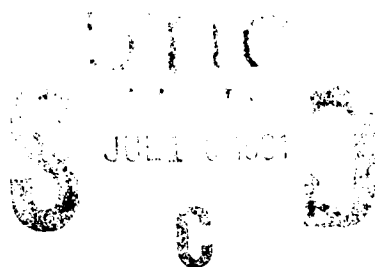


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NWC TP 7138

# Coso Monitoring Program October 1989 Through September 1990

by  
J. H. Monahan  
and  
D. E. Condon  
*Comarco Weapons Support Division*  
for the  
*Public Works Department*

JANUARY 1991

NAVAL WEAPONS CENTER  
CHINA LAKE, CA 93555-6001



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# Naval Weapons Center

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## FOREWORD

This report presents the status of the Coso Monitoring Program conducted for the period October 1989 through September 1990 by the Naval Weapons Center (NWC), China Lake, Calif. The investigation, funded under the NWC Coso Geothermal Development Program, is being conducted to provide baseline information on hydrology and surface geothermal activity in the Coso Hot Springs area.

Comarco personnel aided in the successful completion of the 1989-90 Coso Monitoring Program under contract N60530-88-D-0019 for the Public Works Department, NWC.

This report was reviewed for technical accuracy by Steven C. Bjornstad and James A. Whelan.

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## INTRODUCTION

The Coso Monitoring Program was initiated in 1978 to gather baseline data on the surface and near surface geothermal activity at Devils Kitchen and Coso Hot Springs, the main thermal sites within the Coso Known Geothermal Resource Area (Coso KGRA). This report represents the thirteenth year of continual baseline data collection.

Numerous changes occurred at the thermal sites in the past year. Some are a continuation of work begun in 1989 and reported in the last report, and others are new changes in response to physical events that occurred in 1990. For example, data collection was interrupted at two sites when physical activity made it necessary to reconfigure the collection mechanisms. A mini-weather data station was also installed in the area. These activities will all be discussed in the individual site discussions.

Monitored sites of the Coso Hot Springs area and type of data collected at each site are presented in Table 1. The location of each site is shown in Figures 1 and 2.

## TEMPERATURE AND STEAM FLOW MONITORING

Steam flow and temperature are measured at several sites in the Coso Hot Springs area. One monitoring site is located within Devils Kitchen, and the other stations are located along the Airport Lake-Coso Hot Springs Fault. Temperature data are used as collected, while the steam flow data are converted from graph units to steam flow in pounds per hour. The conversion factors for the steam data are calculated using the standard orifice equation for gas flow. The Barton pressure differential meters and temperature recorders were calibrated during the months of April and May.



TABLE 1. Monitoring Functions and Locations.

Monitored Sites	Continuous Steam Flow	Continuous Water Level	Periodic Water Level	Continuous Steam Temperature	Periodic Steam Temperature	Ambient Temperature	Barometric Pressure	Humidity	Water Level Photography	Water Chemistry
Schober's Resort (4A-2, 3) .....	X			X		X				
Eight-Inch Steam Well (4H-4) .....	X									
Coso Well No.1 (4H-8) .....			X <sup>b</sup>		X					X
Two-Inch Steam Well (4P-2).....	X			X						
Well 4P-1.....		X			X					X
Well 4K-1 .....			X <sup>b</sup>		X					X
Devils Kitchen .....	X									X
Observation Well No. 1...		X <sup>a</sup>								X
Observation Well No. 2...		X <sup>a</sup>								
Observation Well No. 3...		X <sup>a</sup>								
South Pool.....		X <sup>a</sup>			X				X	X
Weather Station No. 1 .....						X <sup>c</sup>	X <sup>c</sup>	X <sup>c</sup>		

a. Weekly monitoring.

b. Less than weekly.

c. Hydrothermograph installed in September 1990 for test chart. Data collection started 1 October 1990



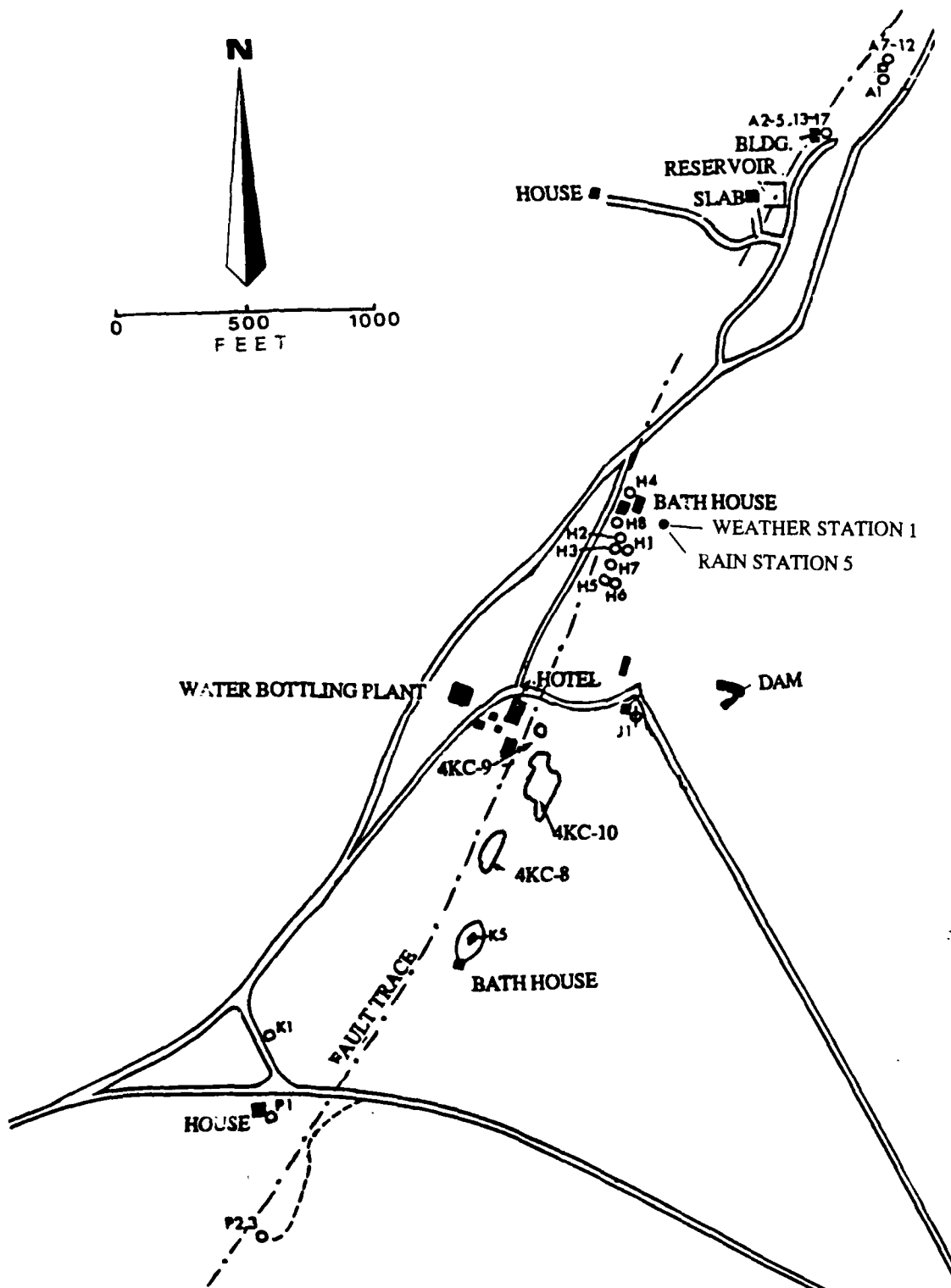


FIGURE 2. Coso Hot Springs Monitoring Sites.

**DEVILS KITCHEN**

Daily high and low steam flow data at Devils Kitchen for this reporting period are presented in Appendix A as Table A-1. Yearly mean data and the standard deviations for high and low daily steam flow are presented in Table 2. These data are shown graphically in Figure 3.

The drastic drop in steam flow in March 1990, shown graphically in Figure 3, was the result of internally corroded plumbing between the orifice block and the manometer valves. The sections of pipe were replaced and an on-site calibration of the Barton recorder was performed. Calibration was accomplished using a portable field calibration unit that was designed to meet the required calibration standards. A significant improvement in the constancy of the steam flow is clearly depicted in Figure 3 following the maintenance and calibration at the end of April 1990.

TABLE 2. Devils Kitchen Statistical Steam Flow.

Date	High daily flow, lb/h		Low daily flow, lb/h	
	Mean	Standard deviation	Mean	Standard deviation
1 Oct 89 - 30 Sep 90	358.7	7.0	356.7	6.8

**4P-2 (TWO-INCH STEAM WELL)**

Daily high and low steam flow and steam temperature data for Well 4P-2 are presented in Appendixes A and B as Tables A-2, A-3, and B-1. These data are shown graphically in Figures 4, 5, and 6. Yearly mean data and standard deviations are presented for high and low daily steam flow (Table 3), and for high and low daily steam temperatures (Table 4).

On 1 May 1990, Well 4P-2 started a small geysering effect with 1 to 5% increase in steam flow 12 to 15 times per hour. "Geysering" is a periodic rapid spiking of the steam flow from the well, rather than an expulsion of hot water as is geysering in the traditional sense. In a week the flow had increased as much as 31%, but the geysering had slowed in frequency. Manometer readings were up 25.2%. On 22 May 1990, the 25-inch water column meter was exchanged for a 50-inch water column meter to record actual readings. The flow continued to increase and was reading off the scale. On 23 May 1990, the orifice plate was removed and the orifice was enlarged from 0.86 to 1.250 inches. This modification changed the conversion factor to 41.99. The geysering effect has continued with pressure up 31.4% as of the end of September 1990.

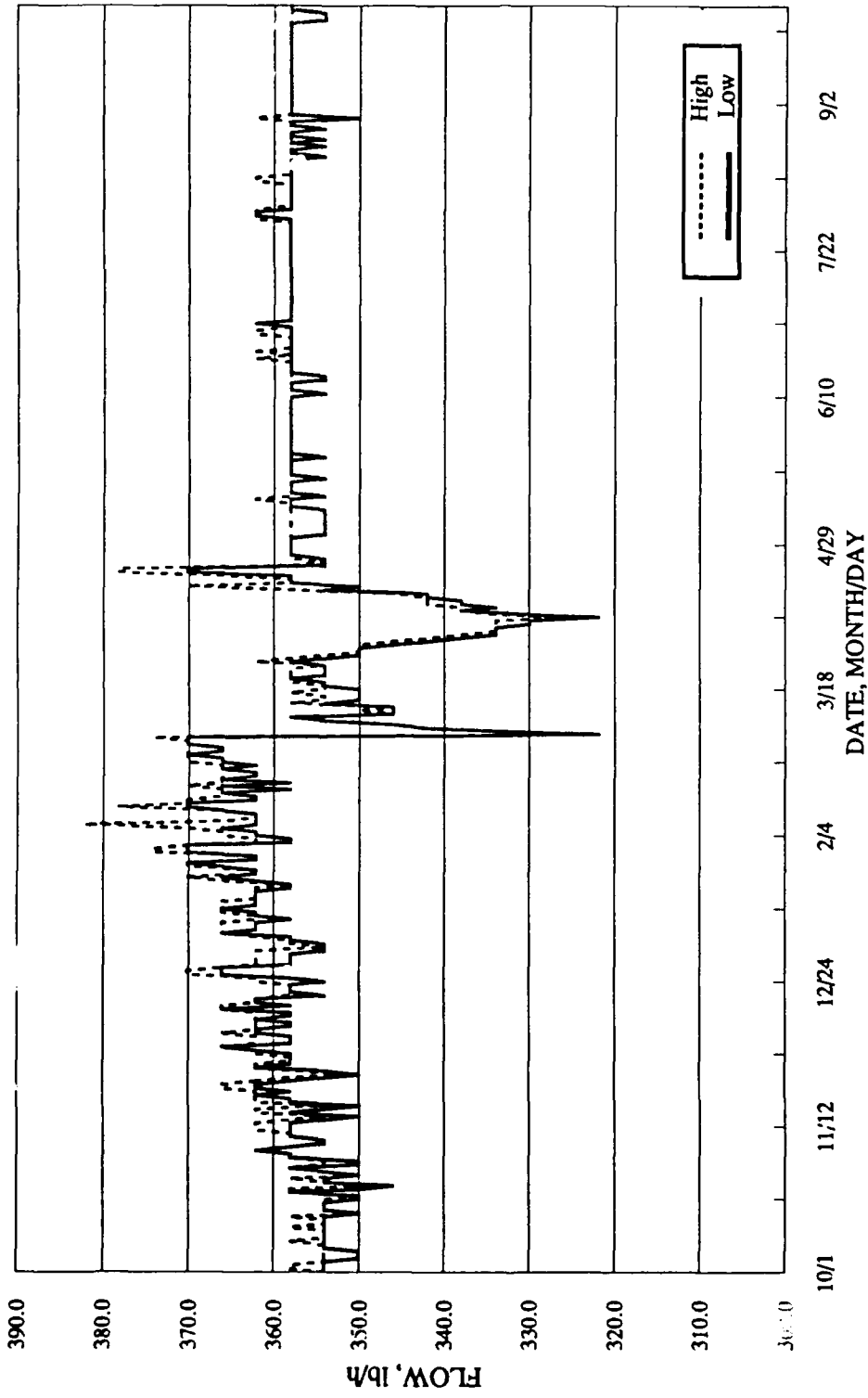


FIGURE 3. Devils Kitchen Steam Flow, 1989 Through 1990.

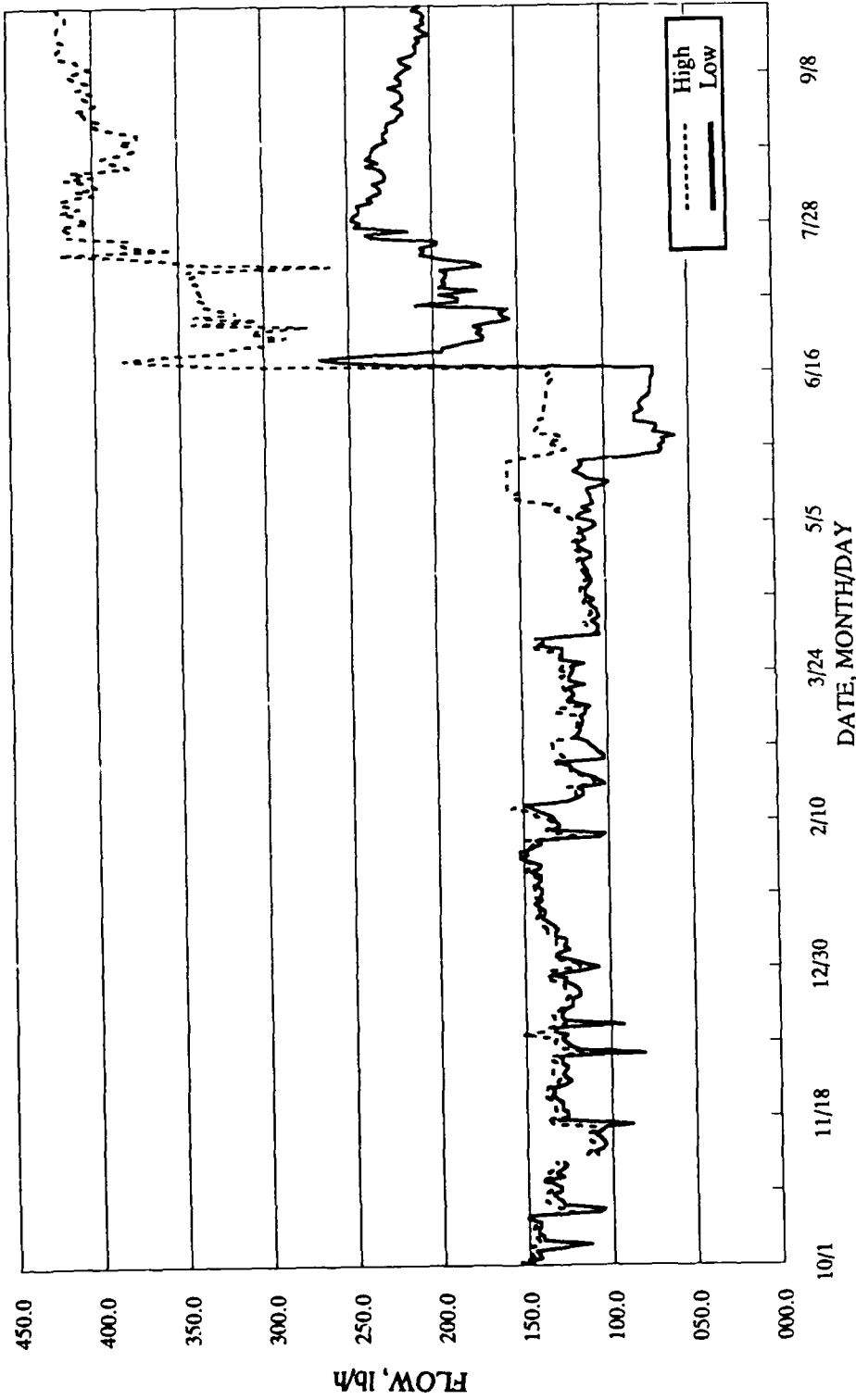


FIGURE 4. 4P-2 (Two-Inch Steam Well) Steam Flow, 1989 Through 1990.

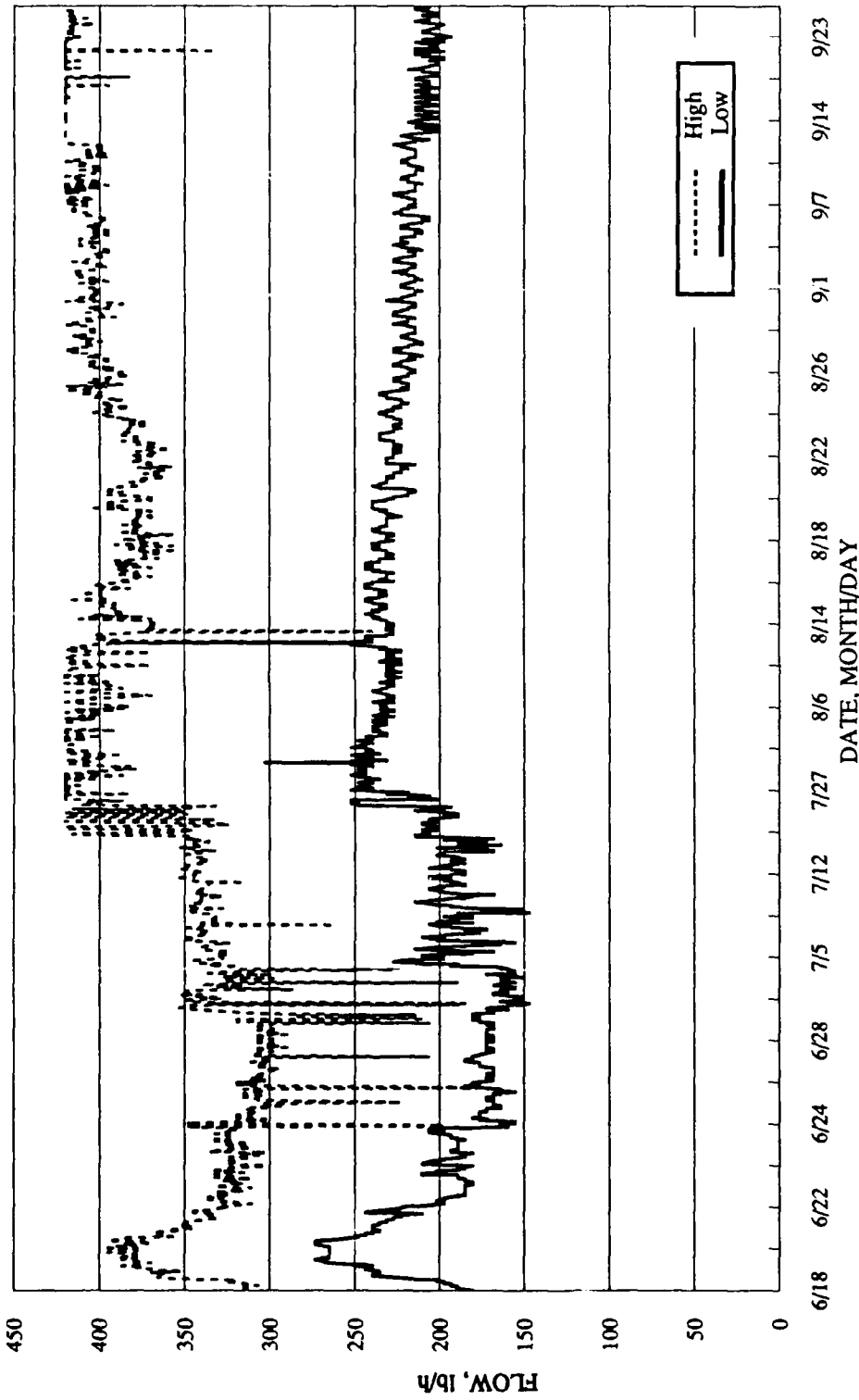


FIGURE 5. 4P-2 (Two-Inch Steam Well) Steam Flow, 1990.

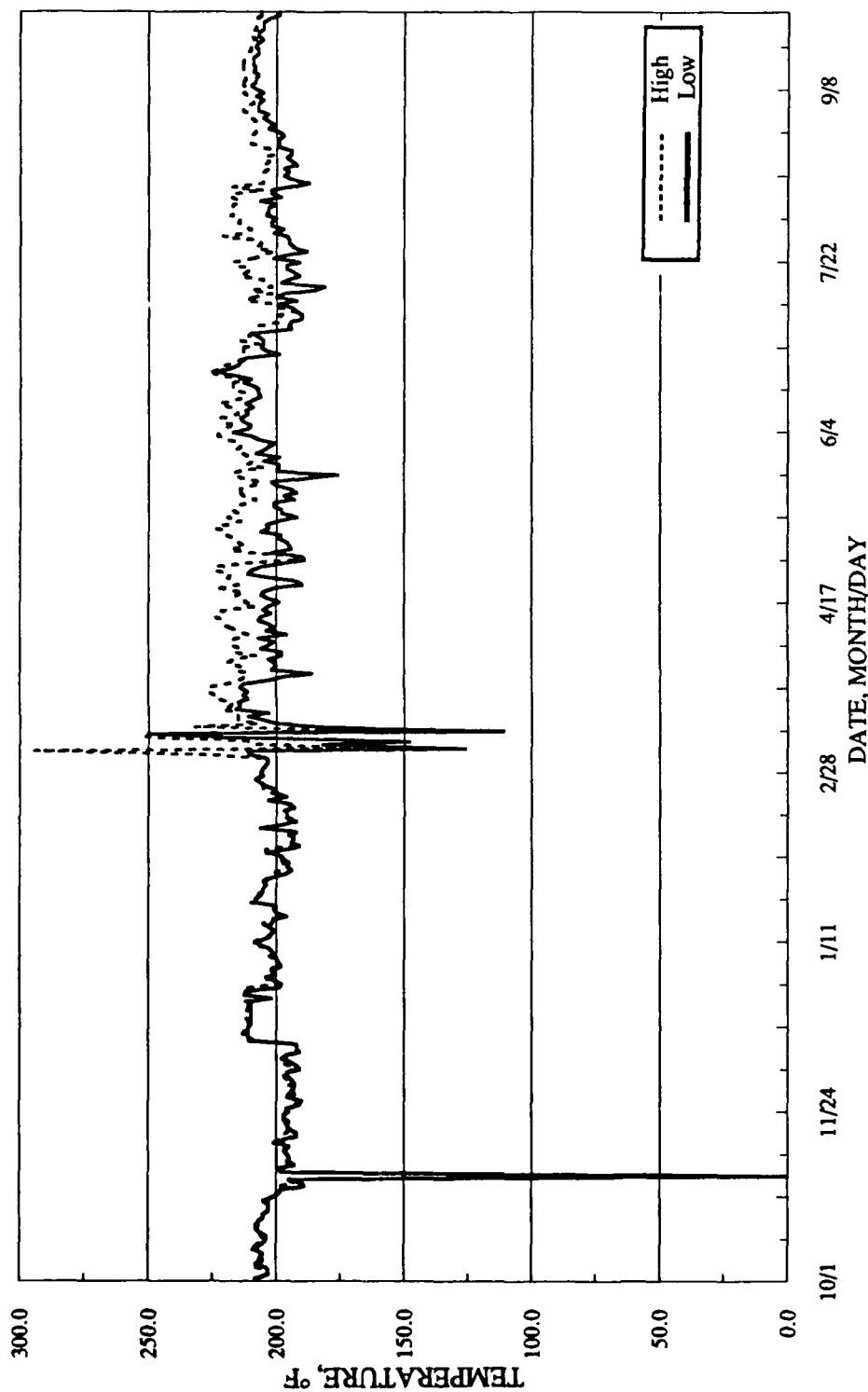


FIGURE 6. 4P-2 (Two-Inch Steam Well) Steam Temperature, 1989 Through 1990.



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Well 4P-2 has been unstable for recording data since June 1989. The Barton meter was calibrated, serviced, zeroed, and balanced several times prior to the constant readable geysering.

TABLE 3. 4P-2 (Two-Inch Steam Well) Statistical Steam Flow.

Date	High daily flow, lb/h		Low daily flow, lb/h	
	Mean	Standard deviation	Mean	Standard deviation
1 Oct 89 - 30 Sep 90	202.8	115.3	144.5	47.7

TABLE 4. 4P-2 (Two-Inch Steam Well) Statistical Steam Temperature.

Date	High daily temperature, °F		Low daily temperature, °F	
	Mean	Standard deviation	Mean	Standard deviation
1 Oct 89 - 30 Sep 90	207.8	15.2	200.3	14.6

**4H-4 (EIGHT-INCH "STOVE PIPE" WELL)**

The daily steam flow for the Eight-Inch "Stove Pipe" Well (4H-4) is presented in Appendix A as Table A-4. Yearly mean data and standard deviations for the high and low daily steam flow at this site are presented in Table 5. These data are shown graphically in Figure 7.

This well was dug and cased with a string of 55-gallon barrels to a depth of approximately 20 feet before the Navy acquired the land. The well was rehabilitated and capped with an 8-inch "stove pipe" by Navy personnel specifically for use as a monitoring site. The site is normally equipped with a 50-inch water column meter, but on 22 May 1990 it was switched with a 25-inch water column meter from Well 4P-2. The larger meter was required on 4P-2 to record the short-term increased steam flow. The conversion factor changed from 46.58 to 20.56 with the 25-inch water column meter on 4H-4.

TABLE 5. 4H-4 (Eight-Inch "Stove Pipe" Well) Statistical Steam Flow.

Date	High daily flow, lb/h		Low daily flow, lb/h	
	Mean	Standard deviation	Mean	Standard deviation
1 Oct 89 - 30 Sep 90	318.4	71.3	299.6	77.7

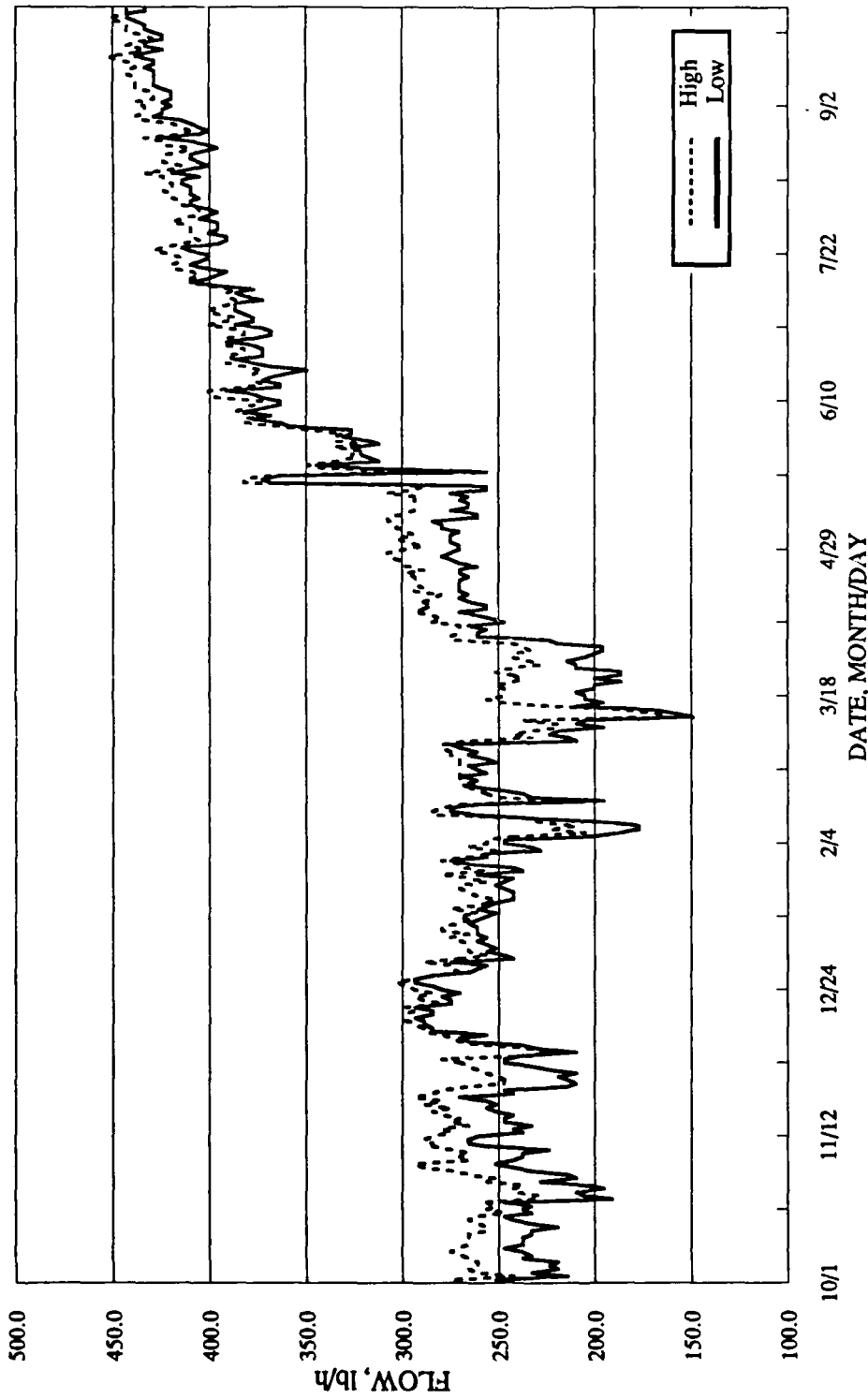


FIGURE 7. 4H-4 (Eight-Inch "Stove Pipe" Well) Steam Flow, 1989 Through 1990.

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4A-2 AND 4A-3 (SCHOBER'S RESORT WELLS )

The daily steam flow, steam temperature, and ambient temperature data for the Schober's Resort site are presented in Appendices A and B as Tables A-5, B-2, and B-3, respectively. Yearly mean data and standard deviations are presented for the daily steam flow (Table 6) and steam temperature (Table 7). The daily steam flow and temperature data are shown graphically in Figures 8 and 9, and ambient temperature in Figure 10.

This site had been reliable for data collection until late May 1990 when the Barton recorder was driven off scale by a sudden increase in steam flow. On 30 May the orifice plate was removed and the orifice enlarged from a diameter of 1.97 to 2.25 inches changing the conversion factor to 150.89 with the 50-inch water column meter. On 14 July 1990, a rain shower washed soil from around the concrete pad supporting the well casing, allowing steam to escape. This caused a drop in the recorded steam flow, which is evident on the steam flow graph (Figure 8). At the same time there was an increase in steam temperature as shown in Figure 9. The unrealistic ambient temperature, recorded from July through September (Figure 10), is a result of the escaping steam blowing in and around the ambient temperature thermocouple shelter. Ambient temperature recording was stopped at this site on 1 October 1990, when the Coso Hot Springs mini-weather recording station was set up. The mini-weather station is described in greater detail later in this report. No further drop occurred after this time, but there is an increase in the activity to the north of Wells 4A-2 and 4A-3, with several small springs and steam vents in an area approximately 25 square feet; and there are some signs that the ground in that area is turning hotter. This area is closely monitored to keep a record of all events that occur.

TABLE 6. 4A-2 and 4A-3 (Schober's Resort Wells) Statistical Steam Flow.

Date	High daily flow, lb/h		Low daily flow, lb/h	
	Mean	Standard deviation	Mean	Standard deviation
1 Oct 89 - 30 Sep 90	1214.9	87.5	1204.9	86.2

TABLE 7. 4A-2 and 4A-3 (Schober's Resort Wells) Statistical Steam Temperature.

Date	High daily temperature, °F		Low daily temperature, °F	
	Mean	Standard deviation	Mean	Standard deviation
1 Oct 89 - 30 Sep 90	213.9	6.4	212.1	6.2

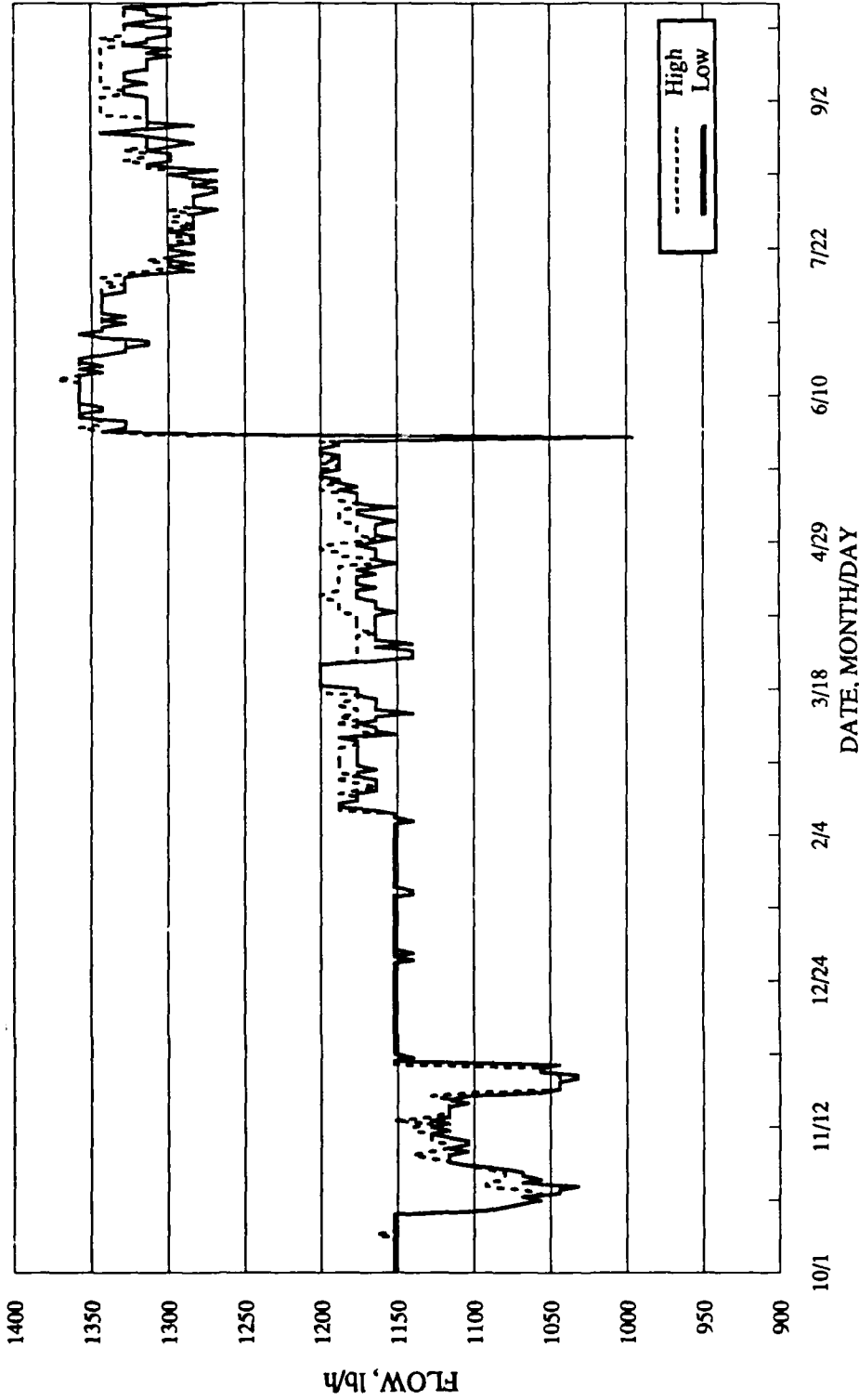


FIGURE 8. 4A-2 and 4A-3 (Schober's Resort Wells) Steam Flow, 1989 Through 1990.

