NWC TP 7056

Coso Monitoring Program
October 1988 Through September 1989

by
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NAVAL WEAPONS CENTER
CHINA LAKE, CA 93555-6001

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Naval Weapons Center

FOREWORD

This report presents the status of the Coso Monitoring Program conducted for the period October 1988 through September 1989 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 1988-89 Coso Monitoring Program under contract N60530-88-D-0019 for the Public Works Department, NWC.

This report was reviewed for technical accuracy by A. M. Katzenstein and James A. Whelan.

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The Coso Monitoring Program is a continuing effort in support of the development of the Navy's geothermal resources within the Coso Known Geothermal Resource Area (KGRA). Data are presented on the monitoring of steam flow rates and temperatures, water levels in ponds and wells, water chemistry, and rainfall in the Coso Hot Springs Resort Area. A monthly photographic essay of the mud pots and pools shows the variation of surface water levels throughout the year.

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The author would like to acknowledge Danielle Condon, COMARCO, Weapons Support Division, for her efforts in the collection and preparation of geothermal data presented in this report.

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 twelfth year of continual baseline data collection.

Numerous changes occurred at the thermal sites in the past year. Each of the steam metering systems was reconfigured with new control manifold blocks. These manifolds, coupled with frequent meter calibration checks, visibly improved data collection. In addition, as will be noted in the individual site discussions, several sites experienced physical changes. These changes resulted in an interruption of data collection at some sites while the collection mechanisms were being reconfigured.

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 monitored site is shown in Figures 1 and 2 . Only those sites that are new to the program or have experienced a significant change are described.

TABLE 1. Monitoring Functions and Locations.

Monitored Sites	Continuous Steam Flow	Continuous Water Level	Periodic Water Level	Continuous Temperature	Periodic Temperature	Ambient Temperature	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		X				X
Coso Corrosion Resort Array (4H-1,2,3,7)	X								
Coso Mud Pots				X		X	X		X
Well 4P-1			X		X				X
Two-Inch Steam Well (4P-2)	X			X					
Well 4K-1					X				X
Devils Kitchen	X								X
Observation Well No. 1			X						
Observation Well No. 2			X						
Observation Well No. 3			X						
South Pool		X	X		X		X		X

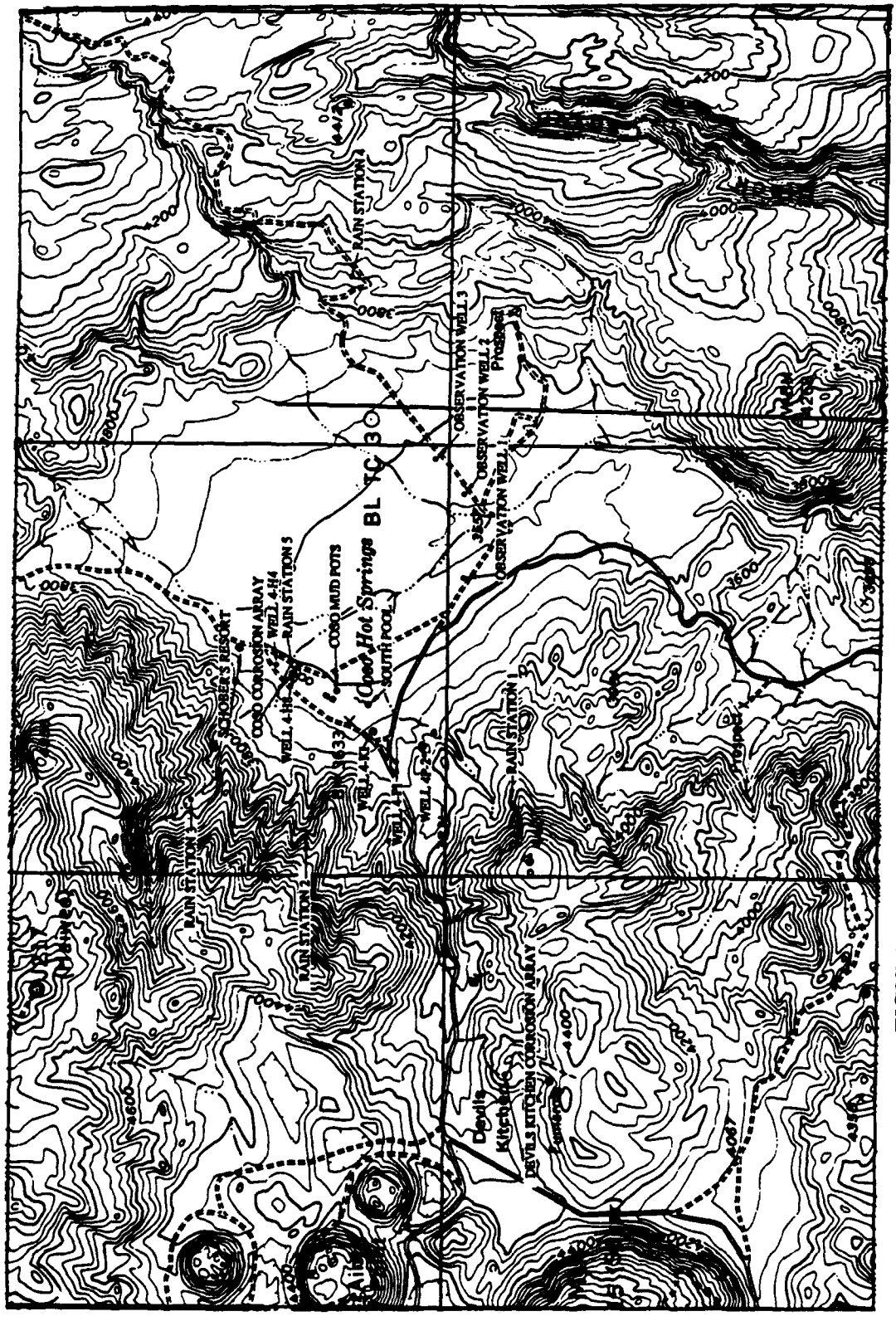


FIGURE 1. Coso Known Geothermal Resource Area Monitoring Sites.

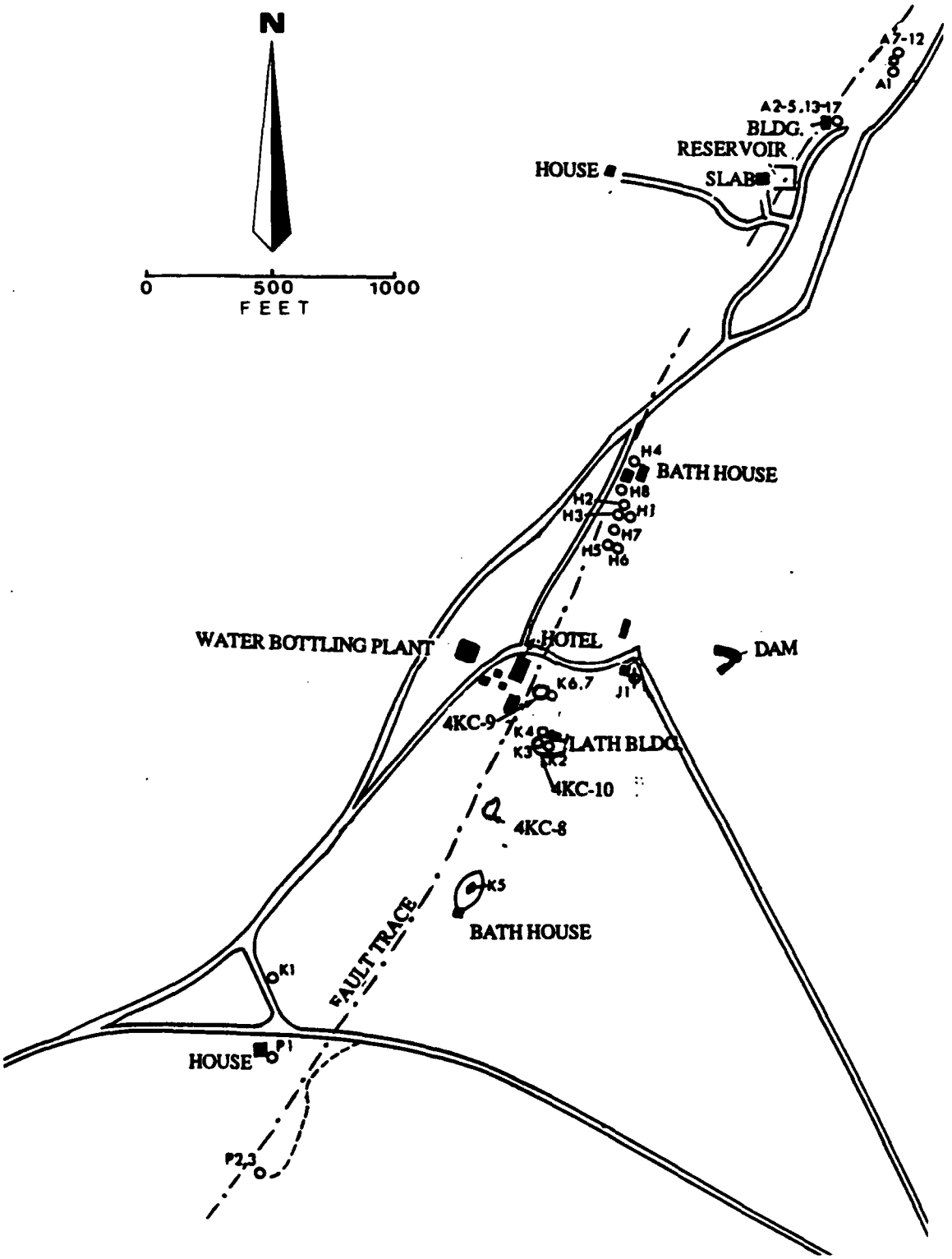


FIGURE 2. Coso Hot Springs Monitoring Sites.

TEMPERATURE AND STEAM FLOW MONITORING

Steam flow and temperature are measured at several sites in the Coso Hot Springs area. One monitoring station 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 (lb/h). The conversion factors for the steam data are calculated using the standard orifice equation for gas flow.

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. These data are shown graphically in Figure 3. Yearly mean data and the standard deviations for high and low daily steam flow are presented in Table 2.

The graph in Figure 3 shows a dramatic change on 28 January 1989, which reflects completion of an upgrade to the system by installing a Barton block manifold assembly. These manifold assemblies have proven to be more reliable than the pipe and valve manifolds, as they provide far more accurate data with less downtime.

No significant changes in steam flow activity at Devils Kitchen were apparent this year.

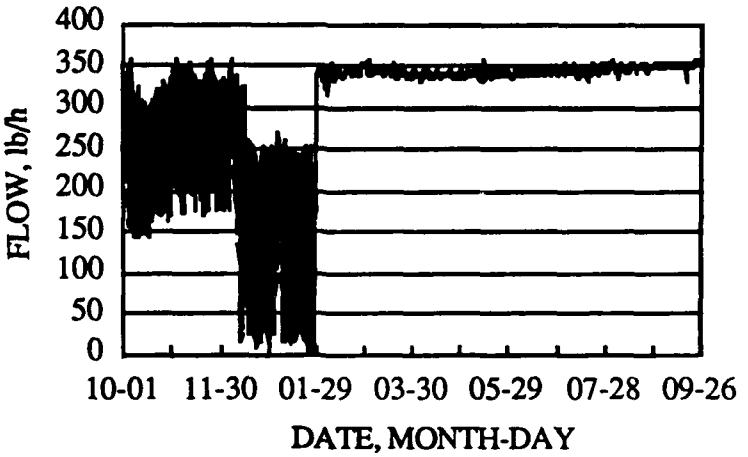


FIGURE 3. Devils Kitchen Steam Flow, 1 October 1988 Through 30 September 1989.

TABLE 2. Devils Kitchen Statistical Steam Flow Data, Pounds Per Hour (lb/h).

Date	High daily flow		Low daily flow	
	Mean	Standard deviation	Mean	Standard deviation
1 Oct 88 - 30 Sep 89	330.7	34.2	272.7	108.4
29 Jan 89 - 30 Sep 89	347.1	4.9	340.7	5.7

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

Daily high and low steam flow data at the Coso Resort Corrosion Array are presented in Appendix A as Table A-2. These data are shown graphically in Figure 4. Yearly mean data and standard deviation for high and low daily steam flow are presented in Table 3. This array was built in the late 1970s and is fed from four old steam wells (4H-1, -2, -3, and -7) that were rehabilitated by the Navy to provide steam and condensate for materials corrosion testing.

Steam flow at the Corrosion Array increased this year, continuing an upward trend that began in 1987. From 1 October through 21 October 1988, the flow meter was reading off scale. The meter was serviced, balanced, and zeroed before data collection was continued. A large increase in steam flow also occurred in March then settled down in mid-April through 17 May 1989, when the well casing of one of the Corrosion Array Wells, 4H-1, blew out. No data have been recorded at this site since 6 June 1989 when the equipment was removed for repairs.

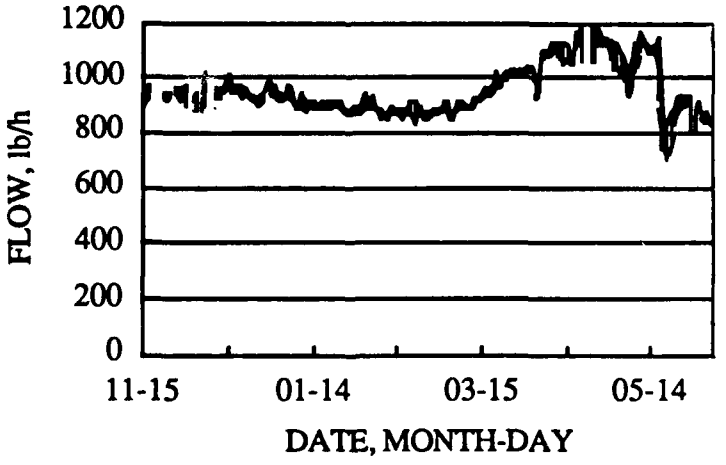


FIGURE 4. Coso Resort Corrosion Array Steam Flow, 15 November 1988 Through 6 June 1989.

TABLE 3. Coso Resort Corrosion Array Statistical Steam Flow Data, Pounds Per Hour (lb/h).

Date	High daily flow		Low daily flow	
	Mean	Standard deviation	Mean	Standard deviation
15 Nov 88 - 6 Jun 89	978.0	91.7	938.8	87.4

TWO-INCH STEAM WELL (4P-2)

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

On 28 January 1989, a Barton block manifold assembly was installed, serviced, balanced, and zeroed. During 24 April 1989 through 17 May 1989, no data were collected because of bad chart drive linkage. The unit was replaced, serviced, balanced, and zeroed. Steam temperature was also checked and adjusted, which accounts for the sudden indicated increase in steam temperature at this time. From 12 June through 7 July 1989, steam temperature data were not collected because of a bad thermocouple housing. Repairs were completed 7 July 1989, and the steam temperature meter was reset and calibrated against two thermometers. In early June 1989, the Geothermal Field Operator, California Energy Co., Inc. (CECI), added a gas tracer chemical to the unused geothermal fluids being reinjected at the BLM-East production site about 4 miles south of Coso Hot Springs. The chemical was added in an attempt to chart the movement of fluids within that field. As part of the test, the Navy requested that CECI also sample steam well 4P-2 to test for tracer breakthrough. No tracer was found there, but total steam flow decreased and was erratic from 12 June through 30 September 1989 while tracer samples were being taken. The meter was serviced, balanced, and zeroed several times to no avail. The meter will be reserviced upon completion of tracer testing.

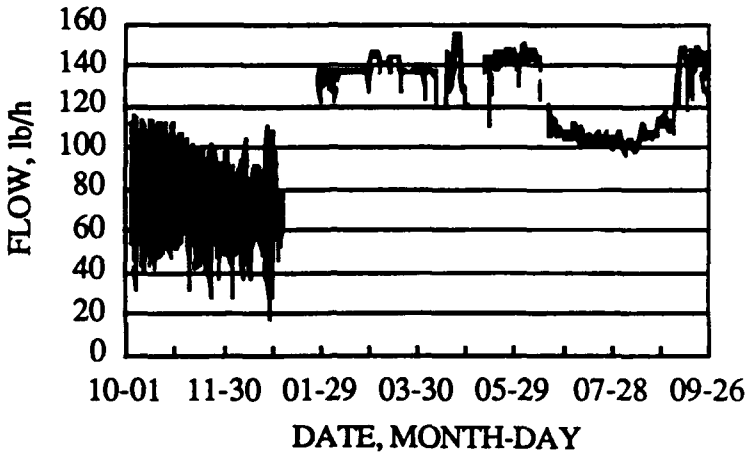


FIGURE 5. Two-Inch Steam Well Steam Flow, 1 October 1988 Through 30 September 1989.

TABLE 4. Two-Inch Steam Well Statistical Steam Flow Data, Pounds Per Hour (lb/h).

Date	High daily flow		Low daily flow	
	Mean	Standard deviation	Mean	Standard deviation
1 Oct 88 - 30 Sep 89	120.3	22.2	103.3	37.4
29 Jan 89 - 30 Sep 89	130.3	17.1	125.3	16.9

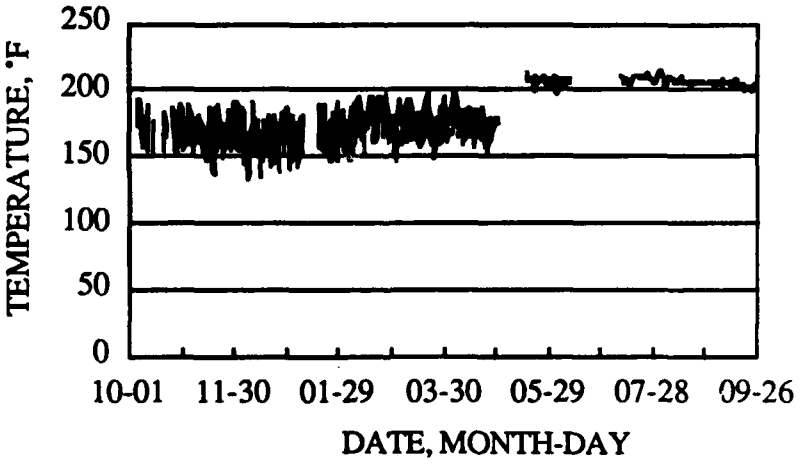


FIGURE 6. Two-Inch Steam Well Steam Temperature (°F), 1 October 1988 Through 30 September 1989.

TABLE 5. Two-Inch Steam Well Statistical Steam Temperature Data, °F.

Date	High daily temperature		Low daily temperature	
	Mean	Standard deviation	Mean	Standard deviation
1 Oct 88 - 30 Sep 89	189.9	14.6	176.1	23.3

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

The daily steam flow for the Eight-Inch "Stove Pipe" Well (4H-4) is presented in Appendix A as Table A-4. These data are shown graphically in Figure 7. Yearly mean data and standard deviations for the high and low daily steam flow at this site are presented in Table 6.

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. It has a 50-inch water column Barton meter and recorder for continuous steam flow monitoring. The orifice diameter is 1.25 inches, resulting in a calibration factor of 46.58. The 50-inch water column meter replaced the 25-inch water column meter on 28 April 1989 because of increased steam flow. On 10 March 1989 the monitoring system was replumbed using 1/2-inch-diameter copper tubing, and a Barton block manifold assembly was installed because of deterioration of the flex line and leaks in the pipe and valve manifold assembly. As in past years, 4H-4 is not the most reliable well for data collection. The surface appearance and numerous steam vents in the surrounding area indicate that steam may be escaping into crevices because of deterioration of the well casing. Since the barrels that make up the well casing are easily corroded in the near-surface acid sulfate zone, loss of this monitoring site should not be unexpected.

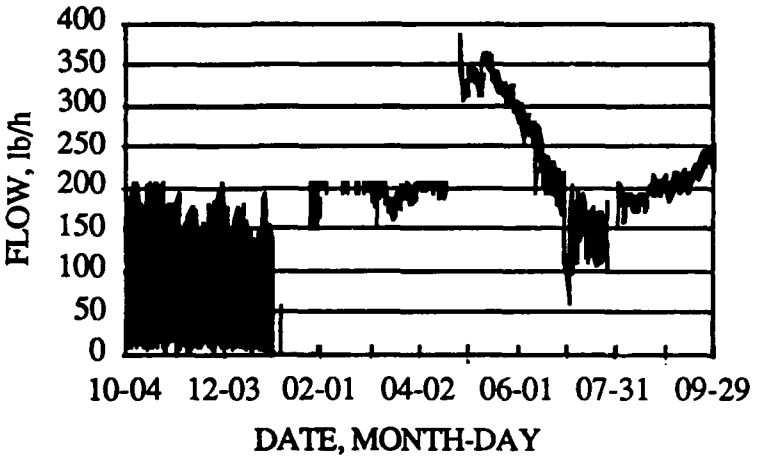


FIGURE 7. Eight-Inch "Stove Pipe" Well Steam Flow, 1 October 1988 Through 30 September 1989.

TABLE 6. Eight-Inch "Stove Pipe" Well Statistical Steam Flow Data, Pounds Per Hour (lb/h).

Date	High daily flow		Low daily flow	
	Mean	Standard deviation	Mean	Standard deviation
24 Jan 89 - 30 Sep 89	229.2	56.0	204.1	67.1

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

The daily steam flow, steam temperature, and ambient temperature data for the Schober's Resort site are presented in Appendixes A and B as Tables A-5, B-2 and B-3, respectively. The daily steam flow and temperature data are shown graphically in Figures 8 through 10. Yearly mean data and standard deviations are presented for the daily steam flow (Table 7) and steam temperature (Table 8). The ambient temperature data are shown graphically in Figure 11, and yearly mean data and standard deviations for the daily ambient temperature are shown in Table 9.

On 9 February 1989 the casing of the adjacent abandoned (plugged) well (Well 4A-3) blew out, causing a sharp decrease in steam flow from Well 4A-2 and an apparent sharp rise in ambient temperature. The ambient temperature thermocouple was in the path of blowing steam, and so was moved on 13 February 1989. A steady and severe pressure drop in the monitored well was noted as the ruptured casing worsened. On

6 June 1989 the monitoring equipment was removed to facilitate repair of the wells. Repair began immediately and the monitoring equipment was reinstalled on 28 July 1989. Two wells were connected (Well 4A-3 with a 4-inch well head and Well 4A-2 with a 2-inch well head) to a 20-foot section of 4-inch pipe with a 1.97-inch orifice plate installed to provide a conversion factor of 120 when using a 50-inch water column meter. The data recovered from this point on are not comparable with that gathered by the old data setup.

As steam activity at this site has increased, other plugged and abandoned wells have failed. (The 1977 U.S. Geological Survey Report by Moyle noted nine (9) shallow wells at the Schober's Resort site (Reference 1).) As these wells are identified, they will be reopened and rehabilitated if they are useful, or properly abandoned if they are not. By 30 September 1989 rehabilitation work was under way on two additional Wells, 4A-4 and 4A-5.

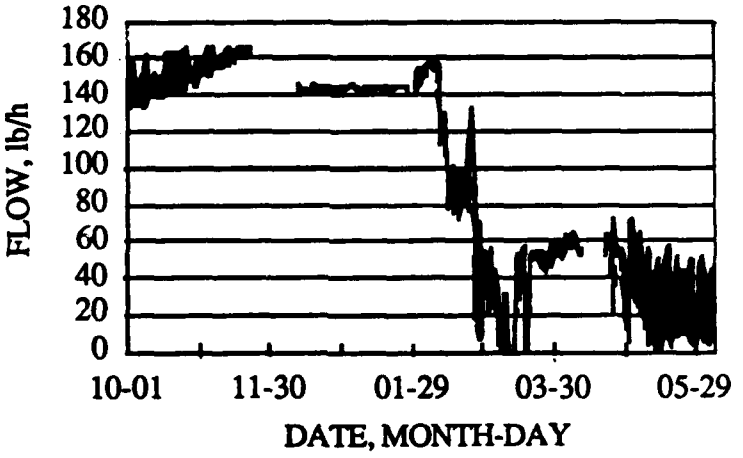


FIGURE 8. Schober's Resort Steam Flow, 1 October 1988 Through 6 June 1989.

TABLE 7. Schober's Resort Statistical Steam Flow Data, Pounds Per Hour (lb/h).

Date	High daily flow		Low daily flow	
	Mean	Standard deviation	Mean	Standard deviation
1 Oct 88 - 6 Jun 89	108.6	49.3	93.1	58.8
31 Jul 89 - 30 Sep 89	1100.9	45.6	1093.0	46.0

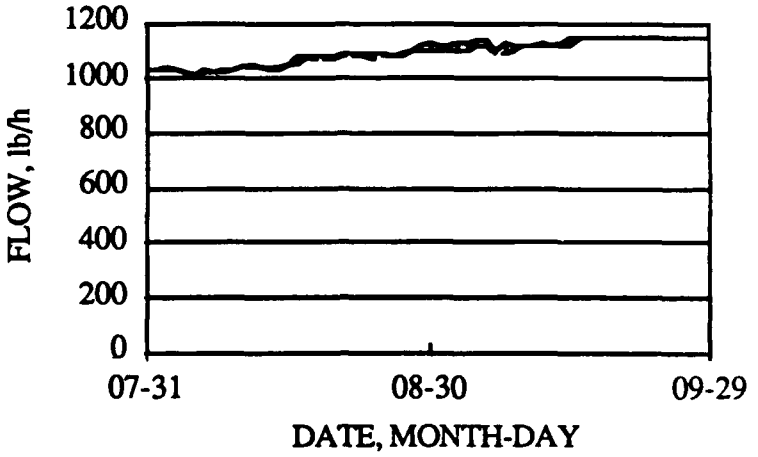


FIGURE 9. Schober's Resort Steam Flow, 31 July 1989 Through 30 September 1989.

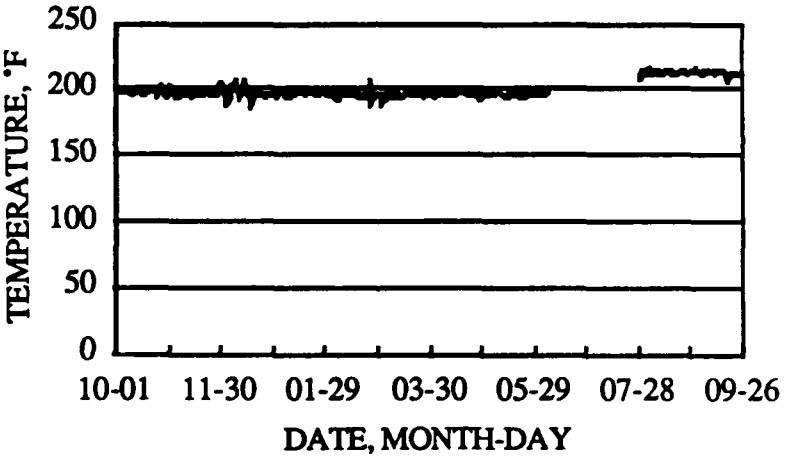


FIGURE 10. Schober's Resort Steam Temperature (°F),
1 October 1988 Through 30 September 1989.

TABLE 8. Schober's Resort Statistical Steam Temperature, °F.

Date	High daily temperature		Low daily temperature	
	Mean	Standard deviation	Mean	Standard deviation
1 Oct 88 - 30 Sep 89	200.8	6.6	198.3	7.1

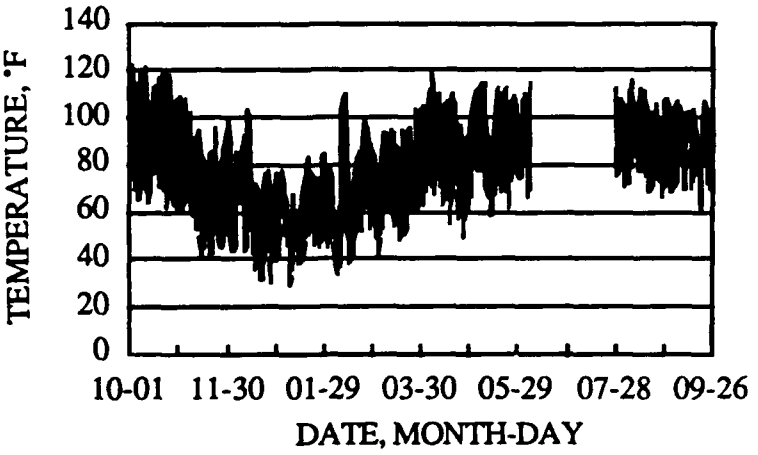


FIGURE 11. Schober's Resort Ambient Temperature (°F), 1 October 1988 Through 30 September 1989.

