.250	5	0.23	4625	4.00	0.690	5	0.51	2512	4.70	0.940	5	0.44	3074	8.70	
Oct-03	31	0.250	5	0.16	4547	2.50	0.870	5	0.36	2476	5.80	1.120	5	0.31	2938	8.30	
Nov-03	30	0.210	5	0.36	4780	2.80	1.040	5	0.46	2524	7.10	1.250	5	0.44	2903	9.90	
Dec-03	31	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	
2003 Summary		**0.162**	**6**	**0.41**	**4660**	**716.60**	**0.505**	**8**	**0.27**	**2476**	**1165.50**	**0.668**	**8**	**0.30**	**3004**	**1872.10**	

Emery Mine TDS Discharge Summary

		NPDES 001					NPDES 003					Monthly Summary					
Date	Days In Month	Flow cfs	TSS mg/L	Iron mg/L	TDS mg/L	TDS-Saltload Tons/day	Flow cfs	TSS mg/L	Iron mg/L	TDS mg/L	TDS-Saltload Tons/day	Flow cfs	TSS mg/L	Iron mg/L	TDS mg/L	TDS-Saltload Tons/day	Comments
Jan-04	31	0.000	0	0.00	0	0.00	0.760	5	0.48	2386	4.90	0.760	5	0.48	2386	4.90	
Feb-04	29	0.220	5	0.89	4140	2.50	1.040	6	0.38	2418	6.80	1.260	6	0.47	2719	9.30	
Mar-04	31	0.250	5	0.90	4294	2.90	0.420	23	0.30	2463	2.80	0.670	16	0.52	3146	5.70	
Apr-04	30	0.220	5	0.53	4267	2.50	0.540	6	0.36	2447	3.60	0.760	6	0.41	2974	6.10	
May-04	31	0.250	13	0.20	4229	2.90	0.580	10	0.38	2547	4.00	0.830	11	0.32	3054	6.90	
Jun-04	30	0.220	54	0.17	4301	2.60	0.570	34	0.36	2970	3.80	0.790	40	0.31	3341	6.40	Possible Lab Error TSS
Jul-04	31	0.260	5	0.19	4490	3.20	0.520	5	0.36	2428	3.40	0.780	5	0.30	3115	6.60	
Aug-04	31	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	
Sep-04	30	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	
Oct-04	31	0.000	0	0.00	0	0.00	0.550	5	0.92	2483	3.70	0.550	5	0.92	2483	3.70	
Nov-04	30	0.000	0	0.00	0	0.00	0.550	5	0.92	2483	3.70	0.550	5	0.92	2483	3.70	
Dec-04	31	0.000	0	0.00	0	0.00	0.550	5	0.77	2590	3.50	0.550	5	0.77	2590	3.50	
2004 Summary		**0.118**	**14**	**0.47**	**4291**	**504.60**	**0.506**	**10**	**0.51**	**2512**	**1221.50**	**0.624**	**11**	**0.51**	**2849**	**1726.00**	
Jan-05	31	0.000	0	0.00	0	0.00	0.550	5	0.23	2834	4.20	0.550	5	0.23	2834	4.20	
Feb-05	28	0.000	0	0.00	0	0.00	0.590	5	0.23	2889	4.60	0.590	5	0.23	2889	4.60	
Mar-05	31	0.045	5	0.73	4549	0.55	0.570	5	0.12	2995	4.60	0.615	5	0.16	3109	5.15	
Apr-05	30	0.000	0	0.00	0	0.00	0.590	5	0.24	2774	4.41	0.590	5	0.24	2774	4.41	
May-05	31	0.000	0	0.00	0	0.00	0.280	5	0.07	2702	2.04	0.280	5	0.07	2702	2.04	
Jun-05	30	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	
Jul-05	31	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	
Aug-05	31	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	0.000	0	0.00	0	0.00	
Sep-05	30	0.000	0	0.00	0	0.00	0.570	10	0.36	3300	5.07	0.570	10	0.36	3300	5.07	
Oct-05	31	0.000	0	0.00	0	0.00	0.308	5	0.25	3508	5.29	0.308	5	0.25	3508	5.29	Exceed TDS
Nov-05	30	0.045	6	0.30	4713	0.57	0.875	8	1.42	3370	7.95	0.920	7	1.36	3436	8.52	
Dec-05	31	0.005	5	0.27	4709	0.07	0.905	5	0.49	3391	8.27	0.910	5	0.49	3398	8.34	
2005 Summary		**0.008**	**5**	**0.60**	**4636**	**36.17**	**0.434**	**6**	**0.47**	**3120**	**1408.10**	**0.442**	**6**	**0.47**	**3147**	**1444.27**	
Jan-06	31	0.000	0	0.00	0	0.00	0.925	5	0.30	3294	8.22	0.925	5	0.30	3294	8.22	
Feb-06	28	0.000	0	0.00	0	0.00	0.915	6	0.54	3263	8.04	0.915	6	0.54	3263	8.04	
Mar-06	31	0.000	0	0.00	0	0.00	0.935	5	0.47	3260	8.23	0.935	5	0.47	3260	8.23	
Apr-06	30	0.206	5	0.62	4513	2.51	0.206	6	0.57	3247	8.24	1.145	5	0.58	3475	10.75	
May-06	31	0.235	5	0.19	4506	2.70	0.871	5	0.46	3275	7.69	1.110	5	0.40	3536	10.53	
Jun-06	30	0.193	5	0.23	4451	2.31	0.851	5	0.61	3249	7.44	1.045	5	0.54	3470	9.75	
Jul-06	31	0.095	7	0.20	4367	1.12	0.909	5	0.29	3229	7.90	1.000	5	0.28	3337	9.03	
Aug-06	31	1.550	5	0.20	4330	1.82	0.955	5	0.27	3328	8.57	1.110	5	0.26	3471	10.39	
Sep-06	30	0.047	6	0.12	4233	0.54	1.019	5	0.16	3343	9.19	1.110	5	0.26	3471	10.39	
Oct-06	31	0.030	10	0.11	4159	0.34	1.238	24	0.16	3379	11.24	0.755	196	3.09	1827	6.80	
Nov-06	30	0.000	0	0.00	0	0.00	1.467	5	0.58	3348	13.24	1.467	5	0.58	3348	13.24	
Dec-06	31	0.000	0	0.00	0	0.00	1.396	9	0.51	3265	12.28	1.396	9	0.51	3265	12.28	
2006 Summary		**0.199**	**5**	**0.23**	**4370**	**345.57**	**0.975**	**8**	**0.40**	**3297**	**3356.45**	**1.076**	**17**	**0.69**	**3291**	**3678.90**	
Average salt load (tons/day)						1.97					4.10					6.06	

APPENDIX VI-13

Data from Miscellaneous
Surface Water Quality Studies

RESULTS OF CHEMICAL ANALYSES OF SURFACE WATER
SAMPLED IN THE EMERY MINE AREA, SITE S-1

Sample Site: S-1 (See Plate VI-1)
Location: USGS Gaging Station: Muddy Creek No. 1 (D-21-6) 21 ABA
Dates of Collection: 8/4/71 through 9/12/78
Source of Data: USGS

	No. of Samples	Mean	Standard Deviation	Max	Min
GENERAL CHARACTERISTICS					
Alkalinity, total (as $CaCO_3$)	7	193.3	17.7	221.0	176.0
Hardness (noncarbonate)	7	13.6	5.4	21.0	4.0
Hardness, total	7	208.6	14.6	230.0	200.0
Iron, total (Fe)	18	0.28	0.32	1.0	0.02
Iron, diss. (Fe)	4	0.02	0.06	0.03	0.02
Manganese, total (Mn)	20	0.05	0.08	0.25	0.01
Oil and grease	3	1.6	.66	2.3	1.0
Oxygen, diss. (DO)	34	10.5	2.5	16.0	6.0
pH, lab (units)	33	9.2	.28	9.7	8.8
Sp. conductance, lab (µmhos/cm at 25°C)	87	416.65	53.6	620.0	286.0
Discharge (cfs)	89	33.05	42.9	201.0	2.7
Temperature (°C)	88	7.1	6.5	23.0	0.0
Total dissolved solids (TDS)	7	212.6	25.1	250.0	175.0
Total suspended solids (TSS)	18	13.8	20.9	68.0	.39
CATIONS					
Calcium (Ca)	7	42.6	3.6	48.0	39.0
Magnesium (Mg)	7	24.3	1.3	26.0	23.0
Potassium (K)	7	0.64	.08	0.8	.60
Sodium (Na)	7	6.9	2.1	10.0	5.0
Sodium adsorption ratio (SAR)	7	0.23	.05	0.3	0.2
ANIONS					
Bicarbonate (HCO_3)	7	228.8	12.7	251.0	214.0
Carbonate (CO_3)	7	3.3	5.2	14.0	0.0
Chloride (Cl)	6	2.8	0.7	3.5	1.8
Fluoride (F)	7	0.2	0.1	0.3	0.03
Sulfate (SO_4)	7	15.4	2.9	21.0	12.0
MACRONUTRIENTS					
Ammonia (NH_4)	4	0.03	.03	0.06	0.0
Nitrogen, total KJD as N	4	0.50	0.74	1.6	0.12
Nitrate + Nitrite as N	9	0.45	0.10	0.61	0.27
Phosphorus, total as P	4	0.05	0.10	0.2	0.0
TRACE AND OTHER ELEMENTS					
Aluminum (µg/ℓ, Al)	4	17.5	9.6	30.0	10.0
Arsenic (µg/ℓ,As)	4	1.25	0.5	2.0	1.0
Boron (µg/ℓ,B)	7	16.3	12.0	30.0	0.0
Carbon, diss. organic	2	2.2	0.14	2.3	2.1
Chromium (µg/ℓ,Cr)	2	2.5	3.5	5.0	0.0
Lead (µg/ℓ,Pb)	5	4.4	4.0	11.0	1.0
Lithium (µg/ℓ,Li)	5	20.0	0.01	20.0	20.0
Phenols (µg/ℓ)	3	0.67	1.15	2.0	0.0
Selenium (µg/ℓ,Se)	4	0.25	0.50	1.0	0.0
Silica, diss. (SiO_2)	7	4.9	0.52	5.5	4.2
Strontium (µg/ℓ,Sr)	4	432.5	22.2	460.0	410.0

REMARKS

1) All results are in milligrams per liter (mg/ℓ) unless otherwise noted.
2) Total Suspended Solids are given in Jackson Turbidity Units.

RESULTS OF CHEMICAL ANALYSES OF SURFACE WATER
SAMPLED IN THE EMERY MINE AREA, SITE S-2

Sample Site: S-2 (See Plate VI-1)
Location: Muddy Creek at Highway 10 (D-21-6) 36 BBB
Dates of Collection: 7/23/75 through 5/31/76
Source of Data: USGS

	No. of Samples	Mean	Standard Deviation	Max	Min
GENERAL CHARACTERISTICS					
Alkalinity, total (as $CaCO_3$)	5	246.0	27.1	287.0	221.0
Hardness (noncarbonate)	5	694.0	196.8	1000.0	500.0
Hardness, total	5	964.0	230.1	1300.0	750.0
Iron, diss. (Fe)	2	0.09	0.02	0.1	0.07
Manganese, total (Mn)	2	0.03	0.03	0.05	0.01
pH, lab (units)	5	7.9	0.2	8.2	7.7
Sp. conductance, lab (µmhos/cm at 25°C)	5	2132.0	465.3	2860.0	1720.0
Discharge (cfs)	6	0.4	0.4	1.0	0.0
Temperature (°C)	5	17.7	10.7	28.0	3.0
Total dissolved solids (TDS)	5	1638.0	380.7	2230.0	1230.0
CATIONS					
Calcium (Ca)	5	204.0	48.3	270.0	160.0
Magnesium (Mg)	5	105.8	21.2	140.0	85.0
Potassium (K)	5	4.5	1.2	6.2	3.5
Sodium (Na)	5	172.0	44.4	240.0	120.0
Sodium adsorption ratio (SAR)	5	2.4	0.4	3.0	1.9
ANIONS					
Bicarbonate (HCO_3)	5	300.0	32.9	350.0	270.0
Carbonate (CO_3)	5	0.0	0.0	0.0	0.0
Chloride (Cl)	5	22.0	4.6	29.0	17.0
Fluoride (F)	5	0.3	0.04	0.4	0.3
Sulfate (SO_4)	5	972.0	266.8	1400.0	690.0
MACRONUTRIENTS					
Nitrate + Nitrite as N	5	0.03	0.03	0.08	0.01
Phosphorus, total as P	5	0.02	0.02	0.03	0.0
TRACE AND OTHER ELEMENTS					
Aluminum (µg/ℓ,Al)	1	20.0			
Arsenic (µg/ℓ,As)	1	0.0			
Boron (µg/ℓ,B)	5	192.0	59.3	290.0	130.0
Lead (µg/ℓ,Pb)	1	10.0			
Lithium (µg/ℓ,Li)	1	110.0			
Selenium (µg/ℓ,Se)	2	0.0	0.0	0.0	0.0
Silica,.diss. (SiO_2)	5	8.5	1.2	10.0	6.8
Strontium (µg/ℓ,Sr)	2	2450.0	495.0	2800.0	2100.0

REMARKS

1) All results are in milligrams per liter (mg/ℓ) unless otherwise noted.

RESULTS OF CHEMICAL ANALYSES OF SURFACE WATER
SAMPLED IN THE EMERY MINE AREA, SITE S-3

Sample Site: S-3 (See Plate VI-1)
Location: Miller Canyon at Mouth (D-22-6) 26 DDD
Date of Collection: 7/23/75 through 8/11/75
Source of Data: USGS

	No. of Samples	Mean	Standard Deviation	Max	Min
GENERAL CHARACTERISTICS					
Alkalinity, total (as $CaCO_3$)	4	171.0	22.1	199.0	147.0
Hardness (noncarbonate)	4	1450.0	591.6	1900.0	600.0
Hardness, total	4	1650.0	591.6	2100.0	800.0
Iron, diss. (Fe)	2	0.03	0.04	0.06	0.0
Manganese, total (Mn)	2	0.45	0.44	0.76	0.14
pH, lab (units)	4	8.02	0.10	8.1	7.9
Sp. conductance, lab (µmhos/cm at 25°C)	4	2795.0	839.6	3470.0	1610.0
Discharge (cfs)	5	0.28	0.42	1.0	0.0
Temperature (°C)	4	15.8	10.3	21.5	0.0
Total dissolved solids (TDS)	4	2407.5	813.4	2990.0	1250.0
CATIONS					
Magnesium (Mg)	4	385.0	142.0	490.0	180.0
Potassium (K)	4	161.0	54.7	200.0	84.0
Sodium (Na)	4	129.7	37.9	170.0	79.0
Sodium adsorption ratio (SAR)	4	1.4	0.22	1.7	1.2
ANIONS					
Bicarbonate (HCO_3)	4	208.8	27.2	243.0	179.0
Carbonate (CO_3)	4	0.0	0.0	0.0	0.0
Chloride (Cl)	4	23.0	5.5	29.0	16.0
Fluoride (F)	4	0.40	0.0	0.40	0.40
Sulfate (SO_4)	4	1590.0	584.6	2000.0	760.0
MACRONUTRIENTS					
Nitrate + Nitrite as N	4	0.5	0.68	1.5	0.03
Phosphorus, total as P	3	0.0	0.0	0.0	0.0
TRACE AND OTHER ELEMENTS					
Aluminum (µg/ℓ,Al)	1	160.0			
Arsenic (µg/ℓ,As)	1	0.0			
Boron (µg/ℓ,B)	4	665.0	217.5	840.0	360.0
Lead (µg/ℓ,Pb)	1	1.0			
Lithium (µg/ℓ,Li)	1	160.0			
Selenium (µg/ℓ,Se)	3	2.0	1.0	3.0	1.0
Silica, diss. (SiO_2)	4	5.9	1.7	6.9	3.3
Strontium (µg/ℓ,Sr)	2	2850.0	212.1	3000.0	2700.0

REMARKS

1) All results are in milligrams per liter (mg/ℓ) unless otherwise noted.