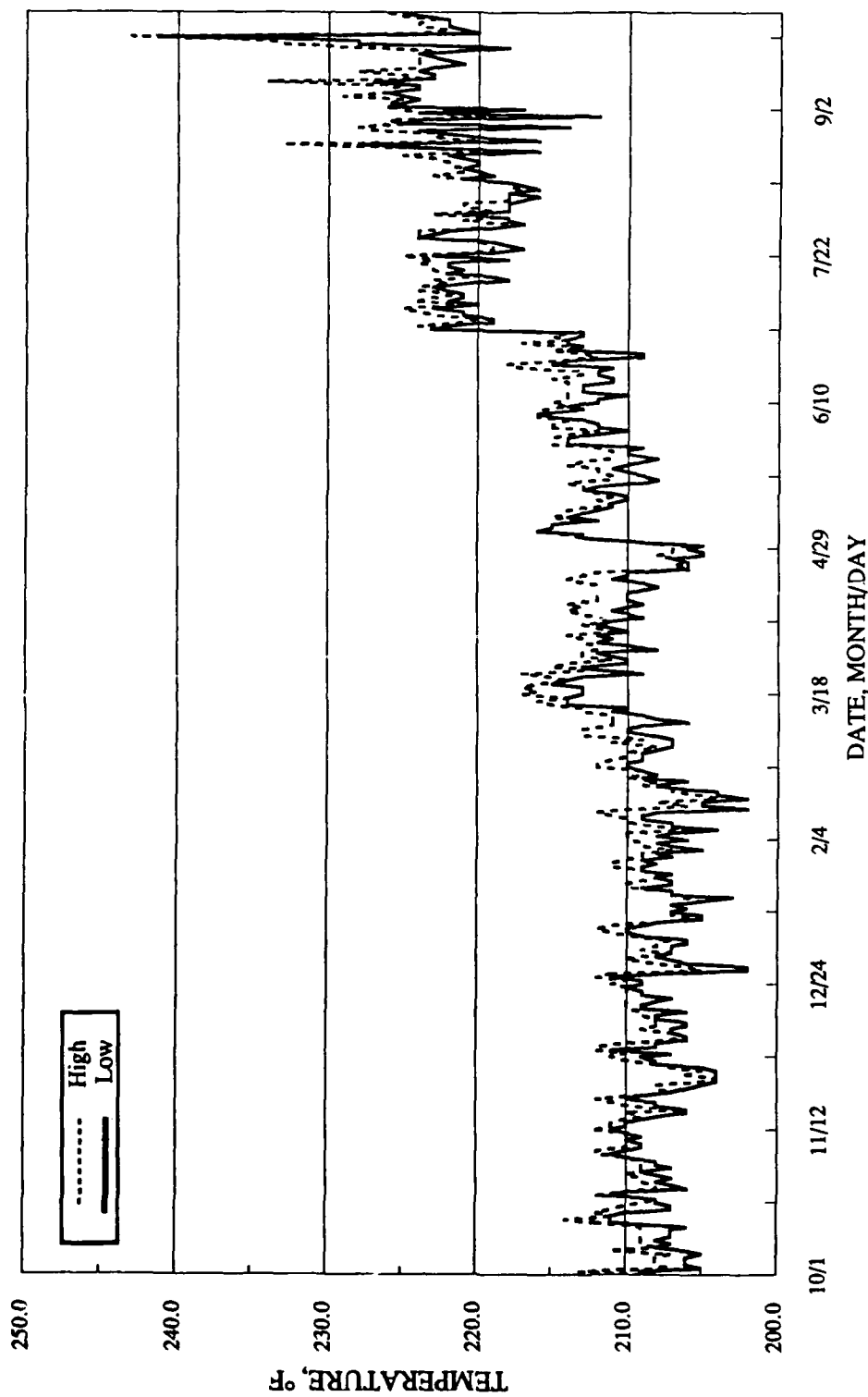


FIGURE 9. 4A-2 and 4A-3 (Schober;s Resort Wells) Steam Flow, 1989 Through 1990.

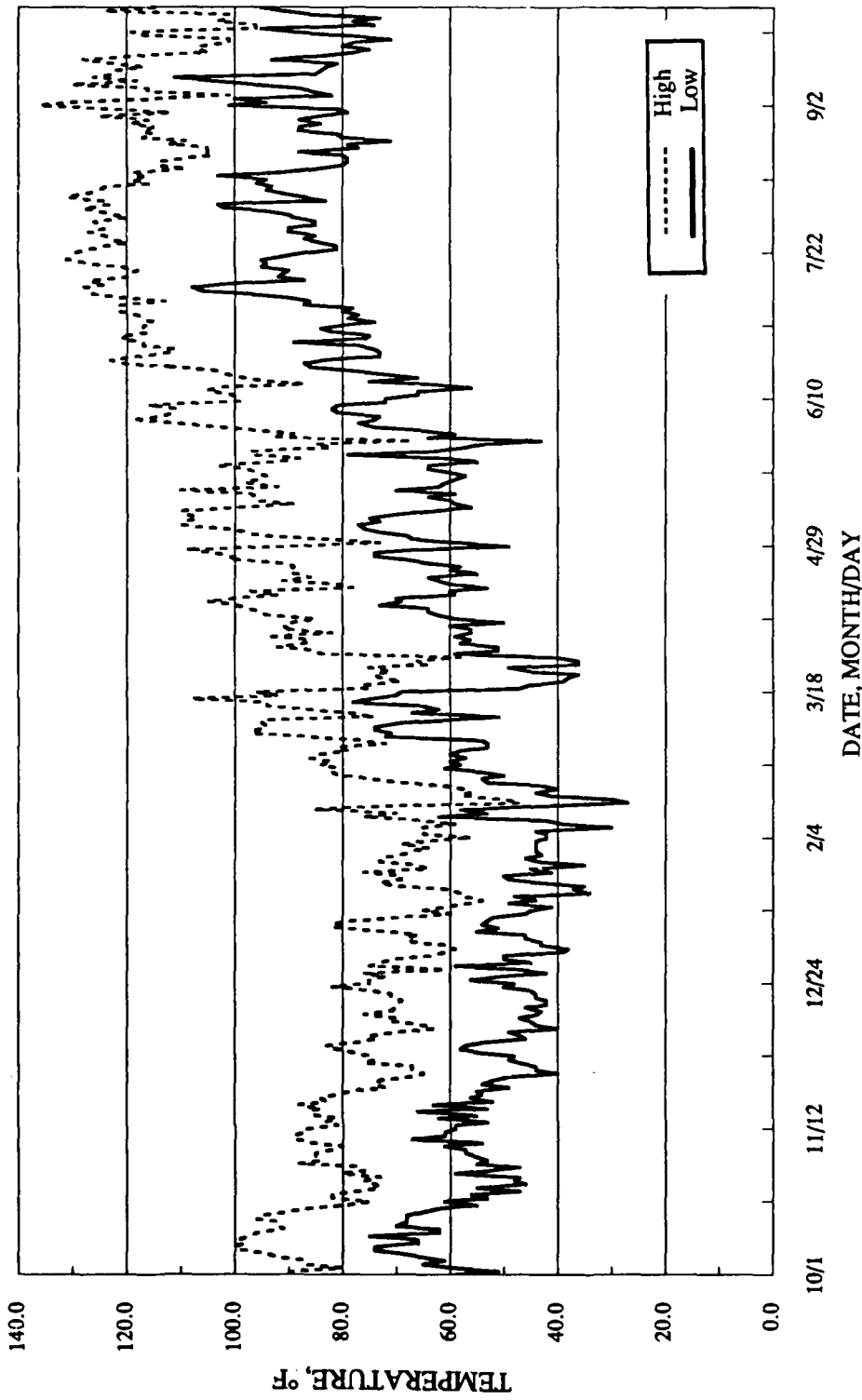


FIGURE 10. 4A-2 and 4A-3 (Schober's Resort Wells) Ambient Temperature, 1989 Through 1990.

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## COSO MUD POT PHOTOGRAPHIC INVESTIGATION

A weekly photographic investigation was initiated in January 1978 to document the fluctuation in fluid levels in several of the more prominent mud pots in the Coso KGRA. This project has continued into the steam production and power-generation stages of the geothermal development.

Figures 11 through 22 illustrate seasonal variations in fluid levels at two Coso Resort sites. The largest pool is the South Pool, which is located inside a circular excavation along the Airport Lake - Coso Hot Springs scarp approximately 1000 feet south of the main resort area. The second site previously included three mud pots located in the fenced compound adjacent to and south of the Main Coso Resort building. As can be seen in the photographs, the area of these mud pots has been impacted by increased thermal activity caused by the blow-out of the adjacent old resort wells. The mud pots have been almost non-existent since December when they were filled with mud from 4KC-10 until they were completely overtaken and became a part of 4KC-10 in April. A complete weekly photographic series is maintained by the Naval Weapons Center (NWC) Geothermal Program Office.

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(a) South Pool.



(b) Mud Pots.

FIGURE 11. Coso Mud Pots, 3 October 1989.





(a) South Pool.



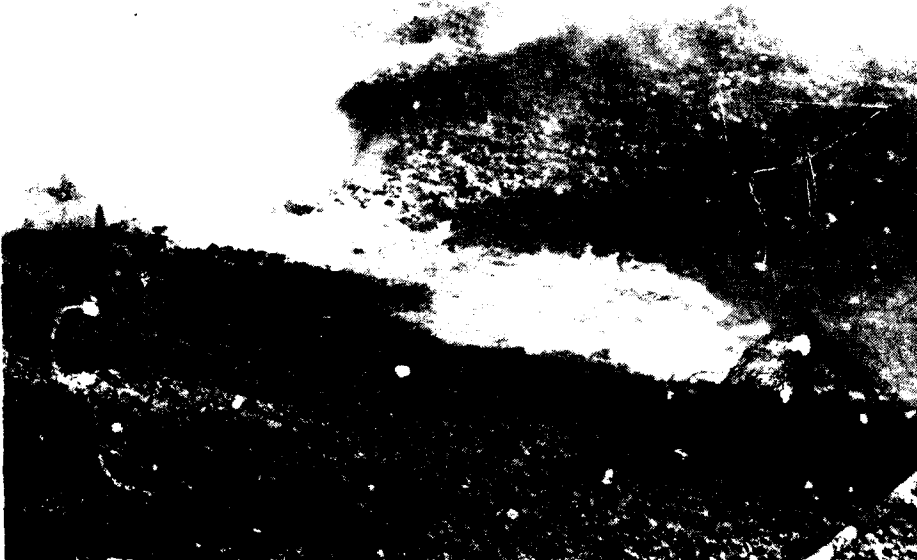
(b) Mud Pots.

FIGURE 12. Coso Mud Pots, 6 November 1989.

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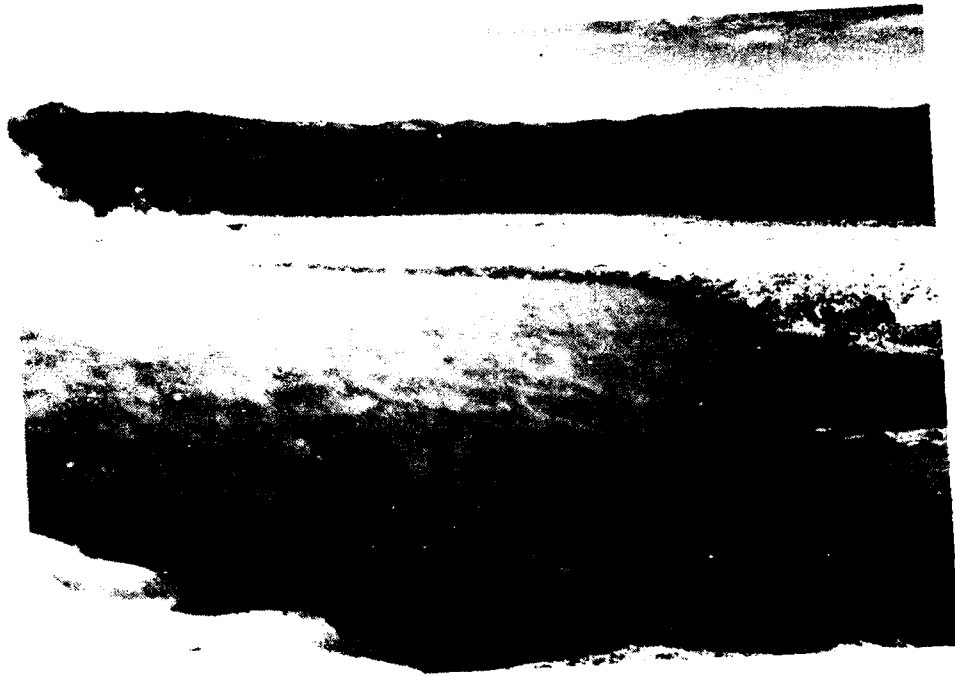
(a) South Pool.



(b) Mud Pots.

FIGURE 13 Coso Mud Pots, 4 December 1989.

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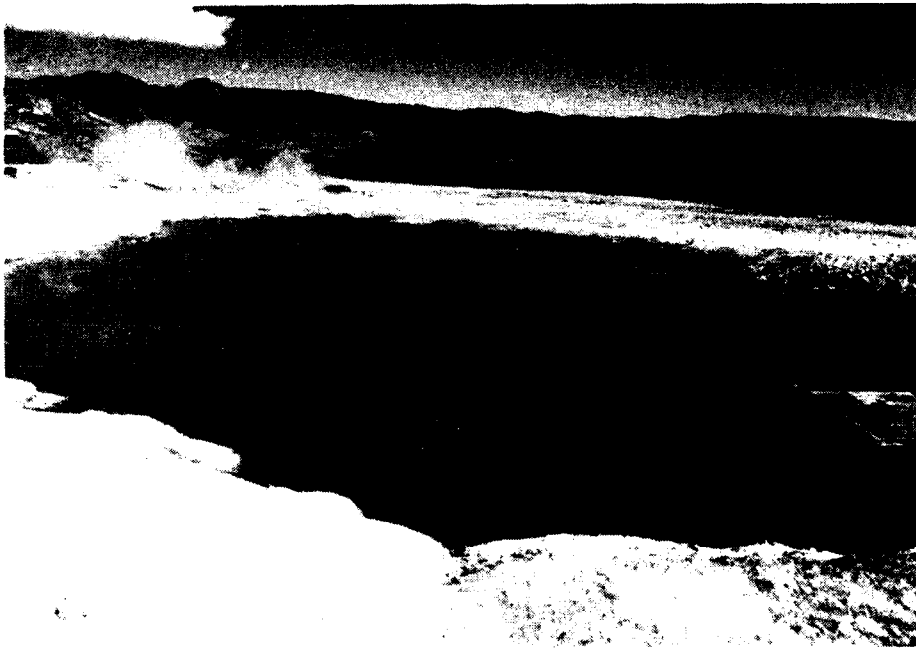


(a) South Pool.

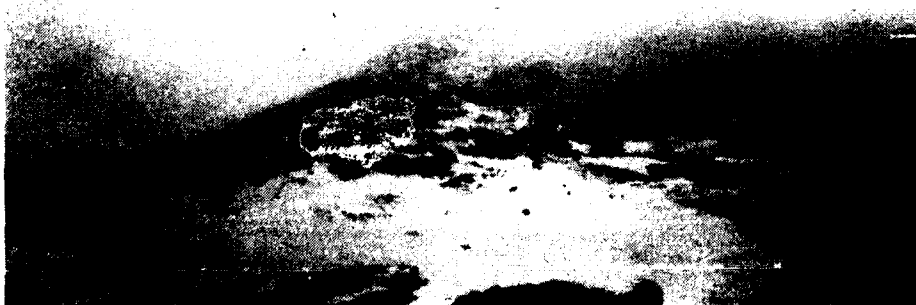


(b) Mud Pots.

FIGURE 14. Coso Mud Pots, 2 January 1990.



(a) South Pool.



(b) Mud Pots.

FIGURE 15. Coso Mud Pots, 12 February 1990.



(a) South Pool.



(b) Mud Pots.

FIGURE 16 . Coso Mud Pots, 5 March 1990.



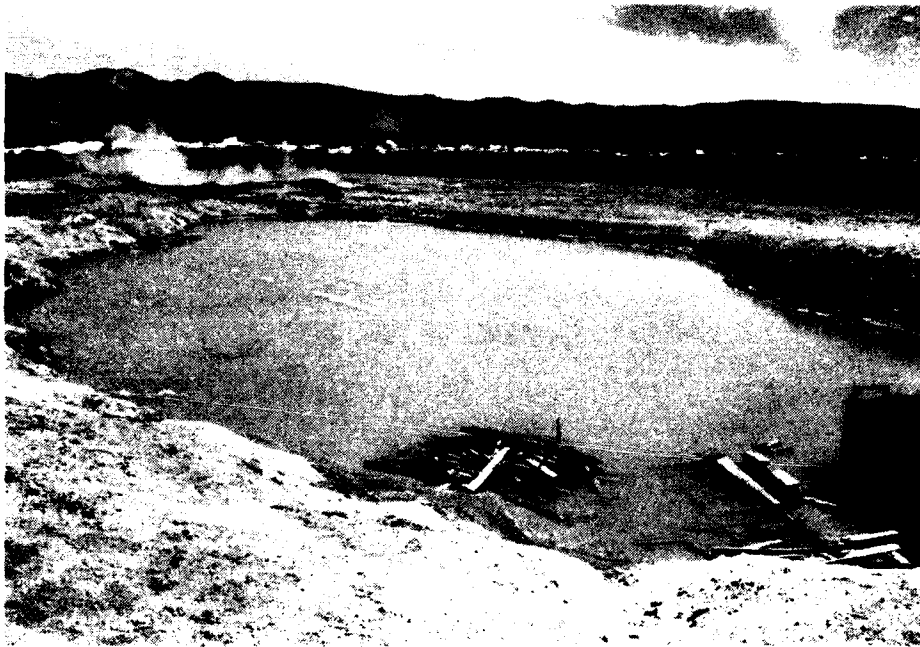
(a) South Pool.



(b) Mud Pots.

FIGURE 17. Coso Mud Pots, 2 April 1990.

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(a) South Pool.



(b) Mud Pots.

FIGURE 18. Coso Mud Pots, 14 May 1990.



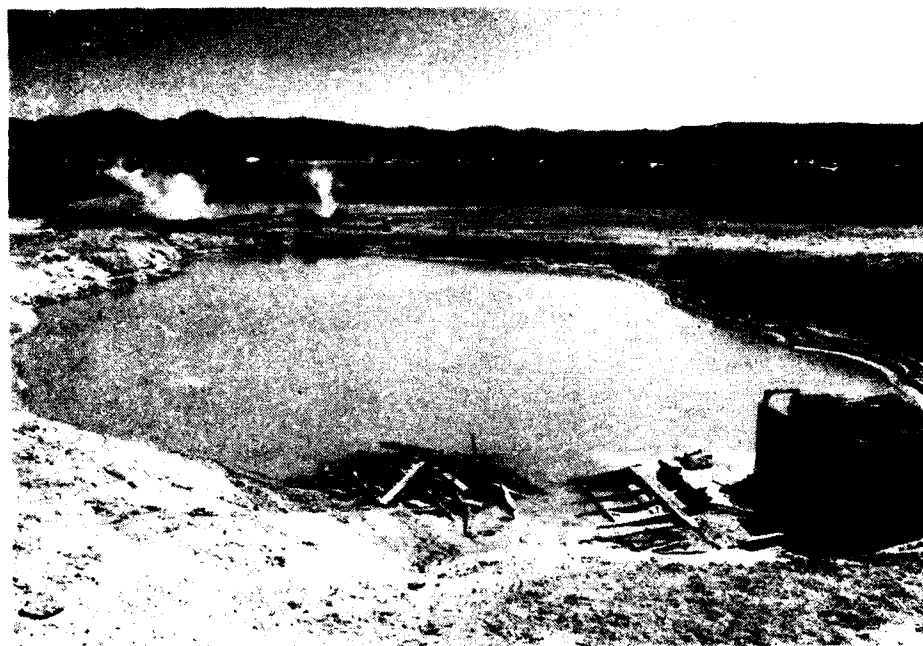
(a) South Pool.



(b) Mud Pots.

FIGURE 19. Coso Mud Pots, 4 June 1990.





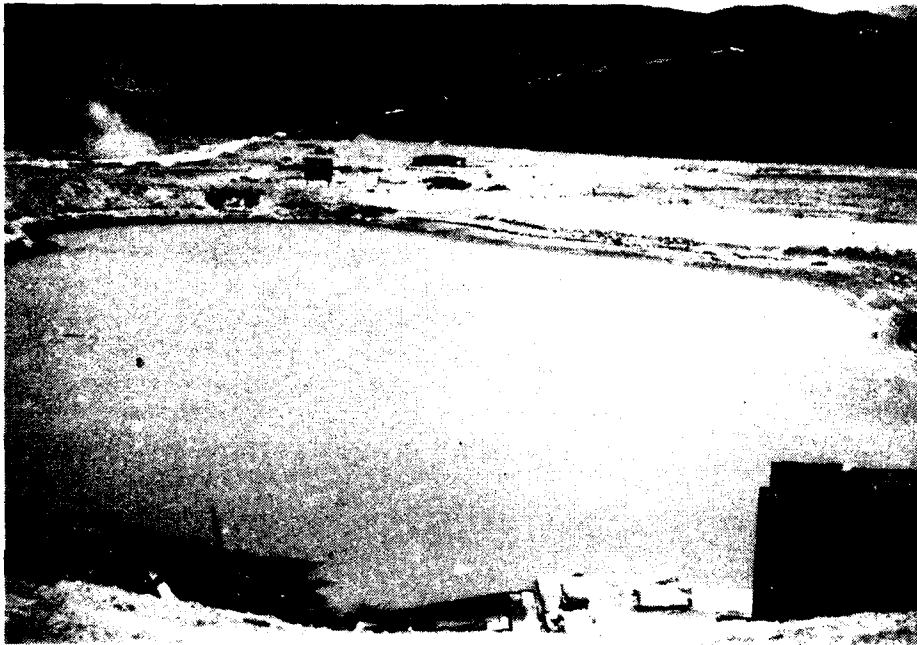
(a) South Pool.



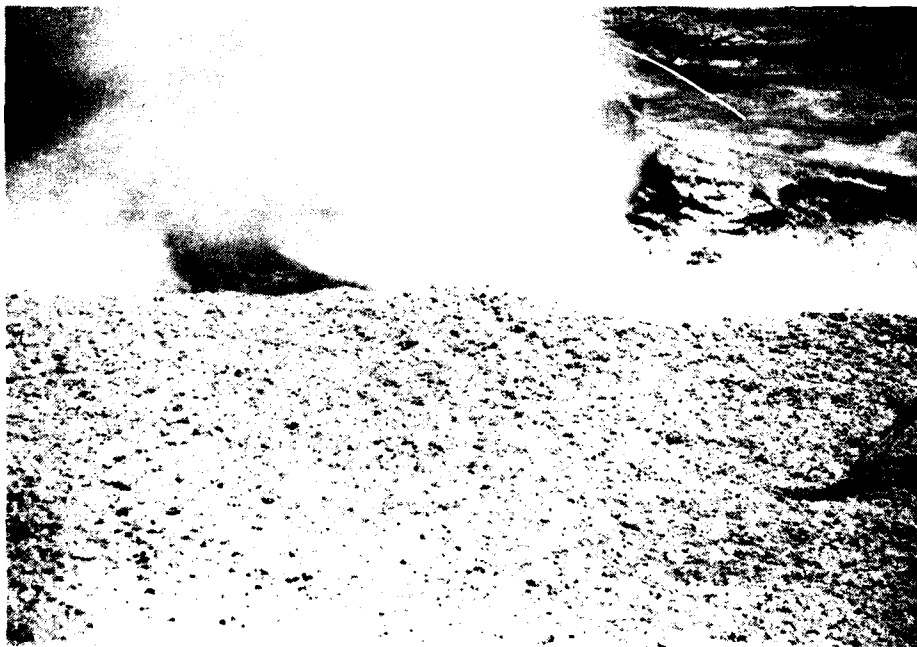
(b) Mud Pots.

FIGURE 20. Coso Mud Pots, 2 July 1990.

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(a) South Pool.

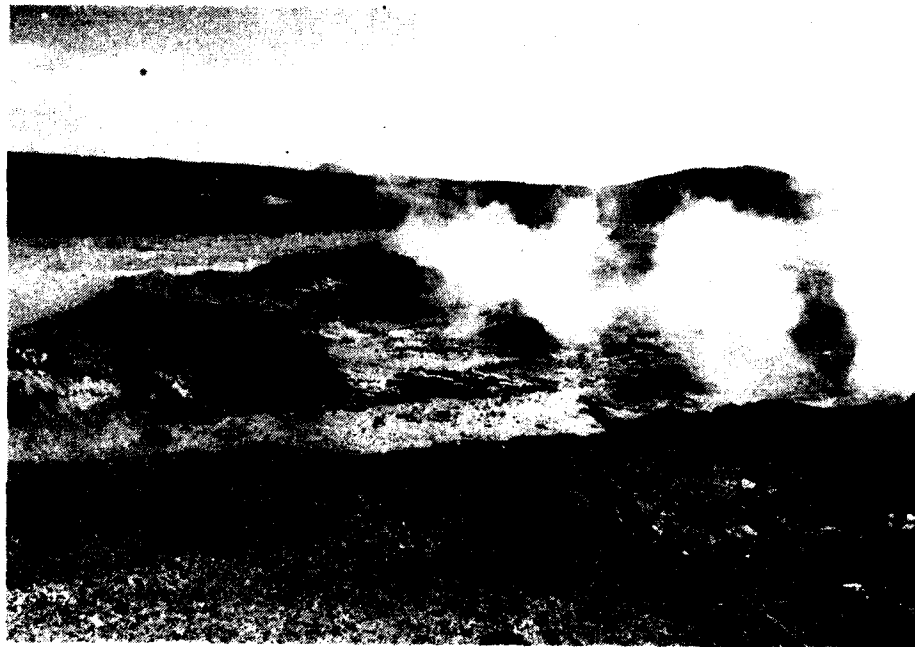


(b) Mud Pots.

FIGURE 21. Coso Mud Pots, 9 August 1990.



(a) South Pool.



(b) Mud Pots.

FIGURE 22. Coso Mud Pots, 4 September 1990.

## WATER LEVEL MONITORING

### OBSERVATION WELLS

Water levels are monitored in seven wells in the Coso Hot Springs area. They are taken weekly at Well 4P-1, Observation Wells (OB) 1, 2 and 3, and intermittently at Wells 4H-8, 4K-1 and 4H-4. At Well 4P-1 and the three Observation Wells, water levels are measured by pressurizing a water-filled pipe with nitrogen and reading the pressure when the water has been forced from the pipe. Manometer readings are also taken at this time to compare readings for accuracy. Due to the violent boiling in Well 4H-8, direct water level measurement is difficult. The well level is determined at Wells 4H-8 and 4K-1 based on temperature logging equipment. Wells 4K-1 and 4H-4 are measured with a Fisher electric water level meter. Water levels for weekly monitored wells are given in Table 8.

Well 4P-1 has had a 6-foot rise in water level since March 1989. Although the chemistry of the water has been somewhat variable this reporting period, the last analysis report (August 1990) is essentially the same as previous years. There appears to be a rise in the steam condensate level around the well that matches the rise in the South Pool.

OB-1 and OB-2 are located in the main drainage of Coso Wash about 1,000 feet apart. Except for recovery of an occasional water sample, neither well has been pumped since 1987. Both wells produce water from stream and valley fill sediments. Since March 1989, the water level in OB-1 has dropped about 9 feet while the water level in OB-2 has risen about 12 feet in the same period. While we believe that OB-1 is showing effects of the long-term drought, there also appears to be some sort of equilibration of the water table going on in the area of these two wells.

The water level in OB-3 rose slightly during this same period (an approximate 1.5 foot net gain). This well is completed in the basalt flows that border Coso Wash on its east side.

### SOUTH POOL

The South Pool water level continued the patterns of seasonal fluctuation (2 to 4 feet) that it has always shown, while maintaining an average elevation that is several feet higher than that of the early reporting years. This trend can be seen graphically in Figure 23. An elevation scale, graduated in tenths of feet was placed at a surveyed point to accurately monitor the water level. Several points around South Pool were surveyed again this year for validation and verification of elevation. The high water level this year was 3620.75 feet with a low of 3618.4 feet, and an average water temperature range of 143 to 147°F. Water levels and temperature are recorded weekly. These data are presented in Table 9 and Figure 24.

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TABLE 8. Observation Well Water Level Data.

Well depth to water, ft											
Date	4P-1	OB-1	OB-2	OB-3	4A-4	Date	4P-1	OB-1	OB-2	OB-3	4A-4
04 Oct 89	64.3	140.6	205.5	377.4	19.5	05 Jun 90	60.1	145.7	199.3	377.6	
11 Oct 89	64.5	140.6	205.6	377.5		12 Jun 90	59.6	145.8	199.9	377.7	19.5
17 Oct 89	64.9	142.1	205.6	377.5		21 Jun 90	59.9	146.4	199.9	378.0	
24 Oct 89	64.3	142.1	205.5	378.0		26 Jun 90	60.2	146.4	199.9	377.6	
31 Oct 89	64.1	141.8	205.6	378.0		03 Jul 90	60.1	146.4	199.3	377.6	
07 Nov 89	64.9	142.1	204.8	377.8		10 Jul 90	60.3	146.4	199.3	377.6	
15 Nov 89	64.9	142.1	205.0	377.5		17 Jul 90	59.5	146.6	198.2	377.6	
21 Nov 89	63.7	141.8	204.6	377.5		24 Jul 90	...	...	...	...	
28 Nov 89	...	...	...	...	...	31 Jul 90	59.5	146.9	197.8	377.6	
05 Dec 89	63.7	142.1	204.0	377.5	19.5	07 Aug 90	59.6	146.9	198.1	377.7	19.5
12 Dec 89	63.7	142.0	203.6	377.5		14 Aug 90	58.9	146.9	198.2	377.8	
20 Dec 89	63.3	141.2	203.9	377.8		21 Aug 90	59.1	146.9	198.2	377.7	
28 Dec 89	...	141.8	203.9	377.5		28 Aug 90	59.6	147.1	198.1	377.7	
03 Jan 90	63.1	142.7	203.3	377.5		05 Sep 90	59.1	147.3	198.2	377.6	
10 Jan 90	62.8	142.6	203.3	377.5		10 Sep 90	59.4	147.3	198.0	377.6	
17 Jan 90	62.8	142.4	203.3	377.5		18 Sep 90	59.0	148.0	197.5	377.8	
23 Jan 90	62.1	142.8	202.7	377.5		25 Sep 90	59.1	148.6	197.6	377.8	19.5
30 Jan 90	...	...	...	...	...						
05 Feb 90	62.9	142.3	202.7	377.4							
13 Feb 90	62.2	142.3	201.5	377.7	19.5						
20 Feb 90	61.2	142.5	202.5	377.8							
26 Feb 90	60.1	143.3	202.3	377.7							
06 Mar 90	60.1	143.3	201.8	377.8							
13 Mar 90	60.6	144.0	202.2	377.8							
20 Mar 90	...	...	...	...	...						
27 Mar 90	60.6	144.6	202.2	377.5							
02 Apr 90	60.3	144.6	202.6	377.8							
10 Apr 90	...	...	...	...	...						
17 Apr 90	60.9	144.6	200.9	377.6							
24 Apr 90	60.3	145.1	201.1	377.6							
02 May 90	59.9	144.8	200.4	377.4							
08 May 90	61.3	145.7	200.2	377.7							
15 May 90	59.9	145.7	199.0	377.6							
22 May 90	60.1	146.3	199.8	377.6							
29 May 90	60.1	146.3	199.8	377.6							

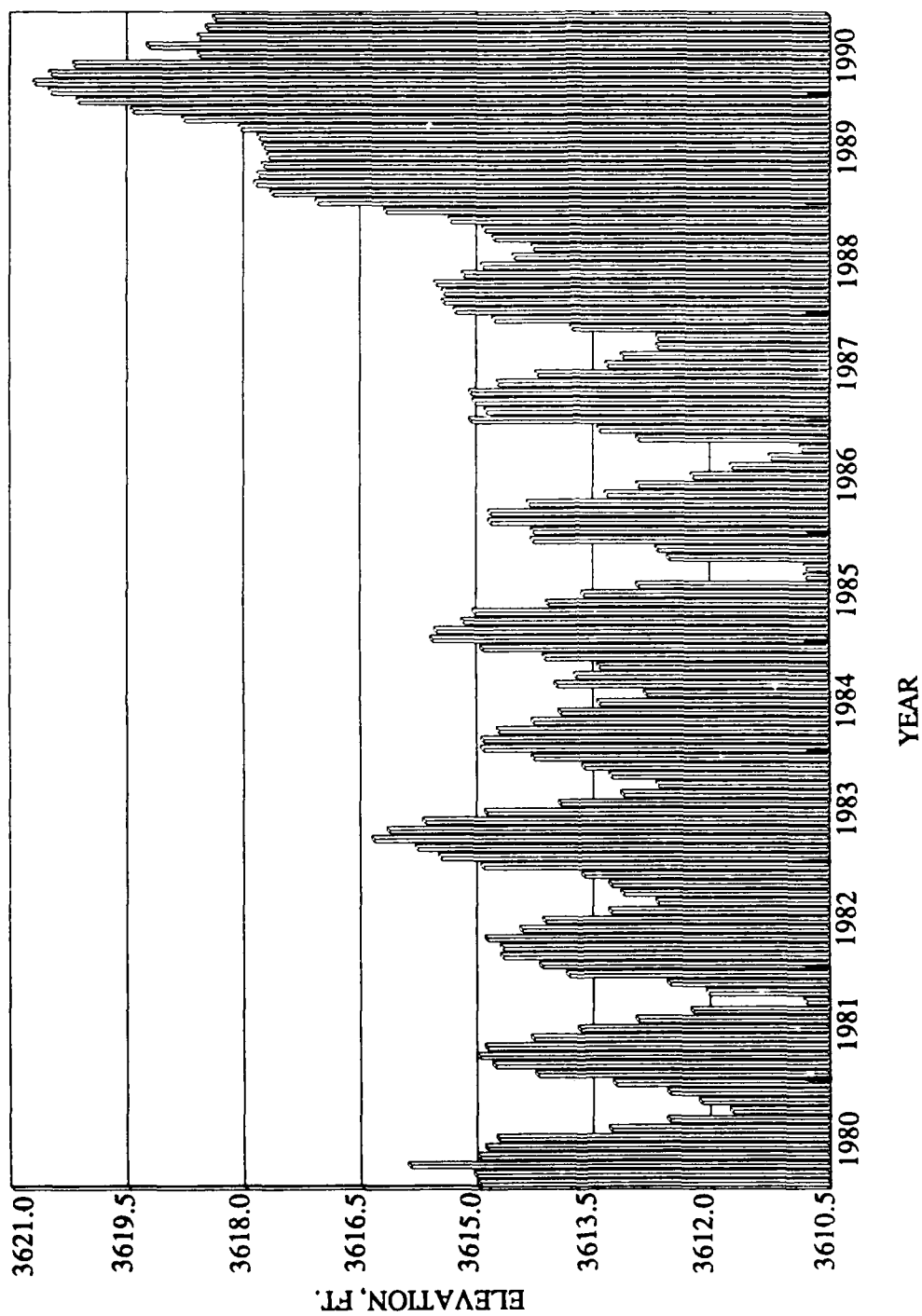


FIGURE 23. South Pool Elevations, January 1980 Through September 1990.