TABLE 9. Schober's Resort Statistical Ambient Temperature, °F.

Date	High daily temperature		Low daily temperature	
	Mean	Standard deviation	Mean	Standard deviation
1 Oct 88 - 30 Sep 89	93.3	16.3	62.7	13.9

COSO MUD POTS

The daily high and low ambient and mud temperatures at the Coso Resort Mud Pot site are presented in Appendix B as Tables B-4 and B-5.. The monitoring equipment was removed on 10 January 1989 because of rapid deterioration of the site. Weekly photographic coverage of the site is still ongoing.

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 at Coso. This project will continue into the production and power-generation stages of the geothermal development.

Figures 12 through 23 illustrate seasonal variations in the fluid levels at two Coso sites. The largest pool is the South Pool, which is located inside a circular excavation along the Airport Lake-Coso Hot Springs fault scarp, approximately 1000 feet south of the main resort area. The other site includes three mud pots located in the fenced compound adjacent to and south of the main Coso Resort building. A complete weekly photographic series is maintained by the Geothermal Program Office, NWC.

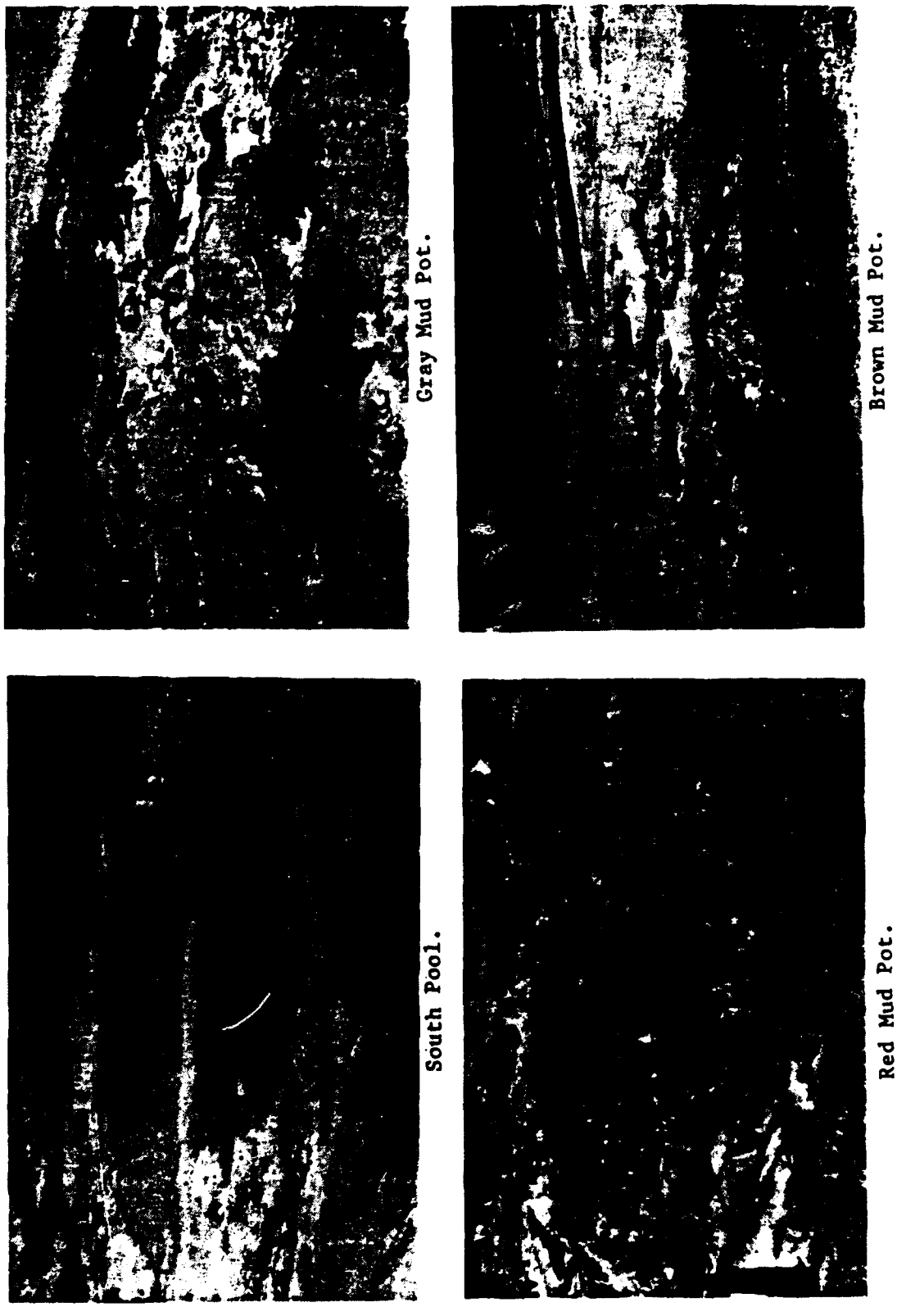
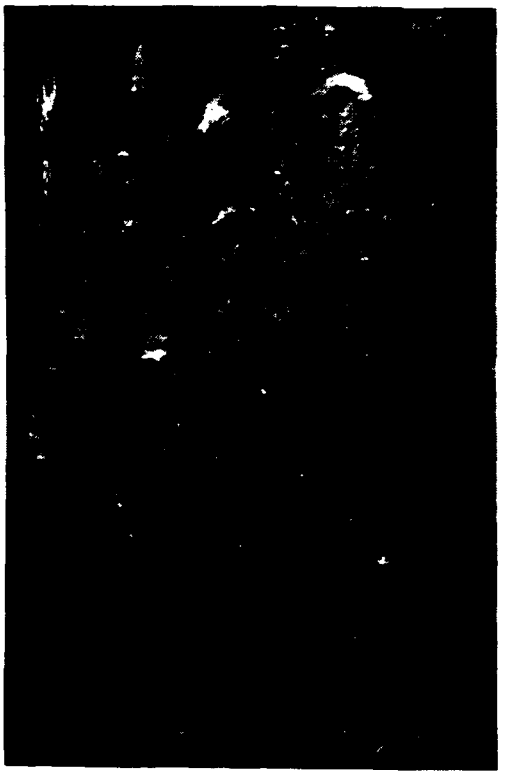


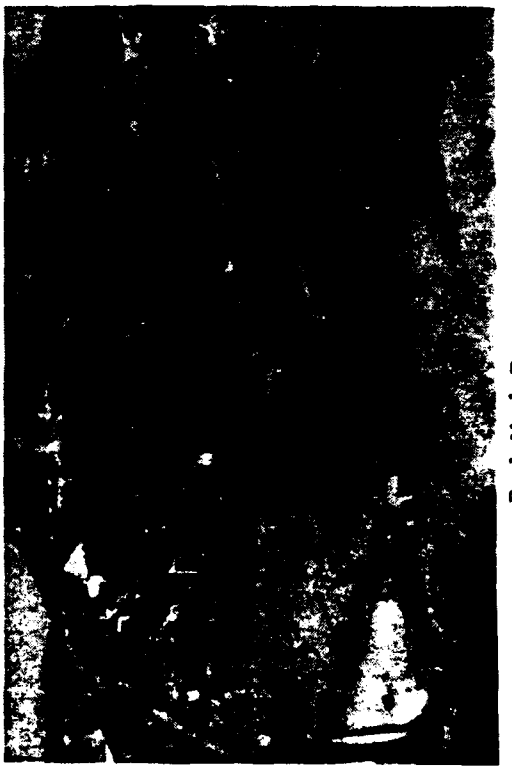
FIGURE 12. Coso Mud Pots, 4 October 1988.



Gray Mud Pot.

Brown Mud Pot.

South Pool.



Red Mud Pot.

FIGURE 13. Coso Mud Pots, 14 November 1988.

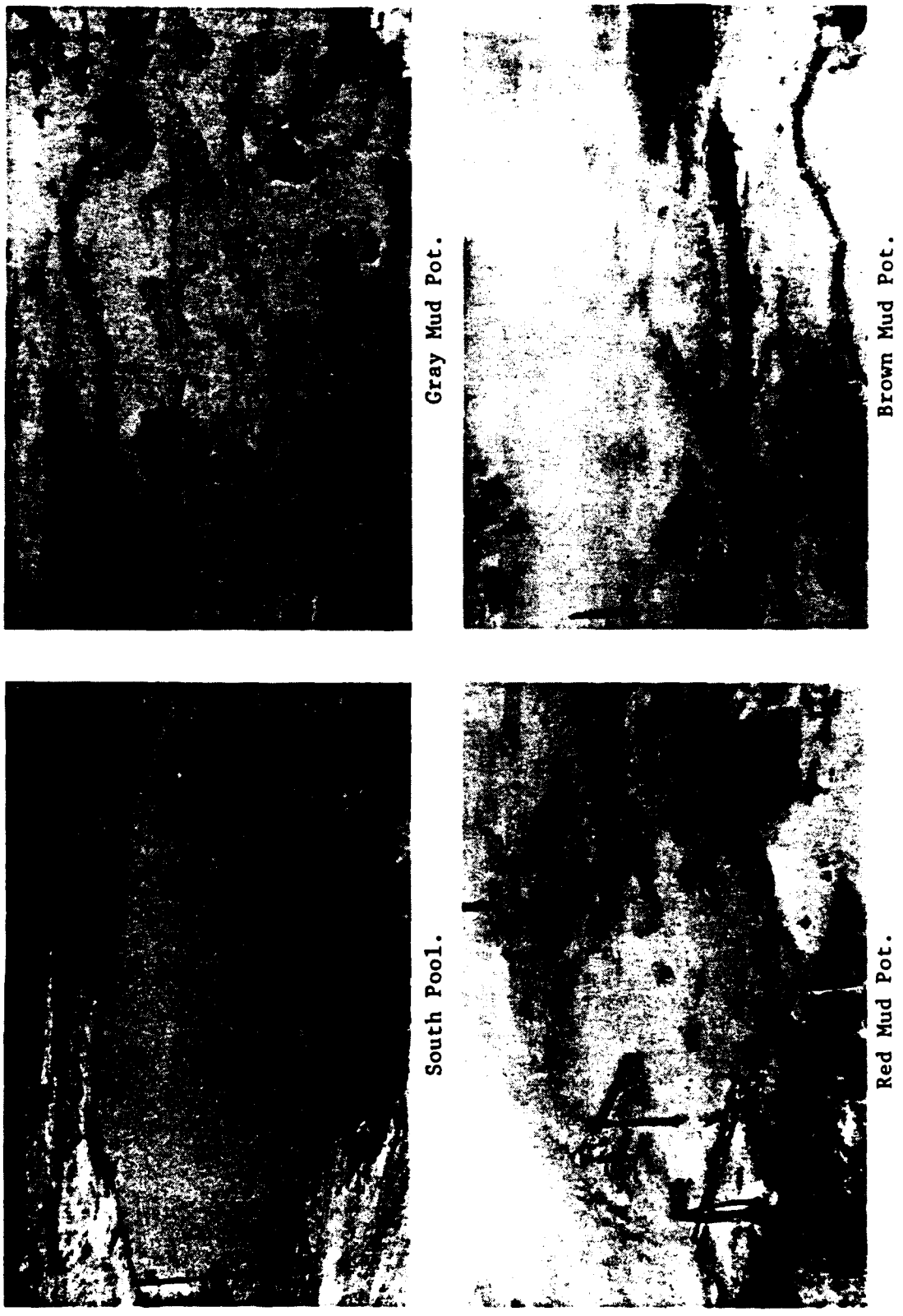


FIGURE 14. Coso Mud Pots, 6 December 1988.

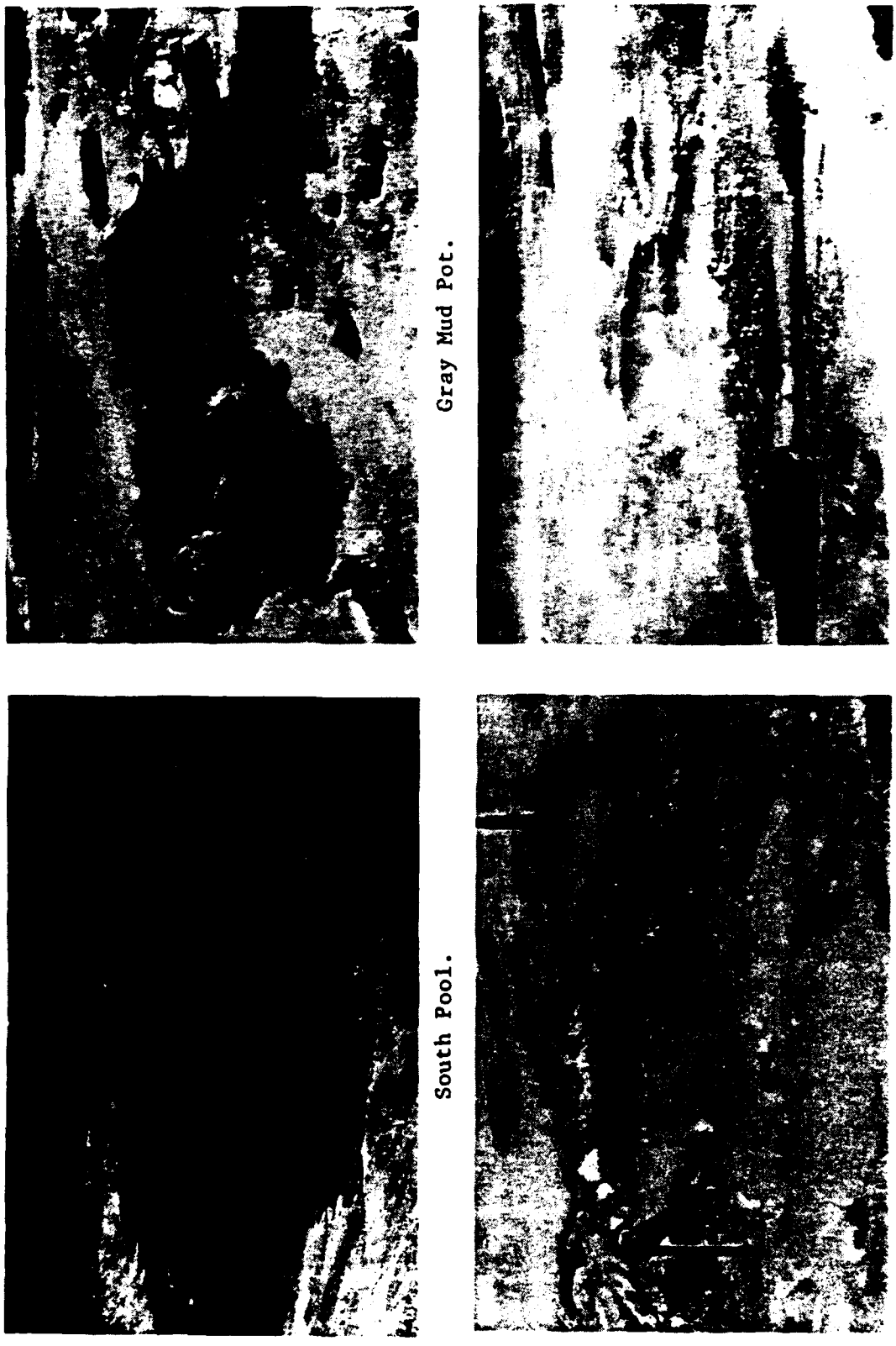


FIGURE 15. Coso Mud Pots, 3 January 1989.

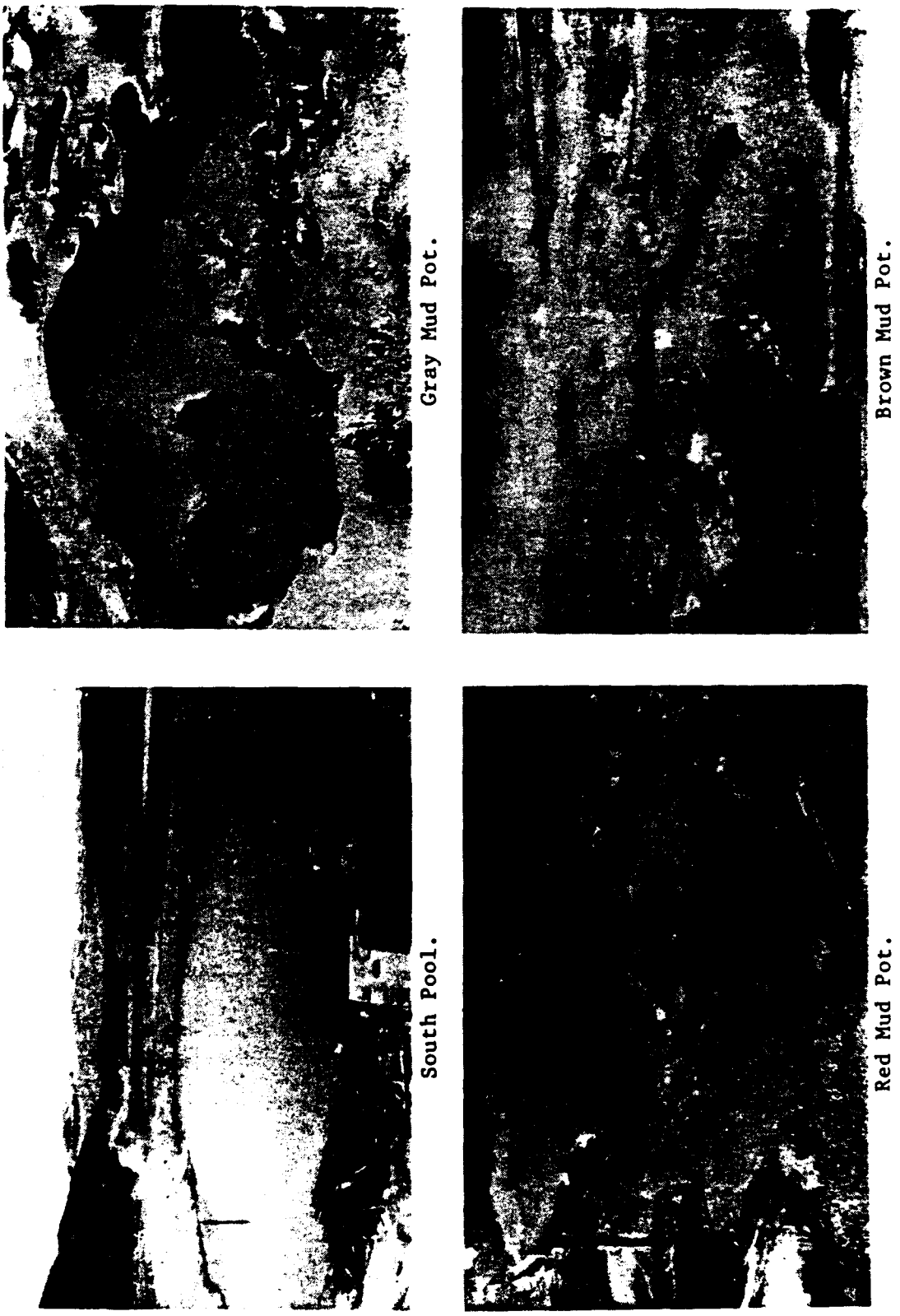


FIGURE 16. Coso Mud Pots, 13 February 1989.

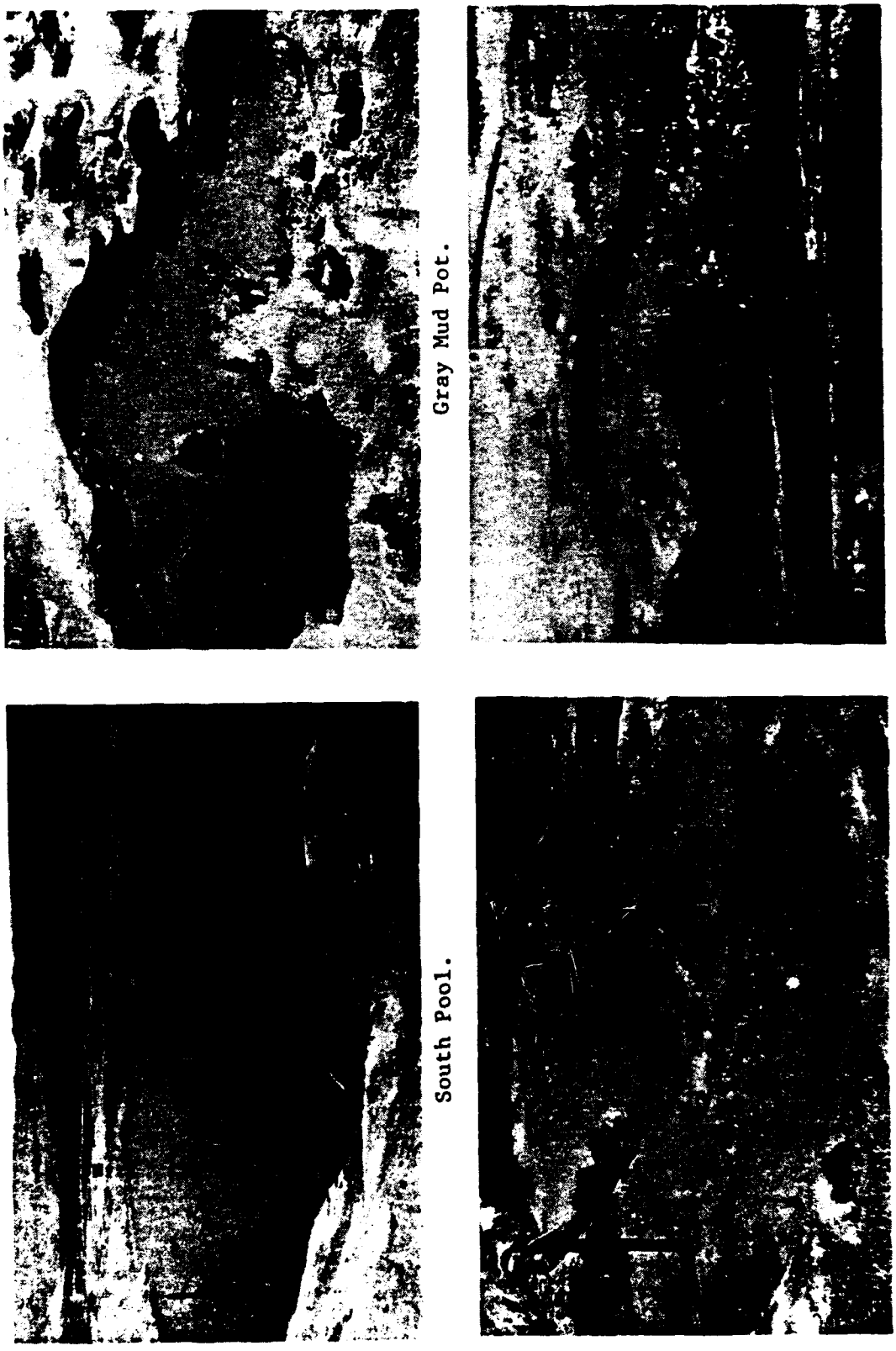
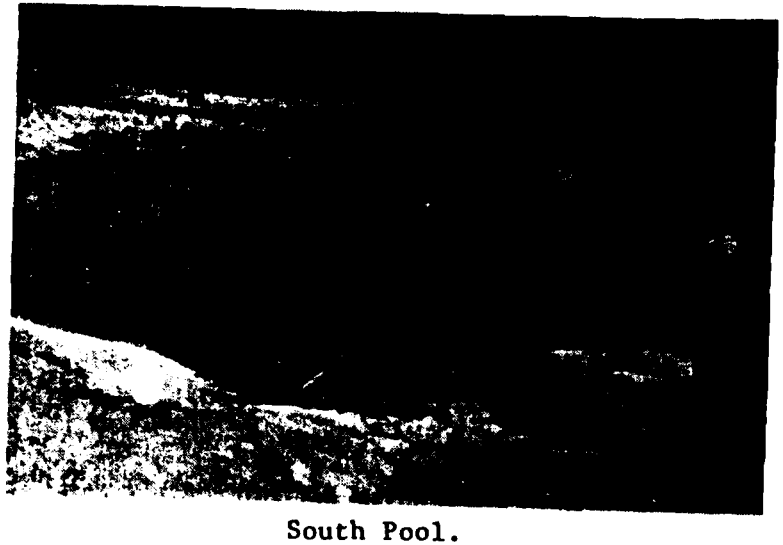
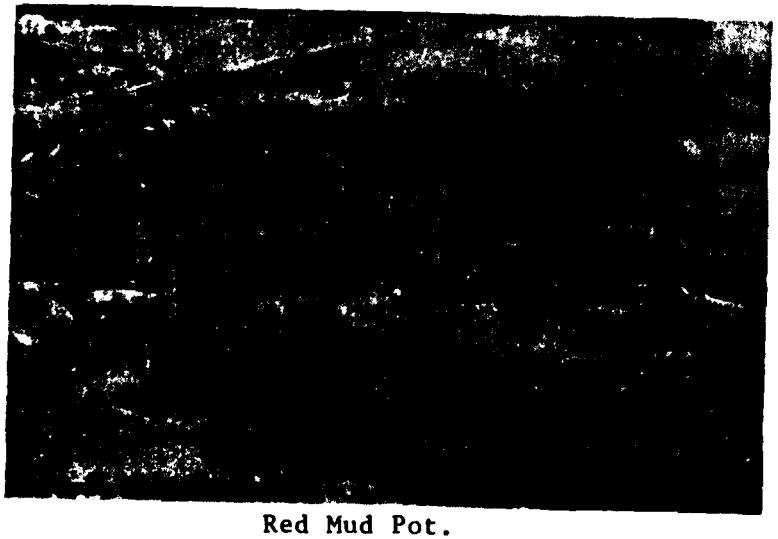


FIGURE 17. Coso Mud Pots, 6 March 1989.

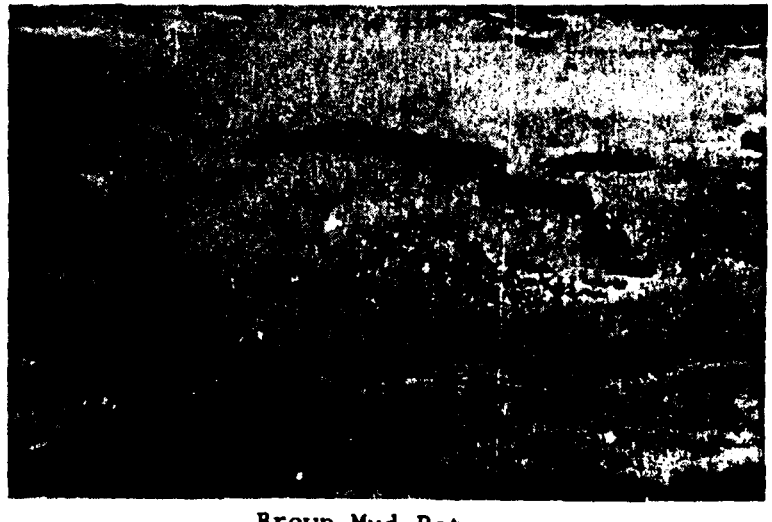


South Pool.

Gray Mud Pot.



Red Mud Pot.



Brown Mud Pot.

FIGURE 18. Coso Mud Pots, 3 April 1989.

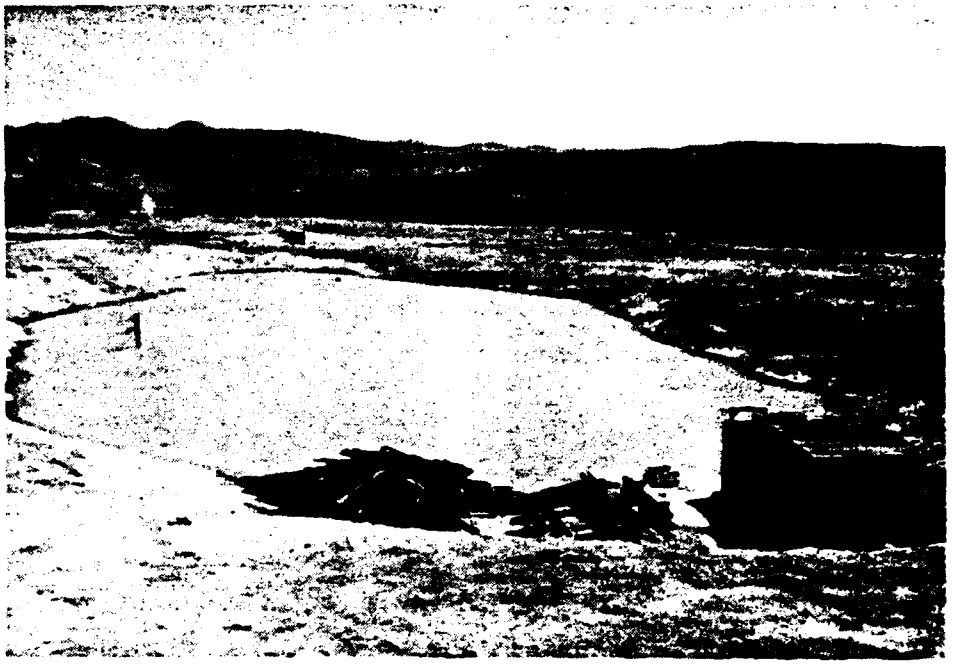
Gray Mud Pot.