RESULTS OF CHEMICAL ANALYSES OF SURFACE WATER
SAMPLED IN THE EMERY MINE AREA, SITE S-4

Sample Site: S-4 (See Plate VI-1)
Location: Muddy Creek Below Miller Canyon (D-22-6) 25 CCC
Dates of Collection: 7/23/75 through 8/11/76
Source of Data: USGS

	No. of Samples	Mean	Standard Deviation	Max	Min
GENERAL CHARACTERISTICS					
Alkalinity, total (as $CaCO_3$)	4	298.7	45.9	346.0	239.0
Hardness (noncarbonate)	4	857.5	570.3	1400.0	350.0
Hardness, total	4	1135.0	543.1	1700.0	670.0
Iron, diss. (Fe)	2	0.04	0.06	80.0	0.0
Manganese, total (Mn)	2	0.09	0.08	0.15	0.03
pH, lab (units)	4	8.22	0.22	8.50	8.00
Sp. conductance, lab (µmhos/cm at 25°C)	4	3355.0	1378.4	5190.0	2250.0
Discharge (cfs)	5	2.8	2.6	6.0	0.0
Temperature (°C)	4	16.3	10.9	25.0	1.0
Total dissolved solids (TDS)	4	2685.0	1280.6	4390.0	1670.0
CATIONS					
Calcium (Ca)	4	217.5	118.4	320.0	110.0
Magnesium (Mg)	4	143.5	62.9	220.0	89.0
Potassium (K)	4	8.3	0.5	8.8	7.8
Sodium (Na)	4	427.5	210.0	740.0	300.0
Sodium adsorption ratio (SAR)	4	5.5	1.6	7.8	4.0
ANIONS					
Bicarbonate (HCO_3)	4	360.0	57.6	422.0	291.0
Carbonate (CO_3)	4	1.7	3.5	7.0	0.0
Chloride (Cl)	4	42.7	16.5	67.0	30.0
Fluoride (F)	4	0.4	0.0	0.4	0.4
Sulfate (SO_4)	4	1652.5	885.3	2800.0	940.0
MACRONUTRIENTS					
Nitrate + Nitrite as N	4	0.94	1.65	3.40	0.01
Phosphorus, total as P	4	0.02	0.03	0.06	0.00
TRACE AND OTHER ELEMENTS					
Aluminum (µg/ℓ,Al)	1	170.0			
Arsenic (µg/ℓ,As)	1	1.0			
Boron (µg/ℓ,B)	4	377.5	170.0	570.0	220.0
Lead (µg/ℓ,Pb)	1	2.0			
Lithium (µg/ℓ,Li)	1	350.0			
Selenium (µg/ℓ,Se)	3	5.0	5.2	11.0	2.0
Silica, diss. (SiO_2)	4	7.1	1.9	9.2	4.7
Strontium (µg/ℓ,Sr)	2	3050.0	353.6	3300.0	2800.0

REMARKS

1) All results are in milligrams per liter (mg/ℓ) unless otherwise noted.

RESULTS OF CHEMICAL ANALYSES OF SURFACE WATER
SAMPLED IN THE EMERY MINE AREA, SITE S-5

Sample Site: S-5 (See Plate VI-1)
Location: Muddy Creek Above Ivie Creek (D-23-6) 13 (BAC)
Dates of Collection: 7/31/75 through 7/9/76
Source of Data: USGS

	No. of Samples	Mean	Standard Deviation	Max	Min
GENERAL CHARACTERISTICS					
Alkalinity, total (as $CaCO_3$)	21	272.6	47.5	353.0	164.0
Hardness (noncarbonate)	21	908.1	483.L	1600.0	280.0
Hardness, total	21	1190.0	508.3	2000.0	480.0
Iron, diss. (Fe)	1	0.02			
Manganese, total (Mn)	1	0.06			
Oil and grease	1	34.0			
Oxygen, diss. (DO)	3	8.6	2.1	10.8	6.6
pH, lab (units)	23	8.0	0.2	8.5	7.7
Sp. conductance, lab (µmhos/cm at 25°C)	23	3584.3	1563.4	6190.0	1330.0
Discharge (cfs)	3	7.4	6.8	14.0	0.34
Temperature (°C)	23	8.2	8.6	26.0	0.5
Total dissolved solids (TDS)	20	3065.2	1524.1	5590.0	974.0
CATIONS					
Calcium (Ca)	21	205.1	87.2	350.0	73.0
Magnesium (Mg)	21	164.4	72.0	270.0	59.0
Potassium (K)	21	7.7	3.5	12.0	2.3
Sodium (Na)	21	544.8	288.0	1100.0	140.0
Sodium adsorption ratio (SAR)	21	6.6	2.6	11.0	2.4
ANIONS					
Bicarbonate (HCO_3)	21	330.7	58.3	430.0	200.0
Carbonate (CO_3)	21	0.8	3.7	17.0	0.0
Chloride (Cl)	20	57.8	34.8	140.0	12.0
Fluoride (F)	1	0.6			
Sulfate (SO_4)	21	1975.2	1018.0	3600.0	550.0
MACRONUTRIENTS					
Ammonia (NH_4)	3	0.09	0.01	0.1	0.08
Nitrogen, total KJD as N	3	1.08	0.72	1.8	0.35
Nitrate + Nitrite as N	3	3.3	1.3	4.8	2.3
Phosphorus, total as P	3	0.6	0.88	1.6	0.0
TRACE AND OTHER ELEMENTS					
Aluminum (µg/ℓ,Al)	1	250.0			
Arsenic (µg/ℓ,As)	1	1.0			
Boron (µg/ℓ,B)	1	530.0			
Carbon, diss. organic	2	5.5	2.5	7.3	3.7
Chromium (µg/ℓ,Cr)	1	0.0			
Lead (µg/ℓ,Pb)	1	2.0			
Lithium (µg/ℓ,Li)	1	310.0			
Phenols (µg/ℓ)	3	4.0	2.0	6.0	2.0
Selenium (µg/ℓ,Se)	1	11.0			
Silica, diss. (SiO_2)	1	9.5			
Strontium (µg/ℓ,Sr)	1	3900.0			

REMARKS

1) All results are in milligrams per liter (mg/ℓ) unless otherwise noted.

RESULTS OF CHEMICAL ANALYSES OF SURFACE WATER
SAMPLED IN THE EMERY MINE AREA, SITE S-6

Sample Site: S-6 (See Plate VI-1)
Location: Muddy Creek Below I-70 (D-23-6) 13 DCA
Dates of Collection: 8/5/73 through 9/14/78
Source of Data: USGS

	No. of Samples	Mean	Standard Deviation	Max	Min
GENERAL CHARACTERISTICS					
Alkalinity, total (as $CaCO_3$)	122	252.2	47.4	418.0	139.0
Hardness (noncarbonate)	122	731.0	408.8	3200.0	120.0
Hardness, total	122	987.8	433.0	3700.0	270.0
Iron, diss. (Fe)	8	68.7	49.1	130.0	10.0
Manganese, total (Mn)	7	37.1	23.6	70.0	10.0
Oil and grease	2	1.5	2.1	3.0	0.0
Oxygen, diss. (DO)	4	8.0	2.2	11.2	6.1
pH, lab (units)	123	8.0	0.2	8.5	7.6
Sp. conductance, lab (µmhos/cm at 25°C)	195	2996.5	1124.3	6700.0	691.0
Discharge (cfs)	87	65.9	481.5	4500.0	0.01
Temperature (°C)	190	9.4	8.9	33.0	0.0
Total dissolved solids (TDS)	120	2305.6	926.5	6310.0	431.1
CATIONS					
Calcium (Ca)	122	157.4	53.5	440.0	62.0
Magnesium (Mg)	122	143.0	75.2	620.0	0.0
Potassium (K)	122	7.5	3.0	20.0	2.7
Sodium (Na)	122	385.3	162.2	940.0	41.0
Sodium adsorption ratio (SAR)	122	5.3	1.6	12.0	1.1
ANIONS					
Bicarbonate (HCO_3)	122	306.7	57.9	510.0	170.0
Carbonate (CO_3)	122	0.4	2.8	25.0	0.0
Chloride (Cl)	120	77.9	56.1	350.0	8.5
Fluoride (F)	14	0.5	0.09	0.6	0.3
Sulfate (SO_4)	122	1407.9	634.9	3400.0	200.0
MACRONUTRIENTS					
Ammonia (NH_4)	4	0.02	0.02	0.05	0.0
Nitrogen, total KJD as N	4	0.70	0.14	0.88	0.54
Nitrate + Nitrite as N	16	3.1	1.77	6.5	0.93
Phosphorus, total as P	4	0.52	0.93	1.9	0.0
TRACE AND OTHER ELEMENTS					
Aluminum (µg/ℓ,Al)	6	80.0	86.7	250.0	20.0
Arsenic (µg/ℓ,As)	6	1.2	0.75	2.0	0.0
Boron (µg/ℓ,B)	15	377.0	158.0	620.0	160.0
Carbon, diss. organic	3	9.0	5.5	15.0	4.3
Chromium (µg/ℓ,Cr)	3	23.3	32.1	60.0	0.0
Lead (µg/ℓ,Pb)	7	13.0	20.8	60.0	2.0
Lithium (µg/ℓ,Li)	7	282.8	95.5	440.0	180.0
Phenols (µg/ℓ)	4	1.5	1.7	4.0	0.0
Selenium (µg/ℓ,Se)	8	10.1	3.4	16.0	7.0
Silica, diss. (SiO_2)	14	9.4	1.7	12.0	6.0
Strontium (µg/ℓ,Sr)	8	2862.5	870.0	4100.0	1900.0

REMARKS

1) All results are in milligrams per liter (mg/ℓ) unless otherwise noted.

RESULTS OF CHEMICAL ANALYSES OF SURFACE WATER
SAMPLED IN THE EMERY MINE AREA, SITE S-7

Sample Site: S-7 (See Plate VI-1)
Location: Canal Near Emery at U-10 (D-22-6) 9 BCB
Dates of Collection: 8/26/75 through 8/12/76
Source of Data: USGS

	No. of Samples	Mean	Standard Deviation	Max	Min
GENERAL CHARACTERISTICS					
Alkalinity, total (as $CaCO_3$)	4	192.75	16.6	217.0	180.0
Hardness (noncarbonate)	4	8.2	7.9	15.0	0.0
Hardness, total	4	197.5	12.6	210.0	180.0
Iron, diss. (Fe)	1	0.02			
Manganese, total (Mn)	2	0.05	0.07	0.01	0.0
pH, lab (units)	4	8.2	0.13	8.3	8.0
Sp. conductance, lab (µmhos/cm at 25°C)	5	405.0	44.8	475.0	360.0
Discharge (cfs)	5	14.5	11.0	32.0	2.5
Temperature (°C)	5	13.5	8.1	22.0	1.0
Total dissolved solids (TDS)	4	220.25	29.8	264.0	198.0
CATIONS					
Calcium (Ca)	4	39.5	5.25	44.0	32.0
Magnesium (Mg)	4	19.6	11.6	27.0	2.2
Potassium (K)	4	0.8	0.29	1.2	0.6
Sodium (Na)	4	9.8	6.9	20.0	5.0
Sodium adsorption ratio (SAR)	4	0.3	0.2	0.6	0.2
ANIONS					
Bicarbonate (HCO_3)	4	235.25	20.4	265.0	219.0
Carbonate (CO_3)	4	0.0	0.0	0.0	0.0
Chloride (Cl)	4	3.2	1.8	5.9	2.2
Fluoride (F)	4	0.3	0.0	0.3	0.3
Sulfate (SO_4)	4	19.0	8.8	32.0	13.0
MACRONUTRIENTS					
Nitrate + Nitrite as N	4	0.44	0.08	0.56	0.38
Phosphorus, total as P	4	0.02	0.05	0.09	0.0
TRACE AND OTHER ELEMENTS					
Arsenic (µg/ℓ,As)	1	0.0			
Boron (µg/ℓ,B)	4	25.0	5.8	30.0	20.0
Lead (µg/ℓ,Pb)	1	0.0			
Lithium (µg/ℓ,Li)	1	20.0			
Selenium (µg/ℓ,Se)	1	0.0			
Silica, diss. (SiO_2)	4	5.13	0.88	6.3	4.4
Strontium (µg/ℓ,Sr)	1	420.0			

REMARKS

1) All results are in milligrams per liter (mg/ℓ) unless otherwise noted.

RESULTS OF CHEMICAL ANALYSES OF SURFACE WATER
SAMPLED IN THE EMERY MINE AREA, SITE S-14

Sample Site: S-14 (See Plate VI-1)
Location: USGS Gauging Station On Christiansen Wash (D-22-6) 33 BDA
Dates of Collection: 8/13/78 through 11/19/78
Source of Data: USGS

	No. of Samples	Mean	Standard Deviation	Max	Min
GENERAL CHARACTERISTICS					
Alkalinity, total (as $CaCO_3$)	4	340.0	52.3	410.0	300.0
Hardness (noncarbonate)	4	865.0	396.1	1300.0	500.0
Hardness, total	4	1215.0	395.9	1600.0	790.0
Iron, diss. (Fe)	1	0.02			
Manganese, total (Mn)	1	0.01			
Oil and grease	1	0.0			
Oxygen, diss. (DO)	4	9.15	1.2	10.6	7.8
pH, field (units)	4	8.45	0.09	8.5	8.3
pH, lab (units)	4	8.12	0.21	8.3	7.9
Sp. conductance, field (µmhos/cm at 25°C)	3	3716.7	2159.7	4900.0	2250.0
Sp. conductance, lab (µmhos/cm at 25°C)	4	3502.0	1194.5	4702.0	1990.0
Discharge (cfs)	4	1.1	0.51	1.7	0.65
Temperature (°C)	4	12.12	7.2	20.0	3.0
Total dissolved solids (TDS)	4	2902.2	894.9	3642.7	1701.0
CATIONS					
Calcium (Ca)	4	180.0	40.8	210.0	120.0
Magnesium (Mg)	4	182.5	72.3	250.0	120.0
Potassium (K)	4	6.75	1.5	8.0	5.0
Sodium (Na)	4	430.0	157.7	580.0	210.0
Sodium adsorption ratio (SAR)	4	5.33	1.5	6.4	3.2
ANIONS					
Bicarbonate (HCO_3)	4	393.5	75.9	500.0	324.0
Carbonate (CO_3)	4	9.25	10.1	18.0	0.0
Chloride (Cl)	4	76.75	31.7	110.0	34.0
Fluoride (F)	1	0.7			
Sulfate (SO_4)	4	1617.5	597.7	2100.0	870.0
MACRONUTRIENTS					
Nitrogen, total KJD as N	1	3.2			
Nitrate + Nitrite as N	1	23.0			
Phosphorus, total as P	1	0.02			
TRACE AND OTHER ELEMENTS					
Arsenic (µg/ℓ,As)	1	0.0			
Boron (µg/ℓ,B)	1	590.0			
Carbon, diss. organic	1	13.0			
Lead (µg/ℓ,Pb)	1	59.0			
Lithium (µg/ℓ,Li)	1	370.0			
Selenium (µg/ℓ,Se)	1	60.0			
Silica, diss. (SiO_2)	4	11.1	2.0	13.0	8.4
Strontium (µg/ℓ,Sr)	1	2900.0			

REMARKS

1) All results are in milligrams per liter (mg/ℓ) unless otherwise noted.