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TABLE 9. South Pool Elevation and Temperature Changes.

Date	True elevation, ft	Water temperature, °F	Date	True elevation, ft	Water temperature, °F
4 Oct 89	...	138	17 Apr 90	3619.9	137
11 Oct 89	...	135	24 Apr 90	3618.8	143
17 Oct 89	3618.9	135	2 May 90	3618.6	119
24 Oct 89	3619.3	131	8 May 90	3618.6	140
31 Oct 89	3619.3	129	10 May 90	3618.5	*
7 Nov 89	3619.5	135	15 May 90	3618.4	140
15 Nov 89	3619.7	144	22 May 90	3619.4	136
21 Nov 89	3619.8	141	29 May 90	3619.3	138
28 Nov 89	3620.0	141	5 Jun 90	3619.3	142
5 Dec 89	3620.2	142	12 Jun 90	3619.0	140
12 Dec 89	3620.2	138	21 Jun 90	3619.0	140
20 Dec 89	3620.8	138	26 Jun 90	3618.8	147
28 Dec 89	3620.5	145	3 Jul 90	3618.7	*
3 Jan 90	3620.5	144	10 Jul 90	3618.7	*
10 Jan 90	3620.7	137	17 Jul 90	3618.6	136
17 Jan 90	3620.7	140	24 Jul 90	3618.6	*
23 Jan 90	3620.8	138	31 Jul 90	3618.5	136
30 Jan 90	3620.8	138	7 Aug 90	3618.5	146
5 Feb 90	3620.7	124	14 Aug 90	3618.4	146
13 Feb 90	3620.7	136	21 Aug 90	3618.4	139
20 Feb 90	3620.7	130	28 Aug 90	3618.4	*
26 Feb 90	3620.7	142	5 Sep 90	3618.4	153
6 Mar 90	3620.5	118	10 Sep 90	3618.6	154
13 Mar 90	3620.5	130	18 Sep 90	3618.6	146
20 Mar 90	3620.4	...	25 Sep 90	3618.6	151
27 Mar 90	3620.3	138			
2 Apr 90	3620.2	137			
9 Apr 90	3620.2	141			

\* No data collected.

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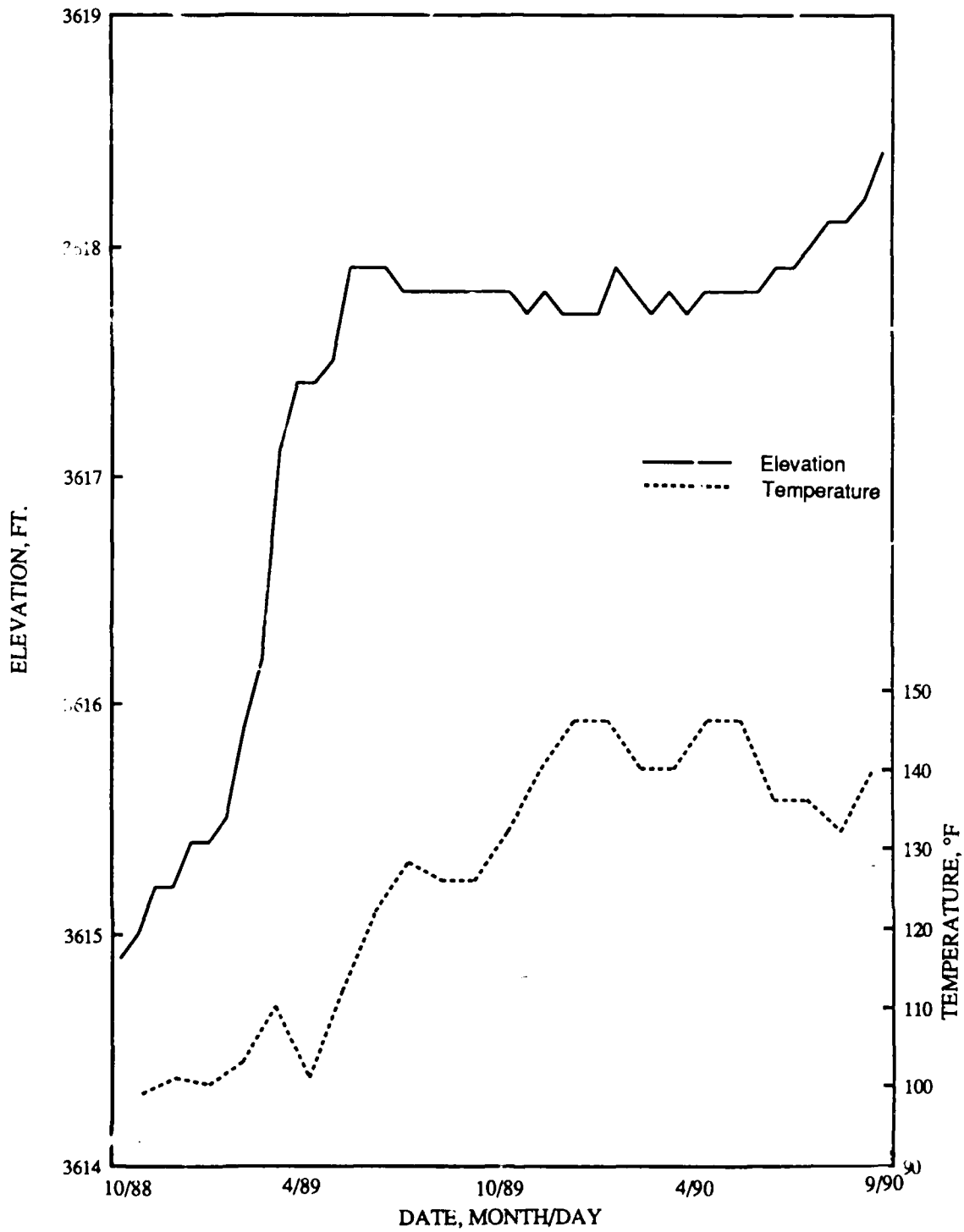


FIGURE 24. South Pool Elevation and Temperature, 4 October 1988 Through 25 September 1990.



**RAINFALL AT COSO RESORT AREA AND ROSE VALLEY**

Rainfall in the Coso Hot Springs basin is monitored at five sites as shown in Figure 1. Instrumentation at each site consists of a battery operated long-term strip recorder that is triggered by a tipping bucket. This year there were no interruptions to rainfall data collection due to equipment failures. Rain stations are checked for proper operation prior to any weather front that may bring rain to the area.

Data from the Coso Stations presented in Table 10 shows daily and cumulative rainfall. The Rose Valley data (Table 11) is collected at the Los Angeles Department of Water and Power (LADWP) Haiwee Reservoir Plant. As shown in Figures 25 and 26, the Coso area generally receives less annual rainfall than Rose Valley. This significant difference in rainfall between two such closely situated areas is not unusual given the nature of high-desert storms.

Comparative rainfall data for Coso Basin, Rose Valley, and Indian Wells Valley (IWV) can be found in Table 12. The Indian Wells Valley data was gathered at Armitage Field, NWC, and was provided by a NWC meteorologist.

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TABLE 10. Rainfall Recorded at Coso Monitoring Stations, Inches.

Date	Tipping bucket stations				
	1	2	3	4	5
02 Jan 90	.02	.03	.04	---	.03
12 Jan 90	---	---	---	.01	---
13 Jan 90	.08	.05	.07	.13	---
16 Jan 90	---	---	---	.01	---
17 Jan 90	.01	---	.02	.01	---
18 Jan 90	.05	.09	.06	---	---
13 Feb 90	---	.01	---	---	---
16 Feb 90	.18	---	---	---	---
17 Feb 90	.01	---	.04	---	---
19 Feb 90	---	---	---	---	.01
26 Mar 90	.01	---	---	---	---
02 Apr 90	.02	---	---	---	---
04 Apr 90	---	---	---	---	.01
07 Apr 90	.01	---	---	.04	---
16 Apr 90	.02	---	---	---	.01
23 Apr 90	---	.04	---	---	---
30 Apr 90	.03	.06	.03	---	.07
03 May 90	---	---	.01	---	---
10 May 90	---	---	.02	---	.01
27 May 90	.04	.01	---	---	.04
28 May 90	.04	.04	.04	---	.01
15 Jun 90	---	---	---	.01	.01
19 Jun 90	---	---	---	---	.16
14 Jul 90	.13	.09	.50	.10	.50
15 Jul 90	.29	.08	.06	.04	.07
04 Aug 90	.04	---	---	---	---
05 Aug 90	.07	.01	.03	.04	.01
06 Aug 90	---	.13	.04	.28	.28
08 Aug 90	---	---	.11	---	.04
09 Aug 90	---	---	.01	---	---
12 Aug 90	---	---	.01	.01	---
13 Aug 90	.04	---	---	---	---
14 Aug 90	---	---	.53	.08	.13
18 Aug 90	---	.01	---	---	---
24 Aug 90	---	.15	---	---	---
18 Sep 90	.04	---	---	---	---
19 Sep 90	---	.05	.05	---	.04
21 Sep 90	.19	.05	.06	---	.04
22 Sep 90	.35	.33	.23	---	.26
TOTAL	1.67	1.23	1.96	.76	1.73

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TABLE 11. Rose Valley Cumulative Rainfall.

Date	Daily, in.	Snowfall, in.	Cumulative, in.
26 Nov 89	.08	...	.08
02 Jan 90	T	...	.08
03 Jan 90	.06	...	.14
13 Jan 90	.01	...	.15
14 Jan 90	.15	...	.30
17 Jan 90	.01	...	.31
18 Jan 90	.15	T	.46
19 Jan 90	T	...	.46
17 Feb 90	.08	...	.54
17 Apr 90	.11	...	.65
18 Apr 90	T	...	.65
10 Jun 90	.01	...	.66
13 Jul 90	T	...	.66
15 Jul 90	.14	...	.80
16 Jul 90	.04	...	.84
18 Jul 90	.01	...	.85
06 Aug 90	T	...	.85
09 Aug 90	.03	...	.88
13 Aug 90	T	...	.88
19 Sep 90	.37	...	1.25
19 Sep 90	.37	...	1.25
20 Sep 90	.10	...	1.35
21 Sep 90	.42	...	1.77
22 Sep 90	.05	...	1.82
29 Sep 90	.03	...	1.85

T = Trace

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TABLE 12. IWV, Rose Valley and Coso Basin  
Rainfall Comparison, 1947 Through 1989.

Year	Rainfall, in.		
	IWV	Rose Valley	Coso Basin
1947	2.03	...	...
1948	0.87	...	...
1949	1.30	...	...
1950	1.28	...	...
1951	0.84	...	...
1952	5.88	...	...
1953	0.14	...	...
1954	4.07	...	...
1955	0.56	...	...
1956	1.73	...	...
1957	2.68	...	...
1958	3.70	...	...
1960	3.01	...	...
1961	2.46	...	...
1962	2.31	...	...
1963	5.45	8.30	...
1964	0.78	2.49	...
1965	9.15	8.66	...
1966	1.31	6.13	...
1967	4.28	4.32	...
1968	3.16	3.26	...
1969	5.55	8.80	...
1970	3.74	6.45	...
1971	1.47	2.87	...
1972	1.24	1.90	...
1973	2.58	4.56	...
1974	7.48	9.19	...
1975	1.64	2.79	...
1976	3.74	8.50	...
1977	4.67	8.34	...
1978	10.68	12.61	...
1979	5.65	4.97	2.67
1980	6.31	7.75	7.34
1981	4.49	6.34	4.28

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TABLE 12. (Contd.).

Year	Rainfall, in.		
	IWV	Rose Valley	Coso Basin
1982	4.73	5.26	4.05
1983	10.56	12.14	10.70
1984	5.95	7.84	3.23
1985	1.29	3.42	1.42
1986	3.68	4.68	4.19
1987	4.43	4.77	5.04
1988	3.76	5.36	1.51
1989	.89	1.85	1.51

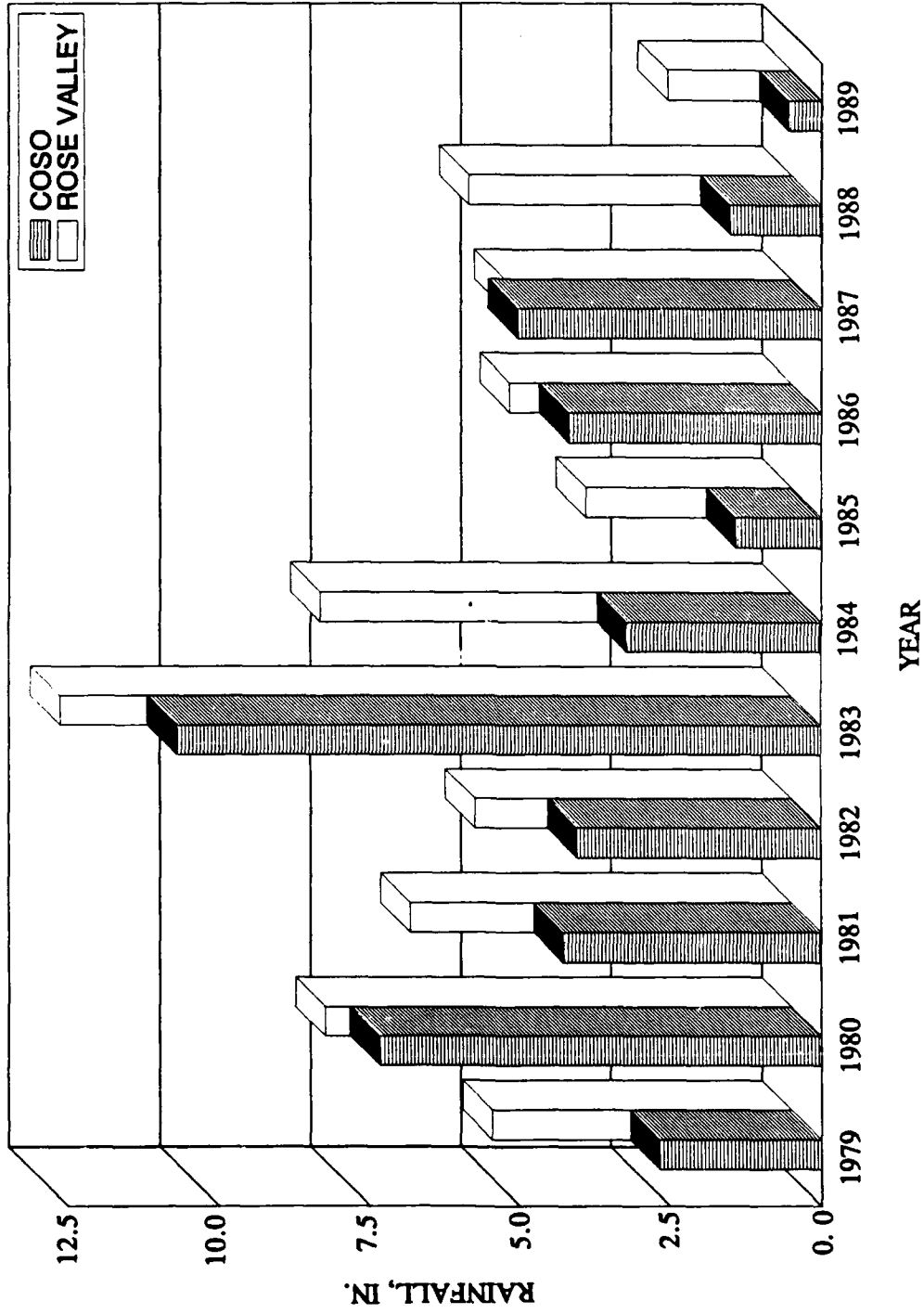


FIGURE 25. Comparison of Total Rainfall at Coso Basin and Rose Valley Sites.

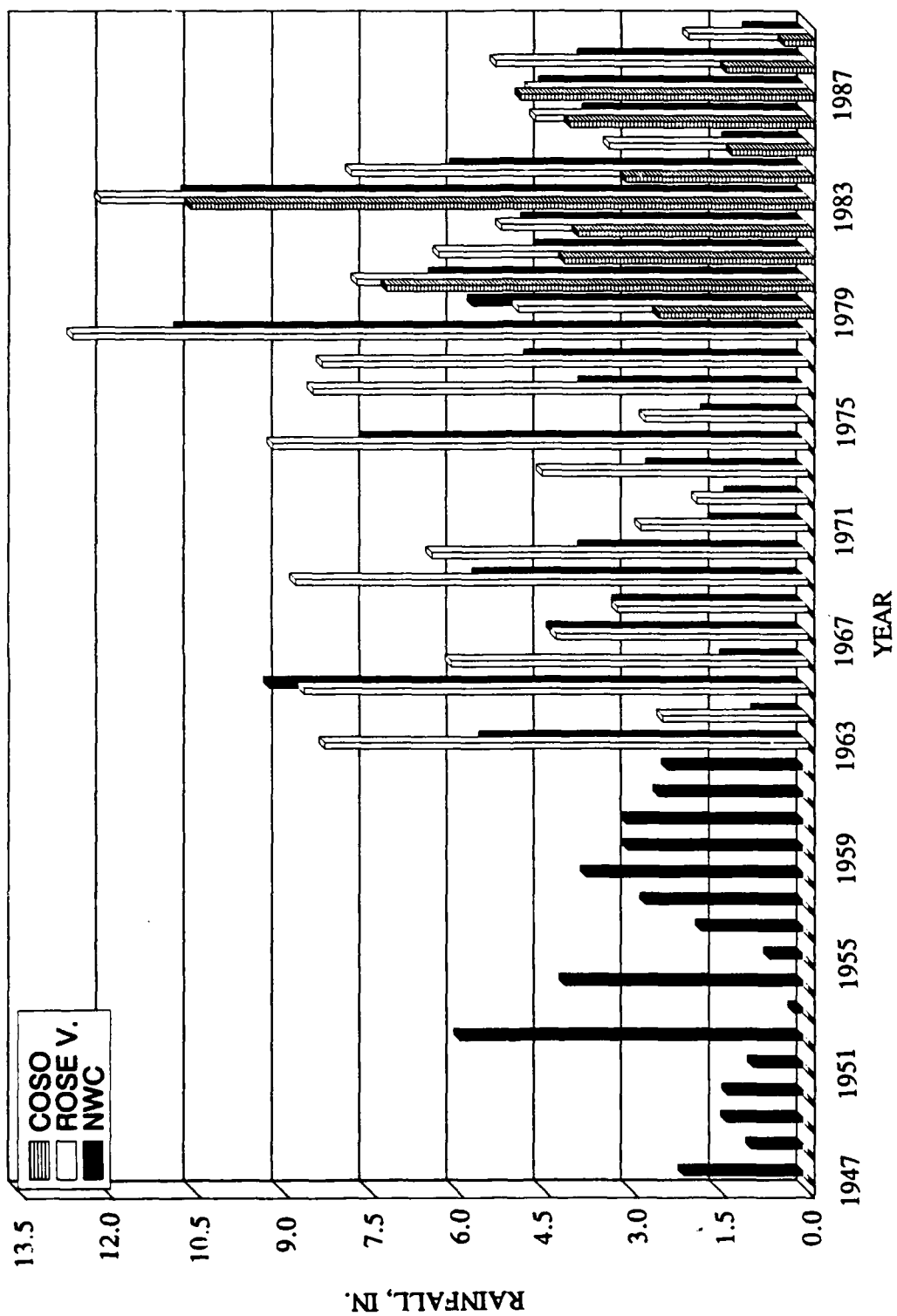


FIGURE 26. Comparison of Total Rainfall at Coso Basin, Rose Valley and NWC Sites.

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### COSO HOT SPRINGS MINI RECORDING STATION

The Coso Hot Springs mini-weather recording station consists of an instrument shelter, Model 8120-1, a microbarograph Model 7010-1, and a Hi-Q hygrothermograph model 5020-1, manufactured by Weathermeasure Weathertronics, a division of Qualmetrics, Inc., Sacramento, California.

The microbarograph was in place 9 August 1990. A test chart was run from 9 to 13 August when data collection was begun. This year's data reflect relative pressure changes rather than absolute barometric pressure at the elevation or the weather station. A graph of these data is shown in Figure 27. Comparing the barometric pressure data with changes in activity in the Coso Hot Springs KGRA will provide a better understanding of how barometric pressure affects these occurrences.

The hygrothermograph was put in place to record the ambient temperature and the relative humidity of the area with minimal influence from blowing steam. Data collection from the hygrothermograph began 1 October 1990. The data will be depicted in the 1990-91 report.

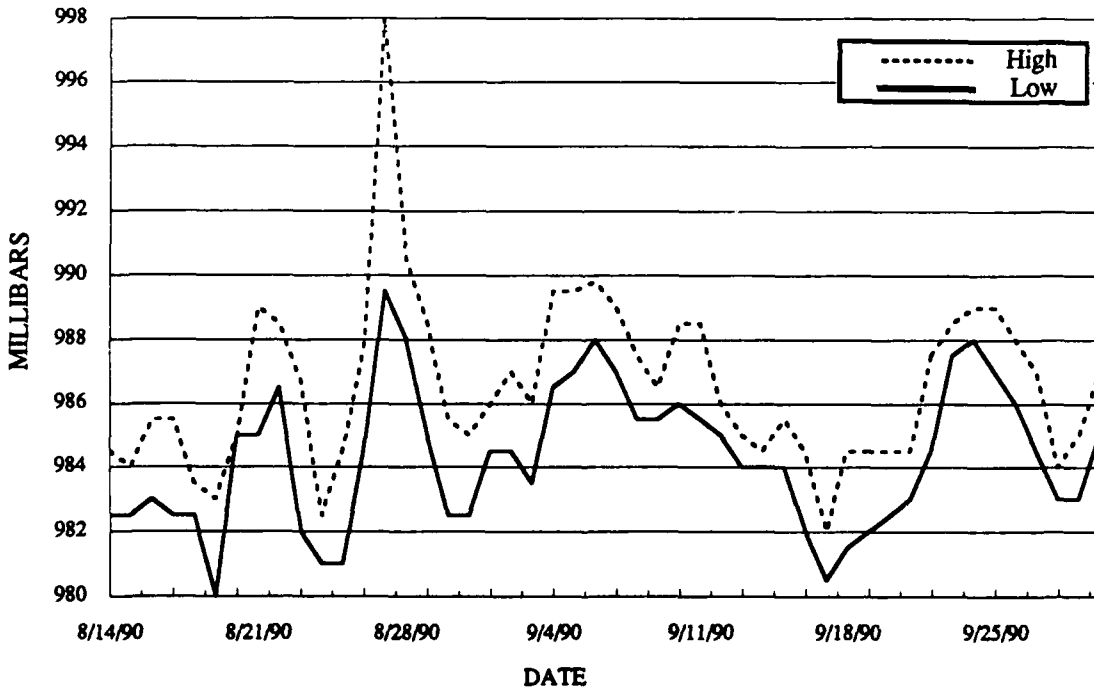


FIGURE 27. Barometric Pressure Readings.



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WATER ANALYSIS OF COSO HOT  
SPRINGS AREA SITES

Water samples were taken from several sites in the Coso Hot Springs area during 1990. These samples were analyzed for a suite of geothermal chemical constituents by B. C. Laboratories, Inc., Bakersfield, California. The results are given in Tables 13 through 21.

TABLE 13. Chemical Analysis of Devils Kitchen.

Constituent	Units	13 Feb 90	2 Aug 90
Calcium .....	mg/L	57.0	72.0
Magnesium .....	mg/L	22.0	26.0
Sodium .....	mg/L	51.0	49.0
Potassium.....	mg/L	37.0	32.4
Carbonate .....	mg/L	<i>a</i>	<i>a</i>
Bicarbonate .....	mg/L	<i>a</i>	<i>a</i>
Chloride .....	mg/L	<i>a</i>	<i>a</i>
Sulfate .....	mg/L	1400.0	1300.0
Nitrate as NO <sub>3</sub> .....	mg/L	<i>a</i>	0.4
Nitrate as N.....	mg/L	<i>a</i>	0.1
Fluoride.....	mg/L	0.29	0.33
Bromide.....	mg/L	<i>a</i>	<i>a</i>
pH.....	pH	2.1	2.0
Electrical conductivity @ 25 °C.....	µmho/cm	5200.0	5100.0
Total dissolved solids @ 180 °C.....	µg/L	2480.0	2170.0
Acidity as H ion.....	µg/L	21.7	19.4
Aluminum.....	µg/L	16 040.0	20 430.
Antimony.....	µg/L	<i>a</i>	<i>a</i>
Arsenic.....	µg/L	325.0	13.0
Boron.....	mg/L	3.2	-4.6
Copper.....	µg/L	13.0	<i>a</i>
Lithium.....	µg/L	75.0	65.0
Manganese.....	µg/L	1681.0	2070.0
Mercury.....	µg/L	<i>a</i>	1.6
Selenium.....	µg/L	<i>a</i>	<i>a</i>
Si as SiO <sub>2</sub> .....	µg/L	295.0	338.0
Strontium.....	mg/L	94.0	114.0
Thallium .....	µg/L	<i>a</i>	<i>a</i>
Zinc.....	µg/L	57.0	86.0
Total Iron .....	µg/L	40 870.0	43 090.
Ammonia as N.....	mg/L	8.0	11.5
Nitrite Nitrogen .....	mg/L	<i>a</i>	<i>a</i>
Ortho-phosphate.....	mg/L	1.14	0.4

<sup>a</sup> None detected

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TABLE 14. Chemical Analysis of Well OB-1.

Constituent	Units	13 Jan 90	13 Feb 90
Calcium.....	mg/L	60.0	56.0
Magnesium.....	mg/L	6.4	5.7
Sodium.....	mg/L	1420.0	1520.0
Potassium.....	mg/L	125.0	125.0
Carbonate.....	mg/L	<i>a</i>	<i>a</i>
Bicarbonate.....	mg/L	236.0	271.0
Chloride.....	mg/L	2308.0	2407.0
Sulfate.....	mg/L	50.0	44.0
Nitrate as NO <sub>3</sub> .....	mg/L	1.8	<i>a</i>
Nitrate as N.....	mg/L	0.4	<i>a</i>
Fluoride.....	mg/L	3.8	3.3
Bromide.....	mg/L	1.8	4.3
pH.....	pH	7.6	6.9
Electrical conductivity @ 25 °C.....	µmho/cm	7600.0	8000.0
Total dissolved solids @ 180 °C.....	µg/L	4160.0	3960.0
Aluminum.....	µg/L	<i>a</i>	<i>a</i>
Antimony.....	µg/L	<i>a</i>	<i>a</i>
Arsenic.....	µg/L	7050.0	1310.0
Boron.....	mg/L	47.6	49.1
Copper.....	µg/L	126.0	<i>a</i>
Lithium.....	µg/L	14 000.0	14 000.0
Manganese.....	µg/L	594.0	785.0
Mercury.....	µg/L	365.0	<i>a</i>
Selenium.....	µg/L	<i>a</i>	<i>a</i>
Si as SiO <sub>2</sub> .....	µg/L	100.0	52.0
Strontium.....	mg/L	2780.0	2990.0
Thallium.....	µg/L	<i>a</i>	<i>a</i>
Zinc.....	µg/L	653.0	51.0
Total Iron.....	µg/L	35 340.0	2120.0
Ammonia as N.....	mg/L	0.03	0.15
Nitrite Nitrogen.....	mg/L	<i>a</i>	<i>a</i>
Ortho-phosphate.....	mg/L	0.54	0.18

*a* None detected

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TABLE 15. Chemical Analysis of Coso Well 4P-1.

Constituent	Units	13 Feb 90	2 Aug 90
Calcium .....	mg/L	10.0	16.0
Magnesium .....	mg/L	0.11	0.26
Sodium .....	mg/L	530.0	66.0
Potassium .....	mg/L	54.0	25.0
Carbonate .....	mg/L	297.0	<i>a</i>
Bicarbonate .....	mg/L	<i>a</i>	174.0
Chloride .....	mg/L	439.0	3.5
Sulfate .....	mg/L	112.0	70.0
Nitrate as NO <sub>3</sub> .....	mg/L	<i>a</i>	<i>a</i>
Nitrate as N .....	mg/L	<i>a</i>	<i>a</i>
Fluoride .....	mg/L	5.0	0.76
Bromide .....	mg/L	<i>a</i>	<i>a</i>
pH .....	pH	9.8	7.8
Electrical conductivity @ 25 °C .....	µmho/cm	2600.0	440.0
Total dissolved solids @ 180 °C .....	mg/L	1815.0	560.0
Aluminum .....	µg/L	76.0	262.0
Antimony .....	µg/L	<i>a</i>	<i>a</i>
Arsenic .....	µg/L	148.0	<i>a</i>
Boron .....	mg/L	4.5	0.11
Copper .....	µg/L	<i>a</i>	<i>a</i>
Lithium .....	µg/L	490.0	21.0
Manganese .....	µg/L	15.0	157.0
Mercury .....	µg/L	<i>a</i>	0.2
Selenium .....	µg/L	<i>a</i>	<i>a</i>
Si as SiO <sub>2</sub> .....	mg/L	266.0	295.0
Strontium .....	µg/L	154.0	219.0
Thallium .....	µg/L	<i>a</i>	<i>a</i>
Zinc .....	µg/L	117.0	508.0
Total Iron .....	µg/L	475.0	1235.0
Ammonia as N .....	mg/L	0.72	0.70
Nitrite Nitrogen .....	mg/L	<i>a</i>	<i>a</i>
Ortho-phosphate .....	mg/L	0.99	0.1

*a* None detected

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TABLE 16. Chemical Analysis of Well 4K-1.

Constituent	Units	21 Feb 90	2 Aug 90
Calcium.....	mg/L	5.3	2.3
Magnesium.....	mg/L	0.34	0.20
Sodium.....	mg/L	36.0	42.0
Potassium.....	mg/L	9.3	7.0
Carbonate.....	mg/L	<i>a</i>	<i>a</i>
Bicarbonate.....	mg/L	56.3	56.3
Chloride.....	mg/L	4.6	5.0
Sulfate.....	mg/L	50.0	53.
Nitrate as NO <sub>3</sub> .....	mg/L	0.4	0.9
Nitrate as N.....	mg/L	0.1	0.2
Fluoride.....	mg/L	3.0	1.1
Bromide.....	mg/L	0.97	0.13
pH.....	pH	8.0	7.3
Electrical conductivity @ 25 °C.....	µmho/cm	240.0	240.0
Total dissolved solids @ 180 °C.....	mg/L	385.0	405.0
Aluminum.....	µg/L	1262.0	2140.0
Antimony.....	µg/L	<i>a</i>	<i>a</i>
Arsenic.....	µg/L	22.0	<i>a</i>
Boron.....	µg/L	0.10	17.0
Copper.....	mg/L	70.0	<i>a</i>
Lithium.....	µg/L	185.0	11.0
Manganese.....	µg/L	252.0	45.0
Mercury.....	µg/L	<i>a</i>	1.9
Selenium.....	µg/L	<i>a</i>	<i>a</i>
Si as SiO <sub>2</sub> .....	mg/L	241.0	189.0
Strontium.....	µg/L	52.0	26.0
Thallium.....	µg/L	<i>a</i>	170.0
Zinc.....	µg/L	2460.0	2190.0
Total Iron.....	µg/L	11 890.0	0.65
Ammonia as N.....	mg/L	1.65	<i>a</i>
Nitrite Nitrogen.....	mg/L	0.3	<i>a</i>
Ortho-phosphate.....	mg/L	0.69	<i>a</i>

*a* None detected

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TABLE 17. Chemical Analysis of South Pool.