Brown Mud Pot.

South Pool.

Red Mud Pot.

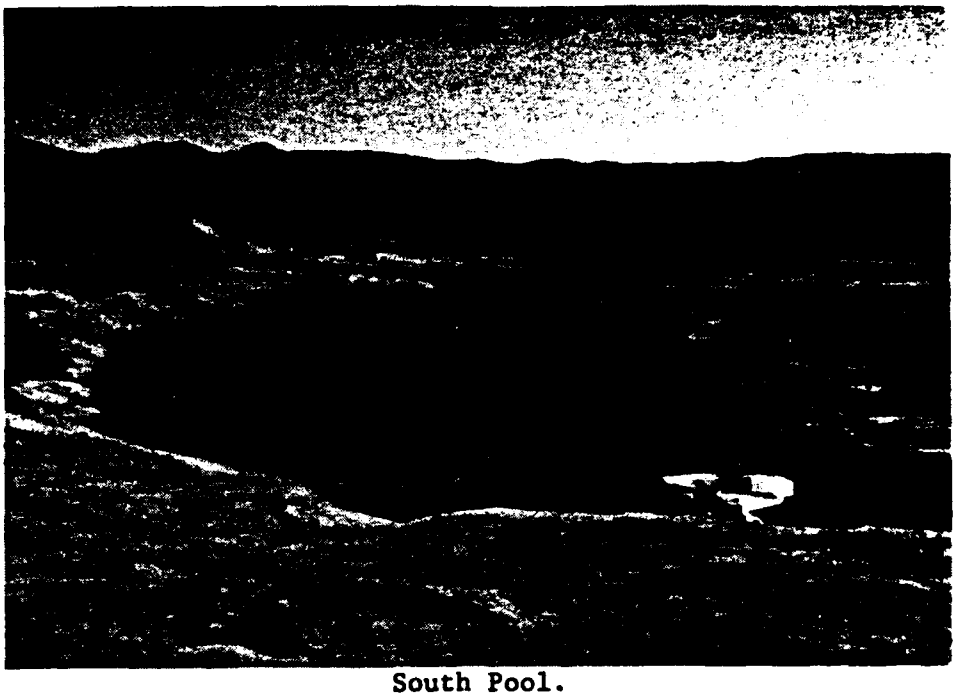
FIGURE 19. Coso Mud Pots, 8 May 1989.



South Pool.

Mud Pots.

FIGURE 20. Coso Mud Pots, 12 June 1989.



South Pool.

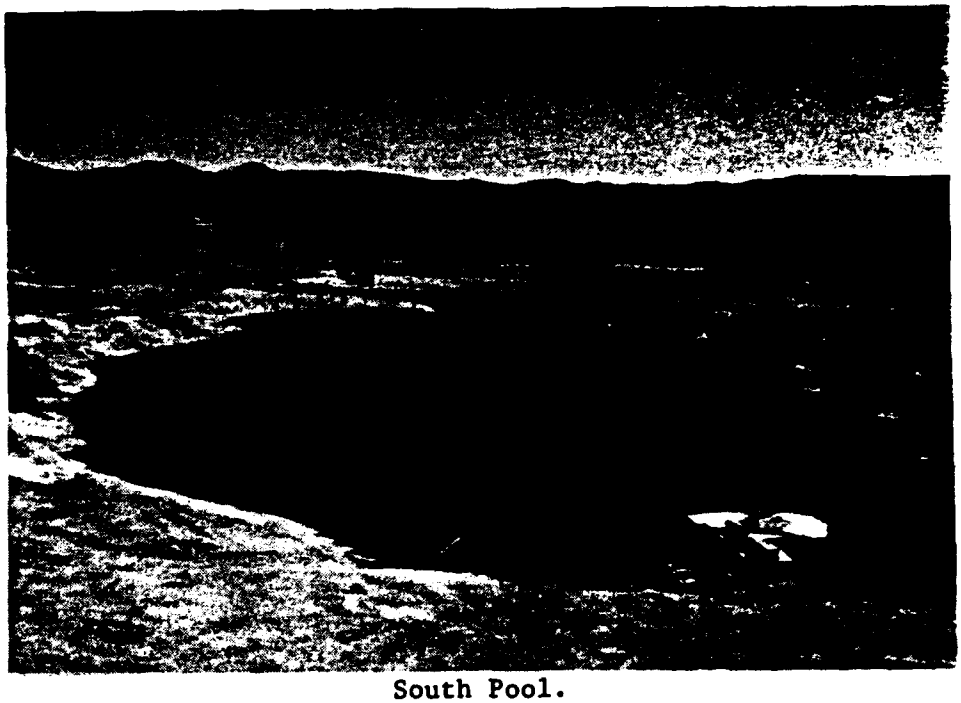
Mud Pots.

FIGURE 21. Coso Mud Pots, 3 July 1989.

South Pool.

Mud Pots.

FIGURE 22. Coso Mud Pots, 5 August 1989.



South Pool.

Mud Pots.

FIGURE 23. Coso Mud Pots, 6 September 1989.

WATER LEVEL MONITORING

OBSERVATION WELLS

Water levels are monitored in five wells in the Coso Hot Springs area. Water levels are taken weekly at Well 4-P1 and Observation Wells (OB) No. 1, 2 and 3, and intermittently at Coso Well No. 1 (4H-8). At Well 4-P1 and the three Observation Wells, water levels are measured by pressurizing a water filled pipe with nitrogen and reading the pressure until the water is forced out of the pipe. Manometer readings are also taken at the same time to compare readings for accuracy. Due to the violent boiling in Well 4H-8, direct water level measurement is difficult. Based on temperature logs the water level is estimated to be 150 to 155 feet. Water level data for the other wells is given in Table 10.

SOUTH POOL

A review of last year's report (Reference 2) revealed that the South Pool elevation measurements did not match the photographs of the pool for the same days. On further investigation we found an apparent propensity for error built into the water level meter, as the same sort of inconsistency occurs in most of the past reports (References 3 through 7) as well.

To correct the problem, all of the published South Pool photographs for the years 1980 through 1989 were visually arranged by water level. The few photographs with known, surveyed, levels were identified and the remaining water level changes extrapolated from these points. Some of the levels may be as much as 3/10 foot off the true elevation, but for the entire period, 1980 through 1988, they are internally consistent. The corrected water elevations are presented in Table 11 and are shown graphically in Figure 24. As the pool rose past historic levels this year, several points in and around the pool area have been surveyed, providing points of reference by which to accurately gauge future changes. The weekly water level data for October 1988 through September 1989 are presented in Table 12 and Figure 25. In addition we began recording weekly water temperature in April 1989. These data are also presented in Table 12 and Figure 25.

We should note that the South Pool was the site used to sample for fluorescein tracer during the first fluid-tracer test run on the 41-pad reinjection wells by CECI. No evidence of tracer was found here.

TABLE 10. Observation Well Water Level Data, Feet Below Ground Level.

	WELLS							
	4P-1		OB1		OB2		OB3	
DATE	Gas Tube	Mano-meter	Gas Tube	Mano-meter	Gas Tube	Mano-meter	Gas Tube	Mano-meter
1 Mar 89	65.31	69.35	139.43	139.05	210.68	209.62	380.13	379.37
7 Mar 89	65.31	67.97	...	...	...	...	...	...
8 Mar 89	...	...	138.85	138.22	210.26	209.67	380.36	379.55
14 Mar 89	64.86	64.89	139.78	...	210.83	...	379.90	...
22 Mar 89	64.74	64.79	139.78	138.85	210.95	209.16	380.13	379.50
29 Mar 89	64.74	64.70	139.78	140.04	210.95	209.84	379.90	379.46
4 Apr 89	65.20	65.25	139.54	139.67	210.30	208.70	379.80	379.70
11 Apr 89	65.20	65.16	139.54	139.67	209.14	209.13	379.70	380.90
18 Apr 89	64.97	64.89	139.54	139.77	209.20	209.17	379.89	380.30
25 Apr 89	65.40	67.20	139.67	141.06	209.20	209.70	380.30	380.30
2 May 89	64.49	66.73	140.23	141.94	209.88	208.68	379.30	379.30
9 May 89	...	...	140.23	141.63	209.21	209.04	379.78	380.17
16 May 89	64.26	66.36	140.23	141.05	209.21	209.66	379.44	380.07
23 May 89	64.86	66.83	140.23	140.80	207.94	209.66	379.44	380.07
31 May 89	...	...	139.76	141.71	209.44	209.49	378.63	380.03
6 Jun 89	66.06	68.13	139.76	141.63	209.44	209.91	378.63	380.62
13 Jun 89	65.46	66.74	139.76	142.24	209.44	208.46	378.97	381.12
20 Jun 89	65.46	67.15	139.76	141.94	209.21	207.63	378.97	379.99
28 Jun 89	65.46	66.55	139.99	142.87	208.51	206.55	378.04	380.08
3 Jul 89	64.86	66.37	139.77	142.91	207.94	206.51	378.63	380.66
11 Jul 89	65.46	65.81	140.00	143.00	208.52	206.46	378.74	379.99
18 Jul 89	64.86	66.46	139.76	145.34	207.94	206.56	378.05	379.90
25 Jul 89	64.86	66.55	139.76	142.25	207.13	205.53	377.47	380.44
1 Aug 89	64.86	66.81	140.23	142.03	207.13	205.04	378.05	380.26
10 Aug 89	64.50	65.53	140.57	143.05	207.13	205.53	377.47	379.63
17 Aug 89	64.50	65.68	140.57	143.05	207.13	205.44	377.47	379.63
22 Aug 89	64.86	65.90	140.57	143.00	207.13	205.53	377.47	379.73
29 Aug 89	65.46	66.96	140.57	143.80	207.15	205.53	377.47	379.41
7 Sep 89	64.85	65.76	140.57	142.73	206.90	205.90	377.47	379.28
12 Sep 89	64.85	65.53	140.57	142.78	206.21	206.55	377.47	379.81
19 Sep 89	66.06	65.53	140.53	143.00	205.63	205.66	377.47	379.90
26 Sep 89	64.49	65.81	140.57	143.00	205.63	205.57	377.47	379.93

TABLE 11. Corrected South Pool Water Level Elevations.

Month	Elevation, ft									
	Year									
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Jan	3615.00	3614.25	3614.20	3615.50	3614.95	3615.60	3614.30	3615.10	3615.30	3617.08
Feb	3615.05	3614.80	3614.70	3615.80	3614.95	3615.55	3614.85	3614.90	3615.45	3617.66
Mar	3615.90	3615.00	3614.70	3616.36	3614.75	3615.20	3614.85	3615.05	3615.45	3617.87
Apr	3615.00	3614.90	3614.90	3616.16	3614.30	3615.05	3614.35	3615.10	3615.55	3617.83
May	3614.90	3614.30	3614.45	3615.70	3613.95	3614.10	3613.35	3614.75	3615.20	3618.78
Jun	3614.75	3613.70	3614.15	3614.90	3613.45	3613.65	3612.95	3614.25	3614.95	3617.71
Jul	3613.30	3612.95	3613.30	3613.95	3612.85	3612.95	3612.25	3613.35	3614.55	3617.77
Aug	3612.55	3612.25	3612.70	3613.15	3614.00	3610.80	3611.75	3613.15	3614.30	3617.83
Sep	3611.75	3610.80	3613.70	3612.70	3613.75	3610.80	3611.25	3612.70	3614.80	3618.07
Oct	3612.15	3612.05	3613.30	3613.30	3613.45	3612.55	3610.85	3612.70	3614.93	---
Nov	3612.55	3612.55	3613.65	3613.65	3614.15	3612.70	3612.95	3613.80	3615.37	---
Dec	3613.25	3613.85	3614.95	3614.30	3615.95	3614.30	3613.45	3614.80	3616.20	---

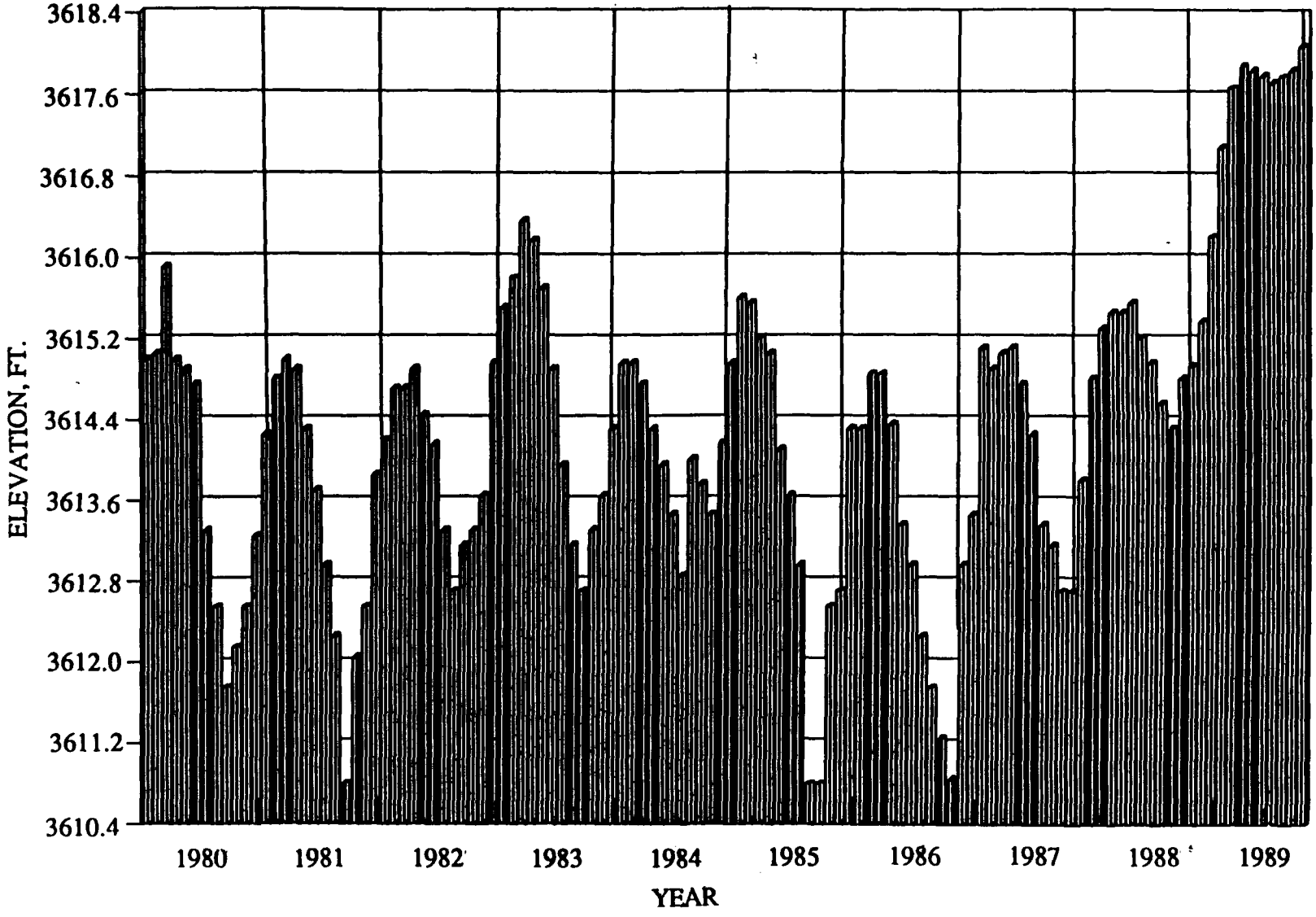


FIGURE 24. Corrected South Pool Water Elevations, January 1980 Through September 1989.

TABLE 12. South Pool Elevation and Temperature Changes.

Date	True elevation, ft	Water temperature, °F
4 Oct 88	3,614.93	...
11 Oct 88	3,614.99	...
24 Oct 88	3,615.24	...
31 Oct 88	3,615.24	...
8 Nov 88	3,615.37	...
14 Nov 88	3.615.37	...
22 Nov 88	3,615.53	...
28 Nov 88	3,615.89	...
6 Dec 88	3,616.20	...
4 Jan 89	3,617.08	...
17 Jan 89	3,617.37	...
24 Jan 89	3,617.40	...
30 Jan 89	3,617.54	...
13 Feb 89	3,617.87	...
6 Mar 89	3,617.87	...
13 Mar 89	3,617.85	...
20 Mar 89	3,617.83	...
27 Mar 89	3,617.83	...
3 Apr 89	3,617.83	99.00
10 Apr 89	3,617.83	101.00
17 Apr 89	3,617.76	...
25 Apr 89	3,617.78	...
1 May 89	3,617.78	100.00
8 May 89	3,617.79	103.00
17 May 89	3,617.74	...
22 May 89	3,617.76	110.00
23 May 89	3,617.76	...
30 May 89	3,617.66	101.00
5 Jun 89	3,617.71	112.00
12 Jun 89	3,617.86	122.00
19 Jun 89	3,617.76	128.00
28 Jun 89	3,617.66	126.00
3 Jul 89	3,617.77	126.00
10 Jul 89	3,617 71	132.00
17 Jul 89	3,617.77	140.00
24 Jul 89	3,617.77	146.00
31 Jul 89	3,617.77	146.00
7 Aug 89	3,617.83	140.00
15 Aug 89	3,617.88	140.00
21 Aug 89	3,617.93	146.00
28 Aug 89	3,618.00	146.00
6 Sep 89	3,618.07	136.00
11 Sep 89	3,618.11	136.00
18 Sep 89	3,618.21	132.00
25 Sep 89	3,618.40	140.00

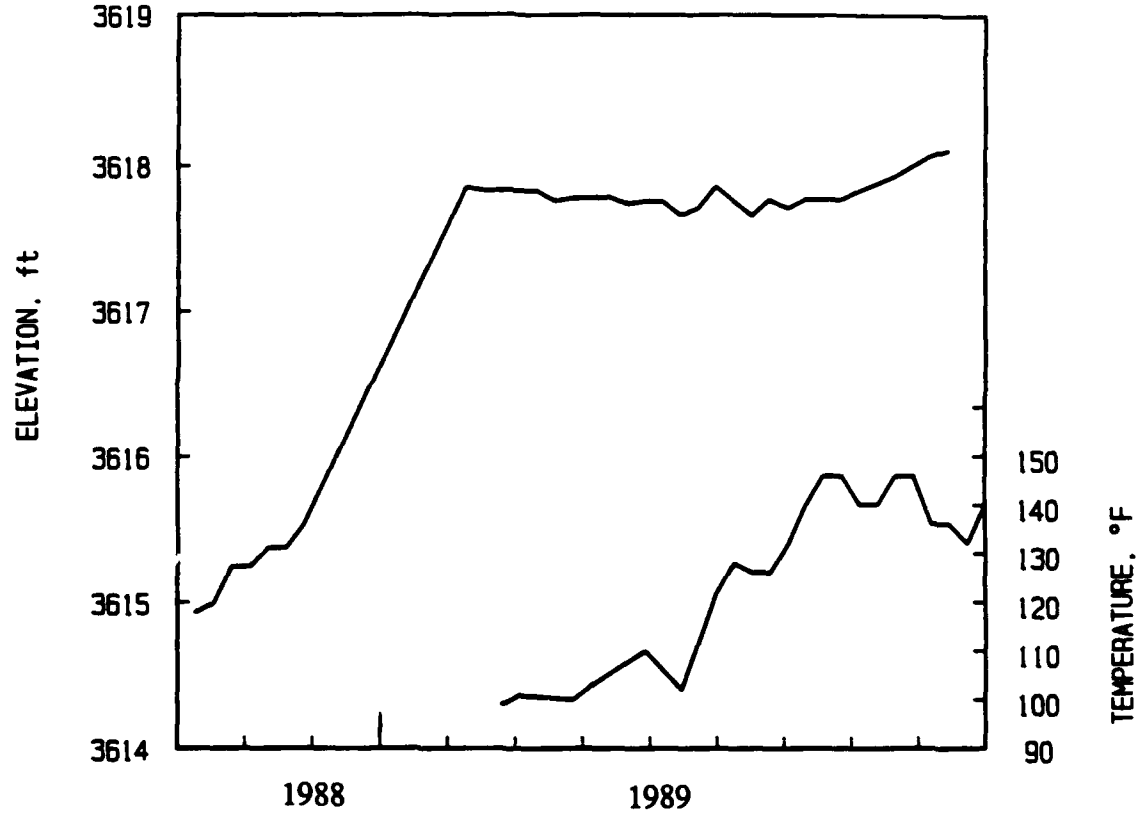


FIGURE 25. South Pool Elevation and Temperature Changes, October 1988 Through September 1989.

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 battery-operated strip recorders that are triggered by a tipping bucket. This equipment is minimally affected by evaporation.

During this reporting period there were several interruptions in recorder operation due to battery failure. New battery packs have been installed at all sites. Also the motor drive of rain gauge No. 3 failed and had to be replaced. All five sites are now checked on a bimonthly schedule.

Data from the Coso Stations presented in Table 13 show daily average and cumulative rainfall. The Rose Valley data (Table 14) are collected at the Los Angeles Department of Water and Power (LADWP) Haiwee Reservoir Plant. As shown in Figure 26, the Coso area has almost consistently received less annual rainfall than Rose Valley. This lower rainfall is, in part, due to the nature of high-desert storms that often result in a significant precipitation differential between two closely spaced sites.

As a reference to historical regional rainfall levels, we have included a table and graph of the yearly Indian Wells Valley (IWV) rainfall versus the Rose Valley and Coso Basin data (Table 15 and Figure 27). The IWV data was gathered at Armitage Field, Naval Weapons Center (NWC), and was provided by the NWC meteorologist.

TABLE 13. Rainfall Recorded at Coso Monitoring Stations, Inches.

Date	Tipping bucket stations				
	1	2	3	4	5
4 Nov 88	---	X	---	---	.01
17 Nov 88	.01	X	---	---	---
24 Nov 88	---	X	.03	---	---
25 Nov 88	---	X	.04	---	---
26 Nov 88	---	X	---	.04	---
27 Nov 88	---	X	---	---	.04
8 Dec 88	.04	X	X	---	---
16 Dec 88	.01	X	X	---	---
17 Dec 88	.02	X	X	.01	.01
20 Dec 88	.09	X	X	---	.07
21 Dec 88	.03	X	X	.03	---
22 Dec 88	.03	X	X	---	.02
23 Dec 88	---	X	X	.02	---
24 Dec 88	.18	X	X	.05	.04
25 Dec 88	.01	X	X	.15	---
3 Jan 89	.06	X	X	---	.02
4 Jan 89	.09	X	X	.07	.05
5 Jan 89	.01	X	X	---	---
31 Jan 89	---	X	X	---	.01
3 Feb 89	---	X	X	.01	---
6 Feb 89	---	X	X	.03	---
8 Feb 89	---	X	X	X	.02
9 Feb 89	---	X	X	X	.34
10 Feb 89	---	.11	X	X	---
2 Mar 89	---	X	X	X	.13
24 Mar 89	---	X	---	---	.02
11 May 89	.08	.06	.09	.06	---
13 May 89	---	---	---	.01	---
14 May 89	.02	.01	.07	---	---
15 May 89	.02	.03	.02	---	---
3 Jun 89	.01	---	---	---	---
15 Jun 89	.01	---	---	---	X
8 Aug 89	.01	---	X	---	X
17 Sep 89	.43	.24	X	.31	X
19 Sep 89	.01	.04	X	.06	.05
TOTAL	1.18	0.49	0.25	0.85	0.83

NOTE: Stations 1, 2, and 3 were read intermittently throughout FY1989. Stations 4 and 5 were read after each rain.

TABLE 14. Rose Valley Cumulative Rainfall, October 1988 Through September 1989.

Date	Daily, in.	Snowfall, in.	Cumulative, in.
25 Nov 88	...	1	...
16 Dec 88	...	6	...
17 Dec 88	...	melted 0.75	0.75
21 Dec 88	.12	...	0.87
25 Dec 88	.35	...	1.22
4 Jan 89	.01	...	1.23
8 Feb 89	.02	2	1.25
9 Feb 89	.93	9	2.18
3 Mar 89	.28	...	2.46
26 Apr 89	.03	...	2.49
13 May 89	.36	...	2.85
9 Aug 89	.10	...	2.95
17 Sep 89	.05		3.00
19 Sep 89	.02	...	3.02
20 Sep 89	0.18	...	3.20

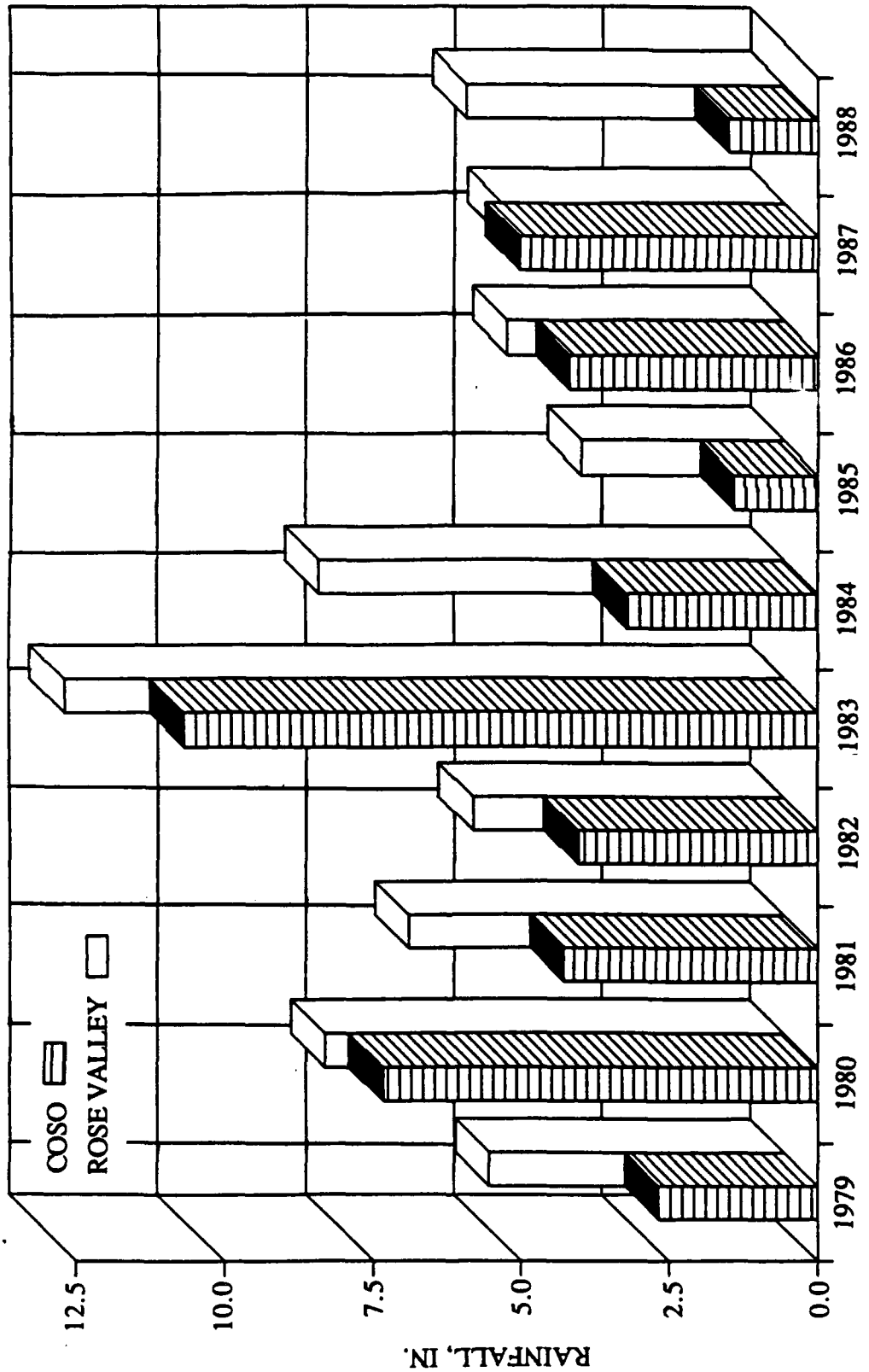


FIGURE 26. Comparison of Total Rainfall at Coso Basin and Rose Valley Sites, by Year.