1977-1978 WATER QUALITY TREND STUDY
ON QUITCHUPAH CREEK AND CHRISTIANSEN WASH

Sample Site: S-16 (See Plate VI-1)
Location: Christiansen Wash
Dates of Collection: 10/25/77, 2/8/78, 4/12/78, and 7/26/78
Source of Data: Owili-Eger

	10/25/77	2/8/78	4/12/78	7/26/78
GENERAL CHARACTERISTICS				
Hardness, total	1800.0	1830.0	1070.0	605.0
Iron, total (Fe)	0.4	0.2	2.0	0.1
pH, lab (units)	8.0	8.1	8.2	8.1
Sp. conductance, field (µmhos/cm at 25°C)				
Sp. conductance, lab (µmhos/cm at 25°C)	4500.0	2500.0	3040.0	1495.0
Discharge (cfs)	1.02	0.66	1.37	4.32
Total dissolved solids (TDS)	4936.0	5030.0	2710.0	1235.0
Total suspended solids (TSS)	110.0	50.0	805.0	100.0
CATIONS				
Calcium (Ca)	625.0	430.0	220.0	94.0
Magnesium (Mg)	1255.0	180.0	170.0	90.0
Potassium (K)	11.0	10.0	7.0	5.0
Sodium (Na)	650.0	760.0	390.0	160.0
Sodium adsorption ratio (SAR)	3.5	7.8	4.8	2.8
ANIONS				
Bicarbonate (HCO_3)	315.0	360.0	290.0	210.0
Chloride (Cl)	90.0	100.0	50.0	20.0
Sulfate (SO_4)	2300.0	2700.0	1655.0	680.0

RESULTS OF CHEMICAL ANALYSES OF SURFACE WATER
SAMPLED IN THE EMERY MINE AREA, SITE S-18

Sample Site: S-18 (See Plate VI-1)
Location: Quitchupah Creek at U-10 Near Emery (D-22-6) 30 BDD
Dates of Collection: 7/23/75 through 9/22/76
Source of Data: USGS

	No. of Samples	Mean	Standard Deviation	Max	Min
GENERAL CHARACTERISTICS					
Alkalinity, total (as $CaCO_3$)	6	287.2	67.2	371.0	208.0
Hardness (noncarbonate)	6	308.8	172.1	470.0	73.0
Hardness, total	6	595.0	210.0	820.0	280.0
Iron, diss. (Fe)	2	0.01	0.01	0.02	0.0
Manganese, total (Mn)	2	0.05	0.06	0.10	0.01
pH, lab (units)	6	8.1	0.5	8.9	7.6
Sp. conductance, lab (µmhos/cm at 25°C)	7	1345.7	396.6	1740.0	640.0
Discharge (cfs)	7	0.8	0.9	2.0	0.01
Temperature (°C)	7	16.1	7.3	23.0	1.5
Total dissolved solids (TDS)	7	938.8	293.6	1290.0	400.0
CATIONS					
Calcium (Ca)	6	117.5	64.4	200.0	55.0
Magnesium (Mg)	6	59.5	16.5	77.0	35.0
Potassium (K)	6	4.5	1.3	5.7	2.0
Sodium (Na)	6	111.7	39.7	160.0	40.0
Sodium adsorption ratio (SAR)	6	2.2	0.9	3.3	1.0
ANIONS					
Bicarbonate (HCO_3)	6	350.2	81.9	452.0	254.0
Carbonate (CO_3)	6	0.0	0.0	0.0	0.0
Chloride (Cl)	6	37.8	13.7	52.0	14.0
Fluoride (F)	6	0.4	0.05	0.4	0.3
Sulfate (SO_4)	6	405.0	182.0	620.0	120.0
MACRONUTRIENTS					
Nitrate + Nitrite as N	6	0.4	0.4	1.0	0.0
Phosphorus, total as P	6	0.02	0.02	0.06	0.0
TRACE AND OTHER ELEMENTS					
Aluminum (µg/ℓ,Al)	2	30.0	0.03	30.0	30.0
Arsenic (µg/ℓ,As)	2	0.5	0.7	1.0	0.0
Boron (µg/ℓ,B)	6	203.3	65.3	250.0	80.0
Lead (µg/ℓ,Pb)	2	0.5	0.7	1.0	0.0
Lithium (µg/ℓ,Li)	2	80.0	14.1	90.0	70.0
Selenium (µg/ℓ,Se)	2	1.0	0.0	1.0	1.0
Silica, diss. (SiO_2)	6	10.7	2.5	13.0	7.5
Strontium (µg/ℓ,Sr)	2	1450.0	212.1	1600.0	1300.0

REMARKS

1) All results are in milligrams per liter (mg/ℓ) unless otherwise noted.

RESULTS OF CHEMICAL ANALYSES OF SURFACE WATER
SAMPLED IN THE EMERY MINE AREA, SITE S-24

Sample Site: S-24 (See Plate VI-1)
Location: USGS Gauging Station On Quitchupah Creek (D-22-6) 32 DAA
Dates of Collection: 8/13/78 through 12/13/78
Source of Data: USGS

	No. of Samples	Mean	Standard Deviation	Max	Min
GENERAL CHARACTERISTICS					
Alkalinity, total (as $CaCO_3$)	5	9.8	1.5	11.8	8.2
Hardness (noncarbonate)	5	518.0	449.9	1300.0	150.0
Hardness, total	5	854.0	493.5	1700.0	470.0
Iron, diss. (Fe)	2	0.01	0.0	0.01	0.01
Manganese, total (Mn)	2	0.02	0.01	0.02	0.01
Oil and grease	2	0.0	0.0	0.0	0.0
Oxygen, diss. (DO)	5	9.8	1.5	11.8	8.2
pH, field (units)	5	8.5	0.18	8.8	8.3
pH, lab (units)	5	8.1	0.25	8.5	7.9
Sp. conductance, field (µmhos/cm at 25°C)	5	2425.2	697.7	3300.0	1500.0
Sp. conductance, lab (µmhos/cm at 25°C)	4	2860.0	1302.9	4623.0	1706.0
Discharge (cfs)	5	2.48	1.5	5.1	1.4
Temperature (°C)	5	7.3	10.1	24.0	0.0
Total dissolved solids (TDS)	5	2297.9	642.1	4188.2	1297.8
CATIONS					
Calcium (Ca)	5	142.8	55.4	230.0	94.0
Magnesium (Mg)	5	121.6	90.6	280.0	56.0
Potassium (K)	5	6.1	1.8	8.2	4.4
Sodium (Na)	5	360.0	152.3	590.0	190.0
Sodium adsorption ratio (SAR)	5	5.36	1.0	6.3	3.8
ANIONS					
Bicarbonate (HCO_3)	5	397.8	95.3	496.0	260.0
Carbonate (CO_3)	5	4.4	3.21	9.0	0.0
Chloride (Cl)	5	67.0	24.9	100.0	40.0
Fluoride (F)	2	0.45	0.07	0.5	0.4
Sulfate (SO_4)	5	1194.0	770.4	2500.0	510.0
MACRONUTRIENTS					
Nitrogen total KJD as N	2	0.7	0.23	0.86	0.53
Nitrate + Nitrite as N	2	1.03	0.09	1.1	0.96
Phosphorus, total as P	2	0.27	0.23	0.43	0.11
TRACE AND OTHER ELEMENTS					
Arsenic (µg/ℓ,As)	2	0.0	0.0	0.0	0.0
Boron (µg/ℓ,B)	2	280.0	110.0	360.0	210.0
Carbon, diss. organic	2	3.35	0.92	4.0	2.7
Chromium (µg/ℓ,Cr)	2	5.0	7.0	1.0	0.0
Lead (µg/ℓ,Pb)	2	29.0	1.0	38.0	2.0
Lithium (µg/ℓ,Li)	2	11.0	4.0	140.0	8.0
Phenols (µg/ℓ)	2	1.5	0.7	2.0	1.0
Selenium (µg/ℓ,Se)	2	4.5	0.04	5.0	4.0
Silica, diss. (SiO_2)	5	9.9	2.53	14.0	7.3
Strontium (µg/ℓ,Sr)	2	1.8	0.42	2.1	1.5

REMARKS

1) All results are in milligrams per liter (mg/ℓ) unless otherwise noted.

Sample Site: S-26 (See Plate VI-1)
Location: Quitchupah Creek
Dates of Collection: 10/26/77, 2/9/78, 4/13/78, and 7/27/78
Source of Data: Owili-Eger

	10/26/77	2/9/78	4/13/78	7/27/78
GENERAL CHARACTERISTICS				
Hardness, total	1230.0	445.0	210.0	1130.0
Iron, total (Fe)	1.8	0.2	0.9	0.6
pH, lab (units)	7.8	8.1	8.0	7.9
Sp. conductance, lab (µmhos/cm at 25°C)	4250.0	545.0	820.0	2255.0
Discharge (cfs)	1.12	3.87	14.84	2.45
Total dissolved solids (TDS)	4040.0	840.0	500.0	2070.0
Total suspended solids (TSS)	60.0	430.0	6810.0	2920.0
CATIONS				
Calcium (Ca)	550.0	150.0	390.0	140.0
Magnesium (Mg)	680.0	20.0	44.0	82.0
Potassium (K)	10.0	11.0	3.0	6.0
Sodium (Na)	730.0	130.0	110.0	480.0
Sodium adsorption ratio (SAR)	4.9	2.6	1.4	8.0
ANIONS				
Bicarbonate (HCO_3)	335.0	250.0	195.0	250.0
Chloride (Cl)	135.0	10.0	10.0	60.0
Sulfate (SO_4)	2100.0	365.0	195.0	1145.0

RESULTS OF CHEMICAL ANALYSES OF SURFACE WATER
SAMPLED IN THE EMERY MINE AREA, SITE S-29

Sample Site: S-29 (See Plate VI-1)
Location: Quitchupah Creek at Mouth Near I-70 (D-23-6) 16 CAA
Dates of Collection: 7/23/75 through 9/21/76
Source of Data: USGS

	No. of Samples	Mean	Standard Deviation	Max	Min
GENERAL CHARACTERISTICS					
Alkalinity, total (as $CaCO_3$)	5	269.8	26.2	306.0	246.0
Hardness (noncarbonate)	5	708.0	338.6	1100.0	310.0
Hardness, total	5	956.0	312.0	1300.0	570.0
Iron, diss. (Fe)	4	0.04	0.03	0.08	0.02
Manganese, total (Mn)	4	0.09	0.02	0.01	0.0
Oxygen, diss. (DO)	1	8.7			
pH, lab (units)	5	8.3	0.02	8.5	8.0
Sp. conductance, lab (µmhos/cm at 25°C)	5	3078.0	1246.4	4600.0	1500.0
Discharge (cfs)	5	5.0	4.8	12.0	0.5
Temperature (°C)	5	16.2	9.3	22.5	0.0
Total dissolved solids (TDS)	5	2406.0	1122.5	3710.0	1070.0
CATIONS					
Calcium (Ca)	5	150.0	40.6	190.0	100.0
Magnesium (Mg)	5	145.0	55.2	210.0	78.0
Potassium (K)	5	7.5	3.1	11.0	3.7
Sodium (Na)	5	416.0	231.4	700.0	150.0
Sodium adsorption ratio (SAR)	5	5.5	2.4	8.3	2.7
ANIONS					
Bicarbonate (HCO_3)	5	329.0	31.7	373.0	300.0
Carbonate (CO_3)	5	0.0	0.0	0.0	0.0
Chloride (Cl)	5	58.2	29.5	96.0	24.0
Fluoride (F)	5	0.5	0.1	0.6	0.4
Sulfate (SO_4)	5	1428.0	754.3	2300.0	540.0
MACRONUTRIENTS					
Nitrate + Nitrite as N	5	6.4	3.6	10.0	1.6
Phosphorus, total as P	5	0.01	0.01	0.03	0.0
TRACE AND OTHER ELEMENTS					
Aluminum (µg/ℓ,Al)	3	23.3	5.8	30.0	20.0
Arsenic (µg/ℓ,As)	3	0.33	0.58	1.0	0.0
Boron (µg/ℓ,B)	5	340.0	192.0	570.0	150.0
Lead (µg/ℓ,Pb)	3	2.3	2.5	5.0	0.0
Lithium (µg/ℓ,Li)	3	273.3	115.5	340.0	140.0
Selenium (µg/ℓ,Se)	3	19.0	9.2	27.0	9.0
Silica, diss. (SiO_2)	5	8.0	1.8	9.8	5.5
Strontium (µg/ℓ,Sr)	3	2733.3	1266.2	3700.0	1300.0

REMARKS

1) All results are in milligrams per liter (mg/ℓ) unless otherwise noted.

RESULTS OF A WATER QUALITY TREND STUDY
ON CHRISTIANSEN WASH, 1977-1978

Sample Site: S-32 (See Plate VI-1)
Location: Christiansen Wash
Dates of Collection: 10/25/77, 2/8/78, 4/12/78, and 7/26/78
Source of Data: Owili-Eger

	10/25/77	2/8/78	4/12/78	7/26/78
GENERAL CHARACTERISTICS				
Hardness, total	2630.0	1150.0	470.0	1305.0
Iron, total (Fe)	0.8	0.2	1.0	0.1
pH, lab (units)	7.7	8.1	7.8	7.8
Sp. conductance, field (µmhos/cm at 25°C)				
Sp. conductance, lab (µmhos/cm at 25°C)	4250.0	1180.0	1180.0	2280.0
Discharge (cfs)	0.13	0.23	0.52	0.44
Total dissolved solids (TDS)	5020.0	2290.0	915.0	2420.0
Total suspended solids (TSS)	100.0	15.0	4540.0	100.0
CATIONS				
Calcium (Ca)	1125.0	350.0	300.0	300.0
Magnesium (Mg)	1505.0	70.0	65.0	170.0
Potassium (K)	10.0	4.0	5.0	
Sodium (Na)	380.0	200.0	120.0	
Sodium adsorption ratio (SAR)	1.7	2.6	1.6	1.5
ANIONS				
Bicarbonate (HCO_3)	420.0	310.0	210.0	310.0
Chloride (Cl)	50.0	10.0	5.0	25.0
Sulfate (SO_4)	2300.0	1260.0	435.0	1320.0

Sample Site: S-33 (See Plate VI-1)
Location: Christiansen Wash
Dates of Collection: 10/25/77, 2/8/78, 4/12/78, and 7/26/78
Source of Data: Owili-Eger

	10/25/77	2/8/78	4/12/78	7/26/78
GENERAL CHARACTERISTICS				
Hardness, total	3825.0	230.0	990.0	745.0
Iron, total (Fe)	0.6	0.2	2.4	0.1
pH, lab (units)	7.9	8.1	8.0	8.0
Sp. conductance, field (µmhos/cm at 25°C)				
Sp. conductance, lab (µmhos/cm at 25°C)	8400.0	3190.0	2995.0	1960.0
Discharge (cfs)	0.22	0.40	0.56	1.68
Total dissolved solids (TDS)	10950.0	6880.0	2580.0	1710.0
Total suspended solids (TSS)	160.0	100.0	2290.0	100.0
CATIONS				
Calcium (Ca)	1250.0	520.0	320.0	120.0
Magnesium (Mg)	2575.0	240.0	170.0	100.0
Potassium (K)	15.0	14.0	7.0	7.0
Sodium (Na)	1500.0	1100.0	380.0	280.0
Sodium adsorption ratio (SAR)	5.6	10.0	4.3	4.6
ANIONS				
Bicarbonate (HCO_3)	410.0	292.0	275.0	280.0
Chloride (Cl)	90.0	140.0	50.0	35.0
Sulfate (SO_4)	6250.0	3910.0	1605.0	890.0

Sample Site: S-34 (See Plate VI-1)
Location: Christiansen Wash
Dates of Collection: 10/25/77, 2/8/78, 4/12/78, and 7/26/78
Source of Data: Owili-Eger