Constituent	Units	13 Feb 90	2 Aug 90
Calcium.....	mg/L	39.0	46.0
Magnesium.....	mg/L	8.9	17.0
Sodium.....	mg/L	10.0	18.0
Potassium.....	mg/L	13.6	16.8
Carbonate.....	mg/L	<i>a</i>	<i>a</i>
Bicarbonate.....	mg/L	<i>a</i>	<i>a</i>
Chloride.....	mg/L	<i>a</i>	<i>a</i>
Sulfate.....	mg/L	740.0	1400.0
Nitrate as NO <sub>3</sub> .....	mg/L	1.8	1.3
Nitrate as N.....	mg/L	0.4	0.3
Fluoride.....	mg/L	0.19	0.35
Bromide.....	mg/L	<i>a</i>	<i>a</i>
pH.....	pH	2.3	2.0
Electrical conductivity @ 25 °C.....	µmho/cm	3400.0	5700.0
Total dissolved solids @ 180 °C.....	mg/L	1360.0	2195.0
Acidity as H ion.....	mg/L	10.1	20.0
Aluminum.....	µg/L	14 790.0	44 730.0
Antimony.....	µg/L	<i>a</i>	<i>a</i>
Arsenic.....	µg/L	<i>a</i>	<i>a</i>
Boron.....	mg/L	0.21	0.78
Copper.....	µg/L	62.0	213.0
Lithium.....	µg/L	55.0	30.0
Manganese.....	µg/L	800.0	1320.0
Mercury.....	µg/L	<i>a</i>	0.2
Selenium.....	µg/L	<i>a</i>	<i>a</i>
Si as SiO <sub>2</sub> .....	mg/L	186.0	315.0
Strontium.....	µg/L	45.0	117.0
Thallium.....	µg/L	<i>a</i>	<i>a</i>
Zinc.....	µg/L	500.0	556.0
Total Iron.....	µg/L	5142.0	13 010.0
Ammonia as N.....	mg/L	27.0	53.0
Nitrite Nitrogen.....	mg/L	<i>a</i>	<i>a</i>
Ortho-phosphate.....	mg/L	0.33	<i>a</i>

*a* None detected

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TABLE 18. Chemical Analysis of Coso Well 4KC-10.

Constituent	Units	2 Aug 90
Calcium .....	mg/L	175.0
Magnesium .....	mg/L	27.0
Sodium.....	mg/L	41.0
Potassium.....	mg/L	28.0
Carbonate .....	mg/L	<i>a</i>
Bicarbonate .....	mg/L	<i>a</i>
Chloride.....	mg/L	<i>a</i>
Sulfate.....	mg/L	870.0
Nitrate as NO <sub>3</sub> .....	mg/L	0.4
Nitrate as N.....	mg/L	0.1
Fluoride .....	mg/L	0.9
Bromide.....	mg/L	<i>a</i>
pH .....	pH	2.8
Electrical conductivity @ 25 °C	µmho/cm	2300.0
Total dissolved solids @ 180 °C	mg/L	1600.0
Acidity as <sup>+</sup> H ion.....	mg/L	3.3
Aluminum.....	µg/L	2540.0
Antimony .....	µg/L	<i>a</i>
Arsenic .....	µg/L	<i>a</i>
Boron.....	mg/L	1.1
Copper .....	µg/L	182.0
Lithium.....	µg/L	80.0
Manganese.....	µg/L	5000.0
Mercury .....	µg/L	0.3
Selenium.....	µg/L	<i>a</i>
Si as SiO <sub>2</sub> .....	mg/L	257.0
Strontium .....	µg/L	1100.0
Thallium.....	µg/L	<i>a</i>
Zinc.....	µg/L	438.0
Total Iron .....	µg/L	22 740.0
Ammonia as N .....	mg/L	25.0
Nitrite Nitrogen .....	mg/L	0.1
Ortho-phosphate .....	mg/L	0.3

*a* None detected

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TABLE 19. Chemical Analysis of Mudfield Runoff.

Constituent	Units	14 Feb 90
Calcium .....	mg/L	309.0
Magnesium .....	mg/L	58.0
Sodium.....	mg/L	103.0
Potassium.....	mg/L	42.0
Carbonate .....	mg/L	<i>a</i>
Bicarbonate .....	mg/L	17.3
Chloride.....	mg/L	6.0
Sulfate.....	mg/L	1360.0
Nitrate as NO <sub>3</sub> .....	mg/L	13.7
Nitrate as N.....	mg/L	3.1
Fluoride .....	mg/L	<i>a</i>
Bromide.....	mg/L	<i>a</i>
pH .....	pH	5.6
Electrical conductivity @ 25 °C	µmho/cm	2500.0
Total dissolved solids @ 180 °C	mg/L	2230.0
Aluminum.....	µg/L	307.0
Antimony .....	µg/L	<i>a</i>
Arsenic .....	µg/L	27.0
Boron.....	mg/L	3.6
Copper .....	µg/L	10.0
Lithium.....	µg/L	50.0
Manganese.....	µg/L	8530.0
Mercury .....	µg/L	<i>a</i>
Selenium .....	µg/L	<i>a</i>
Si as SiO <sub>2</sub> .....	mg/L	223.0
Strontium .....	µg/L	2150.0
Thallium.....	µg/L	<i>a</i>
Zinc.....	µg/L	129.0
Total Iron .....	µg/L	17 540.0
Ammonia as N .....	mg/L	32.0
Nitrite Nitrogen .....	mg/L	<i>a</i>
Ortho-phosphate .....	mg/L	0.45

<sup>a</sup> None detected

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TABLE 20. Chemical Analysis of Well 4H-8.

Constituent	Units	15 Feb 90
Calcium .....	mg/L	0.4
Magnesium .....	mg/L	<i>a</i>
Sodium.....	mg/L	67 500.0
Potassium.....	mg/L	4700.0
Carbonate.....	mg/L	11 417.0
Bicarbonate .....	mg/L	8835.0
Chloride.....	mg/L	87 084.0
Sulfate.....	mg/L	9000.0
Nitrate as NO <sub>3</sub> .....	mg/L	811.0
Nitrate as N.....	mg/L	183.0
Fluoride.....	mg/L	1067.0
Bromide.....	mg/L	160.0
pH.....	pH	10.1
Electrical conductivity @ 25 °C	µmho/cm	121 200.0
Total dissolved solids @ 180 °C	mg/L	190 200.0
Aluminum.....	µg/L	<i>a</i>
Antimony .....	µg/L	1144.0
Arsenic.....	µg/L	540 000.0
Boron.....	mg/L	1639.0
Copper .....	µg/L	<i>a</i>
Lithium.....	µg/L	810 000.0
Manganese.....	µg/L	<i>a</i>
Mercury.....	µg/L	<i>a</i>
Selenium .....	µg/L	<i>a</i>
Si as SiO <sub>2</sub> .....	µg/L	220.0
Strontium .....	µg/L	384.0
Thallium.....	µg/L	<i>a</i>
Zinc.....	µg/L	<i>a</i>
Total Iron .....	µg/L	<i>a</i>
Ammonia as N .....	mg/L	<i>a</i>
Nitrite Nitrogen .....	mg/L	<i>a</i>
Ortho-phosphate .....	mg/L	285.0

*a* None detected



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TABLE 21. Chemical Analysis of Well 4H-4 (Schober's H. W. Well No. 4).

Constituent	Units	4 Oct 89	13 Feb 90	2 Aug 90
Calcium.....	mg/L	37.0	24.0	25.0
Magnesium.....	mg/L	0.68	0.31	1.2
Sodium.....	mg/L	63.0	54.0	58.0
Potassium.....	mg/L	2.6	3.4	2.3
Carbonate.....	mg/L	<i>a</i>	<i>a</i>	<i>a</i>
Bicarbonate.....	mg/L	98.8	89.2	91.8
Chloride.....	mg/L	5.3	5.0	5.3
Sulfate.....	mg/L	142.0	96.0	108.0
Nitrate as NO <sub>3</sub> .....	mg/L	<i>a</i>	0.9	3.1
Nitrate as N.....	mg/L	<i>a</i>	0.2	0.7
Fluoride.....	mg/L	0.14	0.37	0.53
Bromide.....	mg/L	0.12	<i>a</i>	<i>a</i>
pH.....	pH	7.8	8.6	8.0
Electrical conductivity @ 25 °C.....	µmho/cm	490.0	380.0	400.0
Total dissolved solids @ 180 °C....	mg/L	360.0	255.0	375.0
Aluminum.....	µg/L	140.0	957.0	6250.0
Antimony.....	µg/L	<i>a</i>	<i>a</i>	<i>a</i>
Arsenic.....	µg/L	11.0	16.0	<i>a</i>
Boron.....	µg/L	0.62	0.48	0.11
Copper.....	mg/L	<i>a</i>	<i>a</i>	<i>a</i>
Lithium.....	µg/L	<i>a</i>	<i>a</i>	<i>a</i>
Manganese.....	µg/L	30.0	86.0	177.0
Mercury.....	µg/L	0.6	192.0	82.6
Selenium.....	µg/L	<i>a</i>	<i>a</i>	<i>a</i>
Si as SiO <sub>2</sub> .....	mg/L	80.0	114.0	148.0
Strontium.....	µg/L	385.0	375.0	444.0
Thallium.....	µg/L	<i>a</i>	<i>a</i>	<i>a</i>
Zinc.....	µg/L	<i>a</i>	66.0	225.0
Total Iron.....	µg/L	<i>a</i>	14 860.0	20 330.0
Ammonia as N.....	mg/L	1.15	0.79	0.19
Nitrite Nitrogen.....	mg/L	0.2	0.2	0.1
Ortho-phosphate.....	mg/L	0.24	0.36	<i>a</i>

*a* None detected

**WELL 4K-1**

Well 4K-1, traditionally known as the "Mud Well" is located at the juncture of the Coso Resort Road and Wheeler Road. As reported in last year's summary (Reference 1), this well geysered several times from May 1989 through August 1989. This activity must have cleared the well of mud because on 21 February 1990, Well 4K-1 was discovered to be a fresh water well. Major chemical constituents of water samples taken over the last 2 years from this well are compared in Figure 28 and visually show the effect of cleaning out the mud and replacing it with steam condensate.

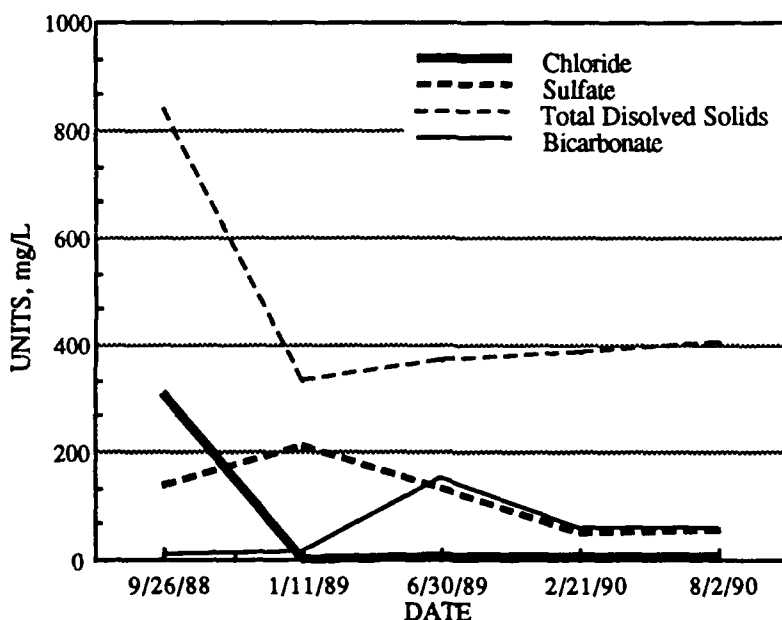


FIGURE 28. Chemical Analysis, Well 4K-1.

**TEMPERATURE RECORDINGS OF THE COSO RESORT AREA WELLS**

The temperature logs from Wells 4H-8, 4K-1, 4P-1, and Schober's Well 4A, are graphed in Figures 29 through 32, with the data listed in Appendix C. The Geothermal Program Office's logging equipment, manufactured by Enviro-Labs, Inc., Glendale, California, was used for the temperature recordings except for the recordings dated 25 September 1990. These data were recorded using the T-D Probe System, manufactured by Natural Progress Instruments, Dallas, Texas. The Enviro-Labs' equipment is no longer supported and has now been replaced with the Natural Progress logging tools.

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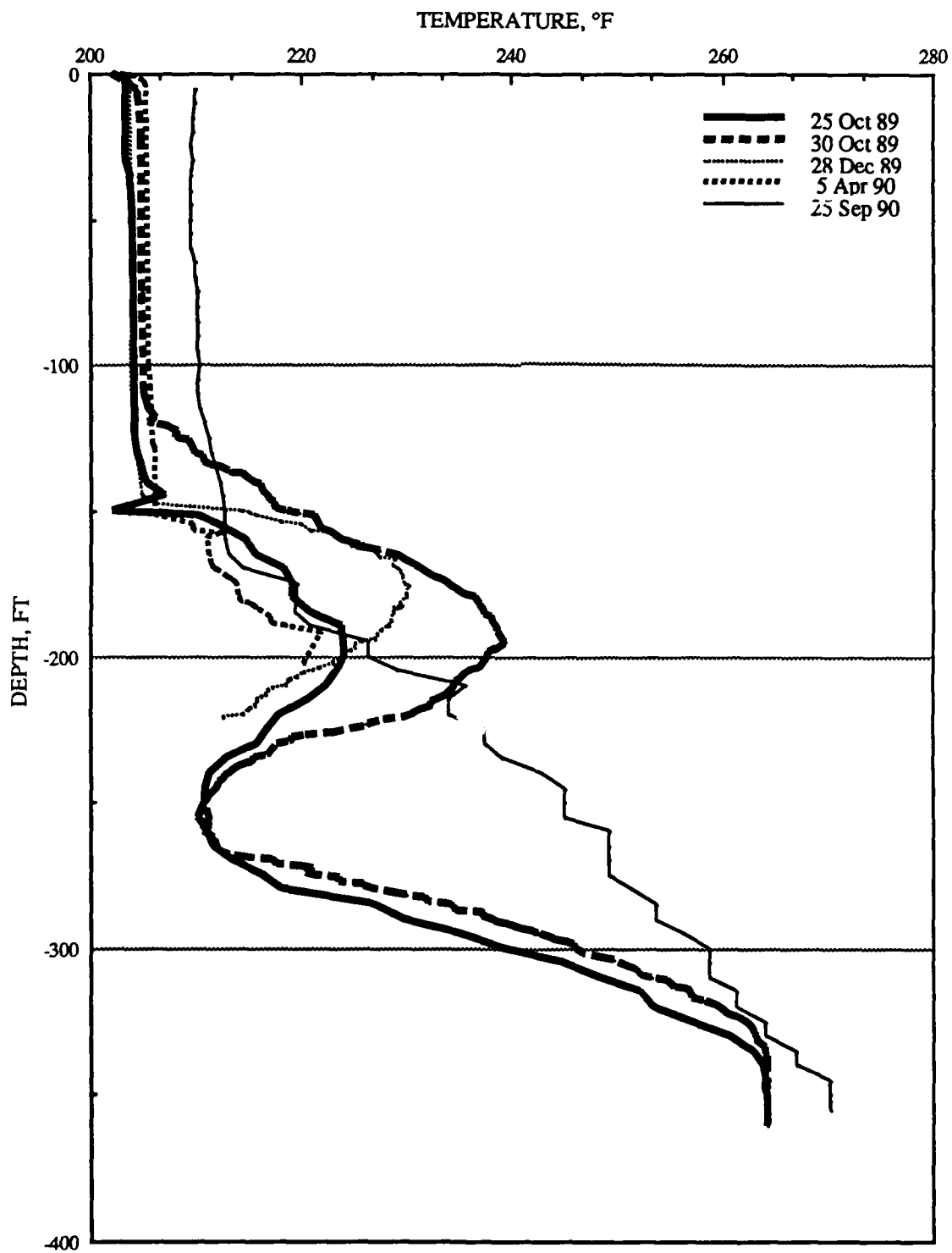


FIGURE 29. Temperature Profile, 4H-8 (Coso Well No. 1).

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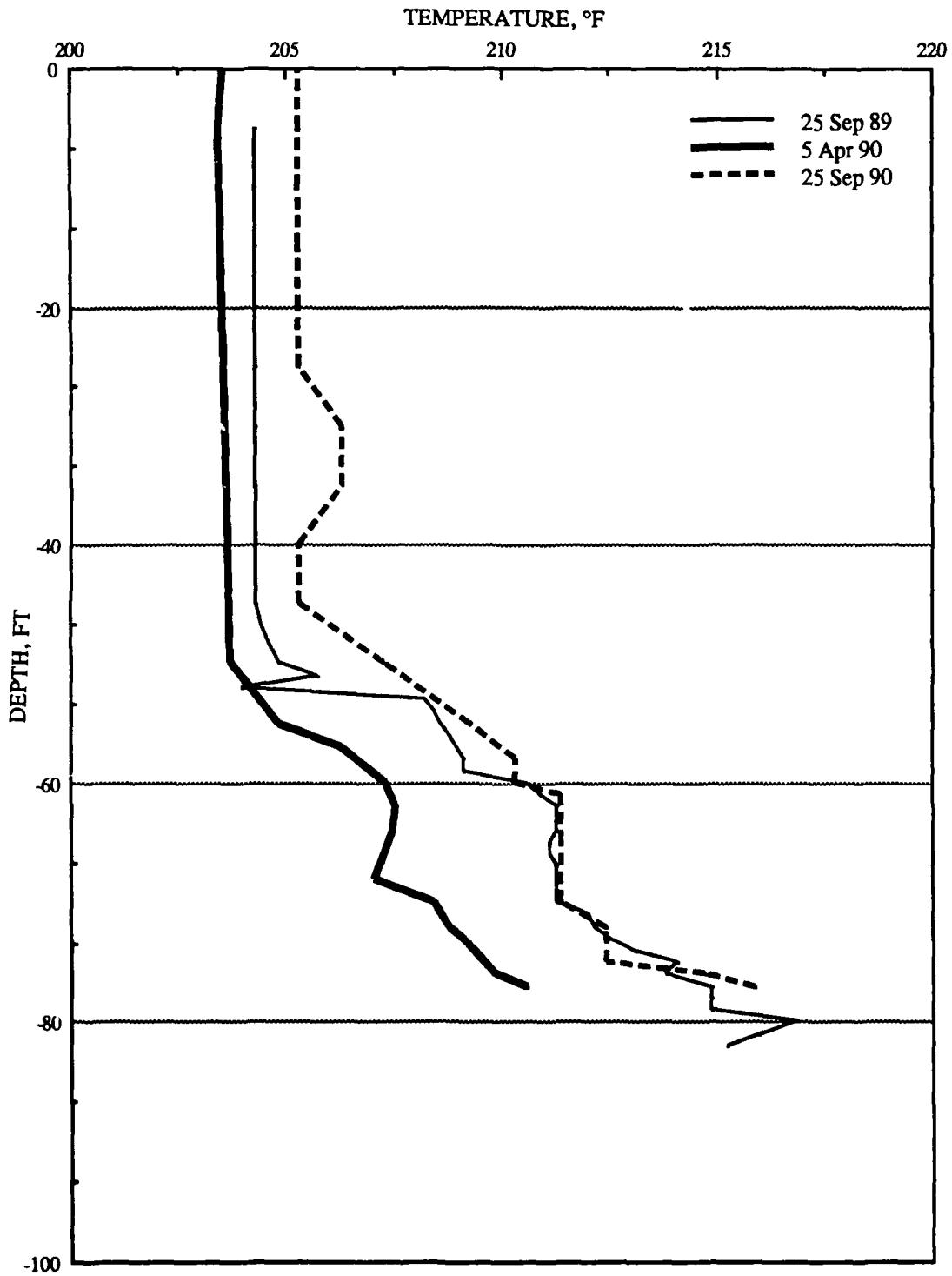


FIGURE 30. Temperature Profile, Well 4K-1.

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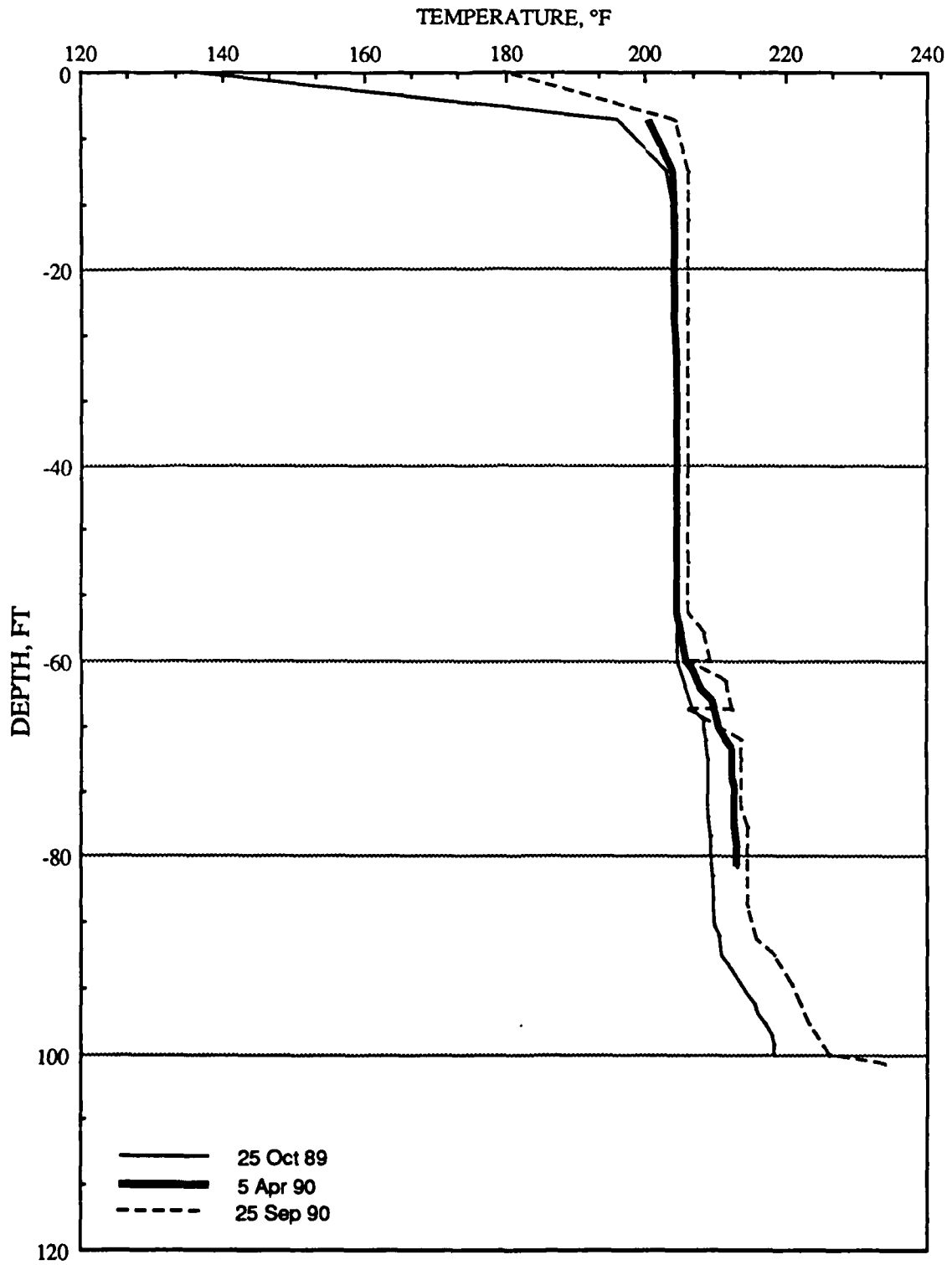


FIGURE 31. Temperature Profile, Well 4P-1.

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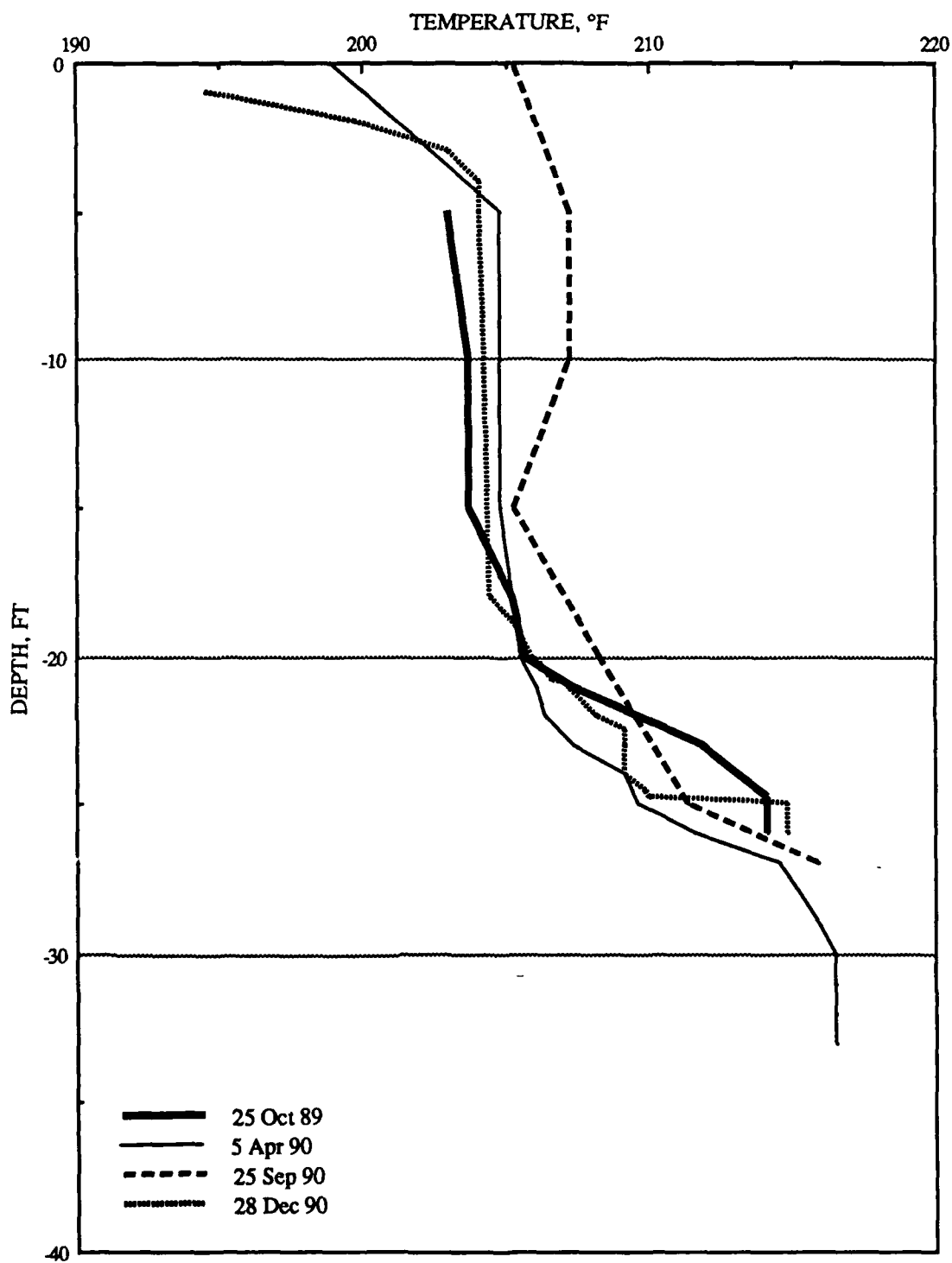


FIGURE 32. Temperature Profile, Well 4A-4.

## OTHER GEOTHERMAL ACTIVITY AT COSO HOT SPRINGS

### WEST CANYONS

Two canyons directly west of the main resort (below Rain Gauge No. 2) have large areas of warm ground and small areas of thermal alteration, particularly in the bedrock of the canyon floors. The warm ground is evidenced by a lack of vegetation and the winter snow melt patterns. The smaller sites are perennially hot with steaming ground and occasionally flowing hot springs. These sites are visited monthly to monitor any changes that occur. During the period of this report, there were four springs documented. Two of the springs display sporadic activity, emitting steam and water for a short time before returning again to a dormant state. The flow of the other two springs has remained constant with only slight variations in size. Three steam vents have also remained active emitting a constant but small steam flow. There is little evidence of any increased activity in the remaining canyon areas, but they will continue to be monitored closely.

### MUD CRATER 4KC-8

Mud Crater 4KC-8 was the first large mud crater to form during this new period of activity. It began to grow in August 1988 and by February 1989 had reached a size of 50 by 80 feet. During October 1989 a slight increase in activity began along the west side of the crater. The activity has continued through this reporting period, with new steam vents and flowing springs along the south, west and north ends, some of which have grown into small craters and joined the main crater enlarging its overall size.

### MUD CRATER 4KC-9

Mud Crater 4KC-9 is in the vicinity of an old Well (4K-7) and was the first activity in this area to grow into a crater. For a short period last year, the activity in 4KC-9 subsided while at the same time Mud Crater 4KC-10 was rapidly growing. In early October 1989 a steam vent appeared approximately 25 feet north of 4KC-9. In 2 weeks it had grown into another mud crater 15 feet in diameter, perking with water and occasionally throwing mud 15 to 20 feet in the air. Activity in both craters continued at a steady pace until they joined together in May 1990. At this time the water level began to diminish, and by late June there was little activity in the crater except for small steam vents. Activity resumed in the northern portion of the crater (newest addition) in September, and 4KC-9 began throwing mud and growing toward 4KC-10. As of 30 September, activity in the original area of 4KC-9 had not resumed but is anticipated.

### **MUD CRATER 4KC-10**

The area that Mud Crater 4KC-10 now covers probably encompasses the old resort wells 4K-2, -3, and -4. There is no visible evidence of old well casings, but numerous sections of 2-inch pipe are along the north bank east of the old monitoring site. In late November 1989 4KC-10 started throwing mud as high as 80 feet. During the first week of December the three monitored mud pots (red, brown, and grey) were overcome by the activity and are now a part of 4KC-10 crater. In early February 4KC-10 had joined with the area north of the Lattice House, leaving a low level island. In late February, the activity decreased and the water level began to go down. Currently there is a crater with an approximate diameter of 150 feet. The dashed black line in Figure 33 shows the area encompassed by the mud craters as of 30 September 1990.

### **ACTIVITY EAST OF THE RESORT AND NORTHEAST OF SOUTH POOL**

An area east of the resort and northeast of South Pool contains several sites of minor thermal activity, including small steamers, pots, and hot ground. As stated in the 1988-89 report (Reference 1), two rather large craters have also formed (one red and one grey) due to increased thermal activity. The red crater is now approximately 35 feet in diameter and occasionally throws mud 20 to 25 feet in the air. The grey crater is approximately 15 by 25 feet and also throws mud, but it is much less active than the red crater. The craters may be the result of failed casings in uncharted wells in the area. The remainder of this area has not shown any drastic change in activity.

### **4H-8 (COSO WELL NO. 1)**

Coso Well No. 1 was dug by NWC in 1967 to a depth of 375 feet and cased with a 4-inch pipe to 370 feet. An attempt was made to log the well temperature on 28 December 1989, but the temperature probe would only go 221 feet. On 5 April a second attempt was made, reaching a depth of 203.6 feet. Clearing of the well was begun on 5 July. Blowing out the well with compressed air was tried, but the obstruction remained. A 13-inch lead weight was then lowered to the obstruction, where it was raised and dropped repeatedly from about 10 feet, after several attempts the weight broke through the obstruction and continued down the well. A galvanized pipe was then lowered until it reached the obstruction and raised and lowered until it broke through the obstruction. Blowing out the well was attempted again and successfully completed. Large pieces of hard, baked materials came out and the well started to steam. Temperature logging was a success on 25 September. The well casing has remained clear with a good steam flow since completion of descaling the well casing.





FIGURE 33. Aerial Photo of Coso Resort Area, 19 July 1989.

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**4A-2 THROUGH 4A-5, 4A-13 THROUGH  
4A-17 (SCHOBBER'S RESORT WELLS)**

On 3 October 1989, a hot water well was found 5 feet from the southeast corner of the bath house. The well is an uncased 8-inch well, 31 feet deep with a water level of 19 feet six inches. The water temperature is 206°F. Chemical analysis of the water can be found in Table 14. A dry steam well was also located 75 feet south of the bath house, which has been properly closed and cemented.

**4H-1, 2, 3, AND 7 (COSO RESORT  
CORROSION ARRAY WELLS)**

As stated in the 1988-89 report (Reference 1), data has not been collected from this site since 6 June 1989, when all equipment was removed to facilitate repairs to the wells. As of this report, repair of the wells is still unfunded.

**SUMMARY**

During this reporting period (1 October 1989 through 30 September 1990) Well 4P-2 began surging with short bursts of steam, and the steam flow increased at 4A-2 and 4A-3 (Schober's Resort Wells). In response to this activity, a larger flow meter from 4H-4 was exchanged with the one at 4P-2, and orifices were enlarged at Wells 4P-2, 4A-2, and 4A-3. A microbarograph was put in place to monitor changes in barometric pressure. This unit, along with the hygrothermograph installed in the Fall 1990, and the rainfall stations will give a more complete record of weather conditions that affect the activity in the area.

New water well temperature logging equipment was purchased due to failure of the previous equipment and lack of repair availability. Temperature logging of Well 4H-8 was hampered by a blockage in the well bore which had to be cleared repeatedly. This blockage appears to be the result of boiling inside the well and the formation of deposits around the boiling.

As part of a general effort to cleanup and improve the safety of the area, the Coso Resort Corrosion Array was torn down; and valves and other salvageable materials were turned into the Department of Defense Property Disposal/Reutilization Branch. The barbed wire fencing is being repaired and extended to enclose the areas of greatest hydrothermal activity.

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**PLANS FOR 1991**

The plans for 1991 are to: (1) closely monitor the increased activity at the Coso Resort Area; (2) continue the extension of barbed wire fencing around the Coso Mud Pots and Schober's area to limit access and increase safety; (3) begin collecting relative humidity and more accurate temperature data with the newly installed hygromograph; (4) upgrade computer hardware and rewrite necessary programs to better retrieve and use data collected from Barton meters, weather station recorders, and other miscellaneous sites.

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**REFERENCES**

1. Naval Weapons Center. *Coso Monitoring Program, October 1989 Through September 1990*, by S. C. Bjornstad, J. H. Monahan and E. M. Edwards. China Lake, Calif., NWC, March 1990. 112 pp. (NWC TP 7056, publication UNCLASSIFIED.)

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Appendix A  
DAILY STEAM FLOW DATA

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TABLE A-1. Devils Kitchen Site Steam Flow Data, lb/h.