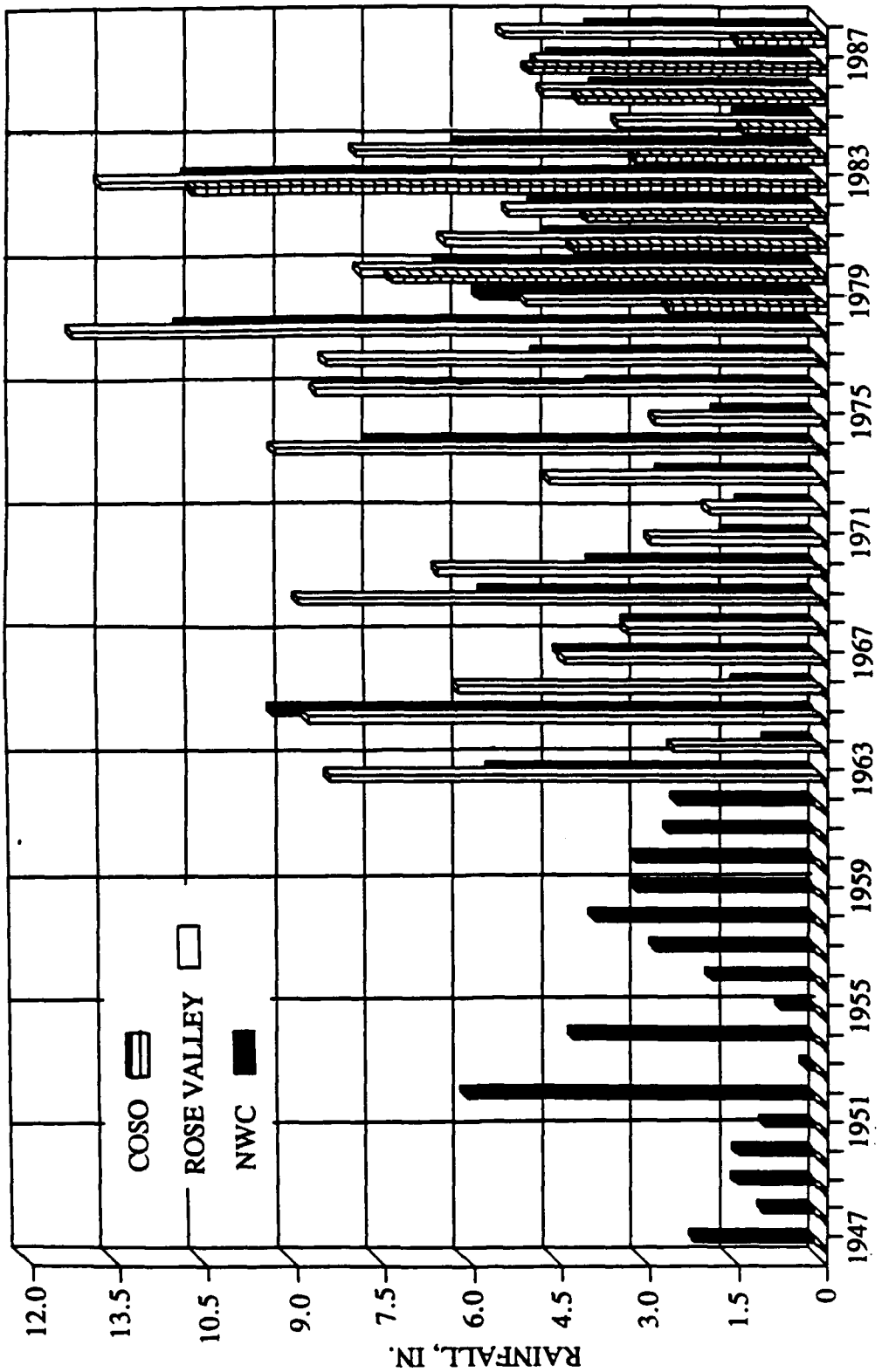


FIGURE 27. Comparison of Total Rainfall (Inches) at Coso Basin, Rose Valley and NWC Sites, by Year.

TABLE 15. IWV, Rose Valley, Coso Basin Rainfall Comparison, 1947 Through 1988.

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

TABLE 15. (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

WATER ANALYSIS OF COSO HOT SPRINGS AREA SITES

Water samples were taken from several sites in the Hot Springs area during 1989. These samples were analyzed for a suite of geothermal chemical constituents by B. C. Laboratories, Inc., Bakersfield, Calif. The results are given in Tables 16 through 22.

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

Constituent	11 Jan 89	29 Jun 89
Calcium	6.9	9.1
Magnesium	0.17	0.15
Sodium	40.0	55.0
Potassium	19.0	21.0
Hydroxide	0.0	...[a]
Carbonate	0.0	2.6
Bicarbonate	0.0	126.0
Chloride	48.0	34.0
Nitrate	< 0.4	< 0.4
Fluoride	0.37	0.48
Iron	2.5	0.45
Manganese	0.20	0.092
Arsenic	0.01	< 0.01
Copper	< 0.01	< 0.01
Zinc	0.16	0.402
Total dissolved solids	740.0	415.0
Mercury	0.017	0.0002
Aluminum	0.13	0.078
Boron	1.0	1.2
Silica	187.0	207.0
Ammonium	2.4	1.8
Lithium	0.0[4]	0.16
Bromide	...[a]	< 0.5
Antimony	...[a]	< 0.1
Selenium	...[a]	< 0.005
Strontium	...[a]	0.174
Thallium	...[a]	< 0.1
Phosphate	0.05	0.11
Electrical conductivity	...[a]	350.0
pH	...[a]	8.4

[a] Not analyzed.

TABLE 17. Chemical Analysis of Well 4K-1.

Constituent	11 Jan 89	30 Jun 89
Calcium	24.0	12.0
Magnesium	1.2	0.9
Sodium	49.0	80.0
Potassium	23.0	52.0
Hydroxide	0.0	...[a]
Carbonate	0.0	< 2.6
Bicarbonate	13.0	150.0
Chloride	< 1.8	5.0
Sulfate	210.0	130.0
Nitrate	< 0.4	2.2
Fluoride	0.54	0.46
Iron	3.5	460.01
Manganese	0.27	0.072
Arsenic	< 0.01	< 0.01
Copper	< 0.01	0.136
Zinc	0.02	0.068
Total dissolved solids	330.0	370.0
Mercury	< 0.0002	0.022
Aluminum	0.96	3.243
Boron	0.16	1.4
Silica	56.0	36.0
Ammonium	4.8	0.0026
Lithium	0.04	< 0.01
Bromide	< 0.01	< 0.01
Antimony	...[a]	< 0.1
Selenium	...[a]	0.108
Thallium	...[a]	< 0.01
Phosphate	0.07	0.09
Electrical conductivity	400.0	440.0
pH	6.6	7.5

[a] Not analyzed.

TABLE 18. Chemical Analysis of South Pool Water.

Constituent	11 Jan 89	20 Jun 89
Calcium	74.0	7.2
Magnesium	22.0	2.0
Sodium	50.0	42.0
Potassium	17.0	28.0
Hydroxide	0.0	...[a]
Carbonate	0.0	< 2.6
Bicarbonate	0.0	< 2.6
Chloride	...[a]	6.4
Sulfate	1150.0	1000.0
Nitrate	0.9	< 0.4
Fluoride	0.26	0.20
Iron	15.3	20.45
Manganese	1.5	0.165
Arsenic	< 0.01	0.049
Copper	0.27	<
Zinc	0.94	0.114
Total dissolved solids	2260.0	2010.0
Mercury	< 0.0002	0.0006
Aluminum	34.2	2.64
Boron	< 0.1	< 0.1
Silica	272.0	34.0
Ammonium	54.0	35.0
Lithium	0.11	0.1
Bromide	...[a]	< 0.5
Antimony	...[a]	< 0.1
Selenium	...[a]	< 0.005
Strontium	...[a]	< 0.10
Thallium	...[a]	< 0.1
Phosphate	0.05	0.12
Electrical conductivity	...[a]	4000.0
pH	1.7	2.1

[a] Not analyzed.

TABLE 19. Chemical Analysis of Well 4H-8 Fluids.

Constituent	Steam Condensate 4 May 89	Water 29 Jun 89
Calcium	4.5	1180.0
Magnesium	0.25	0.35
Sodium	3.0	59009.0
Potassium	0.5	9130.0
Hydroxide	...[a]	...[a]
Carbonate	< 2.6	< 2.6
Bicarbonate	26.0	772.0
Chloride	< 1.8	101598.0
Sulfate	< 5.0	1120.0
Nitrate	< 0.4	95.2
Fluoride	0.09	12.0
Iron	0.519	0.144
Manganese	0.028	0.239
Arsenic	0.011	14.66
Copper	0.045	40.0
Zinc	2.23	42.85
Total dissolved solids	55.0	180600.0
Mercury	< 0.0002	< 0.0002
Aluminum	< 0.05	< 0.05
Boron	0.23	1670.0
Silica	1.2	128.0
Ammonium	3.2	1.5
Lithium	< 0.01	520.0
Bromide	< 0.5	199.0
Antimony	< 0.1	1.352
Selenium	< 0.005	< 0.005
Strontium	0.017	77.81
Thallium	< 0.1	< 0.1
Phosphate	< 0.1	0.48
Electrical conductivity	62.0	141400.0
pH	7.4	6.8

[a] Not analyzed.

TABLE 20. Chemical Analysis of Devils Kitchen Stream.

Constituent	8 Jan 89	10 Jan 89	29 Jun 89
Calcium	52.0	54.0	59.0
Magnesium	21.0	22.0	16.0
Sodium	36.0	37.0	33.0
Potassium	31.0	31.0	20.0
Hydroxide	0.0	0.0	
Carbonate	0.0	0.0	< 2.6
Bicarbonate	0.0	0.0	26.8
Chloride	...[a]	...[a]	< 1.8
Sulfate	1120.0	1140.0	280.0
Nitrate	< 0.4	< 0.4	1.8
Fluoride	0.48	0.48	0.21
Iron	41.1	43.0	397.0
Manganese	1.5	1.6	1.39
Arsenic	0.01	0.01	< 0.1
Copper	< 0.01	< 0.01	< 0.01
Zinc	0.07	0.08	0.017
Total dissolved solids	2900.0	2000.0	690.0
Mercury	< 0.0002	< 0.0002	< 0.0002
Aluminum	14.1	14.6	51.0
Boron	3.0	3.1	< 0.1
Silica	342.0	334.0	205.0
Ammonium	11.8	11.8	4.8
Lithium	0.06	0.11	< 0.01
Bromide	...[a]	...[a]	< 0.5
Antimony	...[a]	...[a]	< 0.1
Selenium	...[a]	...[a]	< 0.005
Strontium	...[a]	...[a]	0.268
Thallium	...[a]	...[a]	< 0.1
Phosphate	0.1	0.1	2.2
Electrical conductivity	...[a]	...[a]	620.0
pH	1.8	1.6	7.2[b]

[a] Not analyzed.

[b] This value is anomalously high. The pH of the stream was checked on 15 Aug 89 and was found to be 3.5.

TABLE 21. Chemical Analysis of Mud Crater 4KC-8.

Constituent	11 Jan 89	30 Jun 89
Calcium	68.0	134.0
Magnesium	26.0	30.0
Sodium	14.0	45.0
Potassium	15.0	26.0
Hydroxide	0.0	...[a]
Carbonate	0.0	< 2.6
Bicarbonate	0.0	21.7
Chloride	< 1.8	1.8
Sulfate	425.0	620.0
Nitrate	< 0.4	4.9
Fluoride	0.93	0.20
Iron	14.0	1.06
Manganese	2.3	3.22
Arsenic	< 0.01	< 0.01
Copper	0.09	< 0.01
Zinc	0.28	0.033
Total dissolved solids	760.0	1070.0
Mercury	...[a]	0.0037
Aluminum	0.31	0.14
Boron	< 0.10	0.20
Silica	119.0	200.0
Ammonium	20.6	15.0
Lithium	...[a]	< 0.01
Bromide	< 0.10	< 0.5
Antimony	...[a]	< 0.1
Selenium	...[a]	< 0.005
Strontium	...[a]	0.349
Thallium	...[a]	< 0.1
Phosphate	0.05	0.33
Electrical conductivity	1010.0	1190.0
pH	3.4	6.2

[a] Not analyzed.

TABLE 22. Chemical Analysis of Mud Pots.

Constituent	Red Pot 8 Jan 89	Red Pot 10 Jan 89	Clear Pot 29 Jun 89
Calcium	44.0	94.0	74.0
Magnesium	12.0	44.0	30.0
Sodium	26.0	42.0	48.0
Potassium	19.0	16.0	35.0
Hydroxide	0.0	...[a]	...[a]
Carbonate	0.0	< 2.6	< 2.6
Bicarbonate	0.0	< 2.6	< 2.6
Chloride	...[a]	< 1.8	< 1.8
Sulfate	505.0	2200.0	1160.0
Nitrate	< 0.4	< 0.4	0.4
Fluoride	0.04	0.34	0.50
Iron	26.4	28.4	58.2
Manganese	0.98	3.5	2.29
Arsenic	< 0.01	< 0.01	0.012
Copper	0.20	224.0	< 0.01
Zinc	2.7	6.3	0.90
Total dissolved solids	1280.0	3400.0	2160.0
Mercury	< 0.0002	0.004	< 0.0002
Aluminum	1.2	94.3	14.0
Boron	< 0.1	2.8	3.6
Silica	206.0	385.0	304.0
Ammonium	45.0	89.0	11.6
Lithium	0.03	100.0	0.07
Bromide	...[a]	< 0.5	< 0.05
Antimony	...[a]	< 0.1	< 0.1
Selenium	...[a]	< 0.005	< 0.005
Strontium	...[a]	0.35	0.10
Thallium	...[a]	< 0.1	< 0.1
Phosphate	< 0.02	0.18	0.19
Electrical conductivity	...[a]	6000.0	4700.0
pH	1.8	2.0	2.0

[a] Not analyzed

TEMPERATURE RECORDINGS OF THE COSO RESORT AREA WELLS

The logs of recorded temperature from Coso Well No. 1 (4H-8), 4K-1, and 4P-1 are shown in Figures 28 through 30, with the data listed in Appendix C. Temperature recordings were taken on 2 August 1989. Comparative logs from 1983 and 1984 were obtained from NWC TP 6558 and NWC TP 6693 (References 8 and 9). Geothermal Program Office logging equipment, manufactured by Enviro-Labs, Inc., Glendale, Calif., was used for the temperature recordings.

OTHER GEOTHERMAL ACTIVITY AT COSO HOT SPRINGS

Numerous visual changes to the surface features have occurred this year in the Coso Hot Springs area, which indicate apparent increases in the levels of hydrothermal activity. Figures 31 through 33 show some of these changes. The following is a discussion of the various sites and what has, and has not, changed. The various wells and mud craters are shown in Figure 2 and are discussed in order south to north.

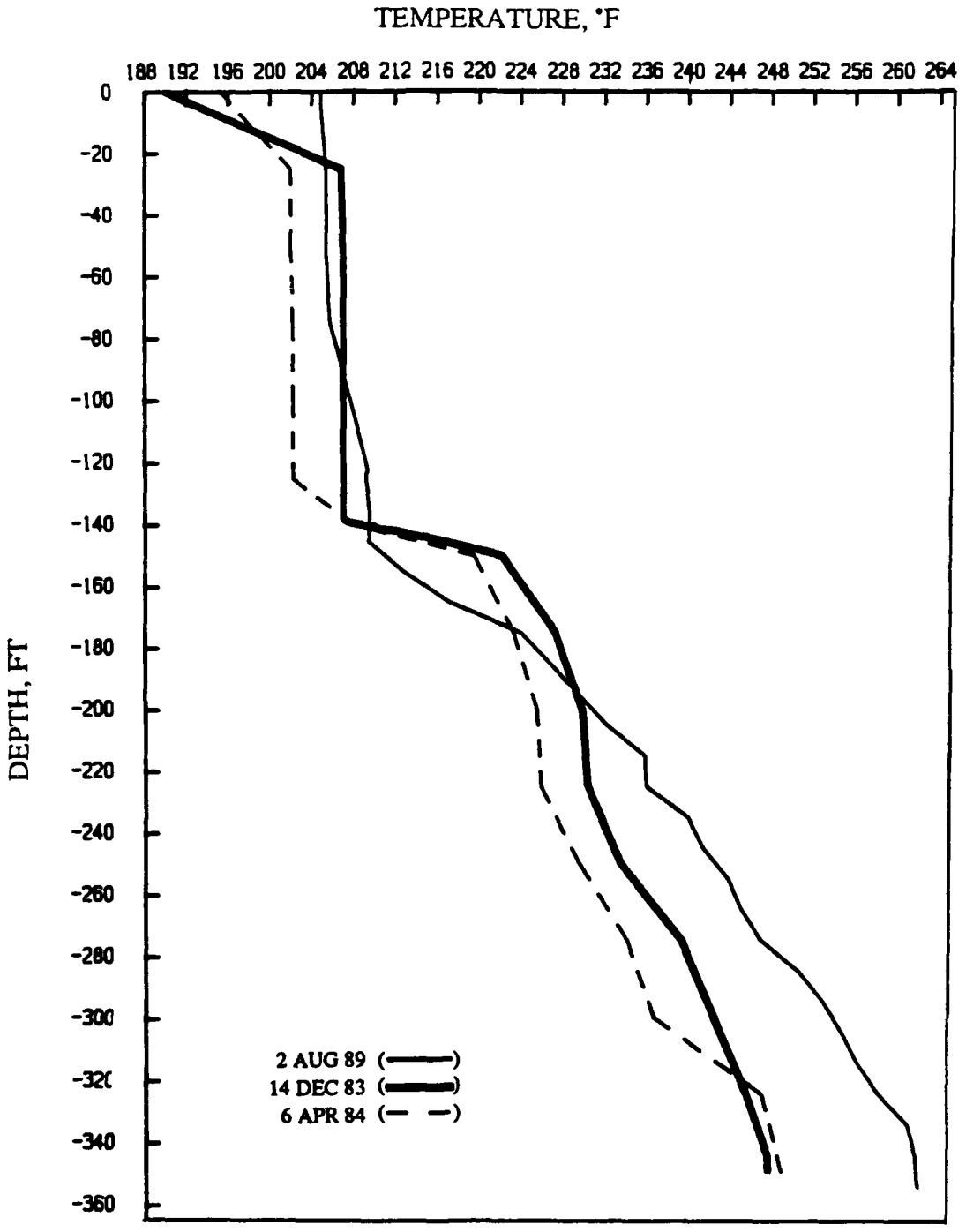


FIGURE 28. Temperature Profile, Coso Well No. 1.

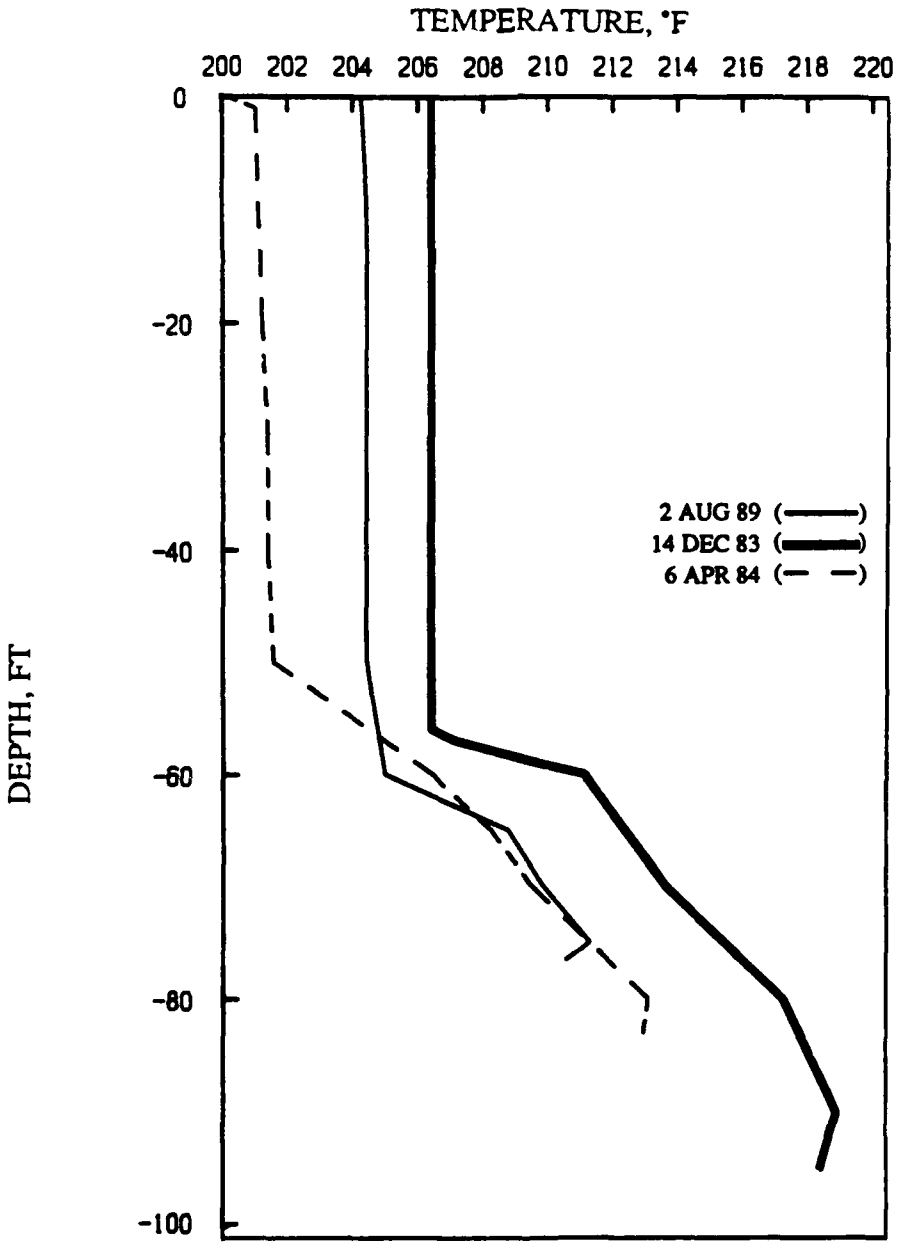


FIGURE 29. Temperature Profile, Well 4K-1.

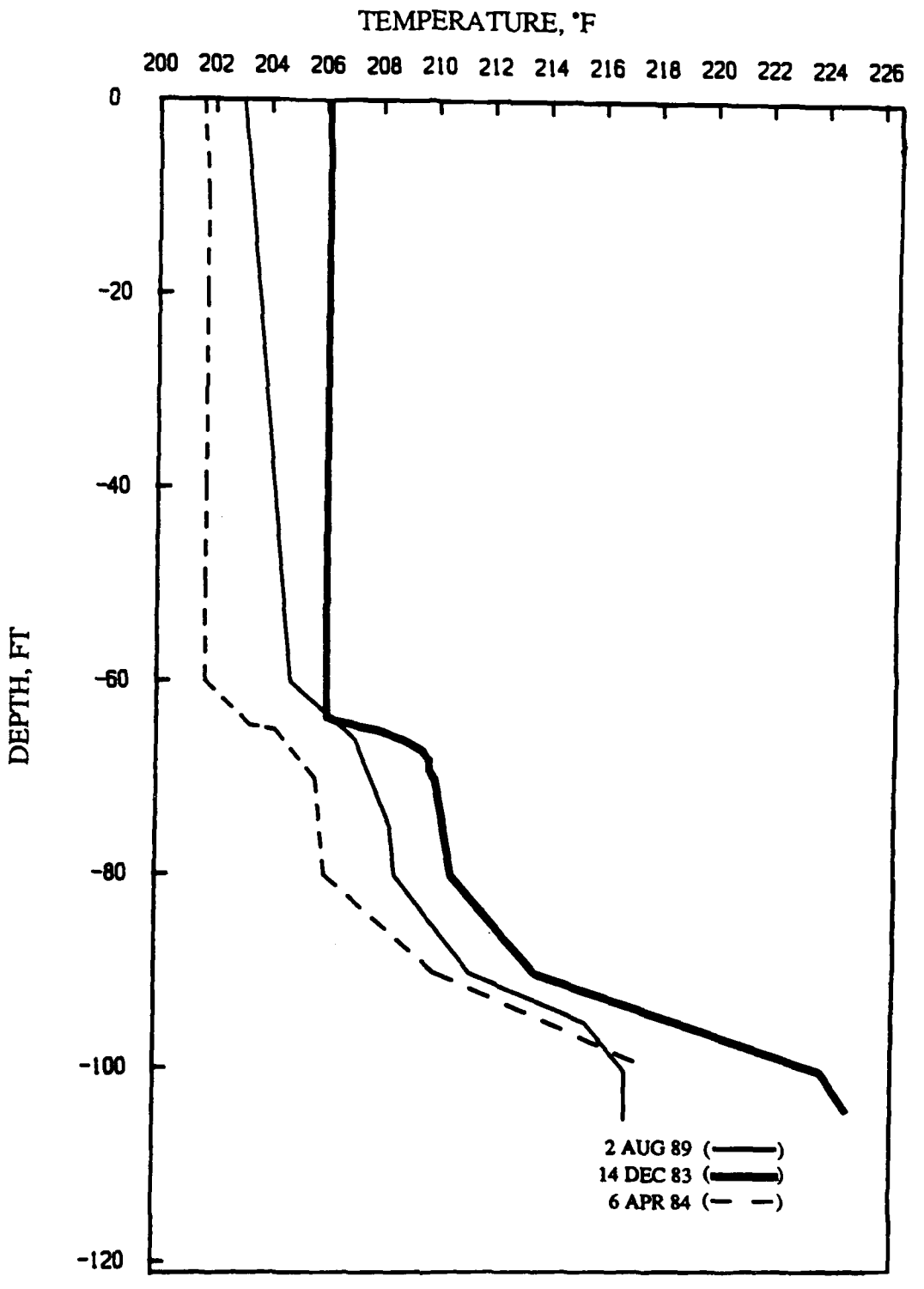


FIGURE 30. Temperature Profile, Well 4P-1.

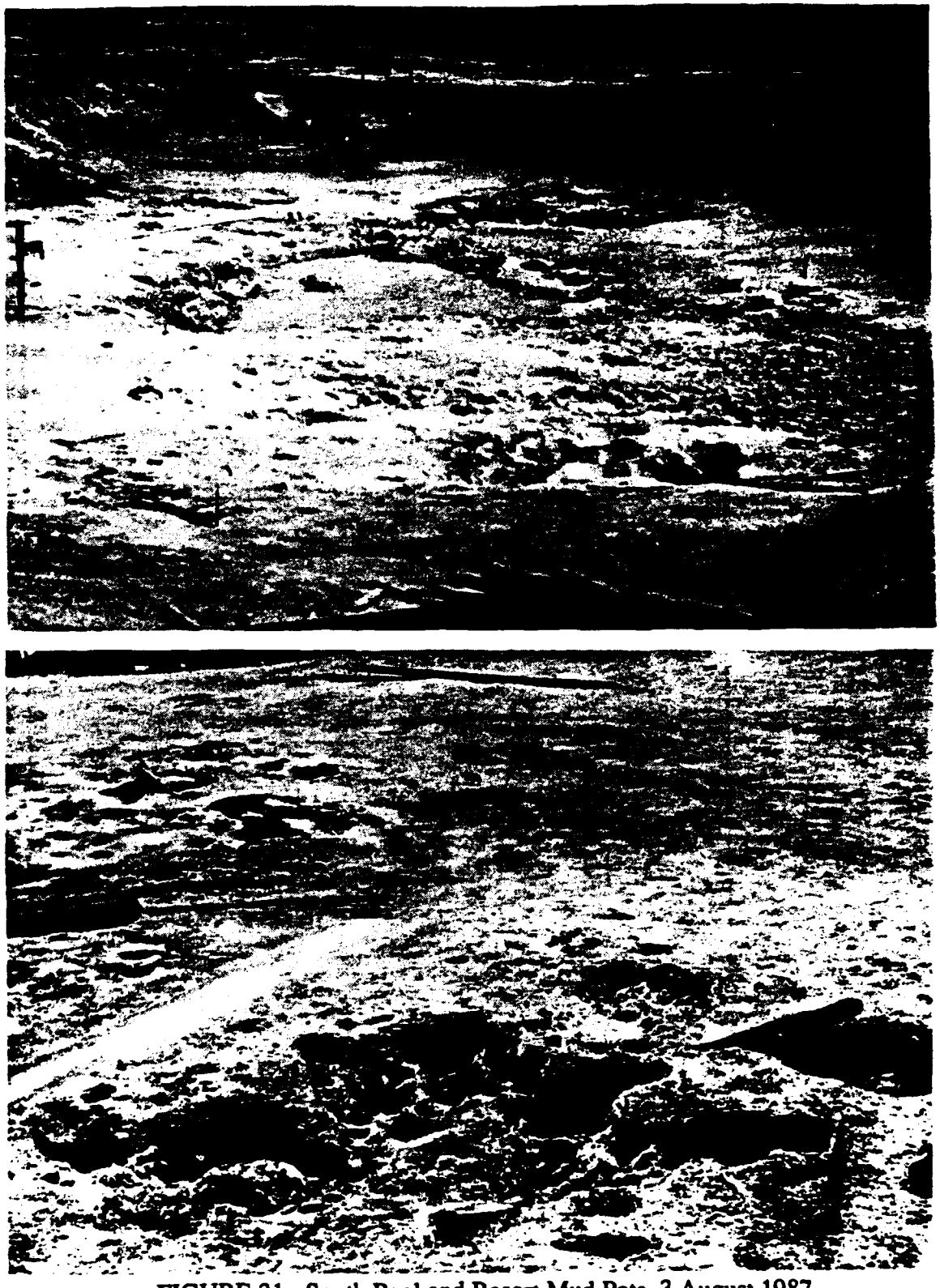


FIGURE 31. South Pool and Resort Mud Pots, 3 August 1987.