	10/25/77	2/8/78	4/12/78	7/26/78
GENERAL CHARACTERISTICS				
Hardness, total	3805.0	235.0	1035.0	735.0
Iron, total (Fe)	0.4	0.2	1.8	0.1
pH, lab (units)	8.0	8.1	8.1	8.1
Sp. conductance, field (µmhos/cm at 25°C)				
Sp. conductance, lab (µmhos/cm at 25°C)	8500.0	3180.0	3050.0	2070.0
Discharge (cfs)	0.27	0.32	0.60	0.98
Total dissolved solids (TDS)	9685.0	7030.0	2720.0	1790.0
Total suspended solids (TSS)	225.0	30.0	1080.0	100.0
CATIONS				
Calcium (Ca)	1250.0	550.0	230.0	130.0
Magnesium (Mg)	2555.0	250.0	170.0	110.0
Potassium (K)	15.0	12.0	7.0	7.0
Sodium (Na)	1500.0	1300.0	400.0	350.0
Sodium adsorption ratio (SAR)	5.6	11.5	4.9	5.5
ANIONS				
Bicarbonate (HCO_3)	440.0	420.0	285.0	280.0
Chloride (Cl)	200.0	130.0	40.0	35.0
Sulfate (SO_4)	6000.0	4080.0	1745.0	940.0

Sample Site: S-35 (See Plate VI-1)
Location: Christiansen Wash
Dates of Collection: 10/25/77, 2/8/78, 4/12/78, and 7/26/78
Source of Data: Owili-Eger

	10/25/77	2/8/78	4/12/78	7/26/78
GENERAL CHARACTERISTICS				
Hardness, total	805.0	1040.0	940.0	805.0
Iron, total (Fe)	0.2	0.2	0.1	0.1
pH, lab (units)	8.0	8.1	8.1	7.8
Sp. conductance, field (µmhos/cm at 25°C)		1280.0	2405.0	1735.0
Sp. conductance, lab (µmhos/cm at 25°C)	2000.0			
Discharge (cfs)				
Total dissolved solids (TDS)	1995.0	2370.0	2100.0	1475.0
Total suspended solids (TSS)	25.0	1.0	1.0	100.0
CATIONS				
Calcium (Ca)	290.0	260.0	160.0	130.0
Magnesium (Mg)	515.0	90.0	150.0	110.0
Potassium (K)	5.0	5.0	4.0	3.0
Sodium (Na)	165.0	290.0	250.0	140.0
Sodium adsorption ratio (SAR)	1.4	4.0	3.4	2.2
ANIONS				
Bicarbonate (HCO_3)	268.0	320.0	310.0	330.0
Chloride (Cl)	30.0	40.0	40.0	30.0
Sulfate (SO_4)	500.0	1310.0	1165.0	730.0

Sample Site: S-36 (See Plate VI-1)
Location: Quitchupah Creek Tributary
Dates of Collection: 10/26/77, 2/9/78, 4/13/78, and 7/27/78
Source of Data: Owili-Eger

	10/26/77	2/9/78	4/13/78	7/27/78
GENERAL CHARACTERISTICS				
Hardness, total	3605.0	150.0	955.0	635.0
Iron, total (Fe)	0.4	0.2	1.4	0.1
pH, lab (units)	8.0	8.2	8.1	8.0
Sp. conductance, lab (μmhos/cm at 25°C)	10800.0	290.0	420.0	2025.0
Discharge (cfs)				
Total dissolved solids (TDS)	13175.0	370.0	240.0	1685.0
Total suspended solids (TSS)	135.0	140.0	8450.0	100.0
CATIONS				
Calcium (Ca)	1215.0	80.0	440.0	110.0
Magnesium (Mg)	2390.0	20.0	36.0	85.0
Potassium (K)	17.0	6.0	4.0	5.0
Sodium (Na)	2500.0	37.0	69.0	360.0
Sodium adsorption ratio (SAR)	9.6	1.0	0.9	6.3
ANIONS				
Bicarbonate (HCO_3)	505.0	210.0	170.0	265.0
Chloride (Cl)	250.0	10.0	5.0	25.0
Sulfate (SO_4)	8500.0	95.0	37.0	940.0

Sample Site:	S-37 (See Plate VI-1)
Location:	Quitchupah Creek
Dates of Collection:	10/26/77, 2/9/78, 4/13/78, and 7/27/78
Source of Data:	Owili-Eger

	10/26/77	2/9/78	4/13/78	7/27/78
GENERAL CHARACTERISTICS				
Hardness, total		680.0	235.0	
Iron, total (Fe)	NO FLOW	0.2	1.4	NO FLOW
pH, lab (units)		8.1	8.1	
Sp. conductance, lab (µmhos/cm at 25°C)		516.0	745.0	
Discharge (cfs)	0.0	1.07	3.83	0.0
Total dissolved solids (TDS)		740.0	470.0	
Total suspended solids (TSS)		295.0	3365.0	
CATIONS				
Calcium (Ca)		90.0	230.0	
Magnesium (Mg)		120.0	37.0	
Potassium (K)		9.0	4.0	
Sodium (Na)		140.0	82.0	
Sodium adsorption ratio (SAR)		2.3	1.3	
ANIONS				
Bicarbonate (HCO_3)		255.0	210.0	
Chloride (Cl)		20.0	20.0	
Sulfate (SO_4)		235.0	140.0	

Sample Site: S-38 (See Plate VI-1)
Location: Quitchupah Creek
Dates of Collection: 10/26/77, 2/9/78, 4/13/78, and 7/27/78
Source of Data: Owili-Eger

	10/26/77	2/9/78	4/13/78	7/27/78
GENERAL CHARACTERISTICS				
Hardness, total	1060.0	445.0	210.0	590.0
Iron, total (Fe)	0.4	0.2	1.3	0.1
pH, lab (units)	7.7	8.1	8.0	7.8
Sp. conductance, lab (µmhos/cm at 25°C)	2500.0	545.0	610.0	1440.0
Discharge (cfs)	0.50	4.27	17.87	0.80
Total dissolved solids (TDS)	2295.0	840.0	310.0	1195.0
Total suspended solids (TSS)	15.0	430.0	6130.0	100.0
CATIONS				
Calcium (Ca)	565.0	150.0	370.0	120.0
Magnesium (Mg)	495.0	20.0	37.0	63.0
Potassium (K)	7.0	11.0	3.0	4.0
Sodium (Na)	310.0	130.0	89.0	160.0
Sodium adsorption ratio (SAR)	2.3	2.6	1.2	2.9
ANIONS				
Bicarbonate (HCO_3)	320.0	250.0	185.0	240.0
Chloride (Cl)	70.0	10.0	5.0	25.0
Sulfate (SO_4)	1250.0	365.0	105.0	655.0

Sample Site: S-39 (See Plate VI-1)
Location: Quitchupah Creek
Dates of Collection: 10/26/77, 2/9/78, 4/13/78, and 7/27/78
Source of Data: Owili-Eger

	10/26/77	2/9/78	4/13/78	7/27/78
GENERAL CHARACTERISTICS				
Hardness, total	1035.0	490.0	200.0	350.0
Iron, total (Fe)	0.3	0.2	1.2	0.1
pH, lab (units)	7.2	8.1	8.0	7.9
Sp. conductance, lab (µmhos/cm at 25°C)	2700.0	600.0	620.0	1325.0
Discharge (cfs)	0.90	4.02	22.00	0.65
Total dissolved solids (TDS)	2360.0	880.0	310.0	1075.0
Total suspended solids (TSS)	125.0	1140.0	6460.0	100.0
CATIONS				
Calcium (Ca)	500.0	130.0	320.0	110.0
Magnesium (Mg)	535.0	40.0	34.0	57.0
Potassium (K)	7.0	17.0	3.0	4.0
Sodium (Na)	325.0	130.0	72.0	140.0
Sodium adsorption ratio (SAR)	2.4	2.6	1.0	2.7
ANIONS				
Bicarbonate (HCO_3)	365.0	250.0	190.0	225.0
Chloride (Cl)	70.0	10.0	5.0	20.0
Sulfate (SO_4)	1150.0	370.0	110.0	600.0

Sample Site:	S-40 (See Plate VI-1)
Location:	Quitchupah Creek Tributary Below Settling Pond
Dates of Collection:	10/26/77, 2/9/78, 4/13/78, and 7/27/78
Source of Data:	Owili-Eger

	10/26/77	2/9/78	4/13/78	7/27/78
GENERAL CHARACTERISTICS				
Hardness, total	1085.0	830.0	745.0	760.0
Iron, total (Fe)	0.1	0.2	0.1	0.1
pH, lab (units)	8.2	8.3	8.3	8.6
Sp. conductance, lab (µmhos/cm at 25°C)	5000.0	2340.0	4865.0	4645.0
Discharge (cfs)				
Total dissolved solids (TDS)	4455.0	4060.0	3850.0	3910.0
Total suspended solids (TSS)	60.0	1.0	1.0	100.0
CATIONS				
Calcium (Ca)	425.0	160.0	130.0	82.0
Magnesium (Mg)	660.0	110.0	140.0	120.0
Potassium (K)	10.0	7.0	7.0	8.0
Sodium (Na)	750.0	960.0	990.0	1100.0
Sodium adsorption ratio (SAR)	5.3	14.3	14.4	18.1
ANIONS				
Bicarbonate (HCO_3)	390.0	390.0	405.0	440.0
Chloride (Cl)	160.0	140.0	135.0	130.0
Sulfate (SO_4)	2350.0	2280.0	2270.0	2095.0

RESULTS OF A SAMPLING PROGRAM CONDUCTED BY CONSOLIDATION COAL CO. ON MAY 10, 1974
TO DETERMINE WATER QUALITY TRENDS ON CHRISTIANSEN WASH AND QUITCHUPAH CREEK

Sample Site:	S-12	S-15	S-18	S-20	S-23	S-25	S-28
Location:	C. Wash Tributary	C. Wash	Q. Creek	Q. Creek Tributary	Q. Creek	Q. Creek	Q. Creek
Date of Collection:	5/10/74	5/10/74	5/10/74	5/10/74	5/10/74	5/10/74	5/10/74
pH, lab (units)	8.4	8.3	7.9	8.2	8.3	8.2	8.2
Sp. conductance, lab (µmhos/cm at 25°C)	10000.0	3460.0	1020.0	5000.0	1350.0	6000.0	1260.0
Total dissolved solids (TDS)	9900.0	2580.0	370.0	4700.0	1000.0	5100.0	910.0
Calcium (Ca)	350.0	180.0	62.0	2400.0	98.0	150.0	110.0
Magnesium (Mg)	830.0	210.0	32.0	270.0	45.0	200.0	62.0
Sodium (Na)	1200.0	440.0	54.0	690.0	110.0	1100.0	140.0
Sodium adsorption ratio (SAR)	8.0	5.3	1.4	3.6	2.3	13.8	2.6
Sulfate (SO_4)	4100.0	1470.0	120.0	2000.0	360.0	3100.0	480.0

Note: All results are in milligrams per liter (mg/ℓ) unless otherwise noted.

Source: Consol/Kaufman Study

RESULTS OF A SAMPLING PROGRAM CONDUCTED BY CONSOLIDATION COAL CO. ON JANUARY 7, 1975
TO DETERMINE WATER QUALITY TRENDS ON CHRISTIANSEN WASH AND QUITCHUPAH CREEK

Sample Site: Location: Date of Collection:	S-16 C. Wash 1/7/75	S-19 Q. Creek 1/7/75	S-26 Q. Creek 1/7/75	S-27 Q. Creek 1/7/75	Emery Mine Discharge 1/7/75
Alkalinity, total (as $CaCO_3$)	459.0	397.0	385.0	403.0	432.0
Iron, total (Fe)	0.6	0.5	0.5	0.7	0.5
Iron, diss. (Fe)	0.55	0.13	0.3	0.3	0.5
Manganese, total (Mn)	0.0	0.0	0.0	0.0	
pH, lab (units)	8.0	7.8	7.7	7.9	8.1
Discharge (cfs)			1.6		
Total dissolved solids (TDS)	3120.0	1260.0	1300.0	1680.0	5590.0
Total suspended solids (TSS)	75.0	128.0	81.0	180.0	121.0
Calcium (Ca)	18.9	13.4	13.6	15.4	18.6
Magnesium (Mg)	18.4	6.9	6.6	9.7	21.1
Sodium (Na)	470.0	180.0	182.0	255.0	1250.0
Sodium adsorption ratio (SAR)	18.4	10.0	10.1	12.5	
Chloride (Cl)	64.2	30.5	31.8	39.0	204.4
Sulfate (SO_4)	1083.0	580.0	460.0	740.0	1251.0
Aluminum (Al)		0.0	0.0	0.0	

Note: All results are in milligrams per liter (mg/ℓ) unless otherwise noted.

Source: Consol/Kaufman Study

RESULTS OF A SAMPLING PROGRAM CONDUCTED BY CONSOLIDATION COAL CO. ON MARCH 22 AND 23, 1977
TO DETERMINE WATER QUALITY TRENDS ON CHRISTIANSEN WASH AND QUITCHUPAH CREEK

Sample Site: Location:	S-9 C. Wash	S-10 C. Wash	S-11 C. Wash Tributary	S-12 C. Wash Tributary	S-13 C. Wash	S-17 C. Wash	S-21 Q. Creek	S-22 Emery Mine Sedimentation Pond Discharge
Date of Collection:	3/23/77	3/22/77	3/22/77	3/22/77	3/22/77	3/22/77	3/23/77	3/23/77
Alkalinity, total (as $CaCO_3$)	345.0	470.0	815.0	439.0	420.0	414.0	452.0	427.0
Iron, total (Fe)	1.0	1.7	1.5	1.2	1.0	1.0	1.2	0.9
Iron, diss. (Fe)	0.9	1.0	0.9	1.0	0.9	0.9	1.0	0.8
Manganese, total (Mn)	0.24	0.03	0.02	0.03	0.08	0.01	0.0	0.0
pH, lab (units)	8.0	8.0	7.6	7.9	8.0	8.0	7.7	8.1
Discharge (cfs)		0.475	0.003	0.51	0.956	1.677		
Total dissolved solids (TDS)	1310.0	5016.0	6584.0	4972.0	3604.0	3304.0	2412.0	4512.0
Total suspended solids (TSS)	70.0	571.0	6962.0	544.0	274.0	529.0	410.0	19.0
Calcium (Ca)	115.0	278.0	335.0	267.0	187.0	169.0	165.0	130.0
Magnesium (Mg)	138.0	681.0	1650.0	365.0	405.0	211.0	131.0	196.0
Potassium (K)	2.67	9.7	11.85	12.6	7.37	8.07	6.09	8.24
Sodium (Na)	120.0	653.0	275.0	598.0	738.0	625.0	480.0	1292.0
Sodium adsorption ratio (SAR)	1.79	3.6	1.3	0.9	6.9	7.6	6.8	16.7
Chloride (Cl)	32.0	113.0	82.0	111.0	82.0	86.0	65.0	183.0
Sulfate (SO_4)	770.0	3750.0	2850.0	3400.0		2060.0	1480.0	2980.0
Aluminum (Al)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0

Note: All results are in milligrams per liter (mg/ℓ) unless otherwise noted.