Date	High	Low	Date	High	Low
1 Oct 89	354.0	354.0	5 Nov 89	362.1	362.1
2 Oct 89	358.0	354.0	6 Nov 89	358.0	358.0
3 Oct 89	358.0	354.0	7 Nov 89	354.0	354.0
4 Oct 89	354.0	354.0	8 Nov 89	354.0	354.0
5 Oct 89	354.0	350.0	9 Nov 89	358.0	358.0
6 Oct 89	354.0	350.0	10 Nov 89	358.0	358.0
7 Oct 89	354.0	350.0	11 Nov 89	362.1	358.0
8 Oct 89	354.0	354.0	12 Nov 89	362.1	358.0
9 Oct 89	354.0	354.0	13 Nov 89	362.1	358.0
10 Oct 89	358.0	354.0	14 Nov 89	358.0	354.0
11 Oct 89	354.0	354.0	15 Nov 89	354.0	350.0
12 Oct 89	354.0	354.0	16 Nov 89	362.1	358.0
13 Oct 89	354.0	354.0	17 Nov 89	362.1	354.0
14 Oct 89	358.0	354.0	18 Nov 89	354.0	350.0
15 Oct 89	354.0	354.0	19 Nov 89	362.1	358.0
16 Oct 89	354.0	354.0	20 Nov 89	362.1	358.0
17 Oct 89	358.0	354.0	21 Nov 89	362.1	362.1
18 Oct 89	350.0	350.0	22 Nov 89	362.1	358.0
19 Oct 89	354.0	354.0	23 Nov 89	366.1	362.1
20 Oct 89	354.0	354.0	24 Nov 89	366.1	362.1
21 Oct 89	354.0	354.0	25 Nov 89	362.1	358.0
22 Oct 89	354.0	350.0	26 Nov 89	358.0	354.0
23 Oct 89	350.0	350.0	27 Nov 89	350.0	350.0
24 Oct 89	358.0	358.0	28 Nov 89	358.0	354.0
25 Oct 89	358.0	350.0	29 Nov 89	362.1	362.1
26 Oct 89	350.0	346.0	30 Nov 89	362.1	358.0
27 Oct 89	354.0	354.0	1 Dec 89	358.0	358.0
28 Oct 89	358.0	354.0	2 Dec 89	358.0	358.0
29 Oct 89	350.0	350.0	3 Dec 89	362.1	358.0
30 Oct 89	354.0	354.0	4 Dec 89	362.1	362.1
31 Oct 89	358.0	358.0	5 Dec 89	366.1	366.1
1 Nov 89	354.0	350.0	6 Dec 89	362.1	358.0
2 Nov 89	354.0	350.0	7 Dec 89	362.1	358.0
3 Nov 89	358.0	358.0	8 Dec 89	362.1	358.0
4 Nov 89	358.0	358.0	9 Dec 89	366.1	362.1

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TABLE A-1 (Contd.)

Date	High	Low	Date	High	Low
10 Dec 89	362.1	362.1	14 Jan 90	366.1	366.1
11 Dec 89	362.1	358.0	15 Jan 90	366.1	362.1
12 Dec 89	362.1	358.0	16 Jan 90	366.1	362.1
13 Dec 89	362.1	362.1	17 Jan 90	362.1	362.1
14 Dec 89	362.1	358.0	18 Jan 90	362.1	362.1
15 Dec 89	362.1	358.0	19 Jan 90	362.1	362.1
16 Dec 89	366.1	366.1	20 Jan 90	362.1	358.0
17 Dec 89	366.1	358.0	21 Jan 90	358.0	358.0
18 Dec 89	362.1	362.1	22 Jan 90	366.1	362.1
19 Dec 89	362.1	362.1	23 Jan 90	370.1	366.1
20 Dec 89	358.0	354.0	24 Jan 90	362.1	362.1
21 Dec 89	358.0	358.0	25 Jan 90	362.1	362.1
22 Dec 89	358.0	358.0	26 Jan 90	370.1	366.1
23 Dec 89	358.0	358.0	27 Jan 90	370.1	370.1
24 Dec 89	362.1	354.0	28 Jan 90	362.1	362.1
25 Dec 89	362.1	358.0	29 Jan 90	362.1	362.1
26 Dec 89	370.1	366.1	30 Jan 90	374.1	370.1
27 Dec 89	370.1	366.1	31 Jan 90	374.1	370.1
28 Dec 89	366.1	366.1	1 Feb 90	370.1	370.1
29 Dec 89	362.1	358.0	2 Feb 90	362.1	358.0
30 Dec 89	362.1	358.0	3 Feb 90	362.1	358.0
31 Dec 89	362.1	358.0	4 Feb 90	366.1	362.1
1 Jan 90	362.1	358.0	5 Feb 90	366.1	362.1
2 Jan 90	362.1	354.0	6 Feb 90	370.1	366.1
3 Jan 90	354.0	354.0	7 Feb 90	382.2	362.1
4 Jan 90	358.0	354.0	8 Feb 90	366.1	362.1
5 Jan 90	358.0	358.0	9 Feb 90	362.1	362.1
6 Jan 90	362.1	358.0	10 Feb 90	362.1	362.1
7 Jan 90	366.1	366.1	11 Feb 90	366.1	366.1
8 Jan 90	366.1	362.1	12 Feb 90	378.2	370.1
9 Jan 90	366.1	362.1	13 Feb 90	370.1	370.1
10 Jan 90	366.1	362.1	14 Feb 90	370.1	362.1
11 Jan 90	362.1	358.0	15 Feb 90	366.1	362.1
12 Jan 90	362.1	362.1	16 Feb 90	366.1	366.1
13 Jan 90	366.1	362.1	17 Feb 90	366.1	358.0

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TABLE A-1 (Contd.)

Date	High	Low	Date	High	Low
18 Feb 90	370.1	366.1	25 Mar 90	354.0	354.0
19 Feb 90	366.1	358.0	26 Mar 90	362.1	358.0
20 Feb 90	366.1	366.1	27 Mar 90	358.0	354.0
21 Feb 90	366.1	362.1	28 Mar 90	354.0	350.0
22 Feb 90	366.1	362.1	29 Mar 90	350.0	350.0
23 Feb 90	366.1	366.1	30 Mar 90	350.0	350.0
24 Feb 90	366.1	362.1	31 Mar 90	350.0	346.0
25 Feb 90	370.1	366.1	1 Apr 90	346.0	342.0
26 Feb 90	370.1	366.1	2 Apr 90	342.0	337.9
27 Feb 90	370.1	370.1	3 Apr 90	337.9	333.9
28 Feb 90	370.1	366.1	4 Apr 90	333.9	333.9
1 Mar 90	370.1	366.1	5 Apr 90	333.9	333.9
2 Mar 90	370.1	370.1	6 Apr 90	333.9	329.9
3 Mar 90	370.1	370.1	7 Apr 90	333.9	329.9
4 Mar 90	374.1	370.1	8 Apr 90	325.9	321.8
5 Mar 90	325.9	321.8	9 Apr 90	333.9	329.9
6 Mar 90	333.9	333.9	10 Apr 90	337.9	337.9
7 Mar 90	342.0	342.0	11 Apr 90	337.9	333.9
8 Mar 90	346.0	346.0	12 Apr 90	342.0	337.9
9 Mar 90	354.0	354.0	13 Apr 90	342.0	337.9
10 Mar 90	358.0	358.0	14 Apr 90	342.0	342.0
11 Mar 90	346.0	346.0	15 Apr 90	346.0	342.0
12 Mar 90	350.0	346.0	16 Apr 90	358.0	354.0
13 Mar 90	346.0	346.0	17 Apr 90	370.1	350.0
14 Mar 89	358.0	354.0	18 Apr 90	358.0	358.0
15 Mar 90	354.0	350.0	19 Apr 90	358.0	358.0
16 Mar 90	354.0	350.0	20 Apr 90	366.1	358.0
17 Mar 90	358.0	350.0	21 Apr 90	378.2	370.1
18 Mar 90	354.0	350.0	22 Apr 90	378.2	370.1
19 Mar 90	354.0	354.0	23 Apr 90	358.0	354.0
20 Mar 90	358.0	354.0	24 Apr 90	354.0	354.0
21 Mar 90	358.0	358.0	25 Apr 90	358.0	354.0
22 Mar 90	358.0	354.0	26 Apr 90	358.0	358.0
23 Mar 90	358.0	354.0	27 Apr 90	358.0	358.0
24 Mar 90	358.0	354.0	28 Apr 90	358.0	358.0



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TABLE A-1 (Contd.)

Date	High	Low	Date	High	Low
29 Apr 90	358.0	358.0	3 Jun 90	358.0	358.0
30 Apr 90	358.0	358.0	4 Jun 90	358.0	358.0
1 May 90	358.0	358.0	5 Jun 90	358.0	358.0
2 May 90	358.0	354.0	6 Jun 90	358.0	358.0
3 May 90	358.0	354.0	7 Jun 90	358.0	358.0
4 May 90	358.0	354.0	8 Jun 90	358.0	358.0
5 May 90	358.0	354.0	9 Jun 90	358.0	358.0
6 May 90	358.0	354.0	10 Jun 90	358.0	358.0
7 May 90	358.0	354.0	11 Jun 90	358.0	354.0
8 May 90	358.0	354.0	12 Jun 90	358.0	358.0
9 May 90	358.0	354.0	13 Jun 90	358.0	358.0
10 May 90	358.0	358.0	14 Jun 90	358.0	358.0
11 May 90	358.0	358.0	15 Jun 90	358.0	354.0
12 May 90	362.1	358.0	16 Jun 90	358.0	354.0
13 May 90	358.0	354.0	17 Jun 90	358.0	358.0
14 May 90	358.0	358.0	18 Jun 90	358.0	358.0
15 May 90	358.0	358.0	19 Jun 90	358.0	358.0
16 May 90	358.0	358.0	20 Jun 90	358.0	358.0
17 May 90	358.0	358.0	21 Jun 90	362.1	358.0
18 May 90	358.0	354.0	22 Jun 90	358.0	358.0
19 May 90	358.0	358.0	23 Jun 90	362.1	358.0
20 May 90	358.0	358.0	24 Jun 90	358.0	358.0
21 May 90	358.0	358.0	25 Jun 90	358.0	358.0
22 May 90	358.0	358.0	26 Jun 90	358.0	358.0
23 May 90	358.0	358.0	27 Jun 90	358.0	358.0
24 May 90	358.0	354.0	28 Jun 90	362.1	358.0
25 May 90	358.0	358.0	29 Jun 90	362.1	358.0
26 May 90	358.0	358.0	30 Jun 90	358.0	358.0
27 May 90	358.0	358.0	1 Jul 90	362.1	362.1
28 May 90	358.0	358.0	2 Jul 90	358.0	358.0
29 May 90	358.0	358.0	3 Jul 90	358.0	358.0
30 May 90	358.0	358.0	4 Jul 90	358.0	358.0
31 May 90	358.0	358.0	5 Jul 90	358.0	358.0
1 Jun 90	358.0	358.0	6 Jul 90	358.0	358.0
2 Jun 90	358.0	358.0	7 Jul 90	358.0	358.0

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TABLE A-1 (Contd.)

Date	High	Low	Date	High	Low
8 Jul 90	358.0	358.0	12 Aug 90	362.1	358.0
9 Jul 90	358.0	358.0	13 Aug 90	358.0	358.0
10 Jul 90	358.0	358.0	14 Aug 90	358.0	358.0
11 Jul 90	358.0	358.0	15 Aug 90	358.0	358.0
12 Jul 90	358.0	358.0	16 Aug 90	358.0	358.0
13 Jul 90	358.0	358.0	17 Aug 90	358.0	358.0
14 Jul 90	358.0	358.0	18 Aug 90	358.0	354.0
15 Jul 90	358.0	358.0	19 Aug 90	358.0	358.0
16 Jul 90	358.0	358.0	20 Aug 90	358.0	358.0
17 Jul 90	358.0	358.0	21 Aug 90	358.0	354.0
18 Jul 90	358.0	358.0	22 Aug 90	358.0	358.0
19 Jul 90	358.0	358.0	23 Aug 90	358.0	354.0
20 Jul 90	358.0	358.0	24 Aug 90	358.0	358.0
21 Jul 90	358.0	358.0	25 Aug 90	358.0	358.0
22 Jul 90	358.0	358.0	26 Aug 90	358.0	354.0
23 Jul 90	358.0	358.0	27 Aug 90	358.0	358.0
24 Jul 90	358.0	358.0	28 Aug 90	358.0	358.0
25 Jul 90	358.0	358.0	29 Aug 90	362.1	350.0
26 Jul 90	358.0	358.0	30 Aug 90	358.0	358.0
27 Jul 90	358.0	358.0	31 Aug 90	358.0	358.0
28 Jul 90	358.0	358.0	1 Sep 90	358.0	358.0
29 Jul 90	358.0	358.0	2 Sep 90	358.0	358.0
30 Jul 90	358.0	358.0	3 Sep 90	358.0	358.0
31 Jul 90	362.1	358.0	4 Sep 90	358.0	358.0
1 Aug 90	362.1	362.1	5 Sep 90	358.0	358.0
2 Aug 90	362.1	362.1	6 Sep 90	358.0	358.0
3 Aug 90	362.1	358.0	7 Sep 90	358.0	358.0
4 Aug 90	358.0	358.0	8 Sep 90	358.0	358.0
5 Aug 90	358.0	358.0	9 Sep 90	358.0	358.0
6 Aug 90	358.0	358.0	10 Sep 90	358.0	358.0
7 Aug 90	358.0	358.0	11 Sep 90	358.0	358.0
8 Aug 90	358.0	358.0	12 Sep 90	358.0	358.0
9 Aug 90	358.0	358.0	13 Sep 90	358.0	358.0
10 Aug 90	358.0	358.0	14 Sep 90	358.0	358.0
11 Aug 90	362.1	358.0	15 Sep 90	358.0	358.0

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TABLE A-1 (Contd.)

Date	High	Low	Date	High	Low
16 Sep 90	358.0	358.0	26 Sep 90	358.0	354.0
17 Sep 90	358.0	358.0	27 Sep 90	358.0	354.0
18 Sep 90	358.0	358.0	28 Sep 90	358.0	354.0
19 Sep 90	358.0	358.0	29 Sep 90	358.0	358.0
20 Sep 90	358.0	358.0	30 Sep 90	358.0	358.0
21 Sep 90	358.0	358.0			
22 Sep 90	358.0	358.0			
23 Sep 90	358.0	358.0			
24 Sep 90	358.0	358.0			
25 Sep 90	358.0	358.0			

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TABLE A-2. 4P-2 (Two-Inch Steam Well) Flow Data, lb/h.

Date	High	Low	Date	High	Low
1 Oct 89	152.3	147.6	11 Nov 89	113.0	105.2
2 Oct 89	155.4	150.7	12 Nov 89	113.0	106.8
3 Oct 89	147.6	142.9	13 Nov 89	114.6	109.9
4 Oct 89	149.2	144.4	14 Nov 89	109.9	106.8
5 Oct 89	149.2	146.0	15 Nov 89	108.3	103.6
6 Oct 89	150.7	130.3	16 Nov 89	135.0	087.9
7 Oct 89	142.9	113.0	17 Nov 89	136.6	131.9
8 Oct 89	144.4	141.3	18 Nov 89	131.9	125.6
9 Oct 89	146.0	141.3	19 Nov 89	131.9	125.6
10 Oct 89	147.6	144.4	20 Nov 89	133.5	128.7
11 Oct 89	147.6	144.4	21 Nov 89	133.5	128.7
12 Oct 89	146.0	142.9	22 Nov 89	133.5	128.7
13 Oct 89	149.2	142.9	23 Nov 89	136.6	131.9
14 Oct 89	150.7	149.2	24 Nov 89	139.7	135.0
15 Oct 89	149.2	147.6	25 Nov 89	138.2	133.5
16 Oct 89	124.0	108.3	26 Nov 89	138.2	135.0
17 Oct 89	130.3	105.2	27 Nov 89	131.9	127.2
18 Oct 89	136.6	128.7	28 Nov 89	131.9	124.0
19 Oct 89	139.7	130.3	29 Nov 89	130.3	127.2
20 Oct 89	138.2	133.5	30 Nov 89	135.0	128.7
21 Oct 89	139.7	135.0	1 Dec 89		
22 Oct 89	136.6	130.3	2 Dec 89	135.0	127.2
23 Oct 89	135.0	130.3	3 Dec 89	131.9	125.6
24 Oct 89	136.6	135.0	4 Dec 89	131.9	128.7
25 Oct 89	142.9	138.2	5 Dec 89	135.0	128.7
26 Oct 89	135.0	128.7	6 Dec 89	136.6	130.3
27 Oct 89	138.2	133.5	7 Dec 89	105.2	080.1
28 Oct 89	135.0	130.3	8 Dec 89	127.2	119.3
29 Oct 89	131.9	127.2	9 Dec 89	131.9	124.0
30 Oct 89	133.5	128.7	10 Dec 89	133.5	127.2
31 Oct 89 - 6 Nov 89	000.0	000.0	11 Dec 89	131.9	128.7
7 Nov 89	114.6	108.3	12 Dec 89	152.3	125.6
8 Nov 89	113.0	109.9	13 Dec 89	136.6	133.5
9 Nov 89	111.5	105.2	14 Dec 89	136.6	133.5
10 Nov 89	109.9	103.6	15 Dec 89	127.2	092.6

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TABLE A-2 (Contd.)

Date	High	Low	Date	High	Low
16 Dec 89	133.5	128.7	20 Jan 90	142.9	139.7
17 Dec 89	135.0	128.7	21 Jan 90	144.4	139.7
18 Dec 89	130.3	127.2	22 Jan 90	144.4	142.9
19 Dec 89	127.2	122.5	23 Jan 90	144.4	141.3
20 Dec 89	127.2	122.5	24 Jan 90	141.3	139.7
21 Dec 89	125.6	122.5	25 Jan 90	144.4	139.7
22 Dec 89	124.0	117.8	26 Jan 90	149.2	146.0
23 Dec 89	124.0	117.8	27 Jan 90	147.6	141.3
24 Dec 89	127.2	119.3	28 Jan 90	144.4	139.7
25 Dec 89	127.2	122.5	29 Jan 90	147.6	146.0
26 Dec 89	131.9	127.2	30 Jan 90	152.3	152.3
27 Dec 89	138.2	125.6	31 Jan 90	152.3	147.6
28 Dec 89	133.5	133.5	1 Feb 90	152.3	149.2
29 Dec 89	136.6	117.8	2 Feb 90	146.0	144.4
30 Dec 89	117.8	106.8	3 Feb 90	144.4	139.7
31 Dec 89	119.3	114.6	4 Feb 90	149.2	142.9
1 Jan 90	128.7	122.5	5 Feb 90	117.8	105.2
2 Jan 90	133.5	131.9	6 Feb 90	130.3	102.1
3 Jan 90	130.3	130.3	7 Feb 90	136.6	133.5
4 Jan 90	128.7	124.0	8 Feb 90	133.5	128.7
5 Jan 90	131.9	127.2	9 Feb 90	131.9	130.3
6 Jan 90	131.9	125.6	10 Feb 90	135.0	131.9
7 Jan 90	131.9	125.6	11 Feb 90	142.9	133.5
8 Jan 90	135.0	131.9	12 Feb 90	144.4	139.7
9 Jan 90	136.6	131.9	13 Feb 90	157.0	144.4
10 Jan 90	136.6	130.3	14 Feb 90	149.2	149.2
11 Jan 90	139.7	133.5	15 Feb 90	124.0	124.0
12 Jan 90	141.3	136.6	16 Feb 90	117.8	117.8
13 Jan 90	142.9	139.7	17 Feb 90	119.3	114.6
14 Jan 90	141.3	138.2	18 Feb 90	119.3	114.6
15 Jan 90	141.3	138.2	19 Feb 90	124.0	117.8
16 Jan 90	144.4	141.3	20 Feb 90	108.3	102.1
17 Jan 90	144.4	144.4	21 Feb 90	108.3	105.2
18 Jan 90	141.3	139.7	22 Feb 90	109.9	108.3
19 Jan 90	144.4	141.3	23 Feb 90	120.9	116.2

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TABLE A-2 (Contd.)

Date	High	Low	Date	High	Low
24 Feb 90	122.5	120.9	31 Mar 90	142.9	139.7
25 Feb 90	122.5	122.5	1 Apr 90	141.3	136.6
26 Feb 90	133.5	130.3	2 Apr 90	141.3	136.6
27 Feb 90	124.0	102.1	3 Apr 90	106.8	103.6
28 Feb 90	127.2	102.1	4 Apr 90	106.8	105.2
1 Mar 90	128.7	105.2	5 Apr 90	109.9	103.6
2 Mar 90	131.9	106.8	6 Apr 90	111.5	105.2
3 Mar 90	131.9	109.9	7 Apr 90	113.0	108.3
4 Mar 90	133.5	111.5	8 Apr 90	109.9	103.6
5 Mar 90	119.3	117.8	9 Apr 90	108.3	105.2
6 Mar 90	119.3	117.8	10 Apr 90	109.9	105.2
7 Mar 90	119.3	116.2	11 Apr 90	111.5	108.3
8 Mar 90	117.8	116.2	12 Apr 90	113.0	109.9
9 Mar 90	117.8	114.6	13 Apr 90	111.5	106.8
10 Mar 90	116.2	114.6	14 Apr 90	113.0	111.5
11 Mar 90	117.8	116.2	15 Apr 90	114.6	111.5
12 Mar 90	130.3	113.0	16 Apr 90	114.6	111.5
13 Mar 90	130.3	113.0	17 Apr 90	111.5	109.9
14 Mar 90	111.5	109.9	18 Apr 90	113.0	108.3
15 Mar 90	122.5	119.3	19 Apr 90	109.9	108.3
16 Mar 90	124.0	122.5	20 Apr 90	111.5	109.9
17 Mar 90	124.0	119.3	21 Apr 90	113.0	109.9
18 Mar 90	124.0	120.9	22 Apr 90	114.6	111.5
19 Mar 90	125.6	122.5	23 Apr 90	116.2	113.0
20 Mar 90	125.6	113.0	24 Apr 90	116.2	113.0
21 Mar 90	125.6	122.5	25 Apr 90	113.0	108.3
22 Mar 90	127.2	122.5	26 Apr 90	113.0	108.3
23 Mar 90	122.5	120.9	27 Apr 90	117.8	113.0
24 Mar 90	127.2	119.3	28 Apr 90	119.3	116.2
25 Mar 90	125.6	120.9	29 Apr 90	119.3	116.2
26 Mar 90	124.0	113.0	30 Apr 90	116.2	111.5
27 Mar 90	127.2	127.2	1 May 90	117.8	113.0
28 Mar 90	127.2	125.6	2 May 90	113.0	113.0
29 Mar 90	127.2	125.6	3 May 90	114.6	108.3
30 Mar 90	141.3	125.6	4 May 90	116.2	105.2

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TABLE A-2 (Contd.)

Date	High	Low	Date	High	Low
5 May 90	117.8	106.8	30 May 90	141.3	070.7
6 May 90	120.9	116.2	31 May 90	139.7	069.1
7 May 90	124.0	114.6	1 Jun 90	138.2	069.1
8 May 90	128.7	108.3	2 Jun 90	139.7	081.6
9 May 90	125.6	113.0	3 Jun 90	135.0	081.6
10 May 90	133.5	106.8	4 Jun 90	136.6	081.6
11 May 90	150.7	108.3	5 Jun 90	135.0	076.9
12 May 90	155.4	108.3	6 Jun 90	135.0	078.5
13 May 90	150.7	109.9	7 Jun 90	133.5	078.5
14 May 90	157.0	109.9	8 Jun 90	133.5	076.9
15 May 90	157.0	100.5	9 Jun 90	133.5	073.8
16 May 90	157.0	097.3	10 Jun 90	133.5	072.2
17 May 90	157.0	109.9	11 Jun 90	133.5	072.2
18 May 90	157.0	113.0	12 Jun 90	131.9	072.2
19 May 90	157.0	117.8	13 Jun 90	131.9	072.2
20 May 90	157.0	114.6	14 Jun 90	128.7	072.2
21 May 90	157.0	113.0	15 Jun 90	133.5	070.7
22 May 90	157.0	114.6	16 Jun 90	130.3	070.7
23 May 90	144.4	086.4	17 Jun 90	131.9	070.7
24 May 90	128.7	067.5			
25 May 90	122.5	065.9			
26 May 90	128.7	067.5			
27 May 90	133.5	064.4			
28 May 90	124.0	065.9			
29 May 90	127.2	058.1			

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TABLE A-3. 4P-2 (Two-Inch Steam Well) Flow Data, lb/h.  
(18 June 1990 through 28 September 1990)

Date	Time	High	Low	Date	Time	High	Low	
18 Jun 90	0040	319.1	189.0	19 Jun 90	1525	382.1	268.7	
	0103	314.9	189.0		1620	377.9	268.7	
	0157	314.9	180.6		1730	386.3	272.9	
	0230	314.9	184.8		1840	386.3	268.7	
	0300	310.7	189.0		2020	377.9	268.7	
	0330	310.7	189.0		2120	386.3	264.5	
	0402	314.9	189.0		2215	382.1	264.5	
	0450	306.5	193.2		2340	382.1	264.5	
	0520	310.7	193.2		20 Jun 90	0100	377.9	264.5
	0630	314.9	193.2			0205	382.1	264.5
	0700	314.9	197.4	0340		386.3	264.5	
	0740	323.3	197.4	0500		394.7	264.5	
	0815	323.3	197.4	0645		377.9	264.5	
	0900	319.1	201.6	0830		390.5	264.5	
	1155	331.7	201.6	1000		386.3	264.5	
	1330	356.9	214.1	1100		377.9	264.5	
	1458	361.1	222.5	1230		394.7	264.5	
	1602	365.3	226.7	1320		394.7	264.5	
1710	361.1	235.1	1400	386.3	264.5			
1855	361.1	239.3	1615	377.9	268.7			
19 Jun 90	1900	361.1	239.3	1705	377.9	272.9		
	2115	361.1	235.1	1855	386.3	272.9		
	2225	369.5	235.1	2020	369.5	272.9		
	2320	352.7	235.1	2200	369.5	272.9		
	0045	356.9	235.1	2325	386.3	272.9		
	0200	365.3	239.3	21 Jun 90	0010	394.7	268.7	
	0315	369.5	243.5		0100	382.1	260.3	
	0455	369.5	239.3		0130	386.3	256.1	
	0602	377.9	243.5		0220	382.1	251.9	
	0855	373.7	243.5		0305	356.9	247.7	
	0905	386.3	247.7		0455	365.3	247.7	
	1025	382.1	239.3		0550	361.1	243.5	
1200	373.7	251.9	0620		361.1	243.5		
1302	382.1	260.3	0715		361.1	243.5		
1410	369.5	264.5	0805		365.3	239.3		



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TABLE A-3 (Contd.)

Date	Time	High	Low	Date	Time	High	Low
21 Jun 90	0900	365.3	239.3	22 Jun 90	1000	327.5	197.4
	0950	356.9	235.1		1030	335.9	193.2
	1010	352.7	235.1		1105	323.3	189.0
	1100	356.9	239.3		1155	327.5	189.0
	1155	344.3	239.3		1225	331.7	184.8
	1240	344.3	239.3		1300	323.3	184.8
	1325	352.7	239.3		1340	327.5	184.8
	1405	344.3	239.3		1405	331.7	184.8
	1455	352.7	239.3		1450	314.9	184.8
	1525	352.7	235.1		1530	319.1	184.8
	1605	348.5	235.1		1605	319.1	184.8
	1650	348.5	235.1		1650	323.3	184.8
	1710	344.3	230.9		1710	310.7	184.8
	1755	344.3	230.9		1755	331.7	184.8
	1815	340.1	230.9		1830	307.5	184.8
	1855	335.9	226.7		1900	323.3	184.8
	1930	331.7	226.7		1955	323.3	180.6
	2005	335.9	226.7		2030	314.9	180.6
	2055	335.9	222.5		2100	323.3	180.6
	2110	335.9	222.5		2150	319.1	180.6
22 Jun 90	2155	335.9	218.3	2155	327.5	184.8	
	2230	331.7	218.3	2220	327.5	184.8	
	2300	331.7	210.0	2300	323.3	184.8	
	2330	344.3	243.5	2350	310.7	184.8	
	0010	340.1	239.3	2350	310.7	184.8	
	0050	344.3	239.3	0035	331.7	189.0	
	0125	331.7	230.9	0105	319.1	189.0	
	0200	331.7	226.7	0150	323.3	189.0	
	0230	327.5	222.5	0220	323.3	189.0	
	0300	327.5	222.5	0305	331.7	210.0	
	0335	323.3	218.3	0355	327.5	210.0	
	0415	323.3	210.0	0420	314.9	201.6	
	0455	319.1	205.8	0500	323.3	201.6	
	0530	310.7	201.6	0555	331.7	201.6	
	0600	327.5	197.4	0635	327.5	189.0	
	0630	319.1	201.6	0730	323.3	189.0	
	0710	327.5	201.6	0800	323.3	184.8	
	0800	331.7	201.6	0850	314.9	184.8	
	0840	335.9	197.4	0920	302.3	184.8	
	0900	327.5	197.4	1000	302.3	180.6	
			1100	319.1	197.4		

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low
25 Jun 90	1150	323.3	210.0	24 Jun 90	1410	331.7	197.4
	1230	323.3	210.0		1450	327.5	201.6
	1300	323.3	205.8		1525	323.3	205.8
	1355	319.1	205.8		1615	323.3	205.8
	1445	323.3	201.6		1700	319.1	197.4
	1520	319.1	197.4		1800	323.3	205.8
	1605	319.1	197.4		1855	319.1	205.8
	1655	310.7	189.0		1950	327.5	197.4
	1740	323.3	189.0		2020	348.5	163.8
	1800	310.7	184.8		2100	197.4	159.6
	1830	306.5	184.8		2140	201.6	159.6
	1915	306.5	184.8		2215	293.9	163.8
	2010	314.9	184.8		2250	344.3	163.8
	2100	302.3	180.6		2325	348.5	155.4
2150	335.9	193.2	2400	310.7	163.8		
24 Jun 90	2245	327.5	193.2	25 Jun 90	0350	302.3	155.4
	2315	327.5	193.2		0600	314.9	172.2
	0035	323.3	189.0		0900	302.3	176.4
	0105	319.1	189.0		0955	319.1	172.2
	0200	310.7	189.0		1030	319.1	180.6
	0255	314.9	189.0		1120	310.7	176.4
	0345	314.9	189.0		1200	314.9	176.4
	0405	327.5	189.0		1235	319.1	176.4
	0450	314.9	189.0		1330	319.1	176.4
	0530	314.9	189.0		1410	310.7	176.4
	0610	314.9	189.0		1500	306.5	176.4
	0705	331.7	189.0		1540	310.7	176.4
	0755	323.3	189.0		1600	310.7	172.2
	0840	331.7	189.0		1640	314.9	172.2
0910	331.7	184.8	1710	310.7	172.2		
1100	323.3	189.0	1750	302.3	172.2		
1155	323.3	193.2	1810	310.7	163.8		
1215	327.5	193.2	1900	298.1	163.8		
1300	323.3	193.2	1955	293.9	163.8		
1340	323.3	193.2	2040	302.3	168.0		

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low
25 Jun 90	2105	302.3	168.0	26 Jun 90	2205	306.5	168.0
	2155	302.3	168.0		2255	302.3	172.2
	2225	222.5	168.0	2355	302.3	168.0	
	2300	239.3	168.0	27 Jun 90	0100	302.3	168.0
26 Jun 90	0005	306.5	168.0		0155	298.1	168.0
	0055	306.5	172.2	0200	302.3	168.0	
	0130	306.5	168.0	0220	293.9	168.0	
	0200	310.7	168.0	0240	302.3	168.0	
	0255	314.9	172.2	0320	302.3	168.0	
	0330	310.7	168.0	0400	306.5	172.2	
	0410	302.3	168.0	0450	302.3	176.4	
	0510	302.3	168.0	0525	306.5	176.4	
	0600	314.9	163.8	0600	306.5	176.4	
	0650	314.9	168.0	0655	302.3	176.4	
	0720	310.7	163.8	0750	310.7	176.4	
	0755	302.3	155.4	0810	310.7	180.6	
	0840	310.7	163.8	0830	298.1	184.8	
	0910	306.5	163.8	0920	298.1	184.8	
	1000	314.9	163.8	1000	306.5	184.8	
	1040	176.4	172.2	1030	302.3	180.6	
	1120	180.6	176.4	1105	302.3	180.6	
	1200	314.9	180.6	1140	205.8	180.6	
	1250	314.9	184.8	1210	306.5	180.6	
	1335	319.1	176.4	1235	310.7	176.4	
	1410	306.5	180.6	1310	306.5	176.4	
	1455	310.7	176.4	1400	306.5	172.2	
	1520	319.1	180.6	1430	302.3	172.2	
	1630	302.3	172.2	1415	298.1	168.0	
	1705	310.7	168.0	1500	302.3	168.0	
	1755	302.3	172.2	1540	306.5	168.0	
	1920	310.7	172.2	1730	306.5	168.0	
	2000	310.7	168.0	1820	289.7	172.2	
	2050	306.5	168.0	1920	298.1	172.2	
	2115	302.3	172.2	2000	293.9	172.2	

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low
27 Jun 90	2055	302.3	172.2	29 Jun 90	1130	214.1	180.6
	2145	298.1	172.2		1410	298.1	176.4
	2230	306.5	172.2		1830	306.5	180.6
	2315	302.3	172.2		2155	319.1	168.0
	2400	298.1	168.0		30 Jun 90	0220	327.5
28 Jun 90	0040	306.5	168.0	0710		331.7	168.0
	0135	302.3	172.2	1110		340.1	168.0
	0220	298.1	168.0	1420		348.5	159.6
	0300	302.3	168.0	1745		352.7	172.2
	0350	306.5	168.0	2120	348.5	168.0	
	0420	302.3	172.2	1 Jul 90	2400	344.3	159.6
	0510	306.5	168.0		0305	348.5	159.6
	0555	289.7	172.2		0600	189.0	159.6
	0620	298.1	172.2		0855	335.9	151.2
	0710	293.9	172.2		1150	184.8	147.0
	0755	302.3	172.2	2 Jul 90	1345	335.9	151.2
	0830	298.1	172.2		1620	348.5	163.8
	0905	306.5	172.2		1850	348.5	159.6
	1000	302.3	172.2		2130	344.3	151.2
	1025	298.1	168.0		0305	327.5	155.4
1100	306.5	168.0	3 Jul 90		0530	340.1	151.2
1125	306.5	168.0			0715	331.7	155.4
1200	306.5	168.0			0900	344.3	151.2
1300	306.5	168.0			1105	352.7	159.6
1355	298.1	172.2			1300	340.1	168.0
1455	306.5	168.0	1455		344.3	168.0	
1605	205.8	168.0	1700		348.5	168.0	
1755	319.1	176.4	1905		348.5	159.6	
1810	319.1	176.4	2100		348.5	159.6	
1830	319.1	176.4	2255		344.3	159.6	
29 Jun 90	1900	319.1	180.6	0050	285.5	163.8	
	2015	210.0	180.6	0250	319.1	159.6	
	0005	214.1	176.4	0440	319.1	155.4	
	0410	285.5	176.4	0620	331.7	155.4	
	0725	285.5	176.4	0830	314.9	159.6	