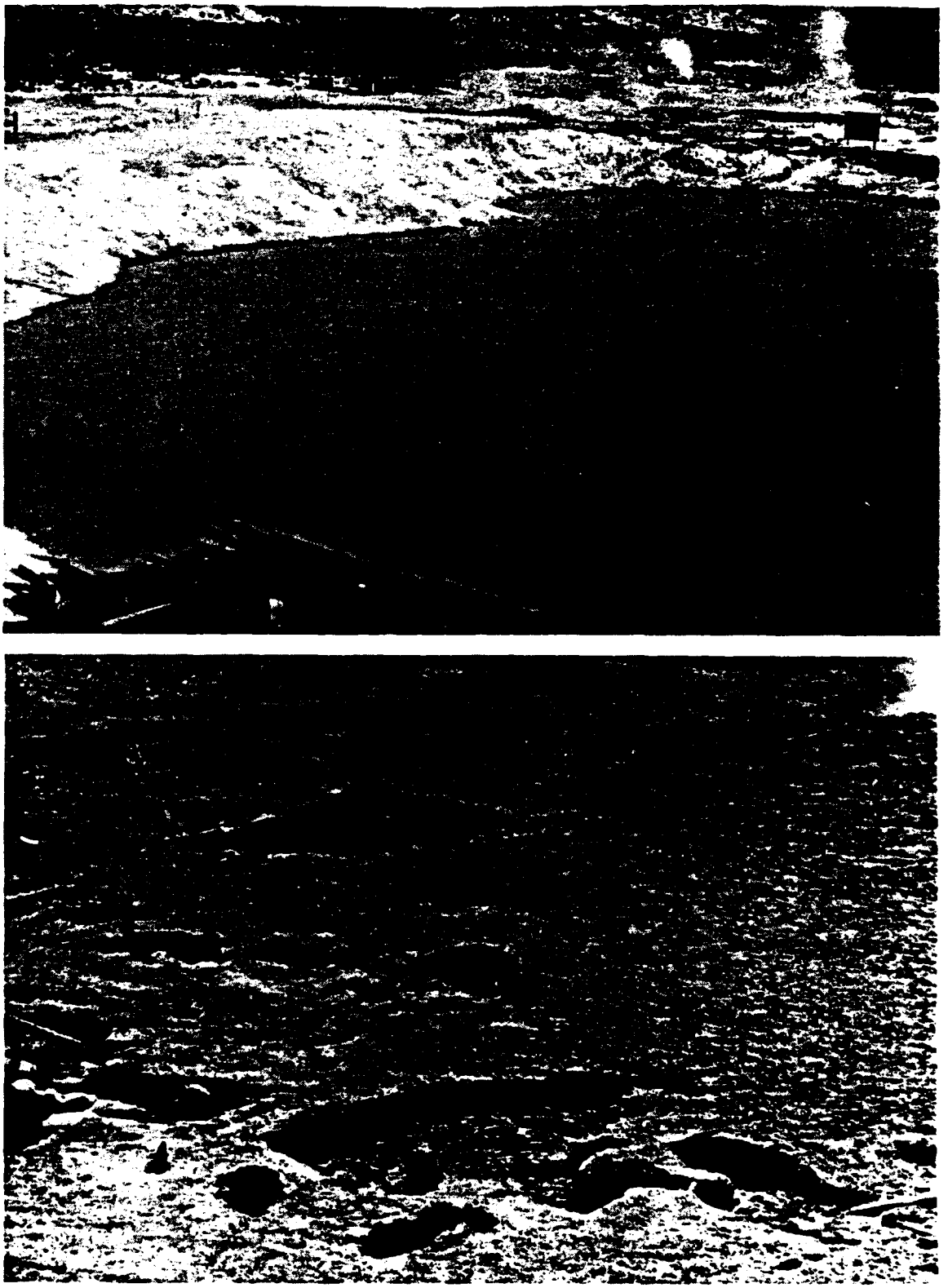


FIGURE 32. South Pool and Resort Mud Pots, 3 August 1989.

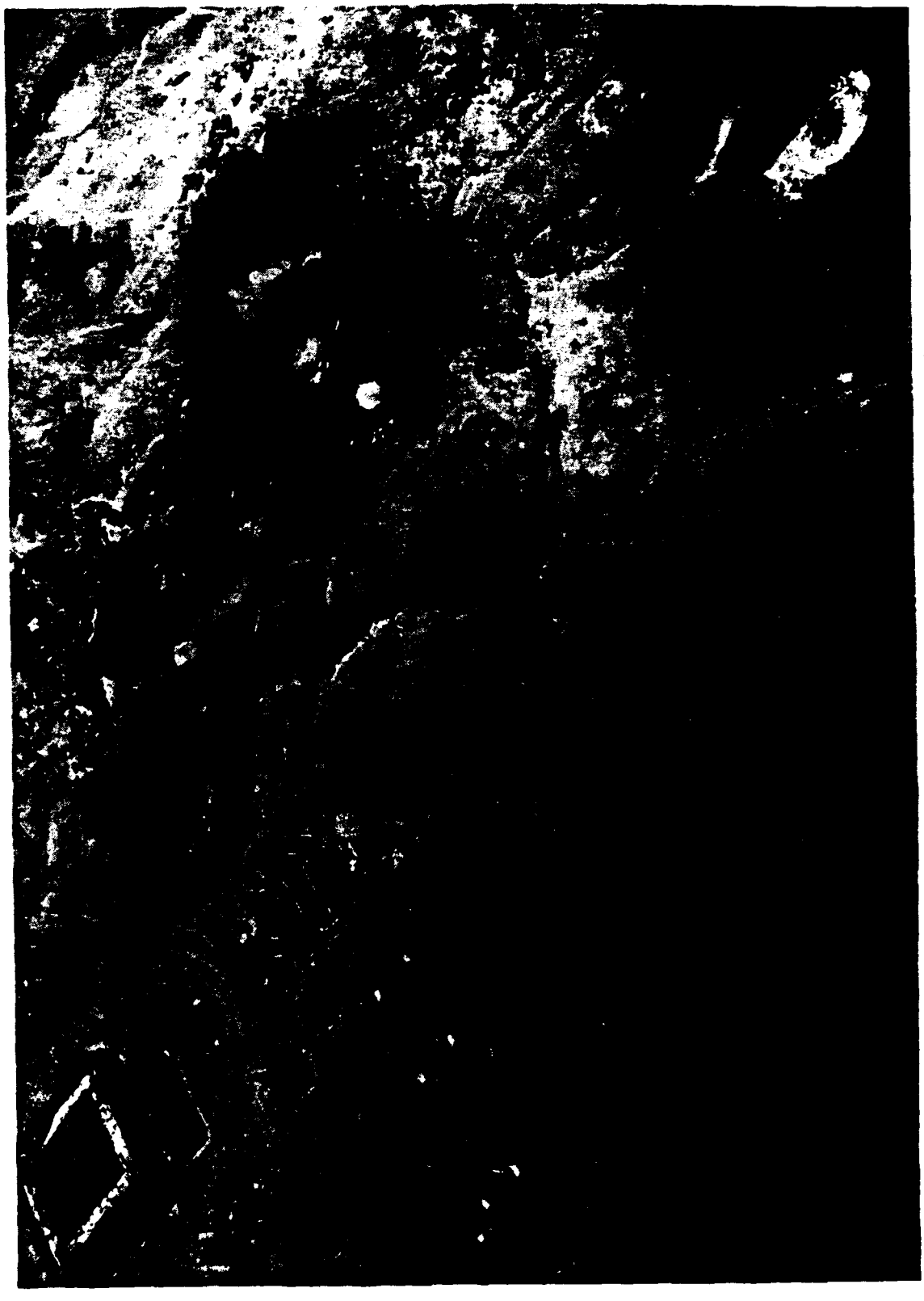


FIGURE 33. Aerial Photo of Coso Resort Area, 19 July 1989.

WELL 4P-2

Well 4P-2 is located near the most southerly surface expression of the Coso Hot Springs fault. The fault scarp is not clearly defined here as it is along most of the Coso Hot Springs area. Rather, since the fault is not in valley fill at this point, it is expressed as a roughly linear zone of hydrothermal alteration of the bedrock and alluvium. From 1980 through 1984, the average steam flow from this well appeared to be relatively stable, staying in the range of 109 to 140 lb/h. The steam flow dropped constantly, however, from 1984 through 1987 to a low of 73 lb/h, followed by a partial rebound in 1988. This trend has continued, and the 1989 data showed an average flow of 107 to 133 lb/h.

WELL 4P-1

Well 4P-1 is the 103-foot hot, fresh-water well (Dayley House) located south of Coso Resort. It was rehabilitated for water chemistry sampling and water-level monitoring in the fall of 1978. Depth to water has been fairly constant, with the level at 67 feet in 1978 and 66.5 feet in 1989. This well is on the west, upthrown side of the fault, but like most of the Coso Hot Springs features, it is located in valley fill sediments at the surface. The water is thought to consist of a high percentage of steam condensate with only a very small amount of local groundwater or geothermal fluid. The low T.D.S. combined with the high temperatures imply that there is sufficient inflow or throughflow of "fresh condensate" to balance the concentrating effects of evaporation in the wellbore. The fluid chemistry has been fairly stable throughout most of the Coso Monitoring Program.

WELL 4K-1

Well 4K-1 is the "mud" well located at the juncture of the Coso Resort road and Wheeler road. It is presently 76.5 feet deep, although it has been recorded in the past down to 95 feet. Like Well 4P-1, it is also on the west side of the fault. Evidence on the ground of the well shows erupting in the past, but no written records have been noted until the recent upsurge that first occurred early this year.

On 24 May 1989, 4K-1 erupted, forming a circle of mud 16 feet in diameter and about 1 inch thick. On 18 June 1989, the well erupted again, covering an area 50 feet wide, east to west; 125 feet north, with a heavy spray of mud. On 17 and 24 July 1989 and 17 August 1989, small eruptions of heavy mud-laden steam were observed, which lasted 10 to 12 minutes. No other eruptions or indications of any eruptions have been observed since 17 August.

SOUTH POOL (4K-5)

The South Pool is a large pool located on the east side of the fault and is part of the weekly water-level monitoring and photographic essay and, more recently, fluid chemistry analysis. In the past, seasonal effects have been very dramatic here, with water-level changes of as much as 4.25 feet between summer and winter. Seasonal water temperature was also variable, ranging from about 80°F in the large winter pool to as much as 160°F in the small, deep, residual pots in the summer. The pond did not dry up in July and August 1988 as it normally would have. Instead, it began to rise. There have been minor fluctuations in the pond level since the rise stabilized, but there was no significant drop this summer. In addition, the water temperature rose dramatically. At present, temperature readings taken along the pond banks range from 140 to 145°F.

The pond level has been, and still is, very sensitive to local weather changes, especially ambient temperature and humidity, as shown by instances of the water level rising several inches within 2 or 3 days of a heavy rainfall.

CANYONS TO THE WEST (BELOW RAIN GAUGE NO. 2)

Two canyons directly west of the main resort area have large areas of warm ground (as evidenced by snowmelt patterns and lack of vegetation) and smaller areas of hydrothermal alteration, especially in the bedrock of the canyon floors. These smaller sites are perennially hot with some steaming ground and occasionally flowing hot springs. Although these sites have only been visited sporadically in recent months, there is no evidence of any change in the level of thermal activity.

MUD CRATER (4KC-8)

Mud Crater 4KC-8 was the first large mud crater to form during this new period of activity. It first began to grow in August 1988 and by February 1989 it had reached its present size of 50 by 80 feet. In December 1988 there was a distinct steam vent in the crater that was flowing an estimated 5000 lb/h. This vent is now beneath the mud pool in the crater.

RED, GREY, AND BROWN MUD POTS

The red, grey, and brown mud pots have been part of the weekly photographic essay since the beginning of the Coso Monitoring Program. Like the South Pool, these pots have shown the effects of seasonal and single precipitation, but on a smaller scale.

The variation in color is probably due to small changes in the Eh of the mud, as well as some iron trash in and around the pots. The activity level went up in November or December 1988. In early January we removed the ambient and mud temperature recorder because the activity was spreading to the west and was beginning to engulf the monitoring site. The ground turned black and a steam vent broke the surface just west of the cement slab in late March 1989. This steam vent became very active in June and has been essentially constant since then. The vent may be the site of an old well.

OTHER MUD POT AREAS EAST OF THE RESORT AND NORTHEAST OF THE SOUTH POOL

From an area east of the resort, to the South Pool, there are several sites of minor thermal activity, small steamers and pots, and hot ground. The activity here has historically been fairly static, but it has increased over the last few weeks of the reporting period, and it now appears there is a good chance that more deep craters will be forming in these areas in the near future.

OLD RESORT WELLS (4K-2, -3, -4, -6, -7)

Little or no activity had been evident at these plugged wells before the general upswing in activity, except for a small show of steam at Well 4K-6 closest to the resort main building and constant small, shallow mud pots and steamers all around the gazebo area immediately east of the resort.

In mid-May Mud Crater 4KC-9 north of the resort monitoring site and due east of the resort main house began to grow. Crater 4KC-9 may be the site of an old well (4K-7 or unknown). Activity in 4KC-9 subsided while Crater 4KC-10 was growing, but renewed its former level of activity after about 2 weeks.

Small pots east of the gazebo became a large, active boiler in early April 1989. This area remained relatively stable until early July when it grew to its present size within 2 weeks. The area that Crater 4KC-10 now covers probably encompasses the old resort Wells 4K-2, -3 and -4; no well casing or other man-made materials have been evident, however, in the pit.

COSO CORROSION ARRAY AREA

As noted earlier, the Coso Resort Corrosion Array was built in the late 1970s by the Navy to test materials in a corrosive geothermal environment. Four old steam wells (4H-1, -2, -3 and -7) were rehabilitated to provide steam for the tests.

A well (4H-5) adjacent to the Coso Resort Corrosion Array wells blew out early in 1989. It has steamed at about the same rate all the time, although the vent has changed as the wellhead and surrounding cement and country rock have been eroded away by the steam. Numerous mud pots grew in the general vicinity of this well in the spring and early summer, but their activity does not appear to be directly related to this well.

In mid-March 1989, the fault line between the storage and maintenance van and the wells began steaming vigorously and some mud pots appeared. By 7 April hot spots had appeared all along the gathering line from the steam wells to the array. Within a few days, a large mud pot had blown out along the pipeline, covering it with mud. By May numerous burnt patches had appeared inside the Coso Resort Corrosion Array compound fence. In mid-May Well 4H-1 blew out along the compound fence line and the entire area was covered with a pink mist of mud. The well continued to blow and by early June the mud pots in this area were nearly dry.

On about 7 August, the mud pot area had again begun to show activity. The old pots are steaming again and a new vent has appeared along the pipeline.

COSO WELL NO. 1 (4H-8)

Coso Well No. 1 was dug by NWC in 1967 to a depth of 375 feet and cased with 4-inch pipe to 370 feet (Reference 5). The static water level has been measured sometimes continuously, other times sporadically, throughout the monitoring period. The water level in this well has always been difficult to measure due to the boiling and degassing activity in the wellbore.

As noted in last year's report (Reference 2), a constriction was in the wellbore at about 210 feet that we could not get our water sampling tool past. This depth is about that of the weathered rock and bedrock interface.

In February 1989 a workover rig was contracted (Lewis' Domestic Water Systems, Inyokern, Calif.) to rehabilitate the well. With a great deal of difficulty we were able to get a 1-inch pipe down to 365 feet and clean out the well with compressed air. The well produced mud, sand, gravel, plastic pipe fittings, and other junk. The well was reentered with 2-inch pipe to 354 feet and blown out a second time. The well produced mud then water and steam on its own for a couple of minutes before it ran out of fluid and stopped. The constriction didn't allow anything larger than 2-inches in diameter to pass, so the 2-inch pipe was hung in the well to a depth of 344 feet. The rehabilitation was completed on 4 May 1989.

The well steamed at a good rate for several days until a head of water built up in the wellbore. The water level now stands at near historic levels.

On 25 October 1988 temperature logs were run of 4H-8 and the other monitor wells. Figure 34 is a graph of the data from the 4H-8 log compared with the one taken in August 1989. The graph shows a dramatic temperature inversion that hasn't been seen before. A confirmation log was run on 30 October 89 with similar results.

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

The Well 4H-4 site has been unreliable for several years. The steam flow is low, although it was vigorous for a time after the well was rehabilitated in the late 1970s. As noted earlier, this well is lined with a series of stacked 55-gallon drums. These drums are easily corroded in the near-surface acid sulfate zone.

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

In the past the Schober's Resort site has been relatively quiet. Only one well had steam flow sufficient for monitoring and the total flow was small. The ground in the Schober's area was generally warm, but not hot and not wet. The flow from this one well became erratic in 1985 and continued to be so until the early part of this year when an adjacent well casing blew out. This was accompanied by a sharp drop in steam flow to the meter. To regain control of this site, two of the old wells there (4A-2 and 4A-3) were rehabilitated starting in June 1989 and the meter was reinstalled before the end of July.

Before the well blowout there were other indications that the Schober's Resort area was becoming more active. The ground around the monitoring site at Schober's Resort began to heat noticeably in November 1988. Numerous old wells and pipes began to emit small amounts of steam. In contrast to most of the Hot Springs area, no mud pots have developed at this end of the fault, although the steam wells there are wet, providing condensate water for the local bird population. While there is no published record of a water well at Schober's Resort, one of the "new" wells (4A-13) was found to have several feet of boiling water in it. It was logged for temperature, sampled for its chemistry, and will be monitored in the future.

As noted earlier, we are adopting the well numbering system used by Moyle (Reference 1). In assigning numbers to the rediscovered wells (especially at Schober's Resort and Schober's Store), well descriptions were matched to the current wells as closely as possible. Wells that are producing large amounts of steam will be rehabilitated, and nonproducing wells will be filled with cement and properly abandoned.

The Schober's Store area (Wells 4A-1 and 4A-7 through 4A-12) is immediately north of Schober's Resort. There was evidence of several wells there, but until this year, none of them emitted more than wisps of steam. Some of these wells are now flowing at the rate of several pounds per hour of steam.

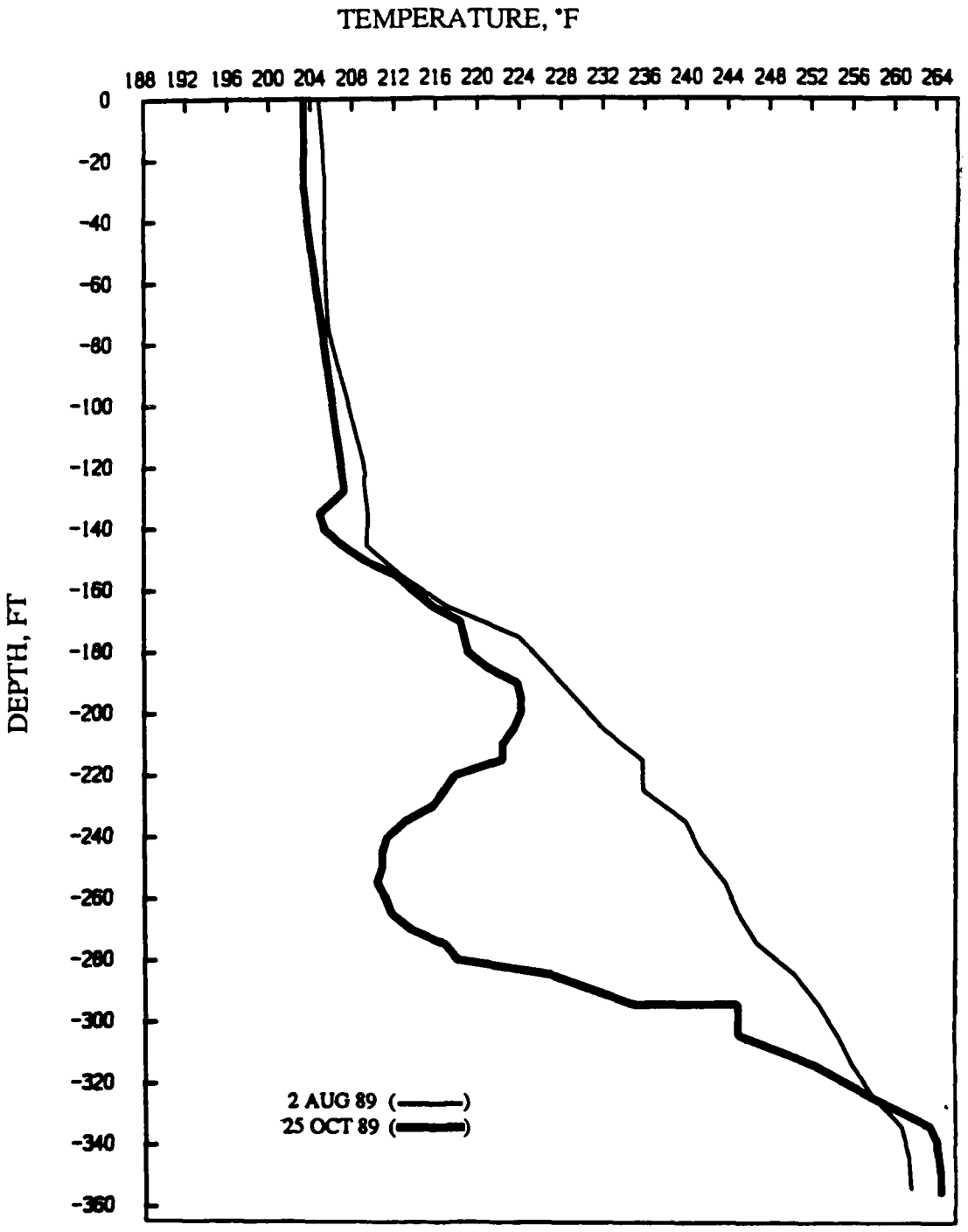


FIGURE 34. Temperature Profile, Coso No. 1 (4H-8).

SUMMARY

During this reporting period (1 October 1988 through 30 September 1989), several factors affected the Coso Monitoring Program. New Barton block manifold assemblies were installed at Devils Kitchen, Two-Inch Steam Well, and Schober's Resort in January 1989. They were also installed at the Eight-Inch Stove Pipe Well in March 1989 and at the Coso Resort Corrosion Array in April 1989. Consistently more accurate and reliable data have been obtained with the new hardware.

Several well casing failures resulted in the shutdown of the Coso Resort Corrosion Array and Schober's Resort monitoring stations from 6 June 1989 through 28 July 1989. The Schober's station was shut down while the monitoring well and an abandoned adjacent well were reworked. The wells have been coupled together and data collected for steam flow on a Barton 0- to 50-inch water column meter. Steam and ambient temperature data are also being recorded on a Barton meter. The monitoring system at Coso Resort Corrosion Array is still out awaiting well repair.

The Coso Resort mud pot monitoring station was removed due to deterioration of the area caused by increased activity in the main Coso Resort compound. Photographic and video coverage of the mud pots area are still ongoing.

Several events affected data collection at the Two-Inch Steam Well (4P-2). The Barton recorder failed and was replaced, the thermocouple sleeve for steam temperature had to be reworked, and the gas tracer sampling interrupted monitoring operations.

The continuous water level recorder at the South Pool had to be removed due to increasing water levels.

The weekly water level monitoring at Wells 4P-1 and Observation Wells No. 1, 2, and 3 have given us better data for the water table in the Coso Basin.

PLANS FOR 1990

The plans for 1990 are as follows. (1) Continue rehabilitation of the wells at Schober's Resort (and Store) and of Well 4H-1 at the Coso Resort Corrosion Array, so the monitoring equipment can be reinstalled. (2) Plug or abandon Well 4H-5 if repair is not feasible. (3) Tear down Coso Resort Corrosion Array, salvage valves and usable materials, and turn in excess material and fencing to the Department of Defense Property Disposal/Reutilization Branch. (4) Repair and extend barbed wire fencing around Resort Mud Pots and Schober's Resort to limit access and increase safety.

REFERENCES

1. W. R. Moyle, Jr., *Summary of Basic Hydrologic Data Collected at Coso Hot Springs Inyo County, California*, U. S. Geological Survey, Open-File Report 77-485, September 1977.

2. Naval Weapons Center. *Coso Monitoring Program, October 1987 Through September 1988*, by E. M. Edwards and D. E. Condon. China Lake, Calif., NWC, April 1989. 108 pp. (NWC TP 6988, publication UNCLASSIFIED.)

3. ------. *Coso Monitoring Program, January through December 1980*, by C. R. Rodgers, E. M. Edwards, and D. L. Bowles. China Lake, Calif., NWC, December 1981. 112 pp. (NWC TP 6314, publication UNCLASSIFIED.)

4. ------. *Coso Monitoring Program, January 1981 Through December 1983*, by Steven C. Bjornstad and C. R. Rodgers. China Lake, Calif., NWC, September 1984. 208 pp. (NWC TP 6558, publication UNCLASSIFIED.)

5. -----. *Coso Monitoring Program, January 1984 Through September 1985*, by S. C. Bjornstad and E. M. Edwards. China Lake, Calif., NWC, January 1986. 133 pp. (NWC TP 6693, publication UNCLASSIFIED.)

6. -----. *Coso Monitoring Program, October 1985 Through September 1986*, by E. M. Edwards. China Lake, Calif., NWC, February 1987. 99 pp. (NWC TP 6794, publication UNCLASSIFIED.)

7. -----. *Coso Monitoring Program, October 1986 Through September 1987*, by E. M. Edwards. China Lake, Calif., NWC, June 1988. 112 pp. (NWC TP 6919, publication UNCLASSIFIED.)

8. ------. *Geologic Investigations at the Coso Thermal Area*, by Carl F. Austin and J. Kenneth Pringle. China Lake, Calif., NWC, June 1970. 40 pp. (NWC TP 4878, publication UNCLASSIFIED.)