Source: Consol/Kaufman Study

APPENDIX VI-14

Mass-Balance Estimates of
Future Mine-Water Discharges

Calibration Calculations and
Comparison with Historic Data

Table 1. Upper Ferron Aquifer Groundwater Elevation Data (units: feet)

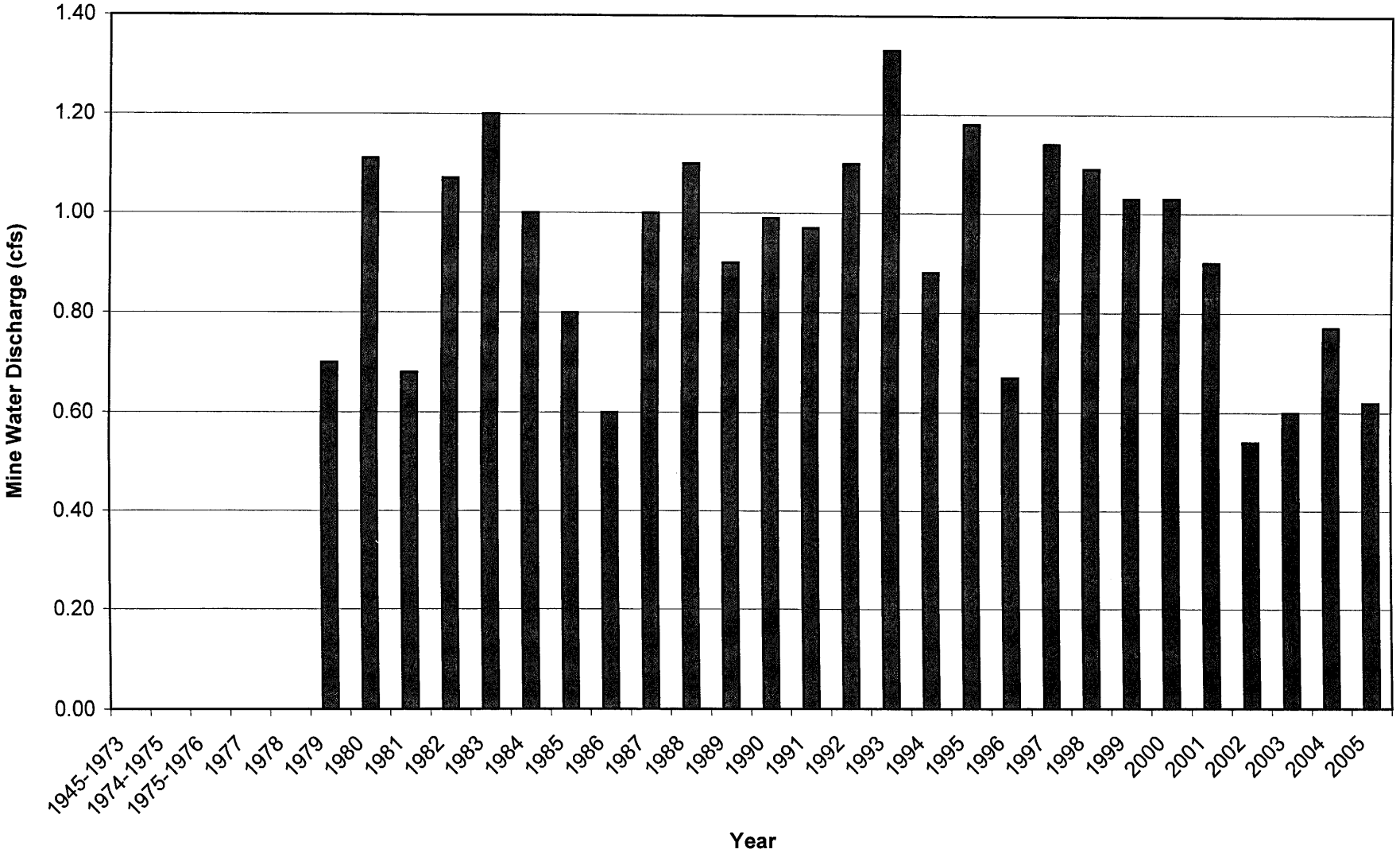
Well	Year							Change
	1979	1982	1983	1986	1989	1990	1995	
R2(U)	6030.4	6043.3	6036.3	5821.9	NA	5550.0	NA	480.4
TP	NA	5722.0	5709.0	5645.5	5637.7	5636.0	5620.0	102.0
AA(U)	5980	5869.5	5863.3	5860.8	5858.2	5858.0	5850.0	130.0
BRYANT	6030.4	5807.2	5798.0	5706.3	5733.9	5732.0	5720.0	310.4
EMRIA3	6041.1	6022.8	6020.0	6028.9	6020.5	6030.0	6010.0	31.1
FC346WW	6095.5	6072.8	6069.1	6058.2	6028.1	6022.0		
H(U)	6187.8	6160.0	6160.0	6173.4	6173.6	6176.0	6160.0	27.8
..	5898.9	5940.4	5939.8	5939.8	5940.0	5940.0	5930.0	-31.1
MUDDY2(U)	6000.8	5975.4	5973.7	5955.6	5948.1	5848.0	5930.0	70.8
USGS1-2(U)	6022.3	5991.6	5958.5	5958.6	5945.9	5944.0	5900.0	122.3
I2	N/A	NA	NA	5711.0	5705.2			
EMEIA2	6053.5	6056.6	6053.5	6063.2	6041.9			
FC343	6061.5							
LEWIS(U)	6038.5	5840.1	5830.1	5751.2	5762.2	5759.0	5750.0	
MUDDY4	6051.8	6045.9	6043.8					
USGS1-3	6047.8							
USGS1-4	6306.8						6307.0	
USGS2-4	6003.0							

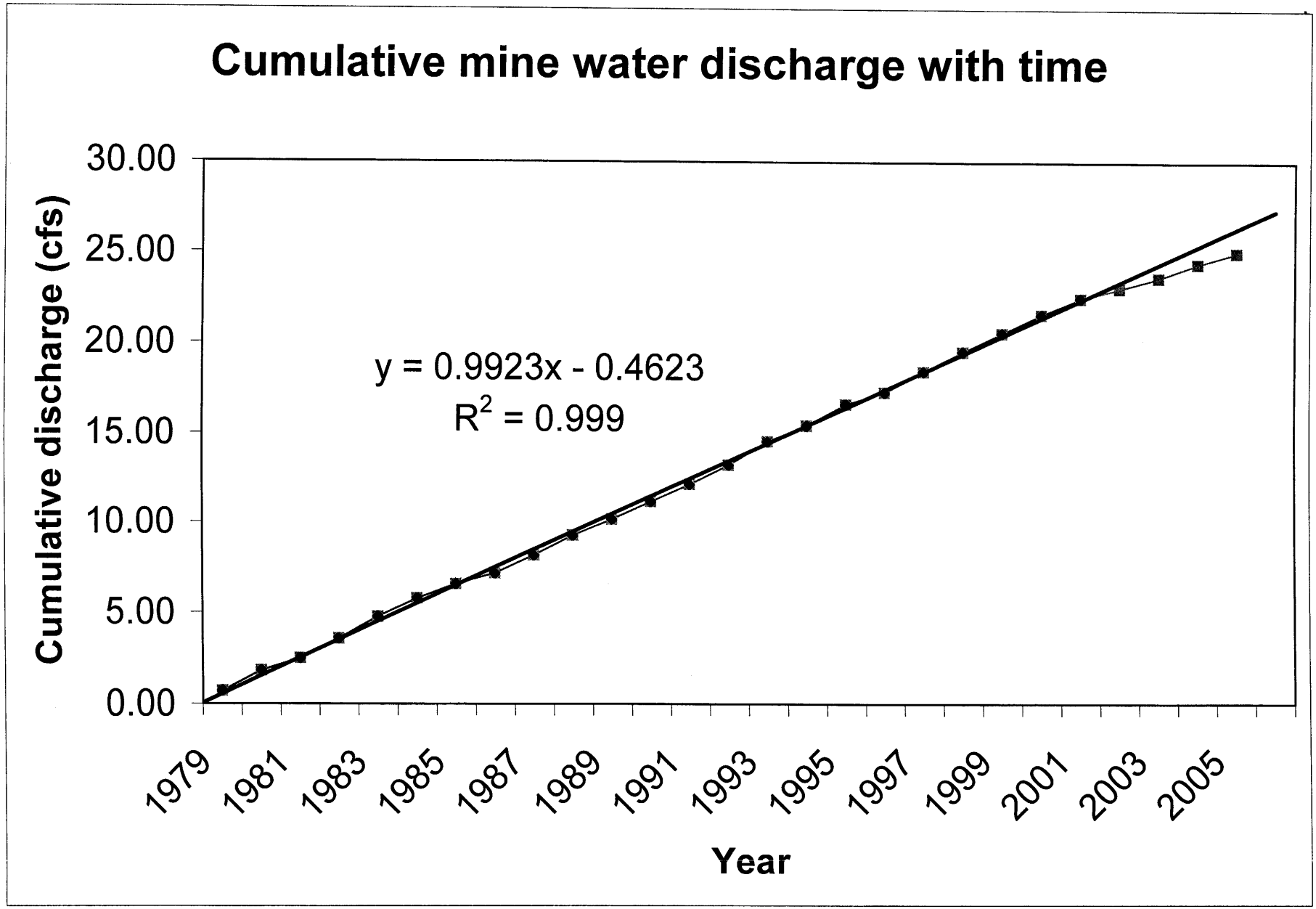
Table 2. Emery Mine discharge data.

Time	Mined Area (acres)	Mine Discharge (cfs)	
		Average	Cumulative
1945-1973	117.15		
1974-1975	48.61		
1975-1976	46.77		
1977	19.63		
1978	43.09		
1979	6.75	0.70	0.70
1980	56.12	1.11	1.81
1981	6.90	0.68	2.49
1982	37.26	1.07	3.56
1983	18.94	1.20	4.76
1984	36.88	1.00	5.76
1985	76.05	0.80	6.56
1986	28.98	0.60	7.16
1987	28.06	1.00	8.16
1988	87.25	1.10	9.26
1989	56.73	0.90	10.16
1990	27.29	0.99	11.15
1991	0.00	0.97	12.12
1992	0.00	1.10	13.22
1993	0.00	1.33	14.55
1994	0.00	0.88	15.43
1995	0.00	1.18	16.61
1996	0.00	0.67	17.28
1997	0.00	1.14	18.42
1998	0.00	1.09	19.51
1999	0.00	1.03	20.54
2000	0.00	1.03	21.57
2001	0.00	0.90	22.47
2002	11.50	0.54	23.01
2003	10.27	0.60	23.61
2004	14.87	0.77	24.38
2005	28.06	0.62	25.00

Statistical Analysis		
Mean	0.87	18.68 cfs
Std. Deviation	0.21	4.52 cfs
Max	1.33	25.00 cfs
Min	0.54	11.15 cfs

Avg. inflow prior to temp. shutdown (1979-1990)=	0.93 cfs
Avg. inflow during temp. shutdown (1991-2001)=	1.03 cfs
Avg. inflow following restart of mining (2002-2005)=	0.63 cfs


Mine Water Discharge (cfs)
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
1945-1973
1974-1975
1975-1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year


Cumulative mine water discharge with time
Cumulative discharge (cfs)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
y = 0.9923x - 0.4623
R2 = 0.999
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
Year

Estimated mine-water discharge from the Emery Mine (1980-1990) based on the Hantush Equation
(see Singh and Atkins, 1985)

Assume: (1) The potentiometric surface is as indicated in Table 1

(2) Average dip of coal bed (ft/ft) = 0.067 (from Chap. V of MRP)

(3) Hydraulic conductivity: 0.20 feet/day (Calibrated value. Compare with site data in Chap. VI of MRP and Lines et al. [1983])
Assumed transmissivity 80 ft^2/day (see Chap. VI of MRP and Lines et al. [1983])
Storage coefficient 1.59E-03 (see Chap. VI of MRP)
K in Bluegate shale 4.40E-04 ft/day (see 2005 slug test data)

(4) The Ferron Sandstone averages 400 feet in thickness in the mine area (see Chap. V of MRP)

(5) The IJ coal seam has an average thickness of 20 feet
The average thickness of the Upper Ferron sandstone above the IJ coal seam is 80 feet

(6) Mine water usage: 0.0221 cfs/acre (using 2002,2004, 2005 data when pillars are pulled out; see data below)
Avg. discharge from mine during temporary shutdown (1991-2001): 1.03 cfs (see Table 2)
Avg. discharge from mine following re-start (2002-2005): 0.63 cfs
Δflow 0.40 cfs (represents water usage in the mine)

(7) Subsurface inflow: Lateral recharge comes from Joes valley fault zone,
The recharge length 2.17 mile after 1990
Average discharge from mine during period of temporary shutdown (1991-2001): 1.03 cfs
Recharge per unit length = 0.47 cfs/mile

Analytical Model: Hantush Equation: $Q=2\pi TDG(\lambda,r/B)$
$\lambda=Tt/r^2S$
$r/B=r(K'/KLL')^{1/2}$

Year	**1980 (1)**	(using 1979 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		787	420	330	400	365			
Calculation		λ	2.97E+01	r/B	0.047631	G value	0.4	Q	0.98 cfs
Year	**1980 (2)**	(using 1979 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		400	215	125	400	365			
Calculation		λ	1.15E+02	r/B	0.039335	G value	0.35	Q	0.44 cfs
Mine facility usage:									1.24 cfs
Lateral recharge									0.87 cfs
Total Mine Discharge:									1.05 cfs
Year	**1981**	(using average of 1979 and 1982 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		300	121	31	400	365			
Calculation		λ	2.04E+02	r/B	0.05924	G value	0.29	Q	0.20 cfs
Mine facility usage:									0.15 cfs
Lateral recharge									0.90 cfs
Total Mine Discharge:									0.96 cfs
Year	**1982(1)**	(using 1982 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		472	48	0	400	365			
Calculation		λ	8.24E+01	r/B	1	G value	0.545	Q	0.15 cfs
Year	**1982(2)**	(using 1982 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		541	248	158	400	365			
Calculation		λ	6.27E+01	r/B	0.04732	G value	0.34	Q	0.49 cfs
Year	**1982(3)**	(using 1982 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		670	100	10	400	365			
Calculation		λ	4.09E+01	r/B	0.232943	G value	0.545	Q	0.32 cfs
Mine facility usage:									0.82 cfs
Lateral recharge									0.90 cfs
Total Mine Discharge:									1.04 cfs

Year	**1983**	(refer to 1979 Potentiometric surface at well FC343)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		724	260	170	400	365			
Calculation	λ	3.50E+01	r/B	0.061051	G value		0.39	Q	0.59 cfs
Mine facility usage:									0.42 cfs
Lateral recharge									0.90 cfs
Total Mine Discharge:									1.08 cfs

Year	**1984(1)**	(refer to 1983 Potentiometric surface at well USGS1-2)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		724	150	60	400	365			
Calculation	λ	3.50E+01	r/B	0.102763	G value		0.41	Q	0.36 cfs
Year	**1984(2)**	(refer to 1983 Potentiometric surface at well USGS1-2)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		500	160	0	400	365			
Calculation	λ	7.35E+01	r/B	1	G value		0.545	Q	0.51 cfs
Mine facility usage:									0.81 cfs
Lateral recharge									0.93 cfs
Total Mine Discharge:									0.98 cfs

Year	**1985(1)**	(using 1983 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		540	263	173	400	365			
Calculation	λ	6.30E+01	r/B	0.045138	G value		0.35	Q	0.54 cfs
Year	**1985(2)**	(using 1986 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		761	289	199	400	365			
Calculation	λ	3.17E+01	r/B	0.059311	G value		0.42	Q	0.71 cfs
Year	**1985(3)**	(using 1986 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		100	50	0	400	365			
Calculation	λ	1.84E+03	r/B	1	G value		0.3	Q	0.09 cfs
Mine facility usage:									1.68 cfs
Lateral recharge									1.01 cfs
Total Mine Discharge:									0.66 cfs

Year	**1986(1)**	(using 1986 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		449	100	10	400	365			
Calculation	λ	9.11E+01	r/B	0.156107	G value		0.33	Q	0.19 cfs
Year	**1986(2)**	(using 1986 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		446	66	0	400	365			
Calculation	λ	9.23E+01	r/B	1	G value		0.545	Q	0.21 cfs
Mine facility usage:									0.64 cfs
Lateral recharge									1.03 cfs
Total Mine Discharge:									0.79 cfs

Year	**1987(1)**	(using 1986 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		366	53	0	400	365			
Calculation	λ	1.37E+02	r/B	1	G value		0.406	Q	0.13 cfs
Year	**1987(2)**	(using 1986 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		500	286	196	400	365			
Calculation	λ	7.35E+01	r/B	0.039266	G value		0.33	Q	0.55 cfs
Mine facility usage:									0.62 cfs
Lateral recharge									1.03 cfs
Total Mine Discharge:									1.09 cfs