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low
3 Jul 90	1030	340.1	168.0	5 Jul 90	2100	327.5	197.4
	1240	323.3	163.8		2230	323.3	210.0
	1400	323.3	159.6	6 Jul 90	0020	331.7	184.8
	1520	189.0	163.8		0230	323.3	180.6
	1700	323.3	155.4		0410	323.3	189.0
4 Jul 90	1910	327.5	159.6	0600	327.5	168.0	
	2110	323.3	159.6	0730	340.1	201.6	
	2300	314.9	163.8	0915	340.1	205.8	
	0105	298.1	163.8	1100	340.1	214.1	
	0255	327.5	163.8	1240	340.1	205.8	
	0430	323.3	151.2	1420	340.1	205.8	
	0600	323.3	163.8	1600	335.9	184.8	
	0725	298.1	159.6	1740	335.9	184.8	
	0900	331.7	172.2	1900	331.7	163.8	
	1030	335.9	159.6	2030	323.3	168.0	
	1205	331.7	155.4	7 Jul 90	2215	331.7	168.0
1330	310.7	155.4	0020		331.7	155.4	
1510	319.1	159.6	0205		344.3	180.6	
1700	222.5	155.4	0330		348.5	201.6	
1850	319.1	163.8	0510		344.3	197.4	
2030	319.1	159.6	0650		348.5	205.8	
2225	323.3	163.8	0820		344.3	197.4	
5 Jul 90	0010	319.1	168.0		0955	344.3	210.0
	0200	335.9	193.2		1010	344.3	197.4
	0335	331.7	189.0		1250	340.1	197.4
	0500	327.5	189.0	1420	335.9	193.2	
	0650	340.1	210.0	1550	340.1	184.8	
	0800	344.3	222.5	1700	340.1	176.4	
	0950	344.3	226.7	1830	340.1	180.6	
	1030	344.3	222.5	1955	335.9	184.8	
	1310	340.1	222.5	2100	340.1	176.4	
	1455	327.5	197.4	2210	340.1	172.2	
1605	327.5	205.8	2320	348.5	172.2		
1755	327.5	210.0	8 Jul 90	0025	344.3	193.2	
1925	331.7	205.8		0150	340.1	193.2	

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low
8 Jul 90	0305	340.1	201.6	10 Jul 90	2230	327.5	180.6
	0440	264.5	201.6	11 Jul 90	0050	340.1	184.8
	0540	340.1	205.8		0155	335.9	168.0
	0710	340.1	197.4		0330	340.1	189.0
	0930	335.9	180.6		0505	344.3	197.4
	1230	335.9	201.6		0630	340.1	197.4
	1550	331.7	189.0		0805	344.3	201.6
	1820	335.9	189.0		1005	340.1	201.6
	2100	331.7	189.0		1205	340.1	205.8
	2350	331.7	193.2		1405	335.9	205.8
9 Jul 90	0305	331.7	180.6		1630	335.9	197.4
	0900	331.7	197.4		1840	335.9	201.6
	1005	331.7	180.6		2150	335.9	193.2
	1130	331.7	189.0		2250	335.9	184.8
	1255	340.1	180.6	12 Jul 90	0050	335.9	184.8
	1320	340.1	189.0		0300	335.9	193.2
	1500	344.3	147.0		0510	314.9	189.0
	1625	348.5	159.6		0710	344.3	193.2
	1855	348.5	163.8		0900	344.3	197.4
	1930	344.3	151.2		1050	348.5	197.4
10 Jul 90	2110	327.5	151.2		1255	348.5	193.2
	2350	344.3	176.4		1340	352.7	205.8
	0115	348.5	184.8		1510	344.3	205.8
	0240	344.3	193.2		1810	344.3	205.8
	0415	340.1	193.2		2010	344.3	193.2
	0540	340.1	201.6		2150	344.3	193.2
	0715	340.1	205.8		2330	340.1	184.8
	0900	344.3	205.8	13 Jul 90	0130	340.1	189.0
	1055	344.3	214.1		0300	340.1	189.0
	1230	340.1	205.8		0440	344.3	189.0
	1420	340.1	205.8		0620	344.3	184.8
	1600	340.1	197.4		0800	352.7	193.2
	1750	340.1	193.2		0920	348.5	193.2
	1910	331.7	184.8		1100	348.5	205.8
	2050	331.7	184.8		1230	348.5	201.6

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low
13 Jul 90	1400	348.5	193.2	18 Jul 90	1930	344.3	214.1
	1520	344.3	197.4		2220	411.5	214.1
	1700	344.3	189.0	19 Jul 90	0105	415.7	210.0
	1830	340.1	189.0		0505	411.5	205.8
	2130	340.1	184.8		0920	361.1	210.0
14 Jul 90	0100	335.9	189.0	20 Jul 90	1300	348.5	205.8
	0505	340.1	193.2		1620	348.5	205.8
	0850	340.1	193.2		1900	344.3	201.6
	1400	335.9	189.0	0030	419.9	210.0	
	1840	340.1	184.8	0540	419.9	205.8	
15 Jul 90	2305	340.1	189.0	21 Jul 90	1105	419.9	201.6
	0345	344.3	189.0		1905	419.9	205.8
	0655	344.3	197.4		0220	331.7	201.6
	0955	348.5	201.6	0620	323.3	205.8	
	1210	344.3	197.4	1055	331.7	210.0	
	16 Jul 90	1555	344.3	197.4	22 Jul 90	1550	335.9
1940		340.1	197.4	2030		415.7	210.0
2310		344.3	197.4	0115		419.9	201.6
0555		331.7	168.0	0500	398.9	201.6	
1055		344.3	168.0	0900	331.7	205.8	
1455		344.3	176.4	23 Jul 90	1330	348.5	205.8
1905		352.7	176.4		1730	352.7	201.6
2310	348.5	201.6	2120		419.9	197.4	
0240	340.1	172.2	2400		419.9	189.0	
17 Jul 90	0600	344.3	180.6	0030	361.1	197.4	
	1000	340.1	163.8	24 Jul 90	0200	348.5	197.4
	1310	344.3	189.0		0345	419.9	189.0
	1620	344.3	189.0		0540	419.9	193.2
	2020	335.9	176.4		0720	348.5	197.4
	2330	335.9	172.2		0905	411.5	205.8
	18 Jul 90	0320	335.9		172.2	1000	352.7
0640		348.5	197.4	1500	415.7	197.4	
0945		344.3	172.2	2055	344.3	197.4	
1255		344.3	168.0	2355	348.5	201.6	
1530		344.3	189.0	0500	352.7	193.2	

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low
24 Jul 90	0850	331.7	201.6	29 Jul 90	0520	390.5	243.5
	1330	411.5	247.7		0705	386.3	247.7
	1605	398.9	247.7		0900	419.9	251.9
	1820	398.9	251.9		1125	419.9	243.5
	2200	407.3	251.9		1320	398.9	247.7
25 Jul 90	0155	403.1	251.9	30 Jul 90	1605	407.3	243.5
	0600	386.3	247.7		1820	398.9	243.5
	1010	419.9	251.9		2005	390.5	247.7
	1405	419.9	201.6		2200	377.9	247.7
	1755	419.9	205.8		0120	390.5	243.5
26 Jul 90	2040	419.9	214.1	31 Jul 90	0305	390.5	243.5
	0250	419.9	218.3		0510	382.1	247.7
	0740	419.9	205.8		0915	411.5	239.3
	1220	419.9	205.8		1120	407.3	247.7
	1630	382.1	230.9		1310	415.7	251.9
27 Jul 90	2050	419.9	218.3	1 Aug 90	1440	419.9	239.3
	0115	411.5	218.3		1620	411.5	302.3
	0530	411.5	226.7		1830	403.1	239.3
	1020	419.9	243.5		1945	419.9	251.9
	1500	419.9	251.9		2150	419.9	230.9
28 Jul 90	1705	415.7	247.7	31 Jul 90	0030	398.9	235.1
	2050	419.9	239.3		0230	411.5	247.7
	0030	419.9	239.3		0440	411.5	247.7
	0315	419.9	247.7		0620	394.7	239.3
	0605	411.5	243.5		0810	398.9	243.5
	0800	419.9	243.5		1100	386.3	251.9
	1050	419.9	243.5		1400	419.9	243.5
	1400	419.9	239.3		1600	419.9	235.1
	1610	419.9	247.7		1810	419.9	243.5
	1755	419.9	239.3		2020	411.5	239.3
29 Jul 90	1955	415.7	239.3	1 Aug 90	2230	407.3	239.3
	2155	403.1	243.5		0030	419.9	239.3
	2350	419.9	235.1		0240	419.9	243.5
	0130	403.1	243.5		0520	419.9	243.5
	0320	419.9	247.7		0750	419.9	251.9



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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low	
1 Aug 90	1000	419.9	243.5	5 Aug 90	2055	411.5	235.1	
	1220	419.9	247.7		2250	407.3	226.7	
	1400	415.7	243.5	6 Aug 90	0040	398.9	239.3	
	1610	419.9	243.5		0205	407.3	235.1	
	1810	419.9	239.3		0340	398.9	235.1	
	2010	419.9	243.5		0455	419.9	230.9	
	2310	419.9	243.5		0610	411.5	230.9	
2 Aug 90	0155	419.9	247.7		0750	390.5	226.7	
2 Aug 90	0500	407.3	243.5		0930	415.7	226.7	
	0820	419.9	239.3		1030	386.3	235.1	
	1300	419.9	239.3		1350	394.7	230.9	
	1650	398.9	239.3		1610	386.3	230.9	
	1915	419.9	243.5		1805	382.1	230.9	
3 Aug 90	0015	407.3	230.9		2050	394.7	235.1	
	0400	411.5	230.9		2320	398.9	235.1	
	0815	415.7	235.1	7 Aug 90	0125	411.5	235.1	
	1205	419.9	230.9		0255	407.3	235.1	
	1615	419.9	235.1		0425	419.9	226.7	
	2000	419.9	239.3		0600	411.5	239.3	
	2330	390.5	239.3		0720	415.7	235.1	
						0900	403.1	230.9
4 Aug 90	0400	419.9	235.1		1120	407.3	226.7	
	0730	419.9	239.3		1420	398.9	230.9	
	1105	419.9	239.3		1645	377.9	226.7	
	1420	419.9	239.3		1820	377.9	230.9	
	1700	419.9	239.3			2010	369.5	226.7
	1915	419.9	235.1		2200	386.3	230.9	
5 Aug 90	2140	419.9	230.9	8 Aug 90	0005	386.3	230.9	
	0130	419.9	235.1		0205	407.3	235.1	
	0355	419.9	235.1		0400	419.9	235.1	
	0625	415.7	239.3			0605	411.5	239.3
	0905	419.9	230.9			0825	407.3	239.3
	1055	407.3	235.1			1155	394.7	235.1
	1300	403.1	239.3			1405	386.3	235.1
	1530	419.9	230.9			1605	390.5	230.9
1800	403.1	235.1						

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low
8 Aug 90	1830	390.5	230.9	12 Aug 90	0950	415.7	230.9
	2105	390.5	230.9		1100	415.7	226.7
	2315	394.7	226.7		1210	415.7	230.9
9 Aug 90	0130	398.9	226.7		1330	403.1	230.9
	0350	419.9	226.7		1450	394.7	230.9
	0700	394.7	230.9		1615	369.5	226.7
	0900	394.7	235.1		1730	386.3	230.9
	1115	411.5	226.7		1855	415.7	222.5
	1430	407.3	230.9		1920	411.5	226.7
10 Aug 90	1815	403.1	226.7		2150	419.9	222.5
	2020	407.3	226.7	13 Aug 90	2220	407.3	235.1
	2315	419.9	226.7		0030	415.7	235.1
	0530	419.9	222.5		0130	415.7	230.9
	0820	398.9	230.9		0220	407.3	235.1
	1040	419.9	230.9		0305	407.3	247.7
	1330	419.9	230.9		0355	394.7	251.9
	1700	419.9	226.7		0445	394.7	251.9
	1945	419.9	230.9		0525	390.5	390.5
	11 Aug 90	2100	419.9		222.5	0605	239.3
0030		419.9	226.7		0700	394.7	247.7
0210		415.7	230.9	0750	386.3	239.3	
0600		415.7	226.7	0830	403.1	239.3	
0900		415.7	230.9	0920	394.7	239.3	
1425		403.1	230.9	1010	398.9	243.5	
1700		394.7	230.9	1055	394.7	243.5	
1900		369.5	226.7	1150	403.1	243.5	
2040		386.3	230.9	1235	403.1	230.9	
12 Aug 90		2220	415.7	222.5	1320	390.5	230.9
	2355	411.5	226.7	1450	386.3	226.7	
	0130	419.9	222.5	1705	373.7	226.7	
	0300	407.3	235.1	1820	247.7	226.7	
	0430	415.7	235.1	1915	239.3	226.7	
	0555	415.7	230.9	2020	373.7	226.7	
	0705	419.9	222.5	2125	373.7	230.9	
	0825	419.9	226.7	2220	369.5	226.7	

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low
13 Aug 90	2340	365.3	230.9	16 Aug 90	0055	398.9	239.3
14 Aug 90	0100	369.5	230.9		0200	398.9	235.1
	0210	365.3	226.7		0300	398.9	235.1
	0350	365.3	230.9		0405	398.9	230.9
	0530	369.5	226.7		0505	398.9	230.9
	0655	365.3	226.7		0600	407.3	235.1
	0820	369.5	230.9		0715	403.1	235.1
	1000	369.5	230.9		0820	398.9	230.9
	1130	377.9	230.9		0915	398.9	230.9
	1300	377.9	230.9		1020	398.9	230.9
	1450	411.5	235.1		1115	398.9	235.1
	1730	369.5	235.1		1200	382.1	239.3
	1800	407.3	239.3		1300	386.3	243.5
	1940	373.7	235.1		1400	398.9	243.5
	2110	403.1	239.3		1500	403.1	243.5
15 Aug 90	2255	394.7	239.3		1550	403.1	243.5
	0050	386.3	243.5		1640	394.7	243.5
	0230	390.5	239.3		1720	394.7	239.3
	0420	390.5	239.3		1810	390.5	239.3
	0600	386.3	239.3		1900	382.1	239.3
	0730	386.3	235.1		1955	386.3	226.7
	0855	390.5	239.3		2050	386.3	235.1
	1005	390.5	235.1		2145	382.1	235.1
	1120	390.5	230.9		2230	377.9	230.9
	1225	394.7	230.9		2320	377.9	230.9
	1330	398.9	235.1	17 Aug 90	0005	382.1	230.9
	1440	398.9	230.9		0100	369.5	230.9
	1555	390.5	230.9		0150	377.9	230.9
	1700	390.5	230.9		0240	390.5	230.9
	1810	390.5	239.3		0335	382.1	230.9
	1920	398.9	239.3		0430	377.9	226.7
	2035	394.7	243.5		0520	377.9	235.1
	2145	403.1	243.5		0610	386.3	239.3
	2300	415.7	243.5		0700	382.1	235.1
	2355	394.7	243.5		0800	390.5	243.5

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low	
17 Aug 90	0900	390.5	239.3	18 Aug 90	1630	373.7	230.9	
	1000	369.5	243.5		1740	369.5	230.9	
	1100	390.5	243.5		1820	373.7	230.9	
	1155	377.9	239.3		1915	377.9	230.9	
	1300	390.5	239.3		2020	361.1	226.7	
	1355	377.9	239.3		2110	356.9	226.7	
	1455	390.5	243.5		2210	377.9	226.7	
	1530	382.1	239.3		2305	386.3	235.1	
	1630	382.1	235.1		2355	382.1	235.1	
	1720	390.5	235.1		19 Aug 90	0055	377.9	239.3
	1810	377.9	235.1			0150	382.1	239.3
	1905	377.9	235.1			0250	382.1	239.3
	2000	365.3	226.7			0325	382.1	235.1
	2055	369.5	230.9			0420	382.1	235.1
2150	373.7	230.9	0510	373.7		235.1		
2245	373.7	230.9	0600	377.9		230.9		
2340	373.7	230.9	0700	386.3		230.9		
18 Aug 90	0030	369.5	226.7	0755		377.9	230.9	
	0125	365.3	230.9	0850		377.9	230.9	
	0225	369.5	230.9	0940		382.1	230.9	
	0315	377.9	230.9	1020		377.9	230.9	
	0410	356.9	230.9	1100		382.1	230.9	
	0505	382.1	235.1	1200		382.1	230.9	
	0605	382.1	239.3	1300	377.9	230.9		
	0700	373.7	239.3	1345	377.9	230.9		
	0800	382.1	239.3	1440	369.5	226.7		
	0900	356.9	235.1	1510	377.9	222.5		
	0955	382.1	239.3	1610	369.5	226.7		
	1050	390.5	239.3	1700	377.9	226.7		
	1100	373.7	239.3	1755	373.7	230.9		
	1155	365.3	235.1	1850	373.7	230.9		
1245	377.9	235.1	1930	377.9	230.9			
1330	377.9	230.9	2020	369.5	235.1			
1420	373.7	226.7	2110	377.9	235.1			
1525	386.3	230.9	2200	382.1	230.9			

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low
19 Aug 90	2255	403.1	239.3	21 Aug 90	0840	365.3	230.9
	2345	386.3	239.3		0920	361.1	226.7
20 Aug 90	0050	390.5	239.3		1010	365.3	230.9
	0155	386.3	239.3		1050	369.5	226.7
	0200	394.7	239.3		1130	365.3	226.7
	0300	390.5	239.3		1220	373.7	226.7
	0405	394.7	239.3		1310	369.5	226.7
	0605	394.7	239.3		1355	369.5	222.5
	0715	390.5	239.3		1440	361.1	222.5
	0820	382.1	235.1		1520	361.1	222.5
	0930	369.5	230.9		1610	365.3	222.5
	1400	373.7	230.9		1700	373.7	218.3
1455	369.5	226.7	1750		377.9	222.5	
1550	369.5	226.7	1820		356.9	222.5	
1645	373.7	226.7	1910	365.3	222.5		
21 Aug 90	1730	386.3	218.3	1955	369.5	222.5	
	1805	394.7	218.3	2030	373.7	214.1	
	1900	390.5	218.3	2105	373.7	230.9	
	1955	390.5	218.3	2200	369.5	230.9	
	2040	386.3	214.1	2230	382.1	230.9	
	2130	394.7	218.3	2310	377.9	230.9	
	2220	390.5	214.1	2355	373.7	230.9	
	2310	394.7	218.3	22 Aug 90	0025	373.7	230.9
	2355	390.5	218.3		0110	373.7	230.9
	0040	390.5	235.1		0155	377.9	226.7
	0125	390.5	235.1		0230	369.5	226.7
	0205	377.9	239.3		0305	382.1	226.7
	0255	377.9	235.1		0355	365.3	226.7
	0335	377.9	235.1		0430	365.3	226.7
0420	377.9	235.1	0505		365.3	226.7	
0500	382.1	230.9	0555		369.5	222.5	
0550	373.7	230.9	0635		377.9	222.5	
0630	377.9	230.9	0715		373.7	226.7	
0715	377.9	230.9	0800		361.1	226.7	
0800	377.9	230.9	0840		361.1	222.5	

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low
22 Aug 90	0925	373.7	226.7	23 Aug 90	1920	390.5	226.7
	1030	365.3	226.7		2030	394.7	226.7
	1120	369.5	226.7		2135	390.5	230.9
	1205	377.9	222.5		2240	398.9	230.9
	1300	369.5	226.7		2345	398.9	230.9
	1355	373.7	226.7	24 Aug 90	0045	403.1	235.1
	1440	365.3	226.7		0130	403.1	230.9
	1525	382.1	226.7		0240	390.5	235.1
	1620	386.3	226.7		0350	394.7	226.7
	1710	377.9	230.9		0455	394.7	230.9
	1805	382.1	235.1		0600	398.9	226.7
	1900	377.9	235.1		0655	382.1	226.7
	2000	382.1	235.1		0755	394.7	222.5
	2100	377.9	235.1		0850	382.1	226.7
2200	386.3	235.1	0950		390.5	222.5	
2255	386.3	235.1	1100	398.9	222.5		
2355	386.3	235.1	1200	394.7	222.5		
23 Aug 90	0055	386.3	235.1	1305	398.9	218.3	
	0155	382.1	230.9	1405	390.5	222.5	
	0250	386.3	226.7	1515	390.5	222.5	
	0350	386.3	226.7	1630	390.5	222.5	
	0445	386.3	226.7	1740	386.3	222.5	
	0550	382.1	226.7	1850	394.7	226.7	
	0650	382.1	222.5	2005	403.1	230.9	
	0755	382.1	226.7	2155	398.9	230.9	
	0855	377.9	226.7	2330	398.9	230.9	
	0950	373.7	226.7	25 Aug 90	0110	403.1	230.9
	1050	382.1	226.7		0230	403.1	235.1
	1155	373.7	222.5		0405	411.5	235.1
	1255	382.1	222.5		0530	398.9	235.1
	1400	373.7	222.5		0700	403.1	230.9
1500	377.9	222.5	0805		407.3	226.7	
1610	377.9	222.5	0945		419.9	222.5	
1710	386.3	222.5	1100		403.1	218.3	
1810	382.1	226.7	1215		407.3	222.5	

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low
25 Aug 90	1330	403.1	222.5	27 Aug 90	1015	398.9	218.3
	1450	394.7	218.3		1100	407.3	214.1
	1605	419.9	218.3		1150	403.1	214.1
	1725	386.3	218.3		1210	398.9	210.0
	1820	386.3	218.3		1310	407.3	214.1
	1950	394.7	218.3		1445	407.3	218.3
	2100	407.3	222.5		1605	415.7	222.5
	2210	394.7	222.5		1730	411.5	226.7
	2330	394.7	226.7		1900	419.9	222.5
	26 Aug 90	0050	394.7		226.7	2030	411.5
0145	403.1	226.7	28 Aug 90	2200	419.9	226.7	
0250	394.7	226.7		2325	411.5	226.7	
0355	390.5	222.5		0100	407.3	222.5	
0500	394.7	222.5		0240	411.5	218.3	
0620	382.1	218.3		0410	407.3	218.3	
0740	390.5	218.3		0600	403.1	218.3	
0900	386.3	218.3		0735	407.3	214.1	
1020	390.5	218.3		0915	403.1	210.0	
1130	386.3	214.1		1100	407.3	214.1	
1255	390.5	214.1		1255	398.9	210.0	
1400	390.5	214.1	1500	407.3	214.1		
1525	394.7	214.1	1700	403.1	214.1		
1640	398.9	218.3	1830	403.1	218.3		
1750	403.1	218.3	2005	411.5	218.3		
1900	390.5	218.3	2120	407.3	222.5		
2005	403.1	222.5	29 Aug 90	2240	411.5	222.5	
2110	407.3	226.7		0005	415.7	222.5	
2235	407.3	226.7		0125	407.3	218.3	
2345	407.3	226.7		0255	407.3	218.3	
27 Aug 90	0110	403.1		222.5	0425	407.3	214.1
0255	407.3	222.5		0550	403.1	214.1	
0420	398.9	222.5		0715	407.3	214.1	
0555	394.7	218.3		0850	407.3	214.1	
0710	398.9	214.1		1010	407.3	214.1	
0855	394.7	218.3		1155	403.1	214.1	

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low
29 Aug 90	1325	407.3	214.1	31 Aug 90	1500	407.3	222.5
	1450	407.3	214.1		1620	411.5	222.5
	1625	407.3	218.3		1750	403.1	218.3
	1755	411.5	218.3		1900	407.3	218.3
	1925	419.9	222.5		2030	398.9	214.1
30 Aug 90	2050	411.5	226.7	1 Sep 90	2200	403.1	214.1
	2220	415.7	222.5		2325	398.9	214.1
	2355	411.5	222.5		0100	403.1	214.1
	0135	407.3	218.3		0240	403.1	214.1
	0300	403.1	218.3		0420	398.9	210.0
	0440	403.1	218.3	0600	403.1	210.0	
	0600	407.3	218.3	0730	403.1	214.1	
	0730	403.1	214.1	0900	403.1	218.3	
	0900	390.5	218.3	1030	407.3	222.5	
	1015	394.7	222.5	1155	407.3	222.5	
	1155	398.9	226.7	1315	407.3	222.5	
	1315	398.9	226.7	1440	407.3	222.5	
	1445	398.9	226.7	1600	403.1	218.3	
	1600	407.3	226.7	1715	411.5	218.3	
	1715	403.1	226.7	1845	403.1	214.1	
1840	403.1	222.5	2010	394.7	214.1		
1950	403.1	222.5	2120	403.1	214.1		
2105	394.7	218.3	2300	398.9	210.0		
2230	394.7	218.3	2 Sep 90	0045	407.3	214.1	
2350	407.3	218.3		0205	403.1	214.1	
31 Aug 90	0125	394.7		214.1	0350	411.5	214.1
	0250	394.7		214.1	0510	407.3	214.1
	0400	394.7		214.1	0625	407.3	218.3
	0530	386.3	214.1	0800	415.7	218.3	
	0705	386.3	214.1	0915	411.5	222.5	
	0835	394.7	218.3	1055	411.5	222.5	
	1000	398.9	222.5	1220	415.7	226.7	
	1110	419.9	226.7	1355	411.5	222.5	
	1225	411.5	230.9	1520	403.1	218.3	
	1355	403.1	222.5	1645	403.1	218.3	



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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low
2 Sep 90	1800	403.1	218.3	5 Sep 90	0820	411.5	222.5
	1925	403.1	214.1		1000	398.9	222.5
	2050	394.7	214.1		1145	403.1	218.3
	2210	403.1	214.1		1320	403.1	214.1
	2315	398.9	214.1		1450	394.7	214.1
3 Sep 90	0105	403.1	214.1	6 Sep 90	1620	398.9	214.1
	0250	407.3	218.3		1755	403.1	214.1
	0420	407.3	222.5		1925	394.7	210.0
	0555	415.7	226.7		2055	398.9	214.1
	0710	407.3	226.7		2220	403.1	210.0
	0855	407.3	226.7		2355	394.7	210.0
	1020	407.3	226.7		0120	403.1	214.1
	1100	403.1	222.5		0255	398.9	222.5
	1150	403.1	222.5		0430	407.3	218.3
	1205	398.9	218.3		0600	407.3	222.5
	1305	398.9	214.1		0745	403.1	222.5
	1450	398.9	214.1		0920	398.9	218.3
	1605	403.1	214.1		1100	403.1	218.3
	1710	394.7	214.1		1230	398.9	214.1
	1825	394.7	214.1		1400	398.9	210.0
4 Sep 90	1940	398.9	218.3	1525	398.9	210.0	
	2100	394.7	214.1	1700	398.9	210.0	
	2200	394.7	210.0	1820	394.7	205.8	
	2240	398.9	214.1	2000	394.7	210.0	
	1420	403.1	218.3	2120	398.9	205.8	
	1555	403.1	222.5	7 Sep 90	2305	403.1	205.8
	1740	407.3	222.5		0050	403.1	205.8
	1920	411.5	222.5		0215	407.3	218.3
	2100	411.5	226.7		0350	407.3	222.5
	2235	411.5	222.5		0515	407.3	222.5
5 Sep 90	0005	398.9	218.3	0645	407.3	226.7	
	0150	403.1	218.3	0820	411.5	222.5	
	0325	407.3	222.5	1000	415.7	222.5	
	0505	411.5	222.5	1130	415.7	222.5	
	0650	411.5	222.5	1300	411.5	222.5	

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low
7 Sep 90	1430	415.7	218.3	9 Sep 90	1155	411.5	222.5
	1600	411.5	218.3		1310	411.5	222.5
	1715	411.5	214.1		1440	411.5	222.5
	1840	411.5	214.1		1600	419.9	218.3
	1950	407.3	218.3		1715	407.3	218.3
8 Sep 90	2055	415.7	214.1	1820	407.3	214.1	
	2200	419.9	214.1	1950	403.1	214.1	
	2305	407.3	214.1	2100	403.1	214.1	
	0020	407.3	214.1	2245	403.1	214.1	
	0130	411.5	214.1	10 Sep 90	0005	398.9	214.1
	0255	419.9	214.1		0145	411.5	214.1
	0400	403.1	214.1		0305	398.9	210.0
	0520	403.1	218.3		0430	398.9	210.0
	0630	411.5	218.3		0600	398.9	210.0
	0750	419.9	222.5		0720	398.9	210.0
	0900	419.9	222.5		11 Sep 90	0900	411.5
	1020	419.9	226.7	0130		411.5	218.3
	1150	419.9	222.5	0600		407.3	218.3
	1300	419.9	226.7	1040		411.5	218.3
	1420	411.5	218.3	1140		415.7	222.5
1550	419.9	218.3	1240	419.9		222.5	
1700	419.9	214.1	1340	411.5		222.5	
1825	407.3	214.1	1440	415.7		222.5	
1955	419.9	214.1	1555	407.3		218.3	
2105	398.9	214.1	1700	407.3		218.3	
9 Sep 90	2230	411.5	214.1	1800	394.7	214.1	
	2350	419.9	214.1	1900	403.1	214.1	
	0100	394.7	214.1	2010	398.9	214.1	
	0220	407.3	214.1	2120	407.3	214.1	
	0350	419.9	214.1	2230	394.7	214.1	
	0505	407.3	210.0	12 Sep 90	2350	407.3	214.1
	0620	398.9	218.3		0110	398.9	214.1
	0755	403.1	218.3		0250	403.1	214.1
	0900	403.1	218.3		0405	407.3	214.1
	1020	415.7	218.3		0530	398.9	214.1

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low
12 Sep 90	0650	403.1	218.3	14 Sep 90	0225	419.9	201.6
	0710	403.1	218.3		0355	419.9	201.6
	0810	398.9	222.5		0520	419.9	201.6
	0940	398.9	222.5		0620	419.9	210.0
	1100	398.9	222.5		0730	419.9	214.1
	1210	419.9	226.7		0850	419.9	210.0
	1350	415.7	222.5		1000	419.9	205.8
	1500	419.9	218.3		1100	419.9	205.8
	1610	419.9	214.1		1205	419.9	201.6
	1725	419.9	214.1		1320	419.9	205.8
	1855	419.9	210.0		1430	419.9	214.1
	2005	419.9	205.8		1550	419.9	214.1
	2125	419.9	214.1		1700	419.9	214.1
	2300	419.9	218.3		1800	419.9	214.1
13 Sep 90	0020	419.9	218.3	1905	419.9	210.0	
	0140	419.9	222.5	2030	419.9	201.6	
	0255	419.9	218.3	2150	419.9	201.6	
	0420	419.9	218.3	2305	419.9	201.6	
	0535	419.9	210.0	15 Sep 90	0020	419.9	210.0
	0700	419.9	210.0		0150	419.9	214.1
	0820	419.9	201.6		0300	419.9	210.0
	0930	419.9	205.8		0415	419.9	205.8
	1040	419.9	201.6		0525	419.9	205.8
	1150	419.9	205.8		0645	419.9	201.6
	1300	419.9	214.1		0800	419.9	205.8
	1400	419.9	214.1		0910	415.7	214.1
	1515	419.9	210.0		1020	419.9	210.0
	1630	419.9	201.6		1130	419.9	201.6
1800	419.9	201.6	1250		419.9	205.8	
1900	419.9	205.8	1425		419.9	210.0	
2035	419.9	214.1	1555		419.9	205.8	
2155	419.9	218.3	1720		419.9	214.1	
2300	419.9	214.1	1840	419.9	205.8		
14 Sep 90	0001	419.9	214.1	2005	419.9	214.1	
	0115	419.9	210.0	2240	419.9	205.8	

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low	
16 Sep 90	0105	419.9	205.8	19 Sep 90	2000	419.9	197.4	
	0350	419.9	201.6		2250	419.9	197.4	
	0600	419.9	205.8	20 Sep 90	0050	419.9	197.4	
	0800	394.7	210.0		0220	419.9	210.0	
	1010	419.9	214.1		0530	419.9	205.8	
	1245	419.9	210.0		0900	419.9	214.1	
	1500	419.9	205.8		1300	419.9	214.1	
	17 Sep 90	1700	419.9	205.8	1725	419.9	210.0	
		1855	419.9	205.8	2130	419.9	201.6	
		2000	419.9	205.8	21 Sep 90	0205	331.7	197.4
2305		419.9	214.1	0600		419.9	214.1	
0110		419.9	214.1	1120		419.9	214.1	
0330		419.9	214.1	1520		419.9	214.1	
0545		382.1	210.0	1900		419.9	205.8	
18 Sep 90		0750	419.9	210.0	2200	419.9	201.6	
		0945	419.9	201.6	22 Sep 90	0115	419.9	201.6
		1415	419.9	201.6		0500	419.9	201.6
	1905	419.9	201.6	0935		419.9	205.8	
	2200	419.9	201.6	1255		419.9	210.0	
	0115	419.9	205.8	1455		419.9	214.1	
	19 Sep 90	0255	419.9	210.0	23 Sep 90	1650	419.9	197.4
		0430	419.9	210.0		1925	415.7	201.6
		0600	419.9	218.3		2200	415.7	197.4
		0805	419.9	214.1		0005	415.7	210.0
1055		411.5	210.0	0220		419.9	205.8	
1400		419.9	210.0	0510		415.7	197.4	
1550		419.9	205.8	0750		411.5	193.2	
1755		419.9	205.8	1020		411.5	197.4	
2015		419.9	201.6	1230		415.7	197.4	
2230		419.9	201.6	1440		415.7	201.6	
19 Sep 90	0220	419.9	201.6	24 Sep 90	1720	419.9	205.8	
	0420	419.9	201.6		1915	419.9	210.0	
	0830	411.5	201.6		2050	415.7	210.0	
	1100	419.9	205.8		2225	419.9	210.0	
	1600	419.9	197.4		0015	419.9	205.8	

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TABLE A-3. (Contd.)

Date	Time	High	Low	Date	Time	High	Low
24 Sep 90	0230	415.7	205.8	25 Sep 90	0815	419.9	201.6
	0420	415.7	201.6		1115	415.7	210.0
	0635	419.9	201.6		1300	419.9	210.0
	0740	415.7	201.6		1800	415.7	201.6
	1020	415.7	201.6		2100	415.7	201.6
	1200	403.1	197.4	26 Sep 90	0140	415.7	205.8
	1400	411.5	201.6		0750	415.7	205.8
	1655	415.7	205.8		0905	419.9	210.0
	1820	415.7	210.0		1520	419.9	214.1
	2000	415.7	214.1		1820	419.9	214.1
25 Sep 90	2155	419.9	205.8	27 Sep 90	2050	419.9	210.0
	2345	415.7	210.0		0020	419.9	205.8
	0105	407.3	205.8		0310	419.9	205.8
	0300	411.5	205.8				
	0500	415.7	205.8				

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TABLE A-4. 4H-4 (Eight-Inch Well) Steam Flow Data, lb/h.