Appendix A

DAILY STEAM FLOW DATA

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

Date	High	Low	Date	High	Low
1 Oct 88	257.5	233.3	5 Nov 88	337.9	209.2
2 Oct 88	257.5	229.3	6 Nov 88	337.9	173.0
3 Oct 88	253.4	221.3	7 Nov 88	350.0	173.0
4 Oct 88	342.0	156.9	8 Nov 88	350.0	229.3
5 Oct 88	358.0	181.0	9 Nov 88	346.0	221.3
6 Oct 88	346.0	152.9	10 Nov 88	333.9	205.2
7 Oct 88	301.7	144.8	11 Nov 88	354.0	201.2
8 Oct 88	297.7	160.9	12 Nov 88	342.0	197.1
9 Oct 88	305.7	144.8	13 Nov 88	337.9	205.2
10 Oct 88	325.9	144.8	14 Nov 88	337.9	177.0
11 Oct 88	301.7	152.9	15 Nov 88	337.9	193.1
12 Oct 88	309.8	148.9	16 Nov 88	325.9	221.3
13 Oct 88	301.7	160.9	17 Nov 88	329.9	189.1
14 Oct 88	305.7	152.9	18 Nov 88	321.8	205.2
15 Oct 88	289.7	148.9	19 Nov 88	321.8	189.1
16 Oct 88	297.7	148.9	20 Nov 88	325.9	169.0
17 Oct 88	297.7	144.8	21 Nov 88	337.9	181.0
18 Oct 88	305.7	173.0	22 Nov 88	342.0	185.1
19 Oct 88	309.8	177.0	23 Nov 88	354.0	177.0
20 Oct 88	305.7	177.0	24 Nov 88	350.0	225.3
21 Oct 88	309.8	177.0	25 Nov 88	358.0	201.2
22 Oct 88	321.8	173.0	26 Nov 88	337.9	201.2
23 Oct 88	313.8	169.0	27 Nov 88	329.9	185.1
24 Oct 88	317.8	169.0	28 Nov 88	329.9	177.0
25 Oct 88	321.8	173.0	29 Nov 88	321.8	181.0
26 Oct 88	329.9	181.0	30 Nov 88	329.9	181.0
27 Oct 88	321.8	181.0	1 Dec 88	325.9	181.0
28 Oct 88	321.8	173.0	2 Dec 88	333.9	177.0
29 Oct 88	313.8	164.9	3 Dec 88	329.9	181.0
30 Oct 88	333.9	169.0	4 Dec 88	317.8	205.2
31 Oct 88	321.8	169.0	5 Dec 88	329.9	177.0
1 Nov 88	346.0	229.3	6 Dec 88	337.9	205.2
2 Nov 88	337.9	221.3	7 Dec 88	358.0	297.7
3 Nov 88	358.0	205.2	8 Dec 88	342.0	245.4
4 Nov 88	342.0	197.1	9 Dec 88	321.8	189.1

TABLE A-1 (Contd.)

Date	High	Low	Date	High	Low
10 Dec 88	321.8	169.0	14 Jan 89	249.4	24.1
11 Dec 88	337.9	164.9	15 Jan 89	249.4	16.1
12 Dec 88	277.6	60.3	16 Jan 89	237.4	20.1
13 Dec 88	269.5	16.1	17 Jan 89	245.4	32.2
14 Dec 88	325.9	32.2	18 Jan 89	245.4	28.2
15 Dec 88	325.9	233.3	19 Jan 89	237.4	32.2
16 Dec 88	237.4	60.3	20 Jan 89	241.4	32.2
17 Dec 88	261.5	128.7	21 Jan 89	245.4	20.1
18 Dec 88	261.5	24.1	22 Jan 89	253.4	16.1
19 Dec 88	257.5	28.2	23 Jan 89	233.3	20.1
20 Dec 88	253.4	40.2	24 Jan 89	...	...
21 Dec 88	249.4	24.1	25 Jan 89	245.4	92.5
22 Dec 88	241.4	16.1	26 Jan 89	253.4	24.1
23 Dec 88	221.3	8.0	27 Jan 89	...	...
24 Dec 88	225.3	20.1	28 Jan 89	...	...
25 Dec 88	237.4	16.1	29 Jan 89	337.9	329.9
26 Dec 88	237.4	24.1	30 Jan 89	337.9	325.9
27 Dec 88	253.4	40.2	31 Jan 89	346.0	337.9
28 Dec 88	249.4	36.2	1 Feb 89	346.0	329.9
29 Dec 88	241.4	28.2	2 Feb 89	346.0	342.0
30 Dec 88	217.2	8.0	3 Feb 89	346.0	333.9
31 Dec 88	249.4	8.0	4 Feb 89	346.0	321.8
1 Jan 89	241.4	32.2	5 Feb 89	337.9	313.8
2 Jan 89	253.4	36.2	6 Feb 89	350.0	337.9
3 Jan 89	245.4	24.1	7 Feb 89	350.0	342.0
4 Jan 89	237.4	160.9	8 Feb 89	354.0	337.9
5 Jan 89	269.5	128.7	9 Feb 89	350.0	333.9
6 Jan 89	253.4	140.8	10 Feb 89	342.0	329.9
7 Jan 89	249.4	16.1	11 Feb 89	346.0	342.0
8 Jan 89	237.4	24.1	12 Feb 89	350.0	342.0
9 Jan 89	237.4	16.1	13 Feb 89	346.0	342.0
10 Jan 89	261.5	28.2	14 Feb 89	342.0	337.9
11 Jan 89	241.4	28.2	15 Feb 89	342.0	333.9
12 Jan 89	241.4	16.1	16 Feb 89	342.0	337.9
13 Jan 89	241.4	12.1	17 Feb 89	346.0	342.0

TABLE A-1 (Contd.)

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

TABLE A-1 (Contd.)

Date	High	Low	Date	High	Low
29 Apr 89	342.0	333.9	3 Jun 89	350.0	342.0
30 Apr 89	346.0	337.9	4 Jun 89	346.0	342.0
1 May 89	342.0	337.9	5 Jun 89	342.0	337.9
2 May 89	337.9	333.9	6 Jun 89	346.0	337.9
3 May 89	342.0	337.9	7 Jun 89	346.0	342.0
4 May 89	346.0	337.9	8 Jun 89	346.0	337.9
5 May 89	342.0	342.0	9 Jun 89	346.0	342.0
6 May 89	342.0	337.9	10 Jun 89	342.0	337.9
7 May 89	342.0	337.9	11 Jun 89	346.0	337.9
8 May 89	346.0	337.9	12 Jun 89	346.0	342.0
9 May 89	346.0	342.0	13 Jun 89	350.0	342.0
10 May 89	342.0	337.9	14 Jun 89	346.0	337.9
11 May 89	346.0	329.9	15 Jun 89	350.0	337.9
12 May 89	342.0	337.9	17 Jun 89	346.0	337.9
13 May 89	342.0	329.9	18 Jun 89	346.0	342.0
14 May 89	358.0	329.9	19 Jun 89	350.0	342.0
15 May 89	346.0	337.9	20 Jun 89	350.0	342.0
16 May 89	342.0	337.9	21 Jun 89	346.0	337.9
17 May 89	346.0	337.9	22 Jun 89	350.0	342.0
18 May 89	346.0	337.9	23 Jun 89	350.0	346.0
19 May 89	342.0	333.9	24 Jun 89	342.0	342.0
20 May 89	342.0	337.9	25 Jun 89	342.0	337.9
21 May 89	346.0	337.9	26 Jun 89	346.0	342.0
22 May 89	342.0	337.9	27 Jun 89	346.0	342.0
23 May 89	346.0	342.0	28 Jun 89	346.0	342.0
24 May 89	346.0	337.9	29 Jun 89	346.0	337.9
25 May 89	342.0	337.9	30 Jun 89	350.0	342.0
26 May 89	346.0	337.9	1 Jul 89	346.0	342.0
27 May 89	346.0	342.0	2 Jul 89	346.0	342.0
28 May 89	342.0	342.0	3 Jul 89	354.0	346.0
29 May 89	346.0	337.9	4 Jul 89	346.0	337.9
30 May 89	342.0	337.9	5 Jul 89	346.0	342.0
31 May 89	337.9	333.9	6 Jul 89	346.0	342.0
1 Jun 89	337.9	333.9	7 Jul 89	346.0	342.0
2 Jun 89	337.9	337.9	8 Jul 89	350.0	342.0

TABLE A-1 (Contd.)

Date	High	Low	Date	High	Low
9 Jul 89	354.0	346.0	14 Aug 89	354.0	346.0
10 Jul 89	346.0	342.0	15 Aug 89	354.0	346.0
11 Jul 89	342.0	337.9	16 Aug 89	350.0	350.0
12 Jul 89	346.0	333.9	17 Aug 89	350.0	346.0
13 Jul 89	350.0	342.0	18 Aug 89	350.0	342.0
14 Jul 89	350.0	342.0	19 Aug 89	350.0	346.0
15 Jul 89	346.0	342.0	20 Aug 89	354.0	346.0
16 Jul 89	342.0	337.9	21 Aug 89	346.0	346.0
17 Jul 89	333.9	329.9	22 Aug 89	350.0	346.0
18 Jul 89	346.0	342.0	23 Aug 89	354.0	346.0
19 Jul 89	350.0	337.9	24 Aug 89	350.0	342.0
20 Jul 89	354.0	342.0	25 Aug 89	350.0	346.0
21 Jul 89	350.0	342.0	26 Aug 89	350.0	346.0
22 Jul 89	350.0	342.0	27 Aug 89	350.0	346.0
23 Jul 89	350.0	342.0	28 Aug 89	350.0	346.0
24 Jul 89	346.0	337.9	29 Aug 89	354.0	350.0
25 Jul 89	350.0	342.0	30 Aug 89	354.0	350.0
26 Jul 89	354.0	346.0	31 Aug 89	350.0	346.0
27 Jul 89	354.0	346.0	1 Sep 89	354.0	346.0
28 Jul 89	346.0	342.0	2 Sep 89	350.0	350.0
29 Jul 89	354.0	342.0	3 Sep 89	350.0	346.0
30 Jul 89	350.0	346.0	4 Sep 89	354.0	350.0
1 Aug 89	354.0	346.0	5 Sep 89	354.0	346.0
2 Aug 89	358.0	350.0	6 Sep 89	354.0	354.0
3 Aug 89	354.0	350.0	7 Sep 89	354.0	350.0
4 Aug 89	346.0	342.0	8 Sep 89	350.0	346.0
5 Aug 89	342.0	337.9	9 Sep 89	354.0	350.0
6 Aug 89	346.0	333.9	10 Sep 89	354.0	350.0
7 Aug 89	354.0	346.0	11 Sep 89	354.0	346.0
8 Aug 89	350.0	346.0	12 Sep 89	350.0	346.0
9 Aug 89	350.0	346.0	13 Sep 89	350.0	346.0
10 Aug 89	350.0	342.0	14 Sep 89	354.0	350.0
11 Aug 89	350.0	342.0	15 Sep 89	354.0	350.0
12 Aug 89	350.0	342.0	16 Sep 89	354.0	350.0
13 Aug 89	350.0	342.0	17 Sep 89	354.0	329.9

TABLE A-1 (Contd.)

Date	High	Low	Date	High	Low
18 Sep 89	354.0	354.0	24 Sep 89	358.0	354.0
19 Sep 89	354.0	350.0	25 Sep 89	354.0	350.0
20 Sep 89	350.0	346.0	26 Sep 89	350.0	350.0
21 Sep 89	350.0	346.0	27 Sep 89	354.0	350.0
22 Sep 89	358.0	350.0	28 Sep 89	354.0	350.0
23 Sep 89	358.0	350.0	29 Sep 89	354.0	350.0
			30 Sep 89	354.0	350.0

NOTE: 15 Oct - 27 Jan: Erroneous data; meter out of balance.
27 Jan: Removed and replaced pipe and valve manifold assembly with new plumbing and Barton block manifold.
28 Jan: Serviced, balanced, and zeroed meter.

TABLE A-2. Coso Resort Corrosion Array Steam Flow Data, lb/h.

Date	High	Low	Date	High	Low
1 Oct 88 - 14 Nov 88	...	...	22 Dec 88	948.0	936.0
15 Nov 88	912.0	900.0	23 Dec 88	936.0	924.0
16 Nov 88	924.0	912.0	24 Dec 88	936.0	912.0
17 Nov 88	972.0	924.0	25 Dec 88	924.0	912.0
18 Nov 88 - 21 Nov 88	...	...	26 Dec 88	924.0	900.0
22 Nov 88	948.0	924.0	27 Dec 88	948.0	912.0
23 Nov 88	924.0	912.0	28 Dec 88	972.0	960.0
24 Nov 88	948.0	936.0	29 Dec 88	996.0	960.0
25 Nov 88	...	...	30 Dec 88	972.0	936.0
26 Nov 88	960.0	948.0	31 Dec 88	972.0	936.0
27 Nov 88	948.0	936.0	1 Jan 89	948.0	924.0
28 Nov 88	960.0	912.0	2 Jan 89	948.0	912.0
29 Nov 88	960.0	936.0	3 Jan 89	936.0	912.0
30 Nov 88	972.0	900.0	4 Jan 89	936.0	924.0
1 Dec 88	...	...	5 Jan 89	972.0	924.0
2 Dec 88	...	...	6 Jan 89	960.0	924.0
3 Dec 88	924.0	924.0	7 Jan 89	936.0	912.0
4 Dec 88	948.0	924.0	8 Jan 89	900.0	888.0
5 Dec 88	...	...	9 Jan 89	900.0	888.0
6 Dec 88	972.0	948.0	10 Jan 89	948.0	888.0
7 Dec 88	1020.0	960.0	11 Jan 89	924.0	888.0
8 Dec 88	...	...	12 Jan 89	912.0	876.0
9 Dec 88	...	...	13 Jan 89	912.0	900.0
10 Dec 88	960.0	960.0	14 Jan 89	912.0	888.0
11 Dec 88	936.0	924.0	15 Jan 89	900.0	888.0
12 Dec 88	960.0	924.0	16 Jan 89	900.0	888.0
13 Dec 88	960.0	948.0	17 Jan 89	912.0	900.0
14 Dec 88	996.0	960.0	18 Jan 89	888.0	888.0
15 Dec 88	1008.0	960.0	19 Jan 89	912.0	888.0
16 Dec 88	972.0	948.0	20 Jan 89	912.0	888.0
17 Dec 88	960.0	948.0	21 Jan 89	912.0	900.0
18 Dec 88	972.0	948.0	22 Jan 89	912.0	900.0
19 Dec 88	972.0	948.0	23 Jan 89	912.0	900.0
20 Dec 88	960.0	924.0	24 Jan 89	912.0	888.0
21 Dec 88	960.0	948.0	25 Jan 89	888.0	876.0

TABLE A-2 (Contd.)

Date	High	Low	Date	High	Low
26 Jan 89	888.0	864.0	2 Mar 89	912.0	888.0
27 Jan 89	876.0	864.0	3 Mar 89	912.0	876.0
28 Jan 89	888.0	864.0	4 Mar 89	864.0	852.0
29 Jan 89	900.0	864.0	5 Mar 89	864.0	852.0
30 Jan 89	900.0	876.0	6 Mar 89	888.0	876.0
31 Jan 89	888.0	864.0	7 Mar 89	912.0	888.0
1 Feb 89	948.0	888.0	8 Mar 89	912.0	888.0
2 Feb 89	924.0	888.0	9 Mar 89	900.0	888.0
3 Feb 89	912.0	888.0	10 Mar 89	900.0	888.0
4 Feb 89	936.0	888.0	11 Mar 89	900.0	888.0
5 Feb 89	900.0	888.0	12 Mar 89	924.0	900.0
6 Feb 89	888.0	876.0	13 Mar 89	924.0	924.0
7 Feb 89	888.0	852.0	14 Mar 89	924.0	912.0
8 Feb 89	864.0	864.0	15 Mar 89	948.0	924.0
9 Feb 89	864.0	852.0	16 Mar 89	960.0	936.0
10 Feb 89	876.0	852.0	17 Mar 89	948.0	936.0
11 Feb 89	900.0	864.0	18 Mar 89	960.0	936.0
12 Feb 89	888.0	876.0	19 Mar 89	972.0	948.0
13 Feb 89	888.0	864.0	20 Mar 89	1020.0	972.0
14 Feb 89	888.0	864.0	21 Mar 89	984.0	960.0
15 Feb 89	888.0	852.0	22 Mar 89	996.0	984.0
16 Feb 89	888.0	864.0	23 Mar 89	1008.0	996.0
17 Feb 89	888.0	864.0	24 Mar 89	1020.0	996.0
18 Feb 89	912.0	876.0	25 Mar 89	1020.0	1008.0
19 Feb 89	912.0	828.0	26 Mar 89	1032.0	1020.0
20 Feb 89	900.0	876.0	27 Mar 89	1020.0	1008.0
21 Feb 89	900.0	864.0	28 Mar 89	1032.0	1008.0
22 Feb 89	852.0	852.0	29 Mar 89	1032.0	1020.0
23 Feb 89	876.0	852.0	30 Mar 89	1032.0	1020.0
24 Feb 89	876.0	852.0	31 Mar 89	1044.0	1020.0
25 Feb 89	876.0	864.0	1 Apr 89	1044.0	1032.0
26 Feb 89	888.0	864.0	2 Apr 89	1032.0	1032.0
27 Feb 89	888.0	864.0	3 Apr 89	984.0	924.0
28 Feb 89	888.0	876.0	4 Apr 89	936.0	936.0
1 Mar 89	888.0	876.0	5 Apr 89	1092.0	1080.0

TABLE A-2 (Contd.)

Date	High	Low	Date	High	Low
6 Apr 89	1104.0	1068.0	8 May 89	1128.0	1044.0
7 Apr 89	1104.0	1080.0	9 May 89	1116.0	1044.0
8 Apr 89	1104.0	1080.0	10 May 89	1164.0	1104.0
9 Apr 89	1128.0	1092.0	11 May 89	1152.0	1128.0
10 Apr 89	1128.0	1116.0	12 May 89	1128.0	1116.0
11 Apr 89	1128.0	1080.0	13 May 89	1116.0	1092.0
12 Apr 89	1128.0	1068.0	14 May 89	1104.0	1092.0
13 Apr 89	1128.0	1056.0	15 May 89	1116.0	1104.0
14 Apr 89	1116.0	1068.0	16 May 89	1116.0	1080.0
15 Apr 89	1080.0	1056.0	17 May 89	1152.0	984.0
16 Apr 89	1068.0	1056.0	18 May 89	984.0	744.0
17 Apr 89	1164.0	1128.0	19 May 89	852.0	744.0
18 Apr 89	1164.0	1128.0	20 May 89	828.0	708.0
19 Apr 89	1188.0	1116.0	21 May 89	888.0	828.0
20 Apr 89			22 May 89	924.0	864.0
21 Apr 89	...	...	23 May 89	936.0	888.0
22 Apr 89	...	...	24 May 89	936.0	900.0
23 Apr 89	1188.0	1164.0	25 May 89	936.0	900.0
24 Apr 89	1164.0	1044.0	26 May 89	936.0	912.0
25 Apr 89	1188.0	1152.0	27 May 89	924.0	936.0
26 Apr 89	1164.0	1116.0	28 May 89	...	...
27 Apr 89	1140.0	1116.0	29 May 89	888.0	888.0
28 Apr 89	1152.0	1116.0	30 May 89	888.0	912.0
29 Apr 89	1140.0	1116.0	1 Jun 89	876.0	852.0
30 Apr 89	1140.0	1092.0	2 Jun 89	864.0	840.0
1 May 89	1128.0	1032.0	3 Jun 89	876.0	840.0
2 May 89	1128.0	1044.0	4 Jun 89	852.0	840.0
3 May 89	1092.0	1008.0	5 Jun 89	828.0	828.0
4 May 89	1068.0	1008.0	6 Jun 89	828.0	816.0
5 May 89	1044.0	960.0	7 Jun 89 - 30 Sep 89	...	...
6 May 89	1032.0	936.0			
7 May 89	1068.0	972.0			

NOTE: 1 Oct - 14 Nov: No data recorded due to indicator off chart.
18 Nov - 21 Nov: No data, pen not contacting chart.
25 Nov: No data, pen not contacting chart.
8 Dec - 9 Dec: No data, pen not contacting chart.
20 Apr - 22 Apr: No data recorded due to leak in manifold assembly.
22 Apr: Repaired manifold assembly.
17 May - 6 Jun: Steam flow dropped due to failure of well casing on Well 4H-2.
6 Jun: Monitoring equipment removed to facilitate well repair.

TABLE A-3. Well 4P-2 Steam Flow Data, lb/h.

Date	High	Low	Date	High	Low
1 Oct 88	...	...	5 Nov 88	106.8	58.1
2 Oct 88	...	...	6 Nov 88	91.1	67.5
3 Oct 88	...	...	7 Nov 88	103.6	55.0
4 Oct 88	111.5	53.4	8 Nov 88	87.9	62.8
5 Oct 88	111.5	55.0	9 Nov 88	95.8	31.4
6 Oct 88	116.2	45.5	10 Nov 88	95.8	51.8
7 Oct 88	114.6	31.4	11 Nov 88	102.1	62.8
8 Oct 88	105.2	55.0	12 Nov 88	95.8	55.0
9 Oct 88	108.3	56.5	13 Nov 88	97.3	42.4
10 Oct 88	108.3	44.0	14 Nov 88	97.3	44.0
11 Oct 88	113.0	50.2	15 Nov 88	91.1	61.2
12 Oct 88	109.9	40.8	16 Nov 88	100.5	44.0
13 Oct 88	106.8	40.8	17 Nov 88	100.5	76.9
14 Oct 88	108.3	51.8	18 Nov 88	80.1	53.4
15 Oct 88	108.3	59.7	19 Nov 88	83.2	44.0
16 Oct 88	113.0	44.0	20 Nov 88	81.6	39.3
17 Oct 88	113.0	59.7	21 Nov 88	97.3	48.7
18 Oct 88	91.1	44.0	22 Nov 88	86.4	28.3
19 Oct 88	92.6	42.4	23 Nov 88	102.1	59.7
20 Oct 88	108.3	56.5	24 Nov 88	87.9	62.8
21 Oct 88	111.5	47.1	25 Nov 88	100.5	53.4
22 Oct 88	111.5	48.7	26 Nov 88	91.1	55.0
23 Oct 88	109.9	50.2	27 Nov 88	83.2	37.7
24 Oct 88	109.9	51.8	28 Nov 88	92.6	47.1
25 Oct 88	111.5	56.5	29 Nov 88	92.6	53.4
26 Oct 88	108.3	58.1	30 Nov 88	92.6	59.7
27 Oct 88	102.1	51.8	1 Dec 88	97.3	48.7
28 Oct 88	103.6	48.7	2 Dec 88	97.3	48.7
29 Oct 88	109.9	47.1	3 Dec 88	94.2	50.2
30 Oct 88	111.5	53.4	4 Dec 88	83.2	45.5
31 Oct 88	105.2	53.4	5 Dec 88	91.1	44.0
1 Nov 88	100.5	51.8	6 Dec 88	91.1	28.3
2 Nov 88	102.1	55.0	7 Dec 88	78.5	62.8
3 Nov 88	106.8	53.4	8 Dec 88	76.9	48.7
4 Nov 88	105.2	55.0	9 Dec 88	87.9	53.4

TABLE A-3 (Contd.)

Date	High	Low	Date	High	Low
10 Dec 88	92.6	55.0	3 Feb 89	138.2	128.7
11 Dec 88	94.2	45.5	4 Feb 89	138.2	135.0
12 Dec 88	84.8	37.7	5 Feb 89	138.2	127.2
13 Dec 88	95.8	50.2	6 Feb 89	136.6	122.5
14 Dec 88	103.6	51.8	7 Feb 89	138.2	124.0
15 Dec 88	56.5	39.3	8 Feb 89	138.2	133.5
16 Dec 88	56.5	44.0	9 Feb 89	136.6	131.9
17 Dec 88	78.5	37.7	10 Feb 89	138.2	136.6
18 Dec 88	83.2	47.1	11 Feb 89	138.2	136.6
19 Dec 88	91.1	56.5	12 Feb 89	138.2	136.6
20 Dec 88	87.9	69.1	13 Feb 89	138.2	138.2
21 Dec 88	91.1	56.5	14 Feb 89	138.2	136.6
22 Dec 88	89.5	56.5	15 Feb 89	138.2	136.6
23 Dec 88	83.2	55.0	16 Feb 89	138.2	138.2
24 Dec 88	65.9	48.7	17 Feb 89	138.2	138.2
25 Dec 88	91.1	55.0	18 Feb 89	138.2	136.6
26 Dec 88	98.9	39.3	19 Feb 89	138.2	138.2
27 Dec 88	109.9	36.1	20 Feb 89	138.2	138.2
28 Dec 88	108.3	36.1	21 Feb 89	138.2	136.6
29 Dec 88	108.3	17.3	22 Feb 89	138.2	136.6
30 Dec 88	108.3	36.1	23 Feb 89	138.2	136.6
31 Dec 88	89.5	45.5	24 Feb 89	138.2	136.6
1 Jan 89	92.6	62.8	25 Feb 89	136.6	136.6
2 Jan 89	97.3	97.3	26 Feb 89	138.2	136.6
3 Jan 89	70.7	45.5	27 Feb 89	138.2	136.6
4 Jan 89	76.9	56.5	28 Feb 89	141.3	127.2
5 Jan 89	80.1	56.5	1 Mar 89	146.0	144.4
6 Jan 89	78.5	62.8	2 Mar 89	146.0	144.4
7 Jan 89 - 27 Jan 89	...	...	3 Mar 89	146.0	144.4
28 Jan 89	136.6	128.7	4 Mar 89	146.0	146.0
29 Jan 89	139.7	122.5	5 Mar 89	146.0	146.0
30 Jan 89	136.6	125.6	6 Mar 89	142.9	136.6
31 Jan 89	138.2	131.9	7 Mar 89	141.3	141.3
1 Feb 89	138.2	135.0	8 Mar 89	141.3	141.3
2 Feb 89	138.2	131.9	9 Mar 89	141.3	141.3

TABLE A-3 (Contd.)

Date	High	Low	Date	High	Low
10 Mar 89	141.3	141.3	18 Apr 89	138.2	131.9
11 Mar 89	141.3	141.3	19 Apr 89	142.9	127.2
12 Mar 89	142.9	141.3	20 Apr 89	144.4	130.3
13 Mar 89	144.4	136.6	21 Apr 89	142.9	130.3
14 Mar 89	144.4	144.4	22 Apr 89	155.4	139.7
15 Mar 89	144.4	144.4	23 Apr 89	155.4	150.7
16 Mar 89	144.4	144.4	24 Apr 89	155.4	150.7
17 Mar 89	144.4	144.4	25 Apr 89	153.9	150.7
18 Mar 89	144.4	144.4	26 Apr 89	155.4	135.0
19 Mar 89	144.4	144.4	27 Apr 89	128.7	127.2
20 Mar 89	135.0	127.2	28 Apr 89	130.3	127.2
21 Mar 89	138.2	136.6	29 Apr 89	120.9	119.3
22 Mar 89	138.2	136.6	30 Apr 89	120.9	119.3
23 Mar 89	136.6	136.6	1 May 89 - 9 May 89	...	...
24 Mar 89	136.6	136.6	10 May 89	144.4	136.6
25 Mar 89	136.6	136.6	11 May 89	144.4	139.7
26 Mar 89	136.6	136.6	12 May 89	141.3	138.2
27 Mar 89	138.2	138.2	13 May 89	144.4	141.3
28 Mar 89	138.2	136.6	14 May 89	142.9	109.9
29 Mar 89	138.2	136.6	15 May 89	144.4	141.3
30 Mar 89	138.2	138.2	16 May 89	141.3	138.2
31 Mar 89	138.2	136.6	17 May 89	146.0	139.7
1 Apr 89	138.2	136.6	18 May 89	146.0	141.3
2 Apr 89	138.2	136.6	19 May 89	146.0	138.2
3 Apr 89	138.2	124.0	20 May 89	146.0	139.7
4 Apr 89	139.7	138.2	21 May 89	146.0	141.3
5 Apr 89	138.2	136.6	22 May 89	142.9	141.3
6 Apr 89	138.2	138.2	23 May 89	146.0	144.4
7 Apr 89	138.2	136.6	24 May 89	147.6	142.9
8 Apr 89	138.2	138.2	25 May 89	147.6	142.9
9 Apr 89	138.2	136.6	26 May 89	146.0	141.3
10 Apr 89	136.6	127.2	27 May 89	147.6	142.9
11 Apr 89	138.2	125.6	28 May 89	147.6	144.4
12 Apr 89 - 16 Apr 89	...	...	29 May 89	147.6	144.4
17 Apr 89	146.0	131.9	30 May 89	144.4	141.3

TABLE A-3 (Contd.)