Year	**1988(1)**	(using 1989 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		400	286	196	400	365			
Calculation		λ	1.15E+02	r/B	0.031413	G value	0.309	Q	0.51 cfs
Year	**1988(2)**	(using 1989 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		400	286	196	400	365			
Calculation		λ	1.15E+02	r/B	0.031413	G value	0.309	Q	0.51 cfs
Year	**1988(3)**	(using 1989 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		570	480	390	400	365			
Calculation		λ	5.65E+01	r/B	0.031734	G value	0.32	Q	0.89 cfs
Year	**1988(4)**	(using 1989 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		625	0	0	400	365			
Calculation		λ	4.70E+01	r/B	1	G value	0.2	Q	0.00 cfs
Mine facility usage:									1.92 cfs
Lateral recharge									1.03 cfs
Total Mine Discharge:									1.03 cfs
Year	**1989(1)**	(using 1989 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		683	360	270	400	365			
Calculation		λ	3.94E+01	r/B	0.0457	G value	0.36	Q	0.75 cfs
Year	**1989(2)**	(using 1989 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		256	250	160	400	365			
Calculation		λ	2.80E+02	r/B	0.022251	G value	0.284	Q	0.41 cfs
Year	**1989(3)**	(using 1989 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		502	0	-90	400	365			
Calculation		λ	7.29E+01	r/B	1	G value	0.2	Q	0.00 cfs
Mine facility usage:									1.25 cfs
Lateral recharge									1.03 cfs
Total Mine Discharge:									0.95 cfs
Year	**1990(1)**	(using 1990 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		272	175	85	400	365			
Calculation		λ	2.48E+02	r/B	0.032437	G value	0.29	Q	0.30 cfs
Year	**1990(2)**	(using 1990 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		272	175	85	400	365			
Calculation		λ	2.48E+02	r/B	0.032437	G value	0.29	Q	0.30 cfs
Year	**1990(3)**	(using 1990 Potentiometric surface)							
Parameters		r (ft)	D (ft)	L' (ft)	L (ft)	t(day)			
		478	15	0	400	365			
Calculation		λ	8.04E+01	r/B	1	G value	0.545	Q	0.05 cfs
Mine facility usage:									0.60 cfs
Lateral recharge									1.03 cfs
Total Mine Discharge:									1.07 cfs

Estimated mine-water discharge from the Emery Mine based on the tunnel inflow equation
(see Freeze and Cherry, 1979)

Assumed avg. hydraulic conductivity: 0.20 ft/day

Vertical mine-water inflow (see Plate VI-6A for mine extents and dimensions each year):

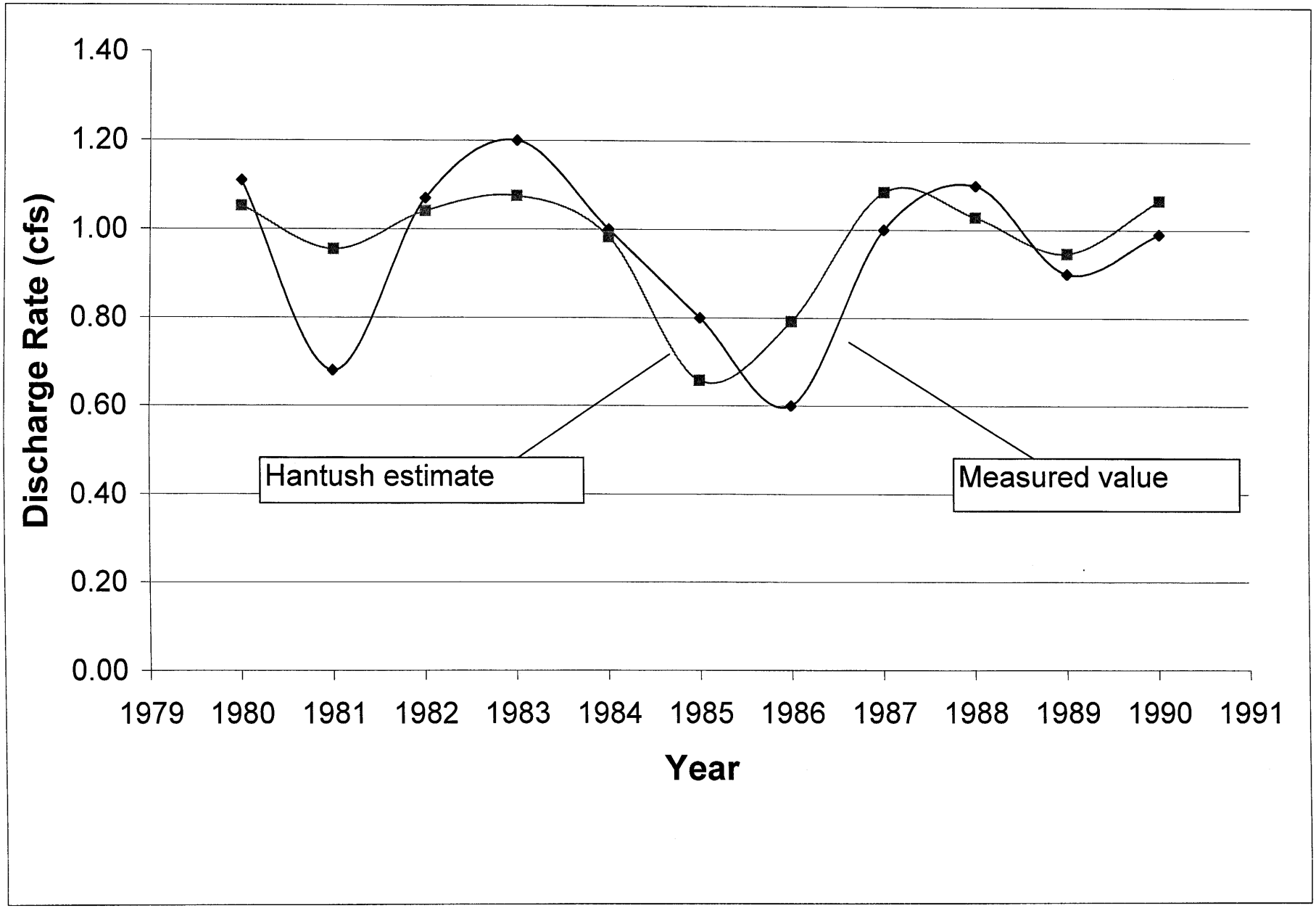
Year	Ho	L	Qo	Vert. Inflow (cfs)
1980(1)	420	6875	0.001517508	10.43
1980(2)	215	1406	0.000931616	1.31
1980				11.74
1981	121	990	0.000632506	0.63
1982(1)	48	1625	0.000375576	0.61
1982(2)	248	5000	0.001030807	5.15
1982(3)	100	2800	0.000561132	1.57
1982				7.34
1983	260	1400	0.001066302	1.49
1984(1)	150	1400	0.000727952	1.02
1984(2)	160	1312.5	0.000760132	1.00
1984				2.02
1985(1)	263	2025	0.001075131	2.18
1985(2)	289	4800	0.001150955	5.52
1985(3)	50	1500	0.000382827	0.57
1985				8.28
1986(1)	100	1000	0.000561132	0.56
1986(2)	66	1625	0.000440957	0.72
1986				1.28
1987(1)	53	1000	0.000393733	0.39
1987(2)	286	1875	0.001142268	2.14
1987				2.54
1988(1)	286	875	0.001142268	1.00
1988(2)	286	1375	0.001142268	1.57
1988(3)	0	2000	0	0.00
1988(4)	480	3250	0.001678673	5.46
1988				8.03
1989(1)	360	5125	0.001352454	6.93
1989(2)	250	5200	0.001036743	5.39
1989(3)	0	2750	0	0.00
1989				12.32
1990(1)	175	750	0.000807776	0.61
1990(2)	175	1250	0.000807776	1.01
1990(3)	15	1375	0.000313014	0.43
1990				2.05

Emery Mine Water Budget Prediction with the Tunnel Inflow Equation (all flows in cfs)

Year	Vertical Inflow	Horizontal Inflow	Total Mine Inflow	Facility Usage	Pump Discharge
1980	11.74	0.87	12.62	1.24	11.38
1981	0.63	0.90	1.53	0.15	1.38
1982	7.34	0.90	8.24	0.82	7.42
1983	1.49	0.90	2.40	0.42	1.98
1984	2.02	0.93	2.95	0.81	2.13
1985	8.28	1.01	9.28	1.68	7.60
1986	1.28	1.03	2.31	0.64	1.67
1987	2.54	1.03	3.57	0.62	2.95
1988	8.03	1.03	9.06	1.92	7.13
1989	12.32	1.03	13.35	1.25	12.10
1990	2.05	1.03	3.08	0.60	2.47
Average	5.25	0.97	6.22	0.92	5.29

Comparison of discharge estimates with measured values - Emery Mine, 1980-1990

Time	Mine Water Discharge (cfs)		
	Measured	Hantush	Tunnel
1980	1.11	1.05	11.38
1981	0.68	0.96	1.38
1982	1.07	1.04	7.42
1983	1.20	1.08	1.98
1984	1.00	0.98	2.13
1985	0.80	0.66	7.60
1986	0.60	0.79	1.67
1987	1.00	1.09	2.95
1988	1.10	1.03	7.13
1989	0.90	0.95	12.10
1990	0.99	1.07	2.47
Average	0.95	0.97	5.29


1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Discharge Rate (cfs)
Hantush estimate
Measured value
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
Year

Predictions of Future
Mine-Water Discharge

Predicted future mine-water discharge from the Emery Mine (through 2013) based on the Hantush equation
(see Singh and Atkins, 1985)

Assume: **(1)** The potentiometric surface is as indicated for 1995 in Table 1

(2) Average dip of the coal bed (ft/ft) = 0.067

(3) Hydraulic conductivity 0.20 feet/day (Calibrated value)
Assumed transmissivity 80 ft^2/day (see Chap. VI of MRP and Lines et al. [1983]))
a storage coefficient 1.59E-03 (see Chap. VI of MRP)
K in Bluegate shale 4.40E-04 ft/day (see 2005 slug test data)

(4) The Ferron Sandstone averages 400 feet in thickness in the mine area

(5) The IJ coal seam has an average thickness of: 20 ft
The average thickness of the Upper Ferron sandstone above the IJ coal seam is: 80 ft

(6) Mine facility usage: 0.0221 cfs/acre
Based on: Average mine discharge from 1991-2001= 1.03 cfs
Average mine discharge from 2002-2005= 0.63 cfs
Difference (i.e., in-mine water usage)= 0.40 cfs
Historic mine areas (from Plate VI-6A)

(7) Horizontal inflow: Originates from the Joes Valley-Paradise fault zone
Mine length exposed to inflow from the fault zone: 2.17 mile
Assumes all inflow from 1991-2001 resulted from horizontal flow to the mine
Horizontal inflow per unit length of mine = 0.47 cfs/mile

(8) Future mine workings to be oriented as indicated on Plate VI-6A

Analytical Model: Hantush Equation: $Q=2\pi TDG(\lambda,r/B)$
$\lambda=Tt/r^2S$
$r/B=r(K'/KLL')^{1/2}$

Year 2006(1)	(using 1995 Potentiometric surface)								
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)			
	550	200			110	400	365		
Calculation	λ	6.07E+01	r/B		0.057656	G value		0.36 Q	0.42 cfs
Year 2006(2)	(using 1995 Potentiometric surface)								
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)			
	312	350			260	400	365		
Calculation	λ	1.89E+02	r/B		0.021274	G value		0.284 Q	0.58 cfs
Year 2006(3)	(using 1995 Potentiometric surface)								
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)			
	579	190			100	400	365		
Calculation	λ	5.48E+01	r/B		0.063658	G value		0.374 Q	0.41 cfs
Mine facility usage:									1.31 cfs
Lateral recharge									1.19
Total Mine Discharge:									1.29 cfs

Year 2007(1)	(using 1995 Potentiometric surface)								
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)			
	667	250			160	400	365		
Calculation	λ	4.13E+01	r/B		0.057975	G value		0.36 Q	0.52 cfs
Year 2007(2)	(using 1995 Potentiometric surface)								
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)			
	356	320			230	400	365		
Calculation	λ	1.45E+02	r/B		0.025808	G value		0.29 Q	0.54 cfs
Year 2007(3)	(using 1995 Potentiometric surface)								
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)			
	583	180			90	400	365		
Calculation	λ	5.40E+01	r/B		0.067565	G value		0.374 Q	0.39 cfs

Mine facility usage:										1.45 cfs
Lateral recharge										1.19
Total Mine Discharge:										1.19 cfs
Year 2008(1)	(using 1995 Potentiometric surface)									
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)				
	655	305		215	400	365				
Calculation	λ	4.28E+01	r/B		0.049113	G value		0.35	Q	0.62 cfs
Year 2008(2)	(using 1995 Potentiometric surface)									
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)				
	743	480		390	400	365				
Calculation	λ	3.33E+01	r/B		0.041365	G value		0.39	Q	1.09 cfs
Year 2008(3)	(using 1995 Potentiometric surface)									
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)				
	678	208		118	400	365				
Calculation	λ	4.00E+01	r/B		0.068622	G value		0.38	Q	0.46 cfs
Mine facility usage:										2.30 cfs
Lateral recharge										1.45
Total Mine Discharge:										1.33 cfs
Year 2009(1)	(using 1995 Potentiometric surface)									
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)				
	543	340		250	400	365				
Calculation	λ	6.23E+01	r/B		0.037758	G value		0.35	Q	0.69 cfs
Year 2009(2)	(using 1995 Potentiometric surface)									
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)				
	230	390		300	400	365				
Calculation	λ	3.47E+02	r/B		0.0146	G value		0.255	Q	0.58 cfs
Year 2009(3)	(using 1995 Potentiometric surface)									
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)				
	686	160		70	400	365				
Calculation	λ	3.90E+01	r/B		0.090147	G value		0.38	Q	0.35 cfs
Mine facility usage:										1.31 cfs
Lateral recharge										1.45
Total Mine Discharge:										1.77 cfs
Year 2010(1)	(using 1995 Potentiometric surface)									
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)				
	611	400		310	400	365				
Calculation	λ	4.92E+01	r/B		0.038154	G value		0.35	Q	0.81 cfs
Year 2010(2)	(using 1995 Potentiometric surface)									
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)				
	790	390		300	400	365				
Calculation	λ	2.94E+01	r/B		0.050147	G value		0.4	Q	0.91 cfs
Year 2010(3)	(using 1995 Potentiometric surface)									
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)				
	699	203		113	400	365				
Calculation	λ	3.76E+01	r/B		0.072296	G value		0.38	Q	0.45 cfs
Mine facility usage:										2.37 cfs
Lateral recharge										1.48
Total Mine Discharge:										1.28 cfs

Year 2011(1)	(using 1995 Potentiometric surface)								
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)			
	568	410		320	400	365			
Calculation	λ	5.69E+01	r/B		0.03491	G value	0.35	Q	0.83 cfs
Year 2011(2)	(using 1995 Potentiometric surface)								
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)			
	572	348		258	400	365			
Calculation	λ	5.61E+01	r/B		0.039153	G value	0.36	Q	0.73 cfs
Year 2011(3)	(using 1995 Potentiometric surface)								
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)			
	689	60		0	400	365			
Calculation	λ	3.87E+01	r/B		1	G value	0.784	Q	0.27 cfs
Mine facility usage:									1.79 cfs
Lateral recharge									1.48
Total Mine Discharge:									1.52 cfs
Year 2012(1)	(using 1995 Potentiometric surface)								
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)			
	564	450		360	400	365			
Calculation	λ	5.77E+01	r/B		0.032682	G value	0.35	Q	0.92 cfs
Year 2012(2)	(using 1995 Potentiometric surface)								
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)			
	288	340		250	400	365			
Calculation	λ	2.21E+02	r/B		0.020026	G value	0.284	Q	0.56 cfs
Year 2012(3)	(using 1995 Potentiometric surface)								
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)			
	579	0		0	400	365			
Calculation	λ	5.48E+01	r/B		1	G value	0.784	Q	0.00 cfs
Mine facility usage:									1.33 cfs
Lateral recharge									1.48
Total Mine Discharge:									1.63 cfs
Year 2013(1)	(using 1995 Potentiometric surface)								
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)			
	643	525		435	400	365			
Calculation	λ	4.44E+01	r/B		0.033895	G value	0.34	Q	1.04 cfs
Year 2013(2)	(using 1995 Potentiometric surface)								
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)			
	404	255		165	400	365			
Calculation	λ	1.13E+02	r/B		0.034579	G value	0.32	Q	0.47 cfs
Year 2013(3)	(using 1995 Potentiometric surface)								
Parameters	r (ft)	D (ft)	L' (ft)		L (ft)	t(day)			
	243	0		0	400	365			
Calculation	λ	3.11E+02	r/B		1	G value	0.545	Q	0.00 cfs
Mine facility usage:									1.01 cfs
Lateral recharge									1.48
Total Mine Discharge:									1.98 cfs

Emery Mine Discharge Prediction

Time	Discharge (cfs)
2006	1.29
2007	1.19
2008	1.33
2009	1.77
2010	1.28
2011	1.52
2012	1.63
2013	1.98
Average	1.50

APPENDIX VI-15

MODFLOW Report

MODFLOW Evaluation of Emery Mine, May 2007

Introduction

The USGS MODFLOW program was utilized to estimate water inflow volumes to and discharge volumes from the Emery Mine, and to estimate the piezometric surface in the Upper Ferron sandstone aquifer after completion of mining as well as recovery of the aquifer after mine abandonment.