Date	High	Low	Date	High	Low
1 Oct 89	270.2	242.2	5 Nov 89	265.5	242.2
2 Oct 89	274.8	251.5	6 Nov 89	270.2	237.6
3 Oct 89	242.2	214.3	7 Nov 89	265.5	237.6
4 Oct 89	260.8	232.9	8 Nov 89	274.8	223.6
5 Oct 89	265.5	218.9	9 Nov 89	284.1	256.2
6 Oct 89	260.8	223.6	10 Nov 89	284.1	265.5
7 Oct 89	260.8	218.9	11 Nov 89	288.8	265.5
8 Oct 89	265.5	237.6	12 Nov 89	284.1	260.8
9 Oct 89	270.2	232.9	13 Nov 89	274.8	237.6
10 Oct 89	274.8	237.6	14 Nov 89	279.5	242.2
11 Oct 89	270.2	246.9	15 Nov 89	265.5	232.9
12 Oct 89	265.5	237.6	16 Nov 89	274.8	246.9
13 Oct 89	265.5	237.6	17 Nov 89	270.2	246.9
14 Oct 89	265.5	237.6	18 Nov 89	279.5	242.2
15 Oct 89	265.5	232.9	19 Nov 89	284.1	251.5
16 Oct 89	256.2	232.9	20 Nov 89	274.8	256.2
17 Oct 89	256.2	218.9	21 Nov 89	288.8	251.5
18 Oct 89	260.8	232.9	22 Nov 89	279.5	256.2
19 Oct 89	265.5	242.2	23 Nov 89	293.5	270.2
20 Oct 89	260.8	246.9	24 Nov 89	284.1	242.2
21 Oct 89	246.9	232.9	25 Nov 89	279.5	246.9
22 Oct 89	256.2	237.6	26 Nov 89	265.5	214.3
23 Oct 89	251.5	232.9	27 Nov 89	246.9	209.6
24 Oct 89	256.2	246.9	28 Nov 89	246.9	214.3
25 Oct 89	232.9	191.0	29 Nov 89	251.5	218.9
26 Oct 89	228.2	205.0	30 Nov 89	256.2	209.6
27 Oct 89	242.2	209.6	1 Dec 89	260.8	223.6
28 Oct 89	242.2	195.6	2 Dec 89	265.5	232.9
29 Oct 89	237.6	205.0	3 Dec 89	270.2	246.9
30 Oct 89	256.2	228.2	4 Dec 89	279.5	246.9
31 Oct 89	251.5	209.6	5 Dec 89	237.6	237.6
1 Nov 89	265.5	214.3	6 Dec 89	223.6	209.6
2 Nov 89	274.8	232.9	7 Dec 89	232.9	228.2
3 Nov 89	288.8	242.2	8 Dec 89	256.2	237.6
4 Nov 89	293.5	251.5	9 Dec 89	270.2	265.5

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TABLE A-4 (Contd.)

Date	High	Low	Date	High	Low
10 Dec 89	274.8	270.2	14 Jan 90	270.2	256.2
11 Dec 89	279.5	256.2	15 Jan 90	260.8	251.5
12 Dec 89	288.8	284.1	16 Jan 90	274.8	260.8
13 Dec 89	288.8	284.1	17 Jan 90	265.5	256.2
14 Dec 89	293.5	288.8	18 Jan 90	256.2	251.5
15 Dec 89	298.1	288.8	19 Jan 90	251.5	242.2
16 Dec 89	298.1	293.5	20 Jan 90	260.8	242.2
17 Dec 89	298.1	284.1	21 Jan 90	265.5	242.2
18 Dec 89	293.5	284.1	22 Jan 90	270.2	246.9
19 Dec 89	298.1	293.5	23 Jan 90	270.2	251.5
20 Dec 89	279.5	274.8	24 Jan 90	256.2	246.9
21 Dec 89	288.8	274.8	25 Jan 90	265.5	242.2
22 Dec 89	293.5	279.5	26 Jan 90	279.5	260.8
23 Dec 89	284.1	270.2	27 Jan 90	256.2	237.6
24 Dec 89	293.5	279.5	28 Jan 90	270.2	242.2
25 Dec 89	298.1	284.1	29 Jan 90	270.2	265.5
26 Dec 89	302.8	293.5	30 Jan 90	279.5	274.8
27 Dec 89	293.5	293.5	31 Jan 90	265.5	256.2
28 Dec 89	284.1	284.1	1 Feb 90	256.2	256.2
29 Dec 89	270.2	265.5	2 Feb 90	251.5	228.2
30 Dec 89	274.8	260.8	3 Feb 90	265.5	232.9
31 Dec 89	274.8	256.2	4 Feb 90	256.2	246.9
1 Jan 90	288.8	274.8	5 Feb 90	256.2	246.9
2 Jan 90	270.2	242.2	6 Feb 90	242.2	200.3
3 Jan 90	256.2	246.9	7 Feb 90	205.0	186.3
4 Jan 90	265.5	256.2	8 Feb 90	223.6	177.0
5 Jan 90	265.5	251.5	9 Feb 90	209.6	177.0
6 Jan 90	265.5	256.2	10 Feb 90	228.2	195.6
7 Jan 90	270.2	260.8	11 Feb 90	232.9	228.2
8 Jan 90	274.8	256.2	12 Feb 90	284.1	260.8
9 Jan 90	265.5	260.8	13 Feb 90	284.1	274.8
10 Jan 90	279.5	260.8	14 Feb 90	279.5	274.8
11 Jan 90	279.5	260.8	15 Feb 90	270.2	260.8
12 Jan 90	270.2	265.5	16 Feb 90	214.3	195.6
13 Jan 90	265.5	260.8	17 Feb 90	251.5	232.9

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TABLE A-4 (Contd.)

Date	High	Low	Date	High	Low
18 Feb 89	256.2	237.6	25 Mar 89	251.5	186.3
19 Feb 89	260.8	246.9	26 Mar 89	242.2	209.6
20 Feb 89	265.5	260.8	27 Mar 89	228.2	209.6
21 Feb 89	270.2	265.5	28 Mar 89	232.9	214.3
22 Feb 89	270.2	260.8	29 Mar 89	242.2	205.0
23 Feb 89	270.2	270.2	30 Mar 89	242.2	200.3
24 Feb 89	270.2	256.2	31 Mar 89	232.9	195.6
25 Feb 89	270.2	260.8	1 Apr 89	237.6	195.6
26 Feb 89	270.2	265.5	2 Apr 89	242.2	218.9
27 Feb 89	270.2	251.5	3 Apr 89	274.8	223.6
28 Feb 89	270.2	256.2	4 Apr 89	274.8	260.8
1 Mar 89	274.8	265.5	5 Apr 89	270.2	260.8
2 Mar 89	274.8	260.8	6 Apr 89	270.2	256.2
3 Mar 89	279.5	270.2	7 Apr 89	270.2	265.5
4 Mar 89	279.5	274.8	8 Apr 89	284.1	246.9
5 Mar 89	265.5	209.6	9 Apr 89	279.5	251.5
6 Mar 89	232.9	214.3	10 Apr 89	284.1	260.8
7 Mar 89	242.2	223.6	11 Apr 89	293.5	270.2
8 Mar 89	232.9	218.9	12 Apr 89	288.8	256.2
9 Mar 89	218.9	195.6	13 Apr 89	284.1	256.2
10 Mar 89	218.9	209.6	14 Apr 89	288.8	265.5
11 Mar 89	237.6	205.0	15 Apr 89	284.1	270.2
12 Mar 89	163.0	149.1	16 Apr 89	279.5	265.5
13 Mar 89	167.7	158.4	17 Apr 89	293.5	270.2
14 Mar 89	186.3	167.7	18 Apr 89	288.8	270.2
15 Mar 89	218.9	209.6	19 Apr 89	293.5	270.2
16 Mar 89	246.9	195.6	20 Apr 89	293.5	270.2
17 Mar 89	256.2	205.0	21 Apr 89	293.5	265.5
18 Mar 89	246.9	205.0	22 Apr 89	298.1	270.2
19 Mar 89	246.9	209.6	23 Apr 89	288.8	270.2
20 Mar 89	246.9	200.3	24 Apr 89	298.1	260.8
21 Mar 89	251.5	200.3	25 Apr 89	298.1	270.2
22 Mar 89	242.2	186.3	26 Apr 89	302.8	274.8
23 Mar 89	237.6	200.3	27 Apr 89	307.4	279.5
24 Mar 89	242.2	186.3	28 Apr 89	307.4	274.8



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TABLE A-4 (Contd.)

Date	High	Low	Date	High	Low
29 Apr 89	298.1	270.2	3 Jun 89	363.3	358.7
30 Apr 89	288.8	270.2	4 Jun 89	382.0	363.3
1 May 89	298.1	274.8	5 Jun 89	382.0	377.3
2 May 89	302.8	274.8	6 Jun 89	372.6	368.0
3 May 89	293.5	274.8	7 Jun 89	386.6	382.0
4 May 89	298.1	270.2	8 Jun 89	382.0	372.6
5 May 89	302.8	279.5	9 Jun 89	377.3	363.3
6 May 89	302.8	279.5	10 Jun 89	372.6	363.3
7 May 89	307.4	284.1	11 Jun 89	395.9	372.6
8 May 89	307.4	260.8	12 Jun 89	400.6	377.3
9 May 89	298.1	260.8	13 Jun 89	400.6	391.3
10 May 89	293.5	274.8	14 Jun 89	382.0	363.3
11 May 89	293.5	265.5	15 Jun 89	372.6	363.3
12 May 89	293.5	265.5	16 Jun 89	377.3	372.6
13 May 89	293.5	270.2	17 Jun 89	377.3	368.0
14 May 89	293.5	265.5	18 Jun 89	377.3	358.7
15 May 89	307.4	274.8	19 Jun 89	372.6	349.4
16 May 89	293.5	256.2	20 Jun 89	382.0	368.0
17 May 89	288.8	256.2	21 Jun 89	391.3	377.3
18 May 89	382.0	368.0	22 Jun 89	386.6	386.6
19 May 89	382.0	372.6	23 Jun 89	391.3	372.6
20 May 89	372.6	363.3	24 Jun 89	382.0	372.6
21 May 89	293.5	256.2	25 Jun 89	382.0	372.6
22 May 89	340.0	316.7	26 Jun 89	391.3	377.3
23 May 89	349.4	344.7	27 Jun 89	391.3	391.3
24 May 89	335.4	312.1	28 Jun 89	391.3	377.3
25 May 89	326.1	316.7	29 Jun 89	382.0	368.0
26 May 89	326.1	321.4	30 Jun 89	382.0	368.0
27 May 89	321.4	321.4	1 Jul 89	391.3	372.6
28 May 89	335.4	326.1	2 Jul 89	400.6	386.6
29 May 89	321.4	312.1	3 Jul 89	391.3	377.3
30 May 89	335.4	316.7	4 Jul 89	386.6	377.3
31 May 89	335.4	330.7	5 Jul 89	395.9	382.0
1 Jun 89	330.7	326.1	6 Jul 89	400.6	386.6
2 Jun 89	349.4	326.1	7 Jul 89	395.9	386.6

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TABLE A-4 (Contd.)

Date	High	Low	Date	High	Low
8 Jul 89	386.6	386.6	12 Aug 89	423.9	414.6
9 Jul 89	386.6	372.6	13 Aug 89	423.9	405.2
10 Jul 89	391.3	382.0	14 Aug 89	433.2	419.2
11 Jul 89	391.3	386.6	15 Aug 89	419.2	409.9
12 Jul 89	386.6	377.3	16 Aug 89	414.6	400.6
13 Jul 89	400.6	395.9	17 Aug 89	423.9	405.2
14 Jul 89	409.9	409.9	18 Aug 89	423.9	409.9
15 Jul 89	400.6	400.6	19 Aug 89	423.9	409.9
16 Jul 89	405.2	395.9	20 Aug 89	414.6	405.2
17 Jul 89	409.9	391.3	21 Aug 89	409.9	395.9
18 Jul 89	419.2	400.6	22 Aug 89	423.9	400.6
19 Jul 89	419.2	409.9	23 Aug 89	423.9	409.9
20 Jul 89	414.6	405.2	24 Aug 89	433.2	423.9
21 Jul 89	414.6	400.6	25 Aug 89	414.6	405.2
22 Jul 89	419.2	400.6	26 Aug 89	409.9	400.6
23 Jul 89	428.5	409.9	27 Aug 89	414.6	405.2
24 Jul 89	423.9	414.6	28 Aug 89	419.2	409.9
25 Jul 89	414.6	395.9	29 Aug 89	433.2	414.6
26 Jul 89	405.2	391.3	30 Aug 89	437.9	428.5
27 Jul 89	409.9	391.3	31 Aug 89	433.2	423.9
28 Jul 89	409.9	400.6	1 Sep 89	433.2	423.9
29 Jul 89	409.9	395.9	2 Sep 89	433.2	419.2
30 Jul 89	409.9	395.9	3 Sep 89	437.9	423.9
31 Jul 89	419.2	395.9	4 Sep 89	428.5	419.2
1 Aug 89	414.6	405.2	5 Sep 89	428.5	419.2
2 Aug 89	405.2	400.6	6 Sep 89	428.5	419.2
3 Aug 89	405.2	395.9	7 Sep 89	437.9	423.9
4 Aug 89	405.2	400.6	8 Sep 89	437.9	428.5
5 Aug 89	414.6	409.9	9 Sep 89	437.9	428.5
6 Aug 89	414.6	409.9	10 Sep 89	437.9	428.5
7 Aug 89	419.2	405.2	11 Sep 89	442.5	428.5
8 Aug 89	419.2	409.9	12 Sep 89	442.5	428.5
9 Aug 89	423.9	409.9	13 Sep 89	437.9	433.2
10 Aug 89	419.2	409.9	14 Sep 89	437.9	428.5
11 Aug 89	419.2	414.6	15 Sep 89	447.2	428.5

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TABLE A-4 (Contd.)

Date	High	Low	Date	High	Low
16 Sep 89	451.8	437.9	26 Sep 89	447.2	437.9
17 Sep 89	437.9	433.2	27 Sep 89	451.8	442.5
18 Sep 89	433.2	423.9	28 Sep 89	442.5	442.5
19 Sep 89	442.5	433.2	29 Sep 89	442.5	433.2
20 Sep 89	437.9	433.2	30 Sep 89	442.5	433.2
21 Sep 89	428.5	423.9			
22 Sep 89	433.2	423.9			
23 Sep 89	442.5	428.5			
24 Sep 89	442.5	433.2			
25 Sep 89	442.5	433.2			

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TABLE A-5. 4A-2 and 4A-3 (Schober's Resort Wells) Steam Flow Data, lb/h.

Date	High	Low	Date	High	Low
1 Oct 89	1152.0	1152.0	5 Nov 89	1128.0	1104.0
2 Oct 89	1152.0	1152.0	6 Nov 89	1116.0	1116.0
3 Oct 89	1152.0	1152.0	7 Nov 89	1116.0	1104.0
4 Oct 89	1152.0	1152.0	8 Nov 89	1128.0	1100.0
5 Oct 89	1152.0	1152.0	9 Nov 89	1128.0	1110.0
6 Oct 89	1152.0	1152.0	10 Nov 89	1128.0	1128.0
7 Oct 89	1152.0	1152.0	11 Nov 89	1140.0	1116.0
8 Oct 89	1152.0	1152.0	12 Nov 89	1140.0	1128.0
9 Oct 89	1152.0	1152.0	13 Nov 89	1128.0	1116.0
10 Oct 89	1152.0	1152.0	14 Nov 89	1152.0	1128.0
11 Oct 89	1152.0	1152.0	15 Nov 89	1128.0	1116.0
12 Oct 89	1164.0	1152.0	16 Nov 89	1116.0	1116.0
13 Oct 89	1152.0	1152.0	17 Nov 89	1116.0	1116.0
14 Oct 89	1152.0	1152.0	18 Nov 89	1116.0	1116.0
15 Oct 89	1152.0	1152.0	19 Nov 89	1116.0	1104.0
16 Oct 89	1152.0	1152.0	20 Nov 89	1116.0	1116.0
17 Oct 89	1152.0	1152.0	21 Nov 89	1128.0	1104.0
18 Oct 89	1152.0	1152.0	22 Nov 89	1104.0	1056.0
19 Oct 89	1092.0	1092.0	23 Nov 89	1044.0	1044.0
20 Oct 89	1080.0	1080.0	24 Nov 89	1044.0	1044.0
21 Oct 89	1068.0	1068.0	25 Nov 89	1044.0	1044.0
22 Oct 89	1068.0	1056.0	26 Nov 89	1044.0	1032.0
23 Oct 89	1068.0	1068.0	27 Nov 89	1044.0	1032.0
24 Oct 89	1056.0	1044.0	28 Nov 89	1056.0	1056.0
25 Oct 89	1068.0	1044.0	29 Nov 89	1056.0	1056.0
26 Oct 89	1092.0	1032.0	30 Nov 89	1152.0	1044.0
27 Oct 89	1092.0	1068.0	1 Dec 89	1152.0	1152.0
28 Oct 89	1080.0	1056.0	2 Dec 89	1152.0	1140.0
29 Oct 89	1080.0	1068.0	3 Dec 89	1152.0	1152.0
30 Oct 89	1080.0	1068.0	4 Dec 89	1152.0	1152.0
31 Oct 89	1092.0	1080.0	5 Dec 89	1152.0	1152.0
1 Nov 89	1104.0	1104.0	6 Dec 89	1152.0	1152.0
2 Nov 89	1116.0	1116.0	7 Dec 89	1152.0	1152.0
3 Nov 89	1128.0	1116.0	8 Dec 89	1152.0	1152.0
4 Nov 89	1140.0	1116.0	9 Dec 89	1152.0	1152.0

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TABLE A-5 (Contd.)

Date	High	Low	Date	High	Low
10 Dec 89	1152.0	1152.0	14 Jan 89	1152.0	1152.0
11 Dec 89	1152.0	1152.0	15 Jan 89	1152.0	1152.0
12 Dec 89	1152.0	1152.0	16 Jan 89	1152.0	1152.0
13 Dec 89	1152.0	1152.0	17 Jan 89	1152.0	1152.0
14 Dec 89	1152.0	1152.0	18 Jan 89	1152.0	1140.0
15 Dec 89	1152.0	1152.0	19 Jan 89	1152.0	1140.0
16 Dec 89	1152.0	1152.0	20 Jan 89	1152.0	1152.0
17 Dec 89	1152.0	1152.0	21 Jan 89	1152.0	1152.0
18 Dec 89	1152.0	1152.0	22 Jan 89	1152.0	1152.0
19 Dec 89	1152.0	1152.0	23 Jan 89	1152.0	1152.0
20 Dec 89	1152.0	1152.0	24 Jan 89	1152.0	1152.0
21 Dec 89	1152.0	1152.0	25 Jan 89	1152.0	1152.0
22 Dec 89	1152.0	1152.0	26 Jan 89	1152.0	1152.0
23 Dec 89	1152.0	1152.0	27 Jan 89	1152.0	1152.0
24 Dec 89	1152.0	1152.0	28 Jan 89	1152.0	1152.0
25 Dec 89	1152.0	1152.0	29 Jan 89	1152.0	1152.0
26 Dec 89	1152.0	1152.0	30 Jan 89	1152.0	1152.0
27 Dec 89	1152.0	1152.0	31 Jan 89	1152.0	1152.0
28 Dec 89	1152.0	1152.0	1 Feb 89	1152.0	1152.0
29 Dec 89	1152.0	1152.0	2 Feb 89	1152.0	1152.0
30 Dec 89	1152.0	1140.0	3 Feb 89	1152.0	1152.0
31 Dec 89	1152.0	1152.0	4 Feb 89	1152.0	1152.0
1 Jan 89	1152.0	1140.0	5 Feb 89	1152.0	1152.0
2 Jan 89	1152.0	1152.0	6 Feb 89	1152.0	1152.0
3 Jan 89	1152.0	1152.0	7 Feb 89	1152.0	1152.0
4 Jan 89	1152.0	1152.0	8 Feb 89	1152.0	1140.0
5 Jan 89	1152.0	1152.0	9 Feb 89	1152.0	1152.0
6 Jan 89	1152.0	1152.0	10 Feb 89	1152.0	1152.0
7 Jan 89	1152.0	1152.0	11 Feb 89	1188.0	1164.0
8 Jan 89	1152.0	1152.0	12 Feb 89	1188.0	1188.0
9 Jan 89	1152.0	1152.0	13 Feb 89	1188.0	1188.0
10 Jan 89	1152.0	1152.0	14 Feb 89	1176.0	1176.0
11 Jan 89	1152.0	1152.0	15 Feb 89	1176.0	1176.0
12 Jan 89	1152.0	1152.0	16 Feb 89	1188.0	1176.0
13 Jan 89	1152.0	1152.0	17 Feb 89	1176.0	1164.0

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TABLE A-5 (Contd.)

Date	High	Low	Date	High	Low
18 Feb 89	1164.0	1164.0	25 Mar 89	1200.0	1200.0
19 Feb 89	1176.0	1164.0	26 Mar 89	1176.0	1164.0
20 Feb 89	1188.0	1164.0	27 Mar 89	1176.0	1140.0
21 Feb 89	1176.0	1176.0	28 Mar 89	1176.0	1140.0
22 Feb 89	1188.0	1176.0	29 Mar 89	1176.0	1140.0
23 Feb 89	1188.0	1164.0	30 Mar 89	1176.0	1164.0
24 Feb 89	1188.0	1176.0	31 Mar 89	1176.0	1140.0
25 Feb 89	1188.0	1176.0	1 Apr 89	1176.0	1164.0
26 Feb 89	1188.0	1176.0	2 Apr 89	1176.0	1164.0
27 Feb 89	1188.0	1176.0	3 Apr 89	1164.0	1164.0
28 Feb 89	1188.0	1176.0	4 Apr 89	1176.0	1164.0
1 Mar 89	1188.0	1176.0	5 Apr 89	1176.0	1164.0
2 Mar 89	1176.0	1176.0	6 Apr 89	1176.0	1164.0
3 Mar 89	1176.0	1176.0	7 Apr 89	1176.0	1164.0
4 Mar 89	1188.0	1188.0	8 Apr 89	1176.0	1164.0
5 Mar 89	1164.0	1152.0	9 Apr 89	1188.0	1152.0
6 Mar 89	1176.0	1164.0	10 Apr 89	1188.0	1164.0
7 Mar 89	1176.0	1164.0	11 Apr 89	1188.0	1164.0
8 Mar 89	1188.0	1176.0	12 Apr 89	1188.0	1164.0
9 Mar 89	1176.0	1164.0	13 Apr 89	1200.0	1176.0
10 Mar 89	1188.0	1164.0	14 Apr 89	1200.0	1176.0
11 Mar 89	1176.0	1140.0	15 Apr 89	1188.0	1176.0
12 Mar 89	1176.0	1164.0	16 Apr 89	1188.0	1164.0
13 Mar 89	1188.0	1164.0	17 Apr 89	1188.0	1176.0
14 Mar 89	1188.0	1164.0	18 Apr 89	1188.0	1176.0
15 Mar 89	1176.0	1164.0	19 Apr 89	1188.0	1176.0
16 Mar 89	1176.0	1176.0	20 Apr 89	1188.0	1164.0
17 Mar 89	1200.0	1176.0	21 Apr 89	1188.0	1176.0
18 Mar 89	1200.0	1176.0	22 Apr 89	1188.0	1164.0
19 Mar 89	1200.0	1200.0	23 Apr 89	1164.0	1152.0
20 Mar 89	1200.0	1200.0	24 Apr 89	1164.0	1164.0
21 Mar 89	1200.0	1200.0	25 Apr 89	1188.0	1164.0
22 Mar 89	1200.0	1200.0	26 Apr 89	1188.0	1164.0
23 Mar 89	1200.0	1200.0	27 Apr 89	1200.0	1164.0
24 Mar 89	1200.0	1200.0	28 Apr 89	1200.0	1176.0

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TABLE A-5 (Contd.)

Date	High	Low	Date	High	Low
29 Apr 89	1176.0	1164.0	3 Jun 89	1342.9	1327.8
30 Apr 89	1164.0	1152.0	4 Jun 89	1358.0	1358.0
1 May 89	1176.0	1164.0	5 Jun 89	1358.0	1358.0
2 May 89	1176.0	1164.0	6 Jun 89	1358.0	1342.9
3 May 89	1176.0	1164.0	7 Jun 89	1358.0	1342.9
4 May 89	1176.0	1164.0	8 Jun 89	1358.0	1358.0
5 May 89	1188.0	1152.0	9 Jun 89	1358.0	1358.0
6 May 89	1188.0	1164.0	10 Jun 89	1358.0	1358.0
7 May 89	1188.0	1176.0	11 Jun 89	1358.0	1358.0
8 May 89	1188.0	1176.0	12 Jun 89	1358.0	1358.0
9 May 89	1176.0	1152.0	13 Jun 89	1358.0	1358.0
10 May 89	1176.0	1176.0	14 Jun 89	1358.0	1358.0
11 May 89	1188.0	1176.0	15 Jun 89	1373.1	1358.0
12 May 89	1188.0	1176.0	16 Jun 89	1358.0	1358.0
13 May 89	1188.0	1176.0	17 Jun 89	1358.0	1342.9
14 May 89	1200.0	1188.0	18 Jun 89	1358.0	1358.0
15 May 89	1200.0	1176.0	19 Jun 89	1358.0	1342.9
16 May 89	1188.0	1188.0	20 Jun 89	1358.0	1358.0
17 May 89	1200.0	1188.0	21 Jun 89	1358.0	1358.0
18 May 89	1200.0	1200.0	22 Jun 89	1342.9	1342.9
19 May 89	1200.0	1200.0	23 Jun 89	1327.8	1327.8
20 May 89	1200.0	1188.0	24 Jun 89	1327.8	1327.8
21 May 89	1183.0	1188.0	25 Jun 89	1327.8	1312.7
22 May 89	1200.0	1188.0	26 Jun 89	1327.8	1312.7
23 May 89	1188.0	1188.0	27 Jun 89	1342.9	1342.9
24 May 89	1200.0	1188.0	28 Jun 89	1358.0	1358.0
25 May 89	1200.0	1200.0	29 Jun 89	1342.9	1342.9
26 May 89	1200.0	1200.0	30 Jun 89	1342.9	1342.9
27 May 89	1188.0	1188.0	1 Jul 89	1342.9	1327.8
28 May 89	1200.0	1188.0	2 Jul 89	1342.9	1342.9
29 May 89	996.0	996.0	3 Jul 89	1342.9	1327.8
30 May 89	1312.7	1252.4	4 Jul 89	1342.9	1342.9
31 May 89	1342.9	1342.9	5 Jul 89	1342.9	1342.9
1 Jun 89	1358.0	1327.8	6 Jul 89	1342.9	1342.9
2 Jun 89	1342.9	1327.8	7 Jul 89	1342.9	1342.9

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Appendix B  
DAILY TEMPERATURE DATA



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TABLE B-1. 4P-2 (Two-Inch Steam Well) Steam Temperature, °F.

Date	High	Low	Date	High	Low
1 Oct 89	207	207	11 Nov 89	196	195
2 Oct 89	208	207	12 Nov 89	196	196
3 Oct 89	203	203	13 Nov 89	197	197
4 Oct 89	203	203	14 Nov 89	196	195
5 Oct 89	208	204	15 Nov 89	201	199
6 Oct 89	208	208	16 Nov 89	199	197
7 Oct 89	207	205	17 Nov 89	198	192
8 Oct 89	206	206	18 Nov 89	196	192
9 Oct 89	206	205	19 Nov 89	195	195
10 Oct 89	209	208	20 Nov 89	197	196
11 Oct 89	208	207	21 Nov 89	196	195
12 Oct 89	207	205	22 Nov 89	198	197
13 Oct 89	204	204	23 Nov 89	197	197
14 Oct 89	206	204	24 Nov 89	196	195
15 Oct 89	207	207	25 Nov 89	196	195
16 Oct 89	208	208	26 Nov 89	192	191
17 Oct 89	208	207	27 Nov 89	191	190
18 Oct 89	207	207	28 Nov 89	196	195
19 Oct 89	206	205	29 Nov 89	195	193
20 Oct 89	205	205	30 Nov 89	195	194
21 Oct 89	203	203	1 Dec 89	196	193
22 Oct 89	204	203	2 Dec 89	193	193
23 Oct 89	204	203	3 Dec 89	196	194
24 Oct 89	205	204	4 Dec 89	197	196
25 Oct 89	201	201	5 Dec 89	197	196
26 Oct 89	199	199	6 Dec 89	192	191
27 Oct 89	198	198	7 Dec 89	195	192
28 Oct 89	198	189	8 Dec 89	198	194
29 Oct 89	193	190	9 Dec 89	198	198
30 Oct 89	196	195	10 Dec 89	196	196
31 Oct 89 - 6 Nov 89	000	000	11 Dec 89	191	191
7 Nov 89	198	198	12 Dec 89	193	192
8 Nov 89	199	199	13 Dec 89	192	192
9 Nov 89	194	193	14 Dec 89	211	209
10 Nov 89	196	195	15 Dec 89	211	211

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TABLE B-1 (Contd.)

Date	High	Low	Date	High	Low
16 Dec 89	213	211	20 Jan 90	201	200
17 Dec 89	212	211	21 Jan 90	200	200
18 Dec 89	211	211	22 Jan 90	210	208
19 Dec 89	211	210	23 Jan 90	208	208
20 Dec 89	211	210	24 Jan 90	207	206
21 Dec 89	213	210	25 Jan 90	206	205
22 Dec 89	212	210	26 Jan 90	206	205
23 Dec 89	211	210	27 Jan 90	204	204
24 Dec 89	211	210	28 Jan 90	205	205
25 Dec 89	213	211	29 Jan 90	203	202
26 Dec 89	203	202	30 Jan 90	202	196
27 Dec 89	213	212	31 Jan 90	198	194
28 Dec 89	212	212	1 Feb 90	198	196
29 Dec 89	211	199	2 Feb 90	197	195
30 Dec 89	199	198	3 Feb 90	198	197
31 Dec 89	203	201	4 Feb 90	198	198
1 Jan 90	204	203	5 Feb 90	204	203
2 Jan 90	201	200	6 Feb 90	204	195
3 Jan 90	202	201	7 Feb 90	193	191
4 Jan 90	201	198	8 Feb 90	194	194
5 Jan 90	201	199	9 Feb 90	194	193
6 Jan 90	201	200	10 Feb 90	195	194
7 Jan 90	203	201	11 Feb 90	194	192
8 Jan 90	204	202	12 Feb 90	206	206
9 Jan 90	204	203	13 Feb 90	197	197
10 Jan 90	209	207	14 Feb 90	193	192
11 Jan 90	208	207	15 Feb 90	196	196
12 Jan 90	204	203	16 Feb 90	196	196
13 Jan 90	202	202	17 Feb 90	197	196
14 Jan 90	202	201	18 Feb 90	193	193
15 Jan 90	203	203	19 Feb 90	196	195
16 Jan 90	205	202	20 Feb 90	203	203
17 Jan 90	203	201	21 Feb 90	198	196
18 Jan 90	197	196	22 Feb 90	201	200
19 Jan 90	200	200	23 Feb 90	205	200

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TABLE B-1 (Contd.)

Date	High	Low	Date	High	Low
24 Feb 90	205	204	31 Mar 90	219	201
25 Feb 90	206	206	1 Apr 90	217	203
26 Feb 90	208	208	2 Apr 90	208	198
27 Feb 90	206	205	3 Apr 90	216	198
28 Feb 90	206	206	4 Apr 90	214	206
1 Mar 90	205	205	5 Apr 90	217	203
2 Mar 90	204	204	6 Apr 90	218	201
3 Mar 90	203	203	7 Apr 90	216	207
4 Mar 90	205	204	8 Apr 90	211	196
5 Mar 90	226	210	9 Apr 90	215	204
6 Mar 90	294	211	10 Apr 90	218	201
7 Mar 90	162	126	11 Apr 90	221	203
8 Mar 90	208	182	12 Apr 90	221	207
9 Mar 90	212	148	13 Apr 90	224	206
10 Mar 90	251	220	14 Apr 90	223	202
11 Mar 90	250	250	15 Apr 90	220	205
12 Mar 90	160	111	16 Apr 90	208	203
13 Mar 90	232	181	17 Apr 90	212	199
14 Mar 90	207	200	18 Apr 90	213	203
15 Mar 90	215	205	19 Apr 90	216	206
16 Mar 90	215	211	20 Apr 90	213	205
17 Mar 90	215	203	21 Apr 90	222	201
18 Mar 90	221	216	22 Apr 90	215	190
19 Mar 90	218	214	23 Apr 90	217	192
20 Mar 90	217	215	24 Apr 90	219	203
21 Mar 90	224	211	25 Apr 90	218	211
22 Mar 90	224	213	26 Apr 90	224	210
23 Mar 90	227	211	27 Apr 90	224	206
24 Mar 90	226	214	28 Apr 90	214	197
25 Mar 90	220	213	29 Apr 90	191	189
26 Mar 90	215	203	30 Apr 90	193	190
27 Mar 90	212	197	1 May 90	210	202
28 Mar 90	211	186	2 May 90	218	194
29 Mar 90	216	202	3 May 90	212	195
30 Mar 90	214	200	4 May 90	215	196

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TABLE B-1 (Contd.)

Date	High	Low	Date	High	Low
5 May 90	216	199	9 Jun 90	215	211
6 May 90	219	198	10 Jun 90	215	212
7 May 90	219	206	11 Jun 90	218	209
8 May 90	224	203	12 Jun 90	222	212
9 May 90	220	204	13 Jun 90	216	209
10 May 90	214	199	14 Jun 90	212	206
11 May 90	219	192	15 Jun 90	212	207
12 May 90	215	198	16 Jun 90	217	207
13 May 90	217	198	17 Jun 90	217	209
14 May 90	216	201	18 Jun 90	217	213
15 May 90	212	201	19 Jun 90	212	210
16 May 90	208	193	20 Jun 90	223	216
17 May 90	213	197	21 Jun 90	225	224
18 May 90	214	192	22 Jun 90	221	218
19 May 90	214	195	23 Jun 90	220	215
20 May 90	209	200	24 Jun 90	216	214
21 May 90	206	202	25 Jun 90	212	212
22 May 90	213	189	26 Jun 90	213	199
23 May 90	217	176	27 Jun 90	213	204
24 May 90	215	199	28 Jun 90	213	206
25 May 90	205	199	29 Jun 90	207	205
26 May 90	211	199	30 Jun 90	214	205
27 May 90	209	205	1 Jul 90	211	207
28 May 90	211	199	2 Jul 90	210	209
29 May 90	213	208	3 Jul 90	208	194
30 May 90	216	205	4 Jul 90	207	195
31 May 90	214	203	5 Jul 90	198	194
1 Jun 90	214	201	6 Jul 90	198	190
2 Jun 90	219	207	7 Jul 90	199	190
3 Jun 90	223	210	8 Jul 90	193	192
4 Jun 90	222	217	9 Jul 90	199	194
5 Jun 90	221	211	10 Jul 90	200	199
6 Jun 90	216	210	11 Jul 90	212	192
7 Jun 90	221	213	12 Jul 90	209	200
8 Jun 90	222	214	13 Jul 90	202	197

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TABLE B-1 (Contd.)