Date	High	Low	Date	High	Low
31 May 89	144.4	130.3	5 Jul 89	111.5	105.2
1 Jun 89	142.9	139.7	6 Jul 89	111.5	105.2
2 Jun 89	146.0	141.3	7 Jul 89	108.3	103.6
3 Jun 89	149.2	144.4	8 Jul 89	106.8	102.1
4 Jun 89	150.7	146.0	9 Jul 89	109.9	109.9
5 Jun 89	144.4	141.3	10 Jul 89	108.3	105.2
6 Jun 89	146.0	139.7	11 Jul 89	105.2	103.6
7 Jun 89	147.6	142.9	12 Jul 89	103.6	102.1
8 Jun 89	146.0	142.9	13 Jul 89	106.8	102.1
9 Jun 89	147.6	144.4	14 Jul 89	106.8	103.6
10 Jun 89	147.6	142.9	15 Jul 89	105.2	102.1
11 Jun 89	146.0	142.9	16 Jul 89	105.2	102.1
12 Jun 89	144.4	141.3	17 Jul 89	105.2	102.1
13 Jun 89	144.4	141.3	18 Jul 89	105.2	103.6
14 Jun 89	144.4	141.3	19 Jul 89	106.8	103.6
15 Jun 89	...	...	20 Jul 89	108.3	102.1
16 Jun 89	...	...	21 Jul 89	105.2	103.6
17 Jun 89	...	...	22 Jul 89	105.2	100.5
18 Jun 89	...	...	23 Jul 89	105.2	100.5
19 Jun 89	120.9	111.5	24 Jul 89	105.2	105.2
20 Jun 89	116.2	105.2	25 Jul 89	108.3	103.6
21 Jun 89	111.5	106.8	26 Jul 89	105.2	103.6
22 Jun 89	114.6	108.3	27 Jul 89	103.6	100.5
23 Jun 89	113.0	111.5	28 Jul 89	105.2	103.6
24 Jun 89	108.3	105.2	29 Jul 89	102.1	98.9
25 Jun 89	106.8	105.2	30 Jul 89	103.6	100.5
26 Jun 89	109.9	105.2	31 Jul 89	106.8	103.6
27 Jun 89	108.3	106.8	1 Aug 89	108.3	105.2
28 Jun 89	106.8	105.2	2 Aug 89	108.3	105.2
29 Jun 89	106.8	103.6	3 Aug 89	106.8	102.1
30 Jun 89	108.3	105.2	4 Aug 89	102.1	98.9
1 Jul 89	108.3	103.6	5 Aug 89	98.9	95.8
2 Jul 89	108.3	103.6	6 Aug 89	102.1	98.9
3 Jul 89	106.8	103.6	7 Aug 89	103.6	103.6
4 Jul 89	111.5	105.2	8 Aug 89	103.6	103.6

TABLE A-3 (Contd.)

Date	High	Low	Date	High	Low
9 Aug 89	103.6	100.5	4 Sep 89	113.0	108.3
10 Aug 89	102.1	98.9	5 Sep 89	116.2	106.8
11 Aug 89	102.1	97.3	6 Sep 89	135.0	130.3
12 Aug 89	102.1	98.9	7 Sep 89	146.0	119.3
13 Aug 89	102.1	98.9	8 Sep 89	147.6	144.4
14 Aug 89	105.2	102.1	9 Sep 89	149.2	144.4
15 Aug 89	111.5	108.3	10 Sep 89	149.2	144.4
16 Aug 89	111.5	106.8	11 Sep 89	149.2	147.6
17 Aug 89	109.9	106.8	12 Sep 89	133.5	125.6
18 Aug 89	106.8	103.6	13 Sep 89	125.6	117.8
19 Aug 89	108.3	105.2	14 Sep 89	144.4	139.7
20 Aug 89	108.3	106.8	15 Sep 89	147.6	131.9
21 Aug 89	105.2	105.2	16 Sep 89	141.3	124.0
22 Aug 89	106.8	103.6	17 Sep 89	149.2	146.0
23 Aug 89	108.3	105.2	18 Sep 89	147.6	146.0
24 Aug 89	106.8	105.2	19 Sep 89	149.2	146.0
25 Aug 89	114.6	105.2	20 Sep 89	147.6	141.3
26 Aug 89	114.6	109.9	21 Sep 89	146.0	142.9
27 Aug 89	114.6	109.9	22 Sep 89	146.0	127.2
28 Aug 89	114.6	109.9	23 Sep 89	144.4	141.3
29 Aug 89	116.2	109.9	24 Sep 89	146.0	141.3
30 Aug 89	117.8	113.0	25 Sep 89	146.0	141.3
31 Aug 89	114.6	111.5	26 Sep 89	146.0	106.8
1 Sep 89	113.0	108.3	27 Sep 89	136.6	92.6
2 Sep 89	111.5	108.3	28 Sep 89	149.2	122.5
3 Sep 89	113.0	108.3	29 Sep 89	149.2	122.5
			30 Sep 89	150.7	116.2

NOTE: 1 Oct - 27 Jan : Meter required service, inaccurate data recorded.
28 Jan: Installed new plumbing and new Barton block manifold assembly. Serviced, balanced and zeroed meter on chart.
12 Apr - 16 Apr: Data recorded off scale. Meter required servicing.
29 Apr - 9 May: Meter chart pen linkage failure.
9 May: Removed and replaced faulty meter. Serviced, balanced, and zeroed meter on chart.
15 Jun - 18 Jun: No data recorded due to steam flow blocked for collecting of water samples by U.C. Riverside.
19 Jun - 30 Sep: Steam flow out of balance due to taking of steam samples as part of a geothermal injection well gas tracer test. Samples taken at 1 to 2 week intervals.

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

Date	High	Low	Date	High	Low
1 Oct 88	...	...	5 Nov 88	193.3	8.2
2 Oct 88	...	...	6 Nov 88	154.2	6.2
3 Oct 88	...	...	7 Nov 88	141.9	16.4
4 Oct 88	172.7	8.2	8 Nov 88	37.0	18.5
5 Oct 88	185.0	10.3	9 Nov 88	154.2	12.3
6 Oct 88	178.9	8.2	10 Nov 88	156.3	10.3
7 Oct 88	189.2	10.3	11 Nov 88	164.5	4.1
8 Oct 88	205.6	22.6	12 Nov 88	168.6	2.1
9 Oct 88	160.4	20.6	13 Nov 88	176.8	12.3
10 Oct 88	178.9	16.4	14 Nov 88	154.2	10.3
11 Oct 88	205.6	10.3	15 Nov 88	162.4	18.5
12 Oct 88	180.9	16.4	16 Nov 88	172.7	12.3
13 Oct 88	180.9	16.4	17 Nov 88	148.0	10.3
14 Oct 88	154.2	16.4	18 Nov 88	139.8	8.2
15 Oct 88	164.5	10.3	19 Nov 88	123.4	8.2
16 Oct 88	189.2	14.4	20 Nov 88	158.3	14.4
17 Oct 88	203.5	6.2	21 Nov 88	152.1	16.4
18 Oct 88	90.5	14.4	22 Nov 88	24.7	22.6
19 Oct 88	205.6	10.3	23 Nov 88	178.9	20.6
20 Oct 88	187.1	10.3	24 Nov 88	135.7	12.3
21 Oct 88	195.3	12.3	25 Nov 88	156.3	10.3
22 Oct 88	205.6	16.4	26 Nov 88	180.9	6.2
23 Oct 88	201.5	8.2	27 Nov 88	183.0	2.1
24 Oct 88	203.5	12.3	28 Nov 88	172.7	18.5
25 Oct 88	195.3	16.4	29 Nov 88	178.9	16.4
26 Oct 88	205.6	10.3	30 Nov 88	199.4	16.4
27 Oct 88	166.5	12.3	1 Dec 88	193.3	8.2
28 Oct 88	160.4	4.1	2 Dec 88	205.6	16.4
29 Oct 88	170.6	10.3	3 Dec 88	170.6	20.6
30 Oct 88	178.9	14.4	4 Dec 88	137.8	12.3
31 Oct 88	141.9	14.4	5 Dec 88	176.8	10.3
1 Nov 88	180.9	20.6	6 Dec 88	100.7	18.5
2 Nov 88	174.8	18.5	7 Dec 88	88.4	14.4
3 Nov 88	183.0	14.4	8 Dec 88	113.1	6.2
4 Nov 88	183.0	8.2	9 Dec 88	143.9	14.4

TABLE A-4 (Contd.)

Date	High	Low	Date	High	Low
10 Dec 88	166.5	8.2	1 Feb 89	205.6	203.5
11 Dec 88	176.8	14.4	2 Feb 89	205.6	203.5
12 Dec 88	148.0	16.4	3 Feb 89	205.6	199.4
13 Dec 88	148.0	8.2	4 Feb 89	205.6	201.5
14 Dec 88	178.9	10.3	5 Feb 89 - 12 Feb 89	...	...
15 Dec 88	37.0	8.2	13 Feb 89	205.6	162.4
16 Dec 88	92.5	45.2	14 Feb 89	205.6	185.0
17 Dec 88	160.4	6.2	15 Feb 89	205.6	195.3
18 Dec 88	148.0	14.4	16 Feb 89	205.6	205.6
19 Dec 88	148.0	20.6	17 Feb 89 - 21 Feb 89	...	...
20 Dec 88	133.6	4.1	22 Feb 89	205.6	191.2
21 Dec 88	121.3	12.3	23 Feb 89	205.6	123.4
22 Dec 88	137.8	18.5	24 Feb 89	...	...
23 Dec 88	121.3	8.2	25 Feb 89	...	...
24 Dec 88	150.1	6.2	26 Feb 89	205.6	152.1
25 Dec 88	137.8	10.3	27 Feb 89	205.6	203.5
26 Dec 88	133.6	8.2	28 Feb 89	203.5	197.4
27 Dec 88	183.0	6.2	1 Mar 89	205.6	205.6
28 Dec 88	191.2	8.2	2 Mar 89	205.6	199.4
29 Dec 88	135.7	4.1	3 Mar 89	205.6	193.3
30 Dec 88	115.1	4.1	4 Mar 89	205.6	183.0
31 Dec 88	154.2	12.3	5 Mar 89	205.6	187.1
1 Jan 89	137.8	10.3	6 Mar 89	205.6	152.1
2 Jan 89	133.6	4.1	7 Mar 89	205.6	191.2
3 Jan 89 - 6 Jan 89	...	...	8 Mar 89	205.6	187.1
7 Jan 89	57.6	10.3	9 Mar 89	205.6	187.1
8 Jan 89 - 23 Jan 89	...	...	10 Mar 89	205.6	189.2
24 Jan 89	139.8	12.3	11 Mar 89	205.6	180.9
25 Jan 89	205.6	8.2	12 Mar 89	205.6	205.6
26 Jan 89	205.6	10.3	13 Mar 89	185.0	185.0
27 Jan 89	...	...	14 Mar 89	183.0	170.6
28 Jan 89	205.6	65.8	15 Mar 89	187.1	172.7
29 Jan 89	205.6	14.4	16 Mar 89	185.0	164.5
30 Jan 89	...	...	17 Mar 89	174.8	160.4
31 Jan 89	...	...	18 Mar 89	180.9	164.5

TABLE A-4 (Contd.)

Date	High	Low	Date	High	Low
19 Mar 89	189.2	174.8	30 Apr 89	328.1	314.9
20 Mar 89	197.4	176.8	1 May 89	332.4	310.6
21 Mar 89	195.3	174.8	2 May 89	345.5	323.7
22 Mar 89	201.5	187.1	3 May 89	349.9	332.4
23 Mar 89	201.5	187.1	4 May 89	349.9	332.4
24 Mar 89	199.4	185.0	5 May 89	345.5	332.4
25 Mar 89	205.6	189.2	6 May 89	341.2	328.1
26 Mar 89	203.5	201.5	7 May 89	345.5	332.4
27 Mar 89	203.5	178.9	8 May 89	319.3	310.6
28 Mar 89	199.4	178.9	9 May 89	314.9	310.6
29 Mar 89	199.4	185.0	10 May 89	349.9	319.3
30 Mar 89	201.5	183.0	11 May 89	363.0	349.9
31 Mar 89	205.6	189.2	12 May 89	358.7	349.9
1 Apr 89	205.6	197.4	13 May 89	363.0	349.9
2 Apr 89	205.6	201.5	14 May 89	363.0	345.5
3 Apr 89	205.6	195.3	15 May 89	354.3	345.5
4 Apr 89	205.6	195.3	16 May 89	358.7	341.2
5 Apr 89	205.6	195.3	17 May 89	345.5	332.4
6 Apr 89	205.6	197.4	18 May 89	341.2	328.1
7 Apr 89	205.6	199.4	19 May 89	341.2	319.3
8 Apr 89	205.6	203.5	20 May 89	341.2	319.3
9 Apr 89	205.6	203.5	21 May 89	328.1	314.9
10 Apr 89	205.6	191.2	22 May 89	323.7	314.9
11 Apr 89	205.6	203.5	23 May 89	323.7	310.6
12 Apr 89	205.6	201.5	24 May 89	328.1	310.6
13 Apr 89	205.6	201.5	25 May 89	323.7	306.2
14 Apr 89	205.6	187.1	26 May 89	314.9	301.8
15 Apr 89	354.3	191.2	27 May 89	314.9	297.4
16 Apr 89	205.6	189.2	28 May 89	323.7	301.8
17 Apr 89	205.6	187.1	29 May 89	323.7	301.8
18 Apr 89	205.6	199.4	30 May 89	306.2	293.1
19 Apr 89 - 26 Apr 89	...	...	31 May 89	306.2	293.1
27 Apr 89	384.9	345.5	1 Jun 89	301.8	279.9
28 Apr 89	310.6	310.6	2 Jun 89	297.4	279.9
29 Apr 89	328.1	306.2	3 Jun 89	301.8	284.3

TABLE A-4 (Contd.)

Date	High	Low	Date	High	Low
4 Jun 89	297.4	284.3	9 Jul 89	166.2	135.6
5 Jun 89	288.7	249.3	10 Jul 89	183.7	135.6
6 Jun 89	288.7	275.6	11 Jul 89	192.5	153.1
7 Jun 89	288.7	275.6	12 Jul 89	179.3	144.3
8 Jun 89	288.7	262.4	13 Jul 89	170.6	118.1
9 Jun 89	275.6	262.4	14 Jul 89	166.2	109.4
10 Jun 89	279.9	258.1	15 Jul 89	170.6	113.7
11 Jun 89	279.9	253.7	16 Jul 89	170.6	122.5
12 Jun 89	271.2	192.5	17 Jul 89	175.0	126.8
13 Jun 89	275.6	249.3	18 Jul 89	166.2	118.1
14 Jun 89	271.2	236.2	19 Jul 89	166.2	105.0
15 Jun 89	266.8	227.4	20 Jul 89	170.6	109.4
16 Jun 89	249.3	218.7	21 Jul 89	170.6	122.5
17 Jun 89	240.6	201.2	22 Jul 89	166.2	113.7
18 Jun 89	236.2	192.5	23 Jul 89	170.6	109.4
19 Jun 89	223.1	192.5	24 Jul 89	153.1	118.1
20 Jun 89	236.2	192.5	25 Jul 89	166.2	201.2
21 Jun 89	218.7	192.5	26 Jul 89	183.7	131.2
22 Jun 89	223.1	192.5	27 Jul 89 - 1 Aug 89	...	...
23 Jun 89	231.8	192.5	2 Aug 89	205.6	201.2
24 Jun 89	218.7	188.1	3 Aug 89	201.2	179.3
25 Jun 89	210.0	179.3	4 Aug 89	188.1	179.3
26 Jun 89	218.7	179.3	5 Aug 89	179.3	157.5
27 Jun 89	223.1	183.7	6 Aug 89	188.1	161.8
28 Jun 89	205.6	166.2	7 Aug 89	192.5	183.7
29 Jun 89	218.7	170.6	8 Aug 89	192.5	179.3
30 Jun 89	122.5	109.4	9 Aug 89	192.5	179.3
1 Jul 89	105.0	91.9	10 Aug 89	188.1	175.0
2 Jul 89	118.1	61.2	11 Aug 89	188.1	170.6
3 Jul 89	170.6	135.6	12 Aug 89	183.7	175.0
4 Jul 89	201.2	144.3	13 Aug 89	188.1	170.6
5 Jul 89	183.7	96.2	14 Aug 89	188.1	175.0
6 Jul 89	179.3	118.1	15 Aug 89	192.5	179.3
7 Jul 89	183.7	109.4	16 Aug 89	192.5	179.3
8 Jul 89	196.8	118.1	17 Aug 89	188.1	175.0

TABLE A-4 (Contd.)

Date	High	Low	Date	High	Low
18 Aug 89	183.7	170.6	12 Sep 89	214.3	205.6
19 Aug 89	188.1	175.0	13 Sep 89	214.3	192.5
20 Aug 89	196.8	183.7	14 Sep 89	218.7	196.8
21 Aug 89	201.2	192.5	15 Sep 89	218.7	201.2
22 Aug 89	205.6	188.1	16 Sep 89	214.3	210.0
23 Aug 89	214.3	201.2	17 Sep 89	223.1	210.0
24 Aug 89	210.0	188.1	18 Sep 89	227.4	223.1
25 Aug 89	210.0	196.8	19 Sep 89	227.4	214.3
26 Aug 89	205.6	192.5	20 Sep 89	227.4	210.0
27 Aug 89	205.6	188.1	21 Sep 89	236.2	214.3
28 Aug 89	210.0	192.5	22 Sep 89	244.9	227.4
29 Aug 89	210.0	201.2	23 Sep 89	244.9	223.1
30 Aug 89	214.3	205.6	24 Sep 89	244.9	227.4
31 Aug 89	205.6	196.8	25 Sep 89	240.6	231.8
1 Sep 89	205.6	183.7	26 Sep 89	249.3	231.8
2 Sep 89	205.6	183.7	27 Sep 89	249.3	231.8
3 Sep 89	205.6	188.1	28 Sep 89	244.9	227.4
4 Sep 89	214.3	196.8	29 Sep 89	249.3	223.1
5 Sep 89	218.7	201.2	30 Sep 89	253.7	227.4
6 Sep 89	218.7	214.3			
7 Sep 89	218.7	201.2			
8 Sep 89	210.0	192.5			
9 Sep 89	214.3	196.8			
10 Sep 89	214.3	196.8			
11 Sep 89	223.1	214.3			

NOTE: 1 Oct - 25 Feb: Erratic data because meter and system maintenance required.
25 Feb: Installed new condensation pots. Serviced and balanced flow meter and zeroed indicator on the chart.
10 Mar: Installed new Barton block manifold assembly. Serviced and balanced flow meter and zeroed indicator on the chart.
19 Apr - 26 Apr: Data recorded off scale due to increased steam flow.
28 Apr: Replaced 0-25-inch scale water column meter with 0-50-inch scale meter.
27 Jul - 1 Aug: Clock programmer defective.
1 Aug: Clock programmer and battery replaced.

TABLE A-5. Schober's Resort Steam Flow Data, lb/h.

Date	High	Low	Date	High	Low
1 Oct 88	158.4	135.0	5 Nov 88	156.7	150.0
2 Oct 88	156.7	133.4	6 Nov 88	166.7	156.7
3 Oct 88	160.0	136.7	7 Nov 88	158.4	155.0
4 Oct 88	145.0	135.0	8 Nov 88	160.0	156.7
5 Oct 88	145.0	135.0	9 Nov 88	161.7	155.0
6 Oct 88	150.0	135.0	10 Nov 88	161.7	156.7
7 Oct 88	151.7	135.0	11 Nov 88	165.0	156.7
8 Oct 88	155.0	133.4	12 Nov 88	166.7	156.7
9 Oct 88	161.7	135.0	13 Nov 88	161.7	158.4
10 Oct 88	145.0	138.4	14 Nov 88	165.0	160.0
11 Oct 88	148.4	138.4	15 Nov 88	160.0	158.4
12 Oct 88	151.7	138.4	16 Nov 88	165.0	160.0
13 Oct 88	146.7	138.4	17 Nov 88	166.7	163.4
14 Oct 88	150.0	140.0	18 Nov 88	166.7	160.0
15 Oct 88	150.0	138.4	19 Nov 88	163.4	160.0
16 Oct 88	155.0	140.0	20 Nov 88	166.7	161.7
17 Oct 88	161.7	140.0	21 Nov 88	166.7	161.7
18 Oct 88	163.4	141.7	22 Nov 88 - 11 Dec 88	...	...
19 Oct 88	161.7	141.7	12 Dec 88	146.7	143.4
20 Oct 88	163.4	143.4	13 Dec 88	143.4	141.7
21 Oct 88	161.7	141.7	14 Dec 88	143.4	141.7
22 Oct 88	163.4	143.4	15 Dec 88	143.4	140.0
23 Oct 88	161.7	143.4	16 Dec 88	140.0	140.0
24 Oct 88	165.0	143.4	17 Dec 88	141.7	140.0
25 Oct 88	165.0	143.4	18 Dec 88	145.0	141.7
26 Oct 88	166.7	146.7	19 Dec 88	146.7	145.0
27 Oct 88	156.7	150.0	20 Dec 88	145.0	143.4
28 Oct 88	150.0	148.4	21 Dec 88	145.0	143.4
29 Oct 88	155.0	145.0	22 Dec 88	145.0	143.4
30 Oct 88	160.0	145.0	23 Dec 88	145.0	143.4
31 Oct 88	155.0	150.0	24 Dec 88	145.0	143.4
1 Nov 88	158.4	151.7	25 Dec 88	145.0	143.4
2 Nov 88	161.7	151.7	26 Dec 88	145.0	143.4
3 Nov 88	166.7	150.0	27 Dec 88	145.0	143.4
4 Nov 88	166.7	150.0	28 Dec 88	143.4	143.4

TABLE A-5 (Contd.)

Date	High	Low	Date	High	Low
29 Dec 88	145.0	143.4	2 Feb 89	155.0	146.7
30 Dec 88	145.0	143.4	3 Feb 89	155.0	151.7
31 Dec 88	145.0	143.4	4 Feb 89	156.7	150.0
1 Jan 89	145.0	143.4	5 Feb 89	158.4	156.7
2 Jan 89	145.0	145.0	6 Feb 89	160.0	155.0
3 Jan 89	146.7	145.0	7 Feb 89	160.0	153.4
4 Jan 89	146.7	145.0	8 Feb 89	158.4	155.0
5 Jan 89	145.0	145.0	9 Feb 89	156.7	120.0
6 Jan 89	145.0	143.4	10 Feb 89	126.7	113.4
7 Jan 89	143.4	141.7	11 Feb 89	126.7	115.0
8 Jan 89	141.7	141.7	12 Feb 89	130.0	125.0
9 Jan 89	145.0	143.4	13 Feb 89	93.4	78.3
10 Jan 89	145.0	143.4	14 Feb 89	98.4	81.7
11 Jan 89	145.0	143.4	15 Feb 89	101.7	75.0
12 Jan 89	145.0	143.4	16 Feb 89	98.4	80.0
13 Jan 89	145.0	143.4	17 Feb 89	96.7	71.7
14 Jan 89	145.0	145.0	18 Feb 89	95.0	78.3
15 Jan 89	145.0	145.0	19 Feb 89	93.4	81.7
16 Jan 89	145.0	143.4	20 Feb 89	100.0	81.7
17 Jan 89	145.0	145.0	21 Feb 89	98.4	81.7
18 Jan 89	145.0	143.4	22 Feb 89	116.7	76.7
19 Jan 89	145.0	143.4	23 Feb 89	133.4	121.7
20 Jan 89	145.0	143.4	24 Feb 89	103.4	18.3
21 Jan 89	145.0	143.4	25 Feb 89	65.0	16.7
22 Jan 89	145.0	145.0	26 Feb 89	70.0	6.7
23 Jan 89	145.0	145.0	27 Feb 89	18.3	11.7
24 Jan 89	145.0	145.0	28 Feb 89	53.3	40.0
25 Jan 89	145.0	145.0	1 Mar 89	55.0	38.3
26 Jan 89	145.0	145.0	2 Mar 89	36.7	21.7
27 Jan 89	145.0	143.4	3 Mar 89	56.7	25.0
28 Jan 89	...	...	4 Mar 89	43.3	30.0
29 Jan 89	...	...	5 Mar 89	45.0	21.7
30 Jan 89	151.7	140.0	6 Mar 89	35.0	6.7
31 Jan 89	155.0	145.0	7 Mar 89	...	...
1 Feb 89	153.4	145.0	8 Mar 89	...	...

TABLE A-5 (Contd.)

Date	High	Low	Date	High	Low
9 Mar 89	31.7	8.3	21 Apr 89	63.3	61.7
10 Mar 89	31.7	13.3	22 Apr 89	60.0	56.7
11 Mar 89	...	...	23 Apr 89	56.7	53.3
12 Mar 89	...	...	24 Apr 89	71.7	20.0
13 Mar 89	...	...	25 Apr 89	58.3	51.7
14 Mar 89	53.3	35.0	26 Apr 89	56.7	53.3
15 Mar 89	51.7	28.3	27 Apr 89	56.7	50.0
16 Mar 89	56.7	36.7	28 Apr 89	52.3	20.9
17 Mar 89	58.3	35.0	29 Apr 89	40.7	16.3
18 Mar 89	...	...	30 Apr 89	48.8	5.8
19 Mar 89	...	...	1 May 89	70.9	37.2
20 Mar 89	53.3	48.3	2 May 89	72.0	32.5
21 Mar 89	55.0	50.0	3 May 89	62.7	27.9
22 Mar 89	55.0	50.0	4 May 89	62.7	24.4
23 Mar 89	55.0	50.0	5 May 89	65.1	22.1
24 Mar 89	55.0	46.7	6 May 89	48.8	19.8
25 Mar 89	53.3	45.0	7 May 89	47.6	17.4
26 Mar 89	51.7	46.7	8 May 89	55.8	4.6
27 Mar 89	51.8	43.3	9 May 89	51.1	5.8
28 Mar 89	55.0	51.7	10 May 89	41.8	9.3
29 Mar 89	60.0	46.7	11 May 89	43.0	12.8
30 Mar 89	60.0	53.3	12 May 89	43.0	1.2
31 Mar 89	60.0	51.7	13 May 89	50.0	4.6
1 Apr 89	60.0	55.0	14 May 89	37.2	1.2
2 Apr 89	55.0	50.0	15 May 89	46.5	8.1
3 Apr 89	63.3	58.3	16 May 89	56.9	8.1
4 Apr 89	63.3	56.7	17 May 89	58.1	7.0
5 Apr 89	61.7	56.7	18 May 89	34.9	2.3
6 Apr 89	63.3	56.7	19 May 89	39.5	5.8
7 Apr 89	65.0	58.3	20 May 89	39.5	10.5
8 Apr 89	61.7	58.3	21 May 89	52.3	8.1
9 Apr 89	55.0	53.3	22 May 89	40.7	9.3
10 Apr 89	56.7	51.7	23 May 89	45.3	9.3
11 Apr 89 - 19 Apr 89	...	...	24 May 89	45.3	9.3
20 Apr 89	63.3	63.3	25 May 89	40.7	10.5

TABLE A-5 (Contd.)

Date	High	Low	Date	High	Low
26 May 89	51.1	5.8	22 Aug 89	1092.0	1080.0
27 May 89	48.8	3.5	23 Aug 89	1092.0	1080.0
28 May 89	38.3	5.8	24 Aug 89	1092.0	1068.0
29 May 89	...	...	25 Aug 89	1092.0	1080.0
30 May 89	45.3	9.3	26 Aug 89	1080.0	1080.0
31 May 89	52.3	9.3	27 Aug 89	1092.0	1080.0
1 Jun 89	47.6	5.8	28 Aug 89	1104.0	1104.0
2 Jun 89	38.3	5.8	29 Aug 89	1116.0	1104.0
3 Jun 89	39.5	3.5	30 Aug 89	1128.0	1104.0
4 Jun 89	45.3	10.5	31 Aug 89	1116.0	1104.0
5 Jun 89	34.9	7.0	1 Sep 89	1116.0	1104.0
6 Jun 89	46.5	8.1	2 Sep 89	1128.0	1104.0
7 Jun 89 - 30 Jul 89	...	...	3 Sep 89	1128.0	1104.0
31 Jul 89	1032.0	1032.0	4 Sep 89	1140.0	1116.0
1 Aug 89	1032.0	1032.0	5 Sep 89	1140.0	1116.0
2 Aug 89	1044.0	1032.0	6 Sep 89	1104.0	1092.0
3 Aug 89	1032.0	1032.0	7 Sep 89	1128.0	1092.0
4 Aug 89	1020.0	1020.0	8 Sep 89	1116.0	1104.0
5 Aug 89	1008.0	1008.0	9 Sep 89	1116.0	1116.0
6 Aug 89	1032.0	1020.0	10 Sep 89	1116.0	1116.0
7 Aug 89	1020.0	1020.0	11 Sep 89	1128.0	1116.0
8 Aug 89	1032.0	1020.0	12 Sep 89	1116.0	1116.0
9 Aug 89	1032.0	1032.0	13 Sep 89	1128.0	1116.0
10 Aug 89	1044.0	1044.0	14 Sep 89	1152.0	1116.0
11 Aug 89	1056.0	1044.0	15 Sep 89	1152.0	1152.0
12 Aug 89	1044.0	1044.0	16 Sep 89	1152.0	1152.0
13 Aug 89	1044.0	1032.0	17 Sep 89	1152.0	1152.0
14 Aug 89	1044.0	1032.0	18 Sep 89	1152.0	1152.0
15 Aug 89	1056.0	1056.0	19 Sep 89	1152.0	1152.0
16 Aug 89	1080.0	1056.0	20 Sep 89	1152.0	1152.0
17 Aug 89	1080.0	1080.0	21 Sep 89	1152.0	1152.0
18 Aug 89	1080.0	1068.0	22 Sep 89	1152.0	1152.0
19 Aug 89	1080.0	1068.0	23 Sep 89	1152.0	1152.0
20 Aug 89	1080.0	1068.0	24 Sep 89	1152.0	1152.0
21 Aug 89	1092.0	1080.0	25 Sep 89	1152.0	1152.0

TABLE A-5 (Contd.)