The vast majority of water inflow into Emery Mine is from the overlying Upper Ferron sandstone aquifer which directly overlies the coal seam. Historically this inflow has been in the 400-450 gallons per minute (gpm) range based on pumpage and weir outflow records. This inflow increased to approximately 600 gpm in 2006. This information was utilized in calibrating the model.

Figure 1 shows the projected mining schedule from June 2007 to the end of 2016.

The MODFLOW model was constructed in three dimensions using the Utah NAD83 coordinate system since CONSOL's mapping was in this coordinate system. The mapping was imported into the model to facilitate assigning of hydraulic properties and boundary conditions to simulate real world conditions as closely as possible. The model consisted of three layers: 1) the Bluegate Shale (where present), 2) Upper Ferron sandstone, and 3) the "I" coal seam horizon. Geologic structure data were also imported into the model to simulate strike, dip and thickness of the various units. Figure 2 shows the model in plan view and Figure 3 shows the model in cross section. The coal seam horizon was simulated hydrologically using extremely high hydraulic conductivity values for the mine works and extremely low conductivity values for the solid coal surrounding the mine. (The reason for the very low conductivity values for the solid coal was to render lateral inflow to the mine through solid coal as negligible – only vertical inflow from the overlying sandstone was evaluated.) The hydraulic properties of the Bluegate Shale and Upper Ferron sandstone were derived from slug and pump tests performed in monitoring wells in the vicinity of Emery Mine. Based on our assumption that the vast majority of mine inflow originates from the Upper Ferron sandstone, its hydraulic properties were adjusted to approximate actual mine inflow rates. This was a key component in calibrating the model prior to any predictions of future mine inflows or piezometric surface changes. As part of this calibration phase, it was assumed that the piezometric surfaces of the Upper Ferron sandstone and the Bluegate Shale remained constant. The purpose of this assumption was to streamline the calibration process. Initial piezometric head values to the predictive phase of the model were based on current (2007) groundwater levels in monitoring wells completed in both the Bluegate Shale and the Upper Ferron sandstone. Mine inflow and piezometric surface changes were predicted from the period June 2007 through December 2016 (the projected life of mine). Aquifer water level recovery after mine closure was then modeled. The following summarizes the modeling steps:

1. Gather pump test, monitor well level, mapping, and geological data
2. Construct model and calibrate results with pumpage and well level data
3. Predict inflow and Upper Ferron and Bluegate Shale piezometric head fields on an annual basis through 2016
4. At end of 2016, predict rate of filling of mine voids after dewatering pumps are shut off and the mine is closed.
5. Predict recovery of piezometric head field in Upper Ferron aquifer after mine closure.

Results

Mine Inflow

As with any numerical model of groundwater flow there are uncertainties as to boundary conditions, the distribution of vertical and horizontal hydraulic conductivity, and recharge rates among other factors. In the Emery mine inflow model, there are additional uncertainties, the major ones being: 1) changes in Upper Ferron aquifer hydraulic conductivity resulting from pillaring of the underlying coal and 2) the hydraulic characteristics of the nearby Joes Valley fault zone. As a result of these uncertainties, differing scenarios were run with MODFLOW to approximate a range of inflows rather than a single number. As a worst case inflow evaluation, it was assumed that groundwater levels in the Upper Ferron aquifer do not change over time from 2007 going forward, that the hydraulic properties of the Joes Valley fault zone are much higher than the surrounding rocks, and that post-subsidence hydraulic conductivity of the sandstone is on the high side. This scenario would assume the greatest amount of recharge to the aquifer and thus inflow to the mine. The conservative nature of this set of assumptions is evidenced by the fact that water levels in the Upper Ferron aquifer *have* declined in the vicinity of the mine as mining has progressed, thereby decreasing the head above the mine and the transmissivity of the aquifer.

As a worst case drawdown evaluation of the Upper Ferron aquifer it was assumed that groundwater levels in the Upper Ferron aquifer are allowed to decline as mining progresses, that the fault zone has lower hydraulic conductivity than for the high inflow scenario, and that post-subsidence hydraulic conductivity of the sandstone is on the low side. Since water-level declines will likely continue as mining progresses, this scenario is considered more realistic than the worst case inflow scenario discussed above. As an independent check to the modeled inflows, a relatively simple calculation of predicted inflow based on inflows measured in the 1st and 2nd South pillared area was used and applied to the remaining areas to be mined. However, it must be kept in mind that the 1st and 2nd South areas of the mine are near the outcrop and may not be representative of the deeper portions of the mine.

The results are summarized in Table 1. There is a wide range in the results with the unit area estimate method falling approximately halfway in between the high and low MODFLOW estimates.

Figure 4 shows the predicted piezometric surface (worst case drawdown scenario) for the Upper Ferron sandstone at the end of the year 2016, that is after all planned mining has been completed.

Post Closure

MODFLOW was also utilized to estimate the post-mine closure piezometric surface of the Upper Ferron aquifer. This was performed in three stages:

1. Estimate the number of years that the mine would fill with water after all pumping ceases. This is admittedly a very rough calculation because single values of mine porosity, mining height, and inflow rate were assumed. In reality, porosity will vary with type of mining (room and pillar vs. pillaring), mining height will vary throughout the mine and inflow rate will vary with time (usually decreases as mine floods). Nonetheless, this approach provides a place to start.
2. Calibrate the calculated head field in the mine with the results from (1) above. In other words, if it takes 5 years for the mine to fill, then, if the model results are accurate, the calculated head field after 5 years should approach the elevation of the lowest drift entry, which is 5995 feet AMSL.
3. Assign constant head value of 5995 feet to the model layer corresponding to the coal seam, and run the model to estimate the effect of post closure and flooding on the head field with time in the Upper Ferron sandstone.

Figures 5 and 6 show the modeled piezometric surface for the Upper Ferron sandstone for the following times:

- Year 2026, ten years after mining complete and pumping ceased, mine is predicted to be nearly full of water to an elevation of 5975 ft AMSL (Figure 5)
- Year 2036, twenty years after mining complete, the mine remains at a constant pool elevation of 5995 ft AMSL for ten years (Figure 6)

The piezometric surface maps shown in Figures 5 and 6 demonstrate that the Upper Ferron aquifer is expected to recover significantly soon after completion of mining. This can be most clearly seen in comparing Figures 5 and 6 with Figure 4. The rate of recovery of the aquifer is most probably due to fairly rapid flooding of the mine because of high recharge rates and the degree of connection between the mine and the overlying aquifer.

TABLE 1

Predicted Inflow for Emery Mine

Year	Predicted Inflow (gpm)		
	Worst Case Drawdown Scenario	Unit Area Method	Worst Case Inflow Scenario
2007	615	704	730
2008	653	861	955
2009	678	973	1125
2010	700	1067	1288
2011	760	1213	1540
2012	770	1280	1665
2013	892	1445	1917
2014	881	1492	1994
2015	960	1686	2375
2016	953	1744	2550

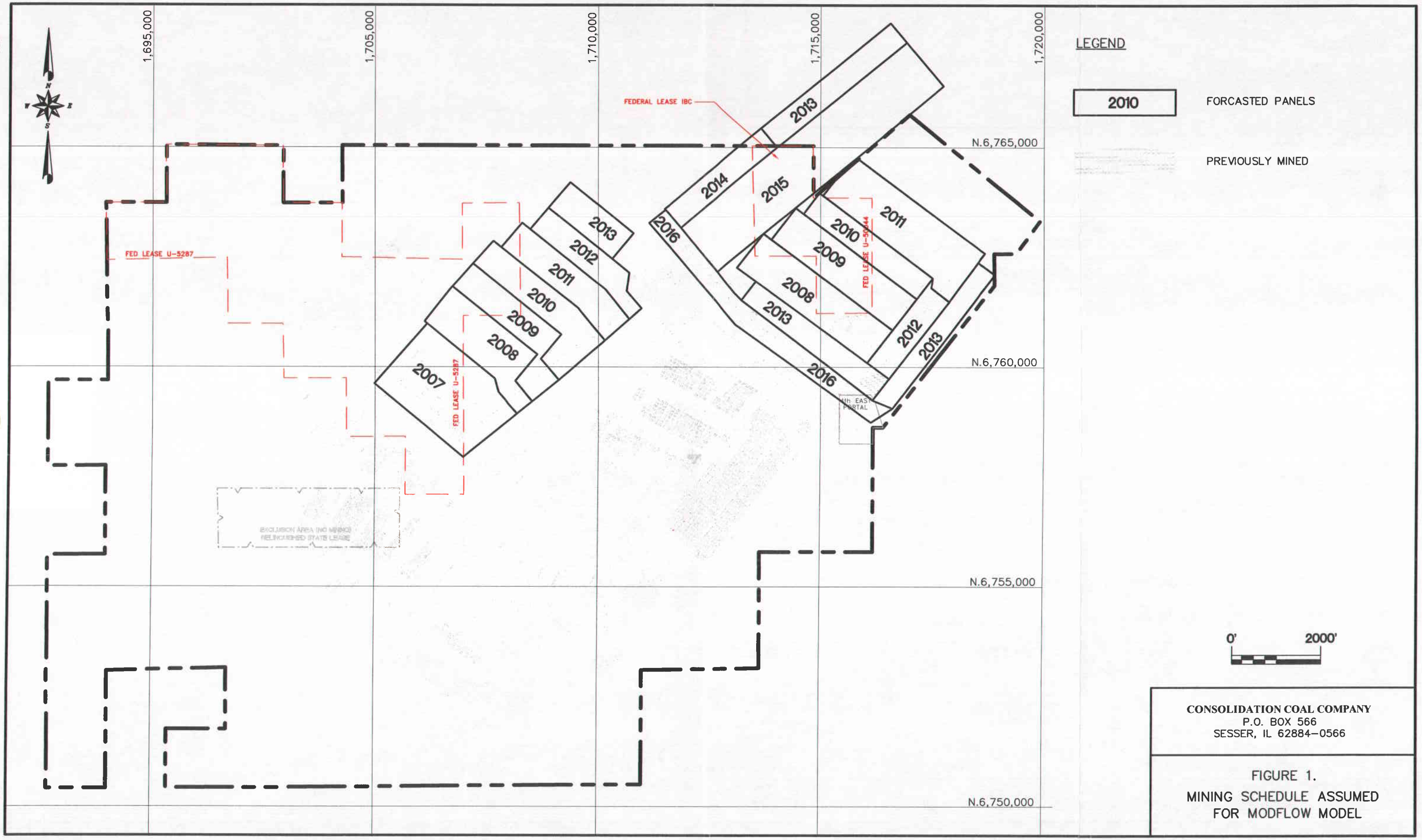


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FIGURE 1.
MINING SCHEDULE ASSUMED
FOR MODFLOW MODEL

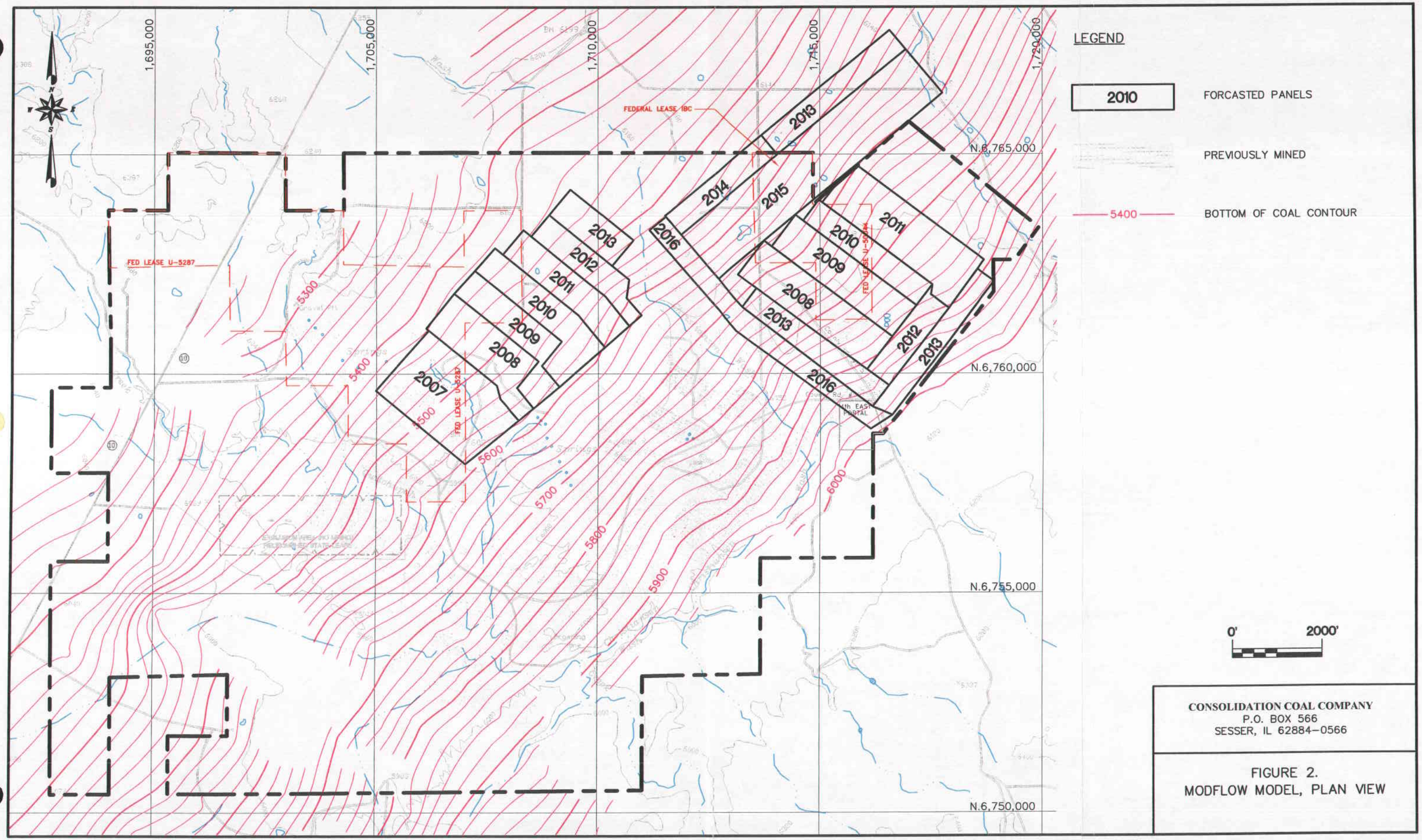

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FIGURE 2.
MODFLOW MODEL, PLAN VIEW