Date	High	Low	Date	High	Low
14 Jul 90	210	185	18 Aug 90	205	192
15 Jul 90	202	181	19 Aug 90	203	194
16 Jul 90	205	198	20 Aug 90	205	196
17 Jul 90	205	195	21 Aug 90	201	194
18 Jul 90	214	191	22 Aug 90	201	194
19 Jul 90	212	193	23 Aug 90	205	199
20 Jul 90	210	196	24 Aug 90	210	199
21 Jul 90	215	196	25 Aug 90	210	199
22 Jul 90	217	191	26 Aug 90	210	197
23 Jul 90	209	201	27 Aug 90	208	199
24 Jul 90	205	195	28 Aug 90	208	203
25 Jul 90	201	188	29 Aug 90	208	201
26 Jul 90	208	193	30 Aug 90	208	203
27 Jul 90	206	195	31 Aug 90	210	205
28 Jul 90	207	195	1 Sep 90	210	203
29 Jul 90	221	196	2 Sep 90	213	207
30 Jul 90	213	201	3 Sep 90	213	207
31 Jul 90	210	197	4 Sep 90	209	207
1 Aug 90	213	202	5 Sep 90	210	205
2 Aug 90	215	202	6 Sep 90	211	208
3 Aug 90	214	200	7 Sep 90	213	205
4 Aug 90	218	204	8 Sep 90	211	208
5 Aug 90	216	203	9 Sep 90	213	210
6 Aug 90	217	203	10 Sep 90	213	208
7 Aug 90	217	200	11 Sep 90	212	208
8 Aug 90	214	206	12 Sep 90	213	207
9 Aug 90	217	198	13 Sep 90	213	209
10 Aug 90	218	202	14 Sep 90	213	208
11 Aug 90	205	202	15 Sep 90	213	209
12 Aug 90	217	193	16 Sep 90	213	209
13 Aug 90	205	187	17 Sep 90	212	209
14 Aug 90	205	194	18 Sep 90	211	207
15 Aug 90	205	197	19 Sep 90	210	207
16 Aug 90	205	195	20 Sep 90	210	208
17 Aug 90	203	197	21 Sep 90	210	207

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TABLE B-1 (Contd.)

Date	High	Low	Date	High	Low
22 Sep 90	208	205	27 Sep 90	208	205
23 Sep 90	210	207	28 Sep 90	208	203
24 Sep 90	210	207	29 Sep 90	206	199
25 Sep 90	208	205	30 Sep 90	206	199
26 Sep 90	208	205			

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TABLE B-2. 4A-2 and 4A-3 (Schober's Resort Wells) Steam Temperature, °F.

Date	High	Low	Date	High	Low
1 Oct 89	209	208	5 Nov 89	212	211
2 Oct 89	213	209	6 Nov 89	212	210
3 Oct 89	207	205	7 Nov 89	210	209
4 Oct 89	208	206	8 Nov 89	210	209
5 Oct 89	208	206	9 Nov 89	210	210
6 Oct 89	208	206	10 Nov 89	210	209
7 Oct 89	207	205	11 Nov 89	210	210
8 Oct 89	211	206	12 Nov 89	212	211
9 Oct 89	208	208	13 Nov 89	211	210
10 Oct 89	209	207	14 Nov 89	211	210
11 Oct 89	209	208	15 Nov 89	210	209
12 Oct 89	209	207	16 Nov 89	209	208
13 Oct 89	209	207	17 Nov 89	210	206
14 Oct 89	209	207	18 Nov 89	206	206
15 Oct 89	209	206	19 Nov 89	210	208
16 Oct 89	212	211	20 Nov 89	211	208
17 Oct 89	214	211	21 Nov 89	212	210
18 Oct 89	211	211	22 Nov 89	209	209
19 Oct 89	212	210	23 Nov 89	207	207
20 Oct 89	211	207	24 Nov 89	208	206
21 Oct 89	210	207	25 Nov 89	208	205
22 Oct 89	209	208	26 Nov 89	205	204
23 Oct 89	208	208	27 Nov 89	204	204
24 Oct 89	212	211	28 Nov 89	206	204
25 Oct 89	210	210	29 Nov 89	205	204
26 Oct 89	208	206	30 Nov 89	207	205
27 Oct 89	208	207	1 Dec 89	208	208
28 Oct 89	209	208	2 Dec 89	210	208
29 Oct 89	209	207	3 Dec 89	211	209
30 Oct 89	210	208	4 Dec 89	210	207
31 Oct 89	209	209	5 Dec 89	212	211
1 Nov 89	209	207	6 Dec 89	212	208
2 Nov 89	209	208	7 Dec 89	210	208
3 Nov 89	209	208	8 Dec 89	207	206
4 Nov 89	210	210	9 Dec 89	206	206

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TABLE B-2 (Contd.)

Date	High	Low	Date	High	Low
10 Dec 89	207	207	14 Jan 90	207	207
11 Dec 89	209	207	15 Jan 90	207	206
12 Dec 89	208	206	16 Jan 90	207	207
13 Dec 89	208	206	17 Jan 90	205	205
14 Dec 89	208	208	18 Jan 90	206	203
15 Dec 89	209	208	19 Jan 90	207	207
16 Dec 89	209	206	20 Jan 90	207	207
17 Dec 89	210	209	21 Jan 90	210	209
18 Dec 89	210	209	22 Jan 90	210	207
19 Dec 89	210	208	23 Jan 90	209	207
20 Dec 89	210	207	24 Jan 90	208	208
21 Dec 89	210	209	25 Jan 90	208	207
22 Dec 89	210	209	26 Jan 90	209	209
23 Dec 89	210	210	27 Jan 90	211	209
24 Dec 89	211	209	28 Jan 90	211	208
25 Dec 89	210	209	29 Jan 90	210	209
26 Dec 89	212	211	30 Jan 90	209	207
27 Dec 89	211	208	31 Jan 90	209	208
28 Dec 89	205	202	1 Feb 90	207	205
29 Dec 89	206	202	2 Feb 90	209	207
30 Dec 89	208	206	3 Feb 90	209	208
31 Dec 89	210	207	4 Feb 90	210	206
1 Jan 90	209	208	5 Feb 90	210	208
2 Jan 90	207	207	6 Feb 90	210	207
3 Jan 90	209	207	7 Feb 90	206	204
4 Jan 90	208	207	8 Feb 90	208	207
5 Jan 90	208	206	9 Feb 90	210	207
6 Jan 90	207	206	10 Feb 90	210	209
7 Jan 90	210	209	11 Feb 90	211	209
8 Jan 90	211	210	12 Feb 90	212	208
9 Jan 90	212	210	13 Feb 90	209	202
10 Jan 90	211	209	14 Feb 90	206	205
11 Jan 90	208	208	15 Feb 90	208	205
12 Jan 90	205	205	16 Feb 90	204	202
13 Jan 90	207	205	17 Feb 90	205	204



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TABLE B-2 (Contd.)

Date	High	Low	Date	High	Low
18 Feb 90	207	204	25 Mar 90	212	212
19 Feb 90	207	207	26 Mar 90	215	213
20 Feb 90	209	208	27 Mar 90	214	210
21 Feb 90	208	206	28 Mar 90	211	210
22 Feb 90	210	209	29 Mar 90	213	211
23 Feb 90	209	208	30 Mar 90	213	212
24 Feb 90	209	209	31 Mar 90	212	208
25 Feb 90	212	210	1 Apr 90	212	210
26 Feb 90	212	210	2 Apr 90	213	212
27 Feb 90	211	209	3 Apr 90	213	211
28 Feb 90	210	209	4 Apr 90	214	212
1 Mar 90	210	209	5 Apr 90	211	210
2 Mar 90	209	208	6 Apr 90	212	211
3 Mar 90	208	207	7 Apr 90	213	212
4 Mar 90	211	207	8 Apr 90	211	211
5 Mar 90	209	207	9 Apr 90	212	209
6 Mar 90	213	208	10 Apr 90	213	210
7 Mar 90	213	210	11 Apr 90	214	211
8 Mar 90	213	210	12 Apr 90	213	210
9 Mar 90	211	209	13 Apr 90	214	209
10 Mar 90	211	206	14 Apr 90	212	210
11 Mar 90	211	208	15 Apr 90	212	210
12 Mar 90	211	209	16 Apr 90	212	210
13 Mar 90	213	211	17 Apr 90	212	209
14 Mar 89	213	210	18 Apr 90	211	208
15 Mar 90	215	214	19 Apr 90	213	209
16 Mar 90	216	214	20 Apr 90	214	211
17 Mar 90	214	214	21 Apr 90	213	210
18 Mar 90	217	213	22 Apr 90	212	210
19 Mar 90	216	213	23 Apr 90	206	206
20 Mar 90	217	213	24 Apr 90	207	206
21 Mar 90	216	215	25 Apr 90	206	206
22 Mar 90	214	214	26 Apr 90	207	207
23 Mar 90	215	213	27 Apr 90	208	205
24 Mar 90	217	209	28 Apr 90	207	205

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TABLE B-2 (Contd.)

Date	High	Low	Date	High	Low
29 Apr 90	207	206	3 Jun 90	215	212
30 Apr 90	206	205	4 Jun 90	215	212
1 May 90	210	210	5 Jun 90	214	213
2 May 90	213	213	6 Jun 90	216	215
3 May 90	214	213	7 Jun 90	216	216
4 May 90	216	216	8 Jun 90	216	213
5 May 90	215	215	9 Jun 90	214	214
6 May 90	215	215	10 Jun 90	215	212
7 May 90	213	212	11 Jun 90	214	212
8 May 90	215	214	12 Jun 90	214	210
9 May 90	214	213	13 Jun 90	214	213
10 May 90	214	212	14 Jun 90	214	213
11 May 90	212	211	15 Jun 90	214	213
12 May 90	211	211	16 Jun 90	214	211
13 May 90	212	210	17 Jun 90	215	211
14 May 90	211	210	18 Jun 90	213	212
15 May 90	212	211	19 Jun 90	213	212
16 May 90	213	213	20 Jun 90	217	211
17 May 90	213	212	21 Jun 90	218	215
18 May 90	214	209	22 Jun 90	215	214
19 May 90	211	208	23 Jun 90	212	209
20 May 90	211	209	24 Jun 90	213	209
21 May 90	212	210	25 Jun 90	215	214
22 May 90	212	211	26 Jun 90	213	213
23 May 90	214	210	27 Jun 90	217	214
24 May 90	213	209	28 Jun 90	214	214
25 May 90	211	208	29 Jun 90	215	213
26 May 90	211	210	30 Jun 90	214	213
27 May 90	211	210	1 Jul 90	223	223
28 May 90	212	209	2 Jul 90	224	222
29 May 90	215	214	3 Jul 90	221	219
30 May 90	215	214	4 Jul 90	220	219
31 May 90	215	214	5 Jul 90	223	221
1 Jun 90	214	212	6 Jul 90	224	221
2 Jun 90	212	210	7 Jul 90	225	223

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TABLE B-2 (Contd.)

Date	High	Low	Date	High	Low
8 Jul 90	221	220	12 Aug 90	218	218
9 Jul 90	224	222	13 Aug 90	221	221
10 Jul 90	223	221	14 Aug 90	223	219
11 Jul 90	221	221	15 Aug 90	221	220
12 Jul 90	224	222	16 Aug 90	221	221
13 Jul 90	224	223	17 Aug 90	222	220
14 Jul 90	222	221	18 Aug 90	222	220
15 Jul 90	223	218	19 Aug 90	223	221
16 Jul 90	220	219	20 Aug 90	225	222
17 Jul 90	222	222	21 Aug 90	219	216
18 Jul 90	223	221	22 Aug 90	224	223
19 Jul 90	223	222	23 Aug 90	233	228
20 Jul 90	224	222	24 Aug 90	220	216
21 Jul 90	223	218	25 Aug 90	223	220
22 Jul 90	225	223	26 Aug 90	222	222
23 Jul 90	220	219	27 Aug 90	227	224
24 Jul 90	219	217	28 Aug 90	228	214
25 Jul 90	219	218	29 Aug 90	225	225
26 Jul 90	220	219	30 Aug 90	226	224
27 Jul 90	224	224	31 Aug 90	219	212
28 Jul 90	224	223	1 Sep 90	224	224
29 Jul 90	224	222	2 Sep 90	225	217
30 Jul 90	219	219	3 Sep 90	226	226
31 Jul 90	217	217	4 Sep 90	226	225
1 Aug 90	221	218	5 Sep 90	225	224
2 Aug 90	219	218	6 Sep 90	229	225
3 Aug 90	223	221	7 Sep 90	226	226
4 Aug 90	219	218	8 Sep 90	226	224
5 Aug 90	221	218	9 Sep 90	225	224
6 Aug 90	221	218	10 Sep 90	234	227
7 Aug 90	218	217	11 Sep 90	224	223
8 Aug 90	218	216	12 Sep 90	225	223
9 Aug 90	218	218	13 Sep 90	228	224
10 Aug 90	217	216	14 Sep 90	224	223
11 Aug 90	218	217	15 Sep 90	224	221

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TABLE B-2 (Contd.)

Date	High	Low	Date	High	Low
16 Sep 90	224	222	26 Sep 90	224	222
17 Sep 90	224	223	27 Sep 90	224	222
18 Sep 90	224	224	28 Sep 90	223	222
19 Sep 90	223	221	29 Sep 90	225	224
20 Sep 90	228	218	30 Sep 90	226	225
21 Sep 90	233	228			
22 Sep 90	234	228			
23 Sep 90	243	241			
24 Sep 90	224	220			
25 Sep 90	222	221			

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TABLE B-3. 4A-2 and 4A-3 (Schober's Resort Wells) Ambient Temperature, °F.

Date	High	Low	Date	High	Low
1 Oct 89	90	59	5 Nov 89	85	57
2 Oct 89	89	51	6 Nov 89	82	57
3 Oct 89	80	60	7 Nov 89	80	61
4 Oct 89	87	65	8 Nov 89	86	54
5 Oct 89	87	61	9 Nov 89	89	67
6 Oct 89	92	65	10 Nov 89	89	61
7 Oct 89	94	69	11 Nov 89	87	61
8 Oct 89	99	74	12 Nov 89	87	59
9 Oct 89	100	74	13 Nov 89	81	59
10 Oct 89	98	66	14 Nov 89	83	53
11 Oct 89	99	66	15 Nov 89	81	62
12 Oct 89	97	75	16 Nov 89	85	55
13 Oct 89	96	62	17 Nov 89	86	66
14 Oct 89	91	62	18 Nov 89	84	53
15 Oct 89	92	70	19 Nov 89	88	63
16 Oct 89	92	68	20 Nov 89	83	52
17 Oct 89	96	68	21 Nov 89	84	56
18 Oct 89	95	68	22 Nov 89	81	54
19 Oct 89	90	65	23 Nov 89	78	55
20 Oct 89	87	62	24 Nov 89	72	49
21 Oct 89	79	55	25 Nov 89	74	54
22 Oct 89	75	61	26 Nov 89	73	52
23 Oct 89	82	53	27 Nov 89	67	49
24 Oct 89	82	56	28 Nov 89	65	40
25 Oct 89	77	47	29 Nov 89	67	44
26 Oct 89	73	55	30 Nov 89	67	44
27 Oct 89	74	46	1 Dec 89	76	47
28 Oct 89	76	48	2 Dec 89	74	49
29 Oct 89	73	47	3 Dec 89	75	48
30 Oct 89	80	59	4 Dec 89	78	54
31 Oct 89	76	53	5 Dec 89	81	58
1 Nov 89	77	47	6 Dec 89	83	57
2 Nov 89	88	55	7 Dec 89	77	54
3 Nov 89	84	53	8 Dec 89	74	46
4 Nov 89	85	55	9 Dec 89	75	47

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TABLE B-3 (Contd.)

Date	High	Low	Date	High	Low
10 Dec 89	69	49	14 Jan 90	65	45
11 Dec 89	63	40	15 Jan 90	61	41
12 Dec 89	65	44	16 Jan 90	56	49
13 Dec 89	71	45	17 Jan 90	54	44
14 Dec 89	70	47	18 Jan 90	58	48
15 Dec 89	76	44	19 Jan 90	58	34
16 Dec 89	71	43	20 Jan 90	60	37
17 Dec 89	70	46	21 Jan 90	70	35
18 Dec 89	70	42	22 Jan 90	73	43
19 Dec 89	69	42	23 Jan 90	69	49
20 Dec 89	71	44	24 Jan 90	69	50
21 Dec 89	71	44	25 Jan 90	76	41
22 Dec 89	75	45	26 Jan 90	64	45
23 Dec 89	82	50	27 Jan 90	66	35
24 Dec 89	75	48	28 Jan 90	73	43
25 Dec 89	75	56	29 Jan 90	73	46
26 Dec 89	72	51	30 Jan 90	69	43
27 Dec 89	76	42	31 Jan 90	67	44
28 Dec 89	61	47	1 Feb 90	64	44
29 Dec 89	75	59	2 Feb 90	69	44
30 Dec 89	73	45	3 Feb 90	64	44
31 Dec 89	70	50	4 Feb 90	56	42
1 Jan 90	63	50	5 Feb 90	65	42
2 Jan 90	61	39	6 Feb 90	64	44
3 Jan 90	59	38	7 Feb 90	65	30
4 Jan 90	61	43	8 Feb 90	59	39
5 Jan 90	67	43	9 Feb 90	66	42
6 Jan 90	68	46	10 Feb 90	76	62
7 Jan 90	66	46	11 Feb 90	70	53
8 Jan 90	72	55	12 Feb 90	85	58
9 Jan 90	81	51	13 Feb 90	72	45
10 Jan 90	82	54	14 Feb 90	47	27
11 Jan 90	78	53	15 Feb 90	50	30
12 Jan 90	69	52	16 Feb 90	58	41
13 Jan 90	60	46	17 Feb 90	56	44

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TABLE B-3 (Contd.)

Date	High	Low	Date	High	Low
18 Feb 90	58	40	25 Mar 90	75	49
19 Feb 90	62	43	26 Mar 90	64	36
20 Feb 90	70	53	27 Mar 90	66	36
21 Feb 90	76	54	28 Mar 90	58	40
22 Feb 90	81	50	29 Mar 90	84	59
23 Feb 90	82	54	30 Mar 90	85	51
24 Feb 90	81	61	31 Mar 90	92	51
25 Feb 90	84	58	1 Apr 90	87	58
26 Feb 90	82	60	2 Apr 90	86	56
27 Feb 90	86	57	3 Apr 90	93	59
28 Feb 90	84	60	4 Apr 90	82	56
1 Mar 90	79	58	5 Apr 90	90	56
2 Mar 90	81	53	6 Apr 90	91	60
3 Mar 90	72	53	7 Apr 90	89	50
4 Mar 90	77	54	8 Apr 90	85	59
5 Mar 90	86	72	9 Apr 90	94	62
6 Mar 90	97	71	10 Apr 90	95	64
7 Mar 90	96	74	11 Apr 90	98	64
8 Mar 90	94	74	12 Apr 90	100	73
9 Mar 90	95	69	13 Apr 90	105	69
10 Mar 90	95	60	14 Apr 90	99	70
11 Mar 90	74	51	15 Apr 90	92	59
12 Mar 90	79	67	16 Apr 90	97	60
13 Mar 90	86	62	17 Apr 90	78	53
14 Mar 89	94	65	18 Apr 90	81	60
15 Mar 90	94	78	19 Apr 90	91	62
16 Mar 90	108	75	20 Apr 90	86	64
17 Mar 90	92	70	21 Apr 90	89	55
18 Mar 90	96	69	22 Apr 90	90	60
19 Mar 90	75	47	23 Apr 90	89	58
20 Mar 90	76	45	24 Apr 90	91	64
21 Mar 90	69	39	25 Apr 90	100	68
22 Mar 90	73	38	26 Apr 90	101	74
23 Mar 90	74	36	27 Apr 90	104	74
24 Mar 90	71	45	28 Apr 90	109	66

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TABLE B-3 (Contd.)

Date	High	Low	Date	High	Low
29 Apr 90	89	49	3 Jun 90	112	77
30 Apr 90	73	59	4 Jun 90	118	74
1 May 90	83	67	5 Jun 90	113	73
2 May 90	95	68	6 Jun 90	111	81
3 May 90	98	73	7 Jun 90	111	82
4 May 90	102	76	8 Jun 90	116	81
5 May 90	110	77	9 Jun 90	99	72
6 May 90	109	73	10 Jun 90	99	72
7 May 90	107	75	11 Jun 90	101	66
8 May 90	109	70	12 Jun 90	105	66
9 May 90	110	63	13 Jun 90	103	56
10 May 90	100	56	14 Jun 90	87	63
11 May 90	89	59	15 Jun 90	94	75
12 May 90	96	60	16 Jun 90	99	66
13 May 90	96	64	17 Jun 90	102	72
14 May 90	97	59	18 Jun 90	104	79
15 May 90	110	70	19 Jun 90	112	86
16 May 90	92	62	20 Jun 90	121	87
17 May 90	98	61	21 Jun 90	123	83
18 May 90	96	59	22 Jun 90	117	73
19 May 90	94	57	23 Jun 90	112	73
20 May 90	96	60	24 Jun 90	111	74
21 May 90	98	64	25 Jun 90	117	77
22 May 90	103	64	26 Jun 90	117	89
23 May 90	92	55	27 Jun 90	121	76
24 May 90	88	61	28 Jun 90	120	75
25 May 90	97	79	29 Jun 90	116	82
26 May 90	97	63	30 Jun 90	117	84
27 May 90	82	57	1 Jul 90	117	80
28 May 90	85	54	2 Jul 90	115	74
29 May 90	67	43	3 Jul 90	117	79
30 May 90	93	64	4 Jul 90	118	77
31 May 90	89	59	5 Jul 90	121	80
1 Jun 90	96	65	6 Jul 90	122	78
2 Jun 90	104	74	7 Jul 90	121	87



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TABLE B-3 (Contd.)

Date	High	Low	Date	High	Low
8 Jul 90	113	86	12 Aug 90	119	94
9 Jul 90	120	90	13 Aug 90	117	103
10 Jul 90	126	97	14 Aug 90	119	91
11 Jul 90	127	106	15 Aug 90	109	85
12 Jul 90	128	108	16 Aug 90	114	80
13 Jul 90	124	102	17 Aug 90	114	79
14 Jul 90	127	87	18 Aug 90	109	79
15 Jul 90	120	92	19 Aug 90	104	80
16 Jul 90	120	91	20 Aug 90	105	88
17 Jul 90	118	90	21 Aug 90	105	77
18 Jul 90	121	95	22 Aug 90	112	79
19 Jul 90	127	94	23 Aug 90	109	71
20 Jul 90	131	95	24 Aug 90	117	80
21 Jul 90	130	91	25 Aug 90	115	81
22 Jul 90	129	87	26 Aug 90	117	88
23 Jul 90	127	81	27 Aug 90	115	88
24 Jul 90	124	81	28 Aug 90	119	84
25 Jul 90	120	84	29 Aug 90	116	88
26 Jul 90	123	87	30 Aug 90	125	85
27 Jul 90	124	85	31 Aug 90	112	79
28 Jul 90	127	90	1 Sep 90	123	81
29 Jul 90	124	90	2 Sep 90	136	101
30 Jul 90	125	85	3 Sep 90	131	94
31 Jul 90	126	85	4 Sep 90	115	100
1 Aug 90	120	89	5 Sep 90	101	82
2 Aug 90	122	90	6 Sep 90	116	85
3 Aug 90	125	94	7 Sep 90	116	88
4 Aug 90	128	102	8 Sep 90	130	96
5 Aug 90	123	103	9 Sep 90	118	104
6 Aug 90	124	83	10 Sep 90	126	111
7 Aug 90	131	87	11 Sep 90	122	85
8 Aug 90	128	91	12 Sep 90	122	84
9 Aug 90	125	94	13 Sep 90	117	83
10 Aug 90	124	93	14 Sep 90	123	81
11 Aug 90	116	96	15 Sep 90	128	93

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TABLE B-3 (Contd.)

Date	High	Low	Date	High	Low
16 Sep 90	119	85	26 Sep 90	103	78
17 Sep 90	105	78	27 Sep 90	101	73
18 Sep 90	107	75	28 Sep 90	101	86
19 Sep 90	106	80	29 Sep 90	124	91
20 Sep 90	101	78	30 Sep 90	114	95
21 Sep 90	101	71			
22 Sep 90	116	79			
23 Sep 90	119	89			
24 Sep 90	96	95			
25 Sep 90	96	74			

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Appendix C  
WELL TEMPERATURE DATA

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TABLE C-1. 4H-8 (Coso Well No. 1) Temperatures, °F.

25 October 1989				30 October 1989			
Depth, ft	Temp °F	Depth, ft	Temp °F	Depth, ft	Temp °F	Depth, ft	Temp °F
0	203.36	270	213.44	0	202.10	152	221.18
30	203.36	275	216.68	5	204.44	153	221.36
35	203.72	280	217.94	10	204.62	155	221.54
50	204.08	285	226.76	23	204.80	156	221.90
125	204.26	290	229.64	75	204.98	158	222.98
130	204.44	295	234.86	110	205.16	160	223.70
135	204.80	300	239.36	112	205.34	161	224.60
140	205.34	305	244.76	115	205.52	162	225.14
145	206.96	310	248.36	116	205.70	163	226.40
150	202.12	315	252.14	118	206.06	164	227.48
152	210.20	320	253.40	120	206.60	165	229.10
155	212.18	325	257.36	121	207.50	166	229.46
160	214.70	330	260.78	123	208.22	167	229.64
165	215.60	335	263.12	125	208.40	168	230.54
170	218.30	340	263.84	126	209.30	169	231.08
175	219.02	344	264.02	129	209.66	171	231.62
180	219.02	348	264.02	130	210.02	172	232.16
185	220.82	350	264.20	131	210.56	173	232.54
187	221.72	357	264.20	133	210.92	174	233.24
190	223.70			134	211.28	175	233.96
195	224.06			135	212.36	176	234.14
200	224.06			136	213.08	177	234.68
205	223.34			137	213.26	178	235.22
210	222.26			138	214.34	179	235.58
215	220.64			139	214.88	180	236.48
220	217.76			140	215.42	181	236.66
225	216.68			141	216.14	182	236.84
230	215.60			143	216.32	183	237.02
235	212.90			145	216.68	184	237.20
240	211.28			146	217.04	185	237.38
245	210.74			147	217.40	186	237.34
250	210.74			148	217.40	187	237.92
255	210.20			149	217.58	189	238.10
260	211.10			150	218.48	190	238.46
265	211.64			151	219.74	191	238.64

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TABLE C-1 (Contd.)

30 October 1989							
Depth, ft	Temp °F	Depth, ft	Temp °F	Depth, ft	Temp °F	Depth, ft	Temp °F
195	239.18	240	213.08	285	233.96	324	261.86
196	239.36	241	212.74	286	234.32	325	262.40
197	238.64	242	212.54	287	234.68	326	262.58
199	237.74	243	212.18	288	237.38	327	262.76
201	237.56	244	212.00	289	236.84	328	262.94
202	237.38	245	211.82	290	238.28	329	263.12
204	237.02	246	211.64	291	238.64	330	263.30
205	236.12	247	211.46	292	239.72	331	263.30
206	235.58	248	211.28	293	240.80	332	263.48
208	235.04	249	211.10	294	241.70	333	263.84
209	234.50	250	210.74	295	242.42	334	264.02
211	234.32	256	211.28	296	243.68	335	264.02
213	233.78	257	211.10	297	244.04	336	264.02
215	232.88	258	211.10	298	245.12	337	264.20
216	232.34	259	210.74	299	245.84	338	264.20
217	232.16	260	210.56	300	246.02	339	264.20
218	231.62	262	211.64	301	246.38	340	264.38
219	231.08	267	212.00	302	246.74	360	264.38
220	230.36	268	213.08	303	248.54		
221	229.64	269	214.70	304	249.62		
222	227.84	270	217.22	306	251.06		
223	226.94	271	217.58	307	251.78		
224	226.22	272	219.92	309	252.50		
225	224.78	273	221.00	310	253.22		
226	222.98	274	220.46	311	254.66		
227	220.46	275	221.18	313	255.38		
228	219.20	276	223.52	314	256.64		
229	218.84	277	223.52	315	256.82		
230	217.22	278	225.86	316	257.00		
234	216.68	279	225.86	317	257.18		
235	215.96	280	226.76	318	258.08		
236	215.24	281	228.92	319	259.34		
237	214.70	282	229.82	321	260.06		
238	213.98	283	231.62	322	260.42		
239	213.44	284	231.98	323	261.14		

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TABLE C-1 (Contd.)

28 December 1989				5 April 1990		25 September 1990	
Depth, ft	Temp °F	Depth, ft	Temp °F	Depth, ft	Temp °F	Depth, ft	Temp °F
0	202.46	183	229.46	0	202.28	0	209.99
1	203.54	184	229.28	1	204.26	5	209.89
2	203.72	185	228.56	2	205.16	10	209.89
3	203.90	184	228.74	4	205.34	15	209.78
69	204.08	188	228.38	75	205.52	20	209.78
100	203.90	190	228.20	100	205.52	25	209.58
120	204.08	191	227.66	108	205.70	30	209.68
144	204.80	193	226.94	127	205.88	35	209.58
145	204.98	195	225.68	129	206.06	40	209.58
146	205.52	196	225.14	152	206.24	45	209.58
147	205.88	197	224.96	155	207.86	50	209.47
148	206.24	198	224.60	157	209.66	55	209.47
150	214.16	200	223.70	158	212.54	60	209.47
151	215.06	201	223.34	159	211.10	65	209.89
152	215.60	202	222.98	165	211.28	70	209.89
154	217.94	203	222.96	168	211.46	75	210.20
155	219.92	204	221.72	170	211.64	80	210.20
157	220.82	205	221.00	171	212.18	85	210.20
158	222.98	206	220.10	173	212.90	90	210.20
159	223.52	207	219.56	174	213.44	95	210.20
160	224.42	208	218.84	175	213.80	100	210.31
161	225.32	209	218.66	179	213.98	105	210.20
162	226.22	210	218.48	181	214.16	110	210.20
163	226.94	211	217.22	182	215.06	115	210.41
165	227.12	212	216.68	183	215.42	120	210.84
166	227.48	213	216.50	184	215.78	125	211.26
167	227.84	214	216.14	187	217.04	130	211.48
169	228.74	215	215.78	189	217.22	135	211.80
170	229.10	216	215.60	190	218.66	140	212.24
171	229.28	217	215.42	192	221.90	145	212.46
172	229.46	218	215.06	203	220.08	150	212.68
175	229.64	219	214.88			155	212.68
176	230.18	220	214.52			160	212.68
179	229.82	221	212.54			165	213.12
180	230.00					170	214.36

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TABLE C-1 (Contd.)

25 September 1990			
Depth, ft	Temp °F	Depth, ft	Temp °F
175	219.53	325	264.17
180	219.53	330	264.17
185	219.25	335	267.11
190	220.78	340	267.11
195	226.22	345	270.22
200	226.22	350	270.22
205	229.16	352	270.22
210	235.60	355	270.22
215	253.97		
220	233.91		
225	237.34		
230	237.34		
235	239.13		
240	242.92		
245	242.92		
250	244.91		
255	244.91		
260	244.91		
265	249.14		
270	249.14		
275	249.14		
280	251.38		
285	253.71		
290	253.71		
295	256.15		
300	258.70		
305	258.70		
310	258.70		
315	261.37		
320	261.37		

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TABLE C-2. Well 4A-4 Temperatures, °F.

25 October 1989		28 December 1989		5 April 1990		25 September 1990	
Depth, ft	Temp °F	Depth, ft	Temp °F	Depth, ft	Temp °F	Depth, ft	Temp °F
5	203.00	1	194.54	0	198.86	0	205.28
10	203.72	2	199.76	5	204.80	5	207.25
15	203.72	3	203.00	10	204.80	10	207.25
18	205.16	4	204.08	15	204.80	15	205.28
20	205.70	5	204.08	20	205.52	20	208.25
21	207.32	10	204.26	21	206.06	25	211.37
22	209.66	18	204.44	22	206.42	27	215.86
23	211.82	19	205.34	23	207.32		
24	213.08	20	205.88	24	209.12		
24.8	214.16	20.3	206.24	25	209.66		
25	214.16	20.8	206.60	26	211.64		
26	214.16	20.9	207.14	27	214.52		
		21	207.14	28	215.24		
		22	208.22	29	215.96		
		22.5	209.12	30	216.50		
		23	209.12	31	216.50		
		24	209.12	32	216.50		
		24.5	209.84	33	216.50		
		24.8	210.02				
		24.9	213.98				
		25	214.88				
		26	214.88				



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TABLE C-3. Well 4K-1 Temperatures, °F.

25 October 1989		5 April 1990				25 September 1990	
Depth, ft	Temp °F	Depth, ft	Temp °F	Depth, ft	Temp °F	Depth, ft	Temp °F
0	203.54	5	204.26	75	214.16	0	205.31
5	203.42	10	204.26	76	213.80	5	205.31
50	203.72	15	204.26	77	214.88	10	205.31
55	204.80	20	204.26	78	214.88	15	205.31
57	206.24	25	204.26	79	214.88	20	205.31
60	207.32	30	204.26	80	216.86	25	205.31
62	207.50	35	204.26	81	215.96	30	206.27
64	207.46	40	204.26	82	215.24	35	206.27
68	207.04	45	204.26			40	205.31
70	208.40	47	204.44			45	205.31
72	208.76	50	204.80			50	207.25
73	209.12	51	205.70			55	209.27
76	209.84	52	206.96			58	210.31
77	210.56	53	208.22			60	210.31
		54	208.40			61	211.37
		55	208.58			65	211.37
		56	208.76			70	211.37
		57	208.94			72	212.46
		58	209.12			75	212.46
		59	209.12			76	214.70
		60	210.56			77	215.86
		61	210.92				
		62	211.28				
		63	211.28				
		64	211.28				
		65	211.10				
		66	211.10				
		67	211.28				
		68	211.28				
		69	211.28				
		70	211.28				
		71	212.00				
		72	212.18				
		73	212.54				
		74	213.08				

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TABLE C-4. Well 4P-1 Temperatures, °F.

25 October 1989		5 April 1990		25 September 1990	
Depth, ft	Temp °F	Depth, ft	Temp °F	Depth, ft	Temp °F
0	135.68	5	200.48	0	179.85
5	195.98	10	203.90	5	204.36
10	203.00	15	204.26	10	206.27
15	204.26	20	204.26	15	206.27
35	204.44	25	204.26	20	206.27
60	204.44	30	204.44	25	206.27
65	206.78	35	204.44	60	206.27
66	208.22	40	204.44	65	206.27
67	208.22	45	204.44	40	206.27
68	208.58	50	204.44	45	206.27
70	208.94	55	204.62	50	206.27
76	209.12	60	205.70	55	206.27
78	209.30	61	206.78	57	208.25
82	209.48	62	207.32	60	209.27
87	209.84	63	208.04	62	211.37
88	210.56	64	209.48	65	212.46
90	210.92	65	209.84	68	213.57
91	211.82	66	210.20	70	213.57
91.5	212.36	67	210.56	75	213.57
94	214.70	68	211.64	77	214.70
95	215.60	69	212.36	80	214.70
96	216.32	70	212.36	85	214.70
97	217.04	71	212.36	88.5	215.86
98	217.94	72	212.54	90	218.26
99	218.30	73	212.72	93	220.78
100	218.30	74	212.72	95	222.09
		75	212.72	97	223.43
		76	212.72	100	226.22
		77	212.72	101	233.91
		79	212.90		
		80	212.90		
		81	212.90		

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