Date	High	Low
26 Sep 89	1152.0	1152.0
27 Sep 89	1152.0	1152.0
28 Sep 89	1152.0	1152.0
29 Sep 89	1152.0	1152.0
30 Sep 89	1152.0	1152.0

NOTE: 30 Jan: Installed 0-50-inch water column meter.
9 Feb: Pressure drop due to adjacent abandoned (plugged) well casing blowing out.
24 Feb: Installed new Barton block manifold assembly. Serviced and balanced flow meter and zeroed meter on chart.
11 Apr - 19 Apr: Batteries and clock programmer failed, replaced same.
28 Apr: Removed 0-50-inch scale water column meter and replaced with 0-25-inch water column meter.
6 Jun: Removed monitoring equipment to facilitate well repair.
31 Jul: Well rework completed and monitoring equipment installed.

Appendix B

DAILY TEMPERATURE DATA

TABLE B-1. Two-Inch Steam Well Temperature, °F.

Date	High	Low	Date	High	Low
1 Oct 88 - 5 Oct 88	...	...	9 Nov 88	180	167
6 Oct 88	193	172	10 Nov 88	178	161
7 Oct 88	193	184	11 Nov 88	175	161
8 Oct 88	173	157	12 Nov 88	170	151
9 Oct 88	174	158	13 Nov 88	166	152
10 Oct 88	169	160	14 Nov 88	163	146
11 Oct 88	188	155	15 Nov 88	185	155
12 Oct 88	...	...	16 Nov 88	186	160
13 Oct 88	...	...	17 Nov 88	186	139
14 Oct 88	171	151	18 Nov 88	182	136
15 Oct 88	176	150	19 Nov 88	186	162
16 Oct 88	...	...	20 Nov 88	174	157
17 Oct 88	...	...	21 Nov 88	189	155
18 Oct 88	...	...	22 Nov 88	175	164
19 Oct 88	...	...	23 Nov 88	174	149
20 Oct 88	170	155	24 Nov 88	171	153
21 Oct 88	182	167	25 Nov 88	170	157
22 Oct 88	173	164	26 Nov 88	179	156
23 Oct 88	...	...	27 Nov 88	185	170
24 Oct 88	...	...	28 Nov 88	169	154
25 Oct 88	187	174	29 Nov 88	190	161
26 Oct 88	179	163	30 Nov 88	190	163
27 Oct 88	173	154	1 Dec 88	191	156
28 Oct 88	176	151	2 Dec 88	187	155
29 Oct 88	179	157	3 Dec 88	185	154
30 Oct 88	188	160	4 Dec 88	186	156
31 Oct 88	185	184	5 Dec 88	183	154
1 Nov 88	172	155	6 Dec 88	169	152
2 Nov 88	175	159	7 Dec 88	164	133
3 Nov 88	179	161	8 Dec 88	163	139
4 Nov 88	189	168	9 Dec 88	166	141
5 Nov 88	183	159	10 Dec 88	175	153
6 Nov 88	177	153	11 Dec 88	190	155
7 Nov 88	174	156	12 Dec 88	171	159
8 Nov 88	176	162	13 Dec 88	176	157

TABLE B-1 (Contd.)

Date	High	Low	Date	High	Low
14 Dec 88	177	154	24 Jan 89	176	146
15 Dec 88	145	134	25 Jan 89	170	147
16 Dec 88	165	151	26 Jan 89	183	148
17 Dec 88	176	162	27 Jan 89	179	158
18 Dec 88	173	152	28 Jan 89	190	158
19 Dec 88	178	165	29 Jan 89	185	147
20 Dec 88	181	160	30 Jan 89	178	171
21 Dec 88	164	143	31 Jan 89	185	157
22 Dec 88	175	148	1 Feb 89	178	156
23 Dec 88	180	145	2 Feb 89	175	153
24 Dec 88	168	151	3 Feb 89	174	154
25 Dec 88	167	139	4 Feb 89	171	149
26 Dec 88	166	141	5 Feb 89	187	146
27 Dec 88	182	166	6 Feb 89	183	163
28 Dec 88	178	152	7 Feb 89	189	154
29 Dec 88	183	166	8 Feb 89	191	167
30 Dec 88	186	160	9 Feb 89	194	166
31 Dec 88	171	156	10 Feb 89	195	171
1 Jan 89	171	141	11 Feb 89	182	165
2 Jan 89	181	153	12 Feb 89	174	152
3 Jan 89	176	150	13 Feb 89	179	170
4 Jan 89	173	151	14 Feb 89	183	171
5 Jan 89	174	150	15 Feb 89	195	180
6 Jan 89	171	142	16 Feb 89	194	178
7 Jan 89	178	150	17 Feb 89	195	168
8 Jan 89	180	158	18 Feb 89	182	160
9 Jan 89	179	152	19 Feb 89	177	160
10 Jan 89 - 16 Jan 89	...	...	20 Feb 89	192	166
17 Jan 89	176	160	21 Feb 89	194	185
18 Jan 89	188	157	22 Feb 89	194	186
19 Jan 89	186	157	23 Feb 89	181	173
20 Jan 89	188	154	24 Feb 89	182	165
21 Jan 89	174	158	25 Feb 89	197	169
22 Jan 89	172	159	26 Feb 89	181	168
23 Jan 89	173	149	27 Feb 89	181	160

TABLE B-1 (Contd.)

Date	High	Low	Date	High	Low
28 Feb 89	177	168	5 Apr 89	197	166
1 Mar 89	181	166	6 Apr 89	199	182
2 Mar 89	173	155	7 Apr 89	188	169
3 Mar 89	179	146	8 Apr 89	183	165
4 Mar 89	193	178	9 Apr 89	185	168
5 Mar 89	193	182	10 Apr 89	183	170
6 Mar 89	175	159	11 Apr 89	185	158
7 Mar 89	183	172	12 Apr 89	182	163
8 Mar 89	184	161	13 Apr 89	186	172
9 Mar 89	192	160	14 Apr 89	187	167
10 Mar 89	191	162	15 Apr 89	183	165
11 Mar 89	192	162	16 Apr 89	185	166
12 Mar 89	184	163	17 Apr 89	177	156
13 Mar 89	177	164	18 Apr 89	185	168
14 Mar 89	181	165	19 Apr 89	184	167
15 Mar 89	183	163	20 Apr 89	179	166
16 Mar 89	173	160	21 Apr 89	186	162
17 Mar 89	180	157	22 Apr 89	177	164
18 Mar 89	184	162	23 Apr 89	173	157
19 Mar 89	185	161	24 Apr 89	176	163
20 Mar 89	192	170	25 Apr 89	171	150
21 Mar 89	187	167	26 Apr 89	179	160
22 Mar 89	179	159	27 Apr 89	176	164
23 Mar 89	175	154	28 Apr 89	174	168
24 Mar 89	171	149	29 Apr 89	178	175
25 Mar 89	179	159	30 Apr 89	178	174
26 Mar 89	179	165	1 May 89 - 16 May 89	...	...
27 Mar 89	187	158	17 May 89	212	207
28 Mar 89	184	163	18 May 89	209	206
29 Mar 89	195	174	19 May 89	209	208
30 Mar 89	189	167	20 May 89	207	206
1 Apr 89	180	161	21 May 89	207	203
2 Apr 89	178	160	22 May 89	210	198
3 Apr 89	182	174	23 May 89	204	204
4 Apr 89	193	175	24 May 89	207	206

TABLE B-1 (Contd.)

Date	High	Low	Date	High	Low
25 May 89	209	207	26 Jul 89	212	210
26 May 89	209	209	27 Jul 89	209	209
27 May 89	210	206	28 Jul 89	207	206
28 May 89	208	205	29 Jul 89	205	204
29 May 89	209	202	30 Jul 89	206	205
30 May 89	207	205	31 Jul 89	212	211
31 May 89	208	202	1 Aug 89	213	211
1 Jun 89	207	202	2 Aug 89	214	213
2 Jun 89	210	201	3 Aug 89	211	209
3 Jun 89	209	197	4 Aug 89	204	202
4 Jun 89	209	200	5 Aug 89	203	201
5 Jun 89	209	204	6 Aug 89	210	210
6 Jun 89	207	203	7 Aug 89	210	208
7 Jun 89	207	202	8 Aug 89	208	208
8 Jun 89	209	203	9 Aug 89	208	207
9 Jun 89	209	207	10 Aug 89	206	205
10 Jun 89	209	206	11 Aug 89	205	205
11 Jun 89	208	205	12 Aug 89	205	204
12 Jun 89 - 9 Jul 89	...	...	13 Aug 89	208	206
10 Jul 89	211	211	14 Aug 89	210	208
11 Jul 89	209	208	15 Aug 89	205	204
12 Jul 89	208	204	16 Aug 89	207	205
13 Jul 89	208	208	17 Aug 89	204	204
14 Jul 89	205	204	18 Aug 89	205	204
15 Jul 89	204	203	19 Aug 89	206	203
16 Jul 89	207	205	20 Aug 89	206	204
17 Jul 89	211	210	21 Aug 89	205	205
18 Jul 89	210	210	22 Aug 89	206	205
19 Jul 89	211	210	23 Aug 89	206	205
20 Jul 89	211	210	24 Aug 89	207	205
21 Jul 89	209	209	25 Aug 89	206	205
22 Jul 89	209	209	26 Aug 89	206	205
23 Jul 89	210	209	27 Aug 89	204	204
24 Jul 89	210	210	28 Aug 89	205	204
25 Jul 89	212	209	29 Aug 89	205	205

TABLE B-1 (Contd.)

Date	High	Low	Date	High	Low
30 Aug 89	206	204	15 Sep 89	207	205
31 Aug 89	206	205	16 Sep 89	202	202
1 Sep 89	206	205	17 Sep 89	204	200
2 Sep 89	204	203	18 Sep 89	204	203
3 Sep 89	204	204	19 Sep 89	201	198
4 Sep 89	206	205	20 Sep 89	203	202
5 Sep 89	205	204	21 Sep 89	202	200
6 Sep 89	207	207	22 Sep 89	201	200
7 Sep 89	208	203	23 Sep 89	201	199
8 Sep 89	205	204	24 Sep 89	205	202
9 Sep 89	204	204	25 Sep 89	205	205
10 Sep 89	204	204	26 Sep 89	205	205
11 Sep 89	206	202	27 Sep 89	211	210
12 Sep 89	204	202	28 Sep 89	209	208
13 Sep 89	205	204	29 Sep 89	206	203
14 Sep 89	208	204	30 Sep 89	200	199

NOTE: 1 Oct - 24 Oct: Intermittent data collected. Pen not contacting chart.
10 Jan - 16 Jan: Chart retaining nut loose, no data recorded.
1 May - 9 May: Removed and replaced meter.
9 May - 16 May: Ran test charts to set steam temperature adjustment.
12 Jun - 9 Jul: Thermocouple housing threads damaged, temperature not recorded.
9 Jul: Thermocouple housing repaired.

TABLE B-2. Schober's Resort Steam Temperature, °F.

Date	High	Low	Date	High	Low
1 Oct 88	...	...	5 Nov 88	196	193
2 Oct 88	...	...	6 Nov 88	197	193
3 Oct 88	...	...	7 Nov 88	200	195
4 Oct 88	199	196	8 Nov 88	197	195
5 Oct 88	200	196	9 Nov 88	198	195
6 Oct 88	199	198	10 Nov 88	201	197
7 Oct 88	199	197	11 Nov 88	199	197
8 Oct 88	199	199	12 Nov 88	198	195
9 Oct 88	199	196	13 Nov 88	197	192
10 Oct 88	197	195	14 Nov 88	197	195
11 Oct 88	197	196	15 Nov 88	198	195
12 Oct 88	198	196	16 Nov 88	197	194
13 Oct 88	198	196	17 Nov 88	196	195
14 Oct 88	199	196	18 Nov 88	197	194
15 Oct 88	200	197	19 Nov 88	198	195
16 Oct 88	200	195	20 Nov 88	197	194
17 Oct 88	199	195	21 Nov 88	199	196
18 Oct 88	197	197	22 Nov 88	196	196
19 Oct 88	200	197	23 Nov 88	198	196
20 Oct 88	201	198	24 Nov 88	197	195
21 Oct 88	201	198	25 Nov 88	198	194
22 Oct 88	201	198	26 Nov 88	197	194
23 Oct 88	197	196	27 Nov 88	196	194
24 Oct 88	198	193	28 Nov 88	200	194
25 Oct 88	200	197	29 Nov 88	205	200
26 Oct 88	202	198	30 Nov 88	205	202
27 Oct 88	200	200	1 Dec 88	202	199
28 Oct 88	199	197	2 Dec 88	195	193
29 Oct 88	198	195	3 Dec 88	190	186
30 Oct 88	196	192	4 Dec 88	193	189
31 Oct 88	199	196	5 Dec 88	200	193
1 Nov 88	202	199	6 Dec 88	203	200
2 Nov 88	201	199	7 Dec 88	203	198
3 Nov 88	199	195	8 Dec 88	207	203
4 Nov 88	195	192	9 Dec 88	203	202

TABLE B-2 (Contd.)

Date	High	Low	Date	High	Low
10 Dec 88	195	194	14 Jan 89	200	193
11 Dec 88	192	190	15 Jan 89	199	193
12 Dec 88	199	194	16 Jan 89	198	197
13 Dec 88	207	201	17 Jan 89	199	195
14 Dec 88	205	203	18 Jan 89	198	196
15 Dec 88	200	196	19 Jan 89	199	196
16 Dec 88	192	189	20 Jan 89	199	197
17 Dec 88	187	185	21 Jan 89	200	198
18 Dec 88	192	188	22 Jan 89	199	196
19 Dec 88	201	195	23 Jan 89	198	195
20 Dec 88	197	196	24 Jan 89	199	196
21 Dec 88	198	194	25 Jan 89	199	195
22 Dec 88	196	194	26 Jan 89	199	196
23 Dec 88	197	194	27 Jan 89	200	196
24 Dec 88	197	195	28 Jan 89	200	196
25 Dec 88	197	192	29 Jan 89	199	196
26 Dec 88	196	194	30 Jan 89	198	194
27 Dec 88	197	196	31 Jan 89	198	195
28 Dec 88	197	195	1 Feb 89	197	196
29 Dec 88	196	194	2 Feb 89	198	195
30 Dec 88	197	194	3 Feb 89	197	193
31 Dec 88	197	195	4 Feb 89	197	192
1 Jan 89	199	192	5 Feb 89	194	191
2 Jan 89	199	196	6 Feb 89	197	193
3 Jan 89	199	196	7 Feb 89	198	196
4 Jan 89	200	198	8 Feb 89	199	197
5 Jan 89	199	197	9 Feb 89	198	194
6 Jan 89	199	195	10 Feb 89	197	195
7 Jan 89	196	193	11 Feb 89	197	194
8 Jan 89	195	192	12 Feb 89	195	195
9 Jan 89	197	19?	13 Feb 89	196	195
10 Jan 89	198	19?	14 Feb 89	199	195
11 Jan 89	198	194	15 Feb 89	198	194
12 Jan 89	198	193	16 Feb 89	198	195
13 Jan 89	200	197	17 Feb 89	196	193

TABLE B-2 (Contd.)

Date	High	Low	Date	High	Low
18 Feb 89	195	194	25 Mar 89	197	196
19 Feb 89	195	192	26 Mar 89	195	192
20 Feb 89	195	194	27 Mar 89	197	194
21 Feb 89	198	195	28 Mar 89	197	194
22 Feb 89	200	193	29 Mar 89	198	194
23 Feb 89	201	195	30 Mar 89	199	195
24 Feb 89	207	186	31 Mar 89	196	196
25 Feb 89	196	193	1 Apr 89	199	196
26 Feb 89	197	194	2 Apr 89	196	193
27 Feb 89	196	193	3 Apr 89	198	195
28 Feb 89	195	194	4 Apr 89	198	195
1 Mar 89	195	194	5 Apr 89	199	196
2 Mar 89	196	187	6 Apr 89	199	196
3 Mar 89	194	191	7 Apr 89	198	196
4 Mar 89	196	192	8 Apr 89	198	195
5 Mar 89	197	191	9 Apr 89	197	195
6 Mar 89	196	194	10 Apr 89	199	197
7 Mar 89	199	194	11 Apr 89	195	194
8 Mar 89	196	193	12 Apr 89	195	194
9 Mar 89	197	193	13 Apr 89	198	197
10 Mar 89	197	193	14 Apr 89	197	195
11 Mar 89	198	195	15 Apr 89	197	196
12 Mar 89	195	193	16 Apr 89	197	197
13 Mar 89	195	193	17 Apr 89	198	196
14 Mar 89	194	192	18 Apr 89	198	196
15 Mar 89	195	194	19 Apr 89	197	196
16 Mar 89	195	195	20 Apr 89	200	196
17 Mar 89	198	198	21 Apr 89	200	194
18 Mar 89	197	197	22 Apr 89	197	194
19 Mar 89	195	194	23 Apr 89	200	195
20 Mar 89	197	194	24 Apr 89	198	194
21 Mar 89	197	194	25 Apr 89	197	195
22 Mar 89	196	195	26 Apr 89	197	194
23 Mar 89	197	194	27 Apr 89	197	193
24 Mar 89	196	194	28 Apr 89	193	191

TABLE B-2 (Contd.)

Date	High	Low	Date	High	Low
29 Apr 89	196	193	3 Jun 89	197	195
30 Apr 89	197	194	4 Jun 89	197	194
1 May 89	197	195	5 Jun 89	197	196
2 May 89	197	194	6 Jun 89	198	196
3 May 89	198	194	7 Jun 89 - 27 Jul 89	...	...
4 May 89	197	197	28 Jul 89	211	209
5 May 89	197	196	29 Jul 89	208	207
6 May 89	197	195	30 Jul 89	214	209
7 May 89	199	197	31 Jul 89	214	216
8 May 89	198	196	1 Aug 89	214	212
9 May 89	197	196	2 Aug 89	214	211
10 May 89	197	196	3 Aug 89	216	213
11 May 89	195	194	4 Aug 89	214	213
12 May 89	194	193	5 Aug 89	215	211
13 May 89	194	192	6 Aug 89	215	215
14 May 89	195	192	7 Aug 89	214	214
15 May 89	197	192	8 Aug 89	214	211
16 May 89	198	196	9 Aug 89	213	212
17 May 89	198	196	10 Aug 89	213	212
18 May 89	198	194	11 Aug 89	212	211
19 May 89	197	194	12 Aug 89	212	212
20 May 89	196	194	13 Aug 89	214	213
21 May 89	196	193	14 Aug 89	214	214
22 May 89	197	193	15 Aug 89	214	214
23 May 89	197	193	16 Aug 89	214	211
24 May 89	196	193	17 Aug 89	213	211
25 May 89	195	194	18 Aug 89	212	212
26 May 89	197	196	19 Aug 89	213	211
27 May 89	198	195	20 Aug 89	212	212
28 May 89	197	194	21 Aug 89	213	213
29 May 89	197	195	22 Aug 89	214	213
30 May 89	196	196	23 Aug 89	214	213
31 May 89	197	194	24 Aug 89	213	212
1 Jun 89	199	197	25 Aug 89	212	210
2 Jun 89	199	197	26 Aug 89	212	212

TABLE B-2 (Contd.)

Date	High	Low	Date	High	Low
27 Aug 89	213	213	14 Sep 89	214.0	214.0
28 Aug 89	215	214	15 Sep 89	212.0	212.0
29 Aug 89	214	212	16 Sep 89	212.0	210.0
30 Aug 89	216	213	17 Sep 89	208.0	205.0
31 Aug 89	213	212	18 Sep 89	213.0	212.0
1 Sep 89	213.0	213.0	19 Sep 89	211.0	209.0
2 Sep 89	212.0	211.0	20 Sep 89	213.0	210.0
3 Sep 89	214.0	212.0	21 Sep 89	213.0	213.0
4 Sep 89	214.0	211.0	22 Sep 89	212.0	211.0
5 Sep 89	214.0	213.0	23 Sep 89	211.0	211.0
6 Sep 89	215.0	212.0	24 Sep 89	213.0	211.0
7 Sep 89	213.0	213.0	25 Sep 89	212.0	210.0
8 Sep 89	212.0	212.0	26 Sep 89	209.0	208.0
9 Sep 89	214.0	213.0	27 Sep 89	212.0	209.0
10 Sep 89	214.0	211.0	28 Sep 89	209.0	206.0
11 Sep 89	214.0	212.0	29 Sep 89	205.0	201.0
12 Sep 89	214.0	212.0	30 Sep 89	209.0	203.0
13 Sep 89	214.0	212.0			

NOTE: 6 Jun - 28 Jul: Monitoring equipment removed to facilitate well repair
28 Jul: Equipment installed.
28 Jul - 5 Aug: Calibrating steam temperatures.

TABLE B-3. Schober's Resort Ambient Temperature, °F.

Date	High	Low	Date	High	Low
1 Oct 88	113	77	5 Nov 88	108	66
2 Oct 88	113	92	6 Nov 88	93	67
3 Oct 88	123	78	7 Nov 88	102	63
4 Oct 88	111	70	8 Nov 88	78	61
5 Oct 88	115	70	9 Nov 88	91	58
6 Oct 88	108	65	10 Nov 88	84	62
7 Oct 88	113	66	11 Nov 88	91	53
8 Oct 88	120	67	12 Nov 88	94	56
9 Oct 88	114	77	13 Nov 88	92	53
10 Oct 88	110	74	14 Nov 88	86	42
11 Oct 88	121	71	15 Nov 88	84	54
12 Oct 88	107	64	16 Nov 88	82	45
13 Oct 88	107	65	17 Nov 88	79	59
14 Oct 88	97	69	18 Nov 88	77	51
15 Oct 88	110	79	19 Nov 88	68	48
16 Oct 88	112	76	20 Nov 88	84	42
17 Oct 88	114	77	21 Nov 88	85	43
18 Oct 88	103	82	22 Nov 88	75	64
19 Oct 88	117	71	23 Nov 88	96	55
20 Oct 88	112	80	24 Nov 88	67	51
21 Oct 88	117	71	25 Nov 88	67	48
22 Oct 88	119	70	26 Nov 88	80	45
23 Oct 88	117	69	27 Nov 88	83	46
24 Oct 88	114	62	28 Nov 88	85	47
25 Oct 88	117	66	29 Nov 88	92	56
26 Oct 88	118	66	30 Nov 88	97	55
27 Oct 88	106	65	1 Dec 88	99	53
28 Oct 88	101	63	2 Dec 88	89	44
29 Oct 88	103	68	3 Dec 88	75	46
30 Oct 88	108	66	4 Dec 88	70	44
31 Oct 88	100	61	5 Dec 88	85	46
1 Nov 88	109	59	6 Dec 88	80	61
2 Nov 88	103	61	7 Dec 88	82	68
3 Nov 88	105	62	8 Dec 88	84	64
4 Nov 88	104	65	9 Dec 88	85	65

TABLE B-3 (Contd.)

Date	High	Low	Date	High	Low
10 Dec 88	92	60	15 Jan 89	64	39
11 Dec 88	84	44	16 Jan 89	71	40
12 Dec 88	87	46	17 Jan 89	75	49
13 Dec 88	103	60	18 Jan 89	77	53
14 Dec 88	100	61	19 Jan 89	83	55
15 Dec 88	63	43	20 Jan 89	77	50
16 Dec 88	52	47	21 Jan 89	76	55
17 Dec 88	69	45	22 Jan 89	74	51
18 Dec 88	72	36	23 Jan 89	69	46
19 Dec 88	70	42	24 Jan 89	71	56
20 Dec 88	66	31	25 Jan 89	74	48
21 Dec 88	59	35	26 Jan 89	71	45
22 Dec 88	64	31	27 Jan 89	70	48
23 Dec 88	71	37	28 Jan 89	83	53
24 Dec 88	76	45	29 Jan 89	84	57
26 Dec 88	78	44	30 Jan 89	78	50
27 Dec 88	64	30	31 Jan 89	77	45
28 Dec 88	51	51	1 Feb 89	80	48
29 Dec 88	69	39	2 Feb 89	79	51
30 Dec 88	76	39	3 Feb 89	74	53
31 Dec 88	66	53	4 Feb 89	69	49
1 Jan 89	70	43	5 Feb 89	48	38
2 Jan 89	60	40	6 Feb 89	53	34
3 Jan 89	77	62	7 Feb 89	57	37
4 Jan 89	72	58	8 Feb 89	64	37
5 Jan 89	67	50	9 Feb 89	102	46
6 Jan 89	64	50	10 Feb 89	108	55
7 Jan 89	52	34	11 Feb 89	110	58
8 Jan 89	53	29	12 Feb 89	108	53
9 Jan 89	62	36	13 Feb 89	76	47
10 Jan 89	67	53	14 Feb 89	68	38
11 Jan 89	57	48	15 Feb 89	70	40
12 Jan 89	61	44	16 Feb 89	74	42
13 Jan 89	60	38	17 Feb 89	76	48
14 Jan 89	60	38	18 Feb 89	82	52

TABLE B-3 (Contd.)

Date	High	Low	Date	High	Low
19 Feb 89	84	59	26 Mar 89	87	60
20 Feb 89	86	54	27 Mar 89	104	67
21 Feb 89	84	52	28 Mar 89	99	60
22 Feb 89	89	60	29 Mar 89	103	67
23 Feb 89	100	63	30 Mar 89	101	67
24 Feb 89	93	62	31 Mar 89	105	63
25 Feb 89	96	72	1 Apr 89	100	73
26 Feb 89	87	61	2 Apr 89	98	68
27 Feb 89	89	53	3 Apr 89	108	72
28 Feb 89	85	62	4 Apr 89	109	73
1 Mar 89	83	49	5 Apr 89	113	71
2 Mar 89	76	58	6 Apr 89	119	80
3 Mar 89	66	48	7 Apr 89	110	67
4 Mar 89	71	41	8 Apr 89	109	82
5 Mar 89	81	50	9 Apr 89	108	77
6 Mar 89	93	55	10 Apr 89	110	82
7 Mar 89	92	66	11 Apr 89	107	76
8 Mar 89	93	65	12 Apr 89	99	63
9 Mar 89	91	61	13 Apr 89	101	70
10 Mar 89	89	60	14 Apr 89	106	69
11 Mar 89	94	61	15 Apr 89	105	69
12 Mar 89	93	62	16 Apr 89	107	71
13 Mar 89	93	56	17 Apr 89	106	55
14 Mar 89	87	54	18 Apr 89	110	70
15 Mar 89	88	58	19 Apr 89	108	73
16 Mar 89	86	54	20 Apr 89	106	72
17 Mar 89	80	48	21 Apr 89	101	74
18 Mar 89	86	53	22 Apr 89	95	57
19 Mar 89	94	61	23 Apr 89	89	64
20 Mar 89	91	50	24 Apr 89	97	66
21 Mar 89	93	53	25 Apr 89	84	49
22 Mar 89	94	60	26 Apr 89	86	52
23 Mar 89	96	59	27 Apr 89	91	61
24 Mar 89	94	63	28 Apr 89	92	61
25 Mar 89	82	64	29 Apr 89	94	60

TABLE B-3 (Contd.)

Date	High	Low	Date	High	Low
30 Apr 89	102	67	4 Jun 89	105	66
1 May 89	102	68	5 Jun 89	102	82
2 May 89	108	83	6 Jun 89	115	70
3 May 89	111	77	7 Jun 89 - 27 Jul 89	...	...
4 May 89	111	83	28 Jul 89	113	99
5 May 89	113	78	29 Jul 89	108	75
6 May 89	112	80	30 Jul 89	107	76
7 May 89	115	77	31 Jul 89	108	86
8 May 89	115	88	1 Aug 89	107	88
9 May 89	103	71	2 Aug 