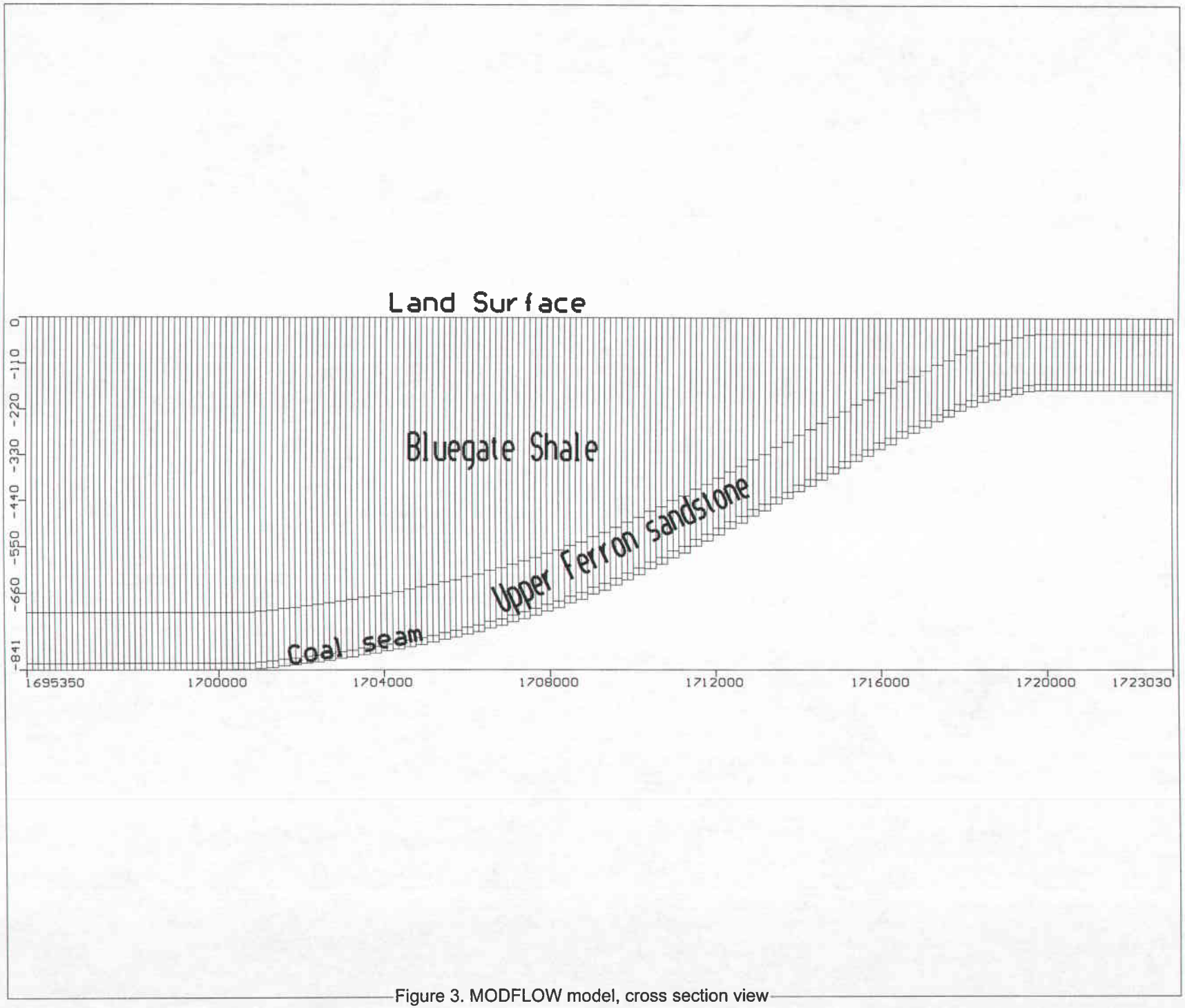

Figure 3. MODFLOW model, cross section view

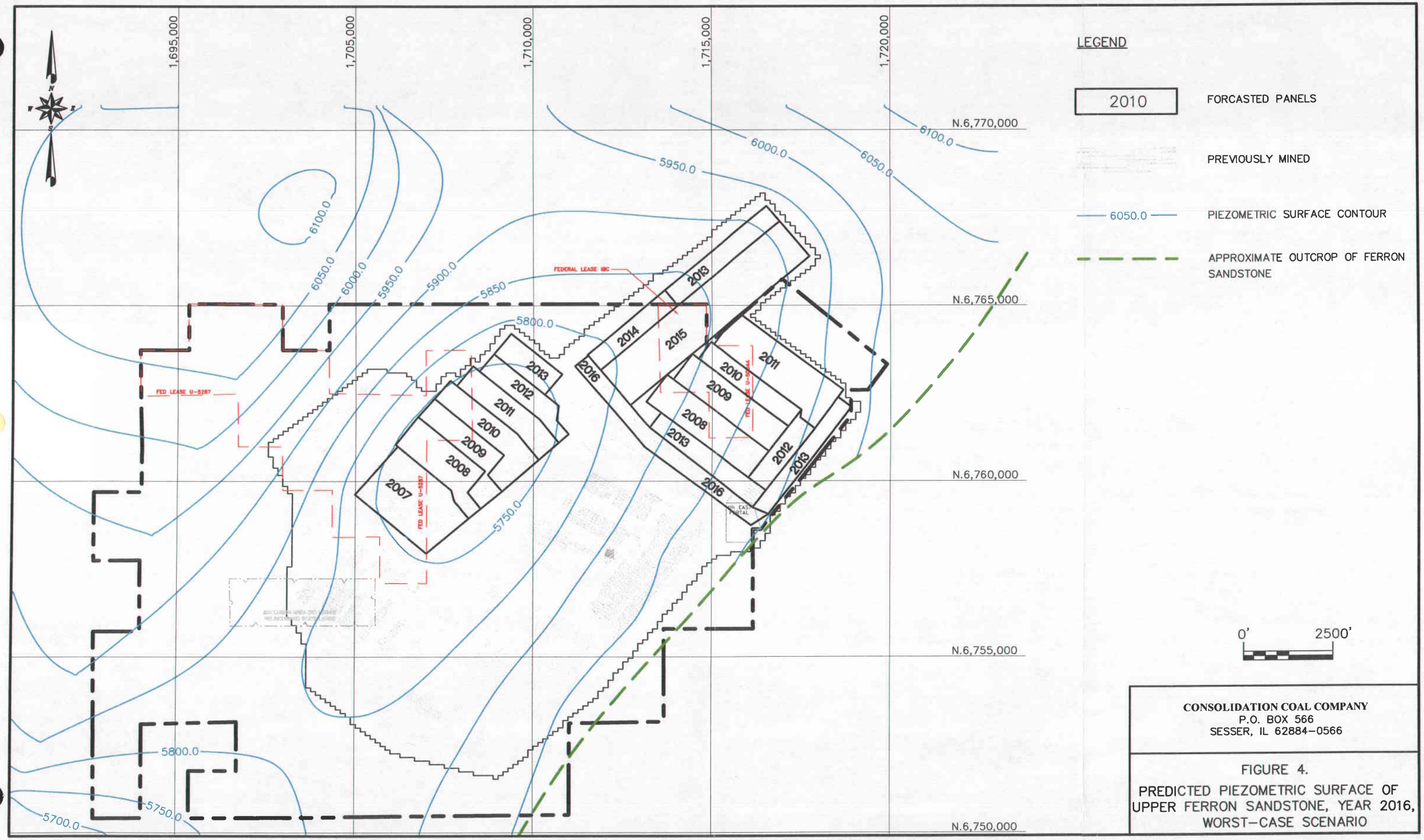

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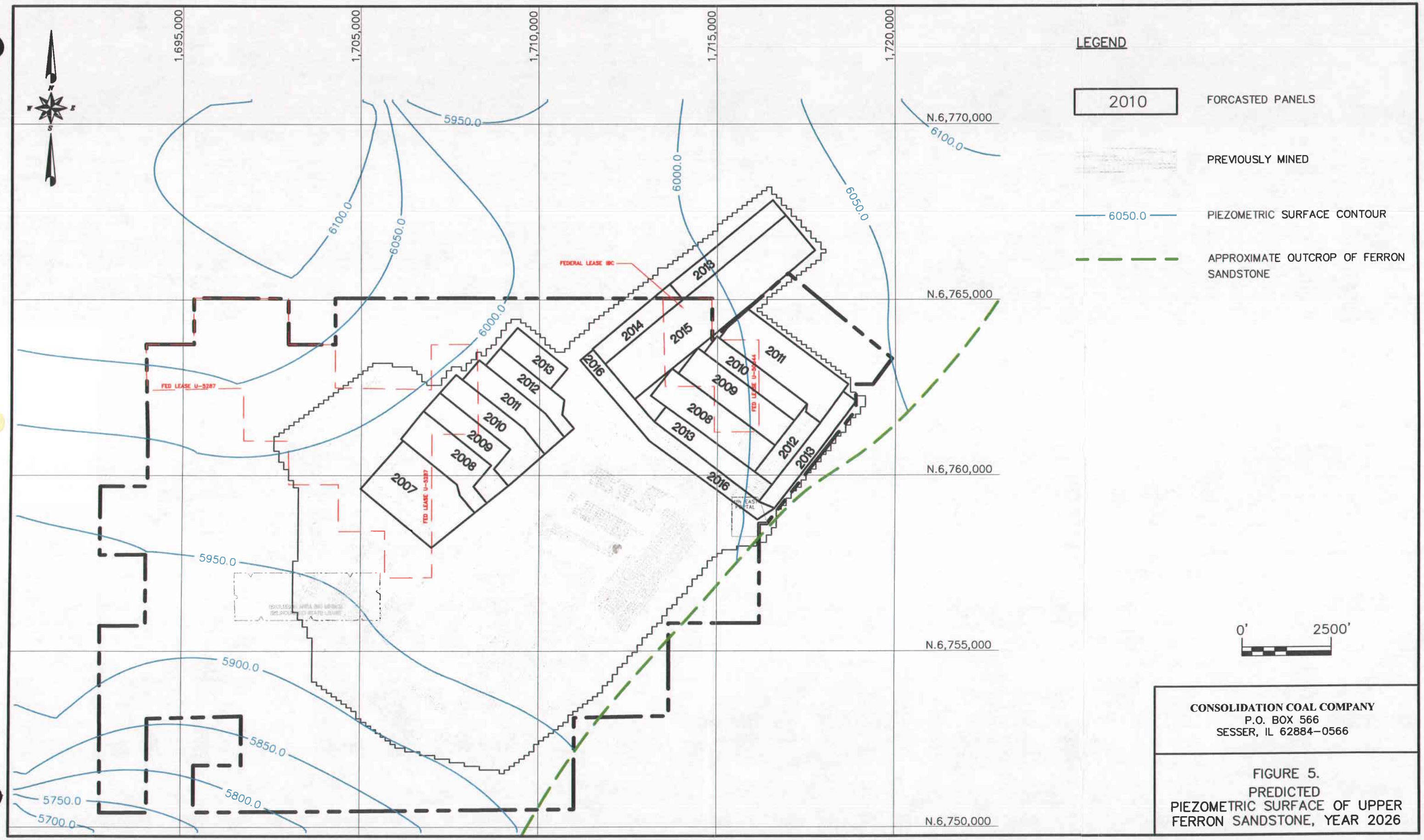
FIGURE 4.
PREDICTED PIEZOMETRIC SURFACE OF UPPER FERRON SANDSTONE, YEAR 2016, WORST-CASE SCENARIO



LEGEND

2010	FORCASTED PANELS
	PREVIOUSLY MINED
6050.0	PIEZOMETRIC SURFACE CONTOUR
	APPROXIMATE OUTCROP OF FERRON SANDSTONE

0' 2500'

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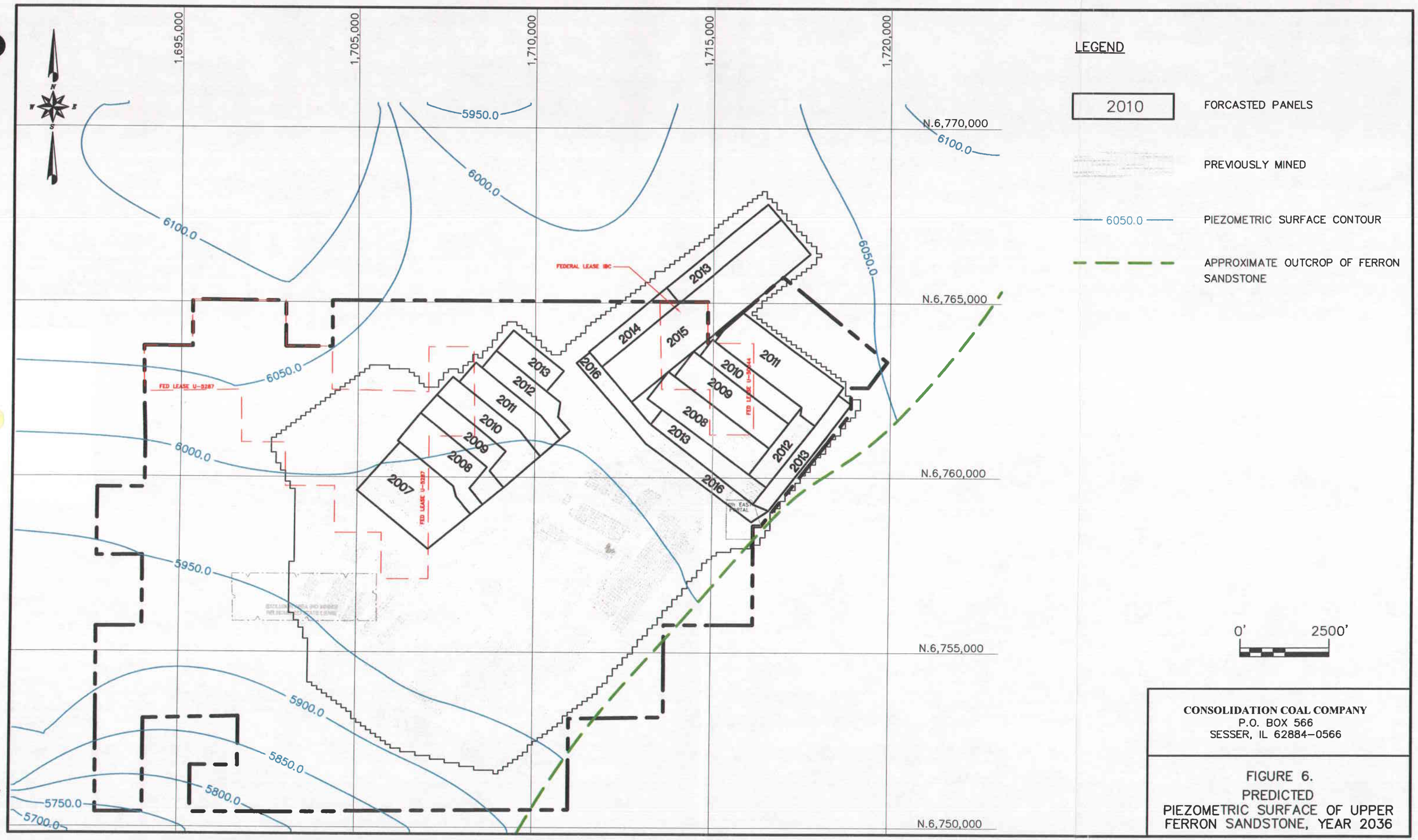
FIGURE 5.
PREDICTED
PIEZOMETRIC SURFACE OF UPPER
FERRON SANDSTONE, YEAR 2026



LEGEND

2010	FORCASTED PANELS
	PREVIOUSLY MINED
6050.0	PIEZOMETRIC SURFACE CONTOUR
	APPROXIMATE OUTCROP OF FERRON SANDSTONE

0' 2500'

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FIGURE 6.
PREDICTED
PIEZOMETRIC SURFACE OF UPPER
FERRON SANDSTONE, YEAR 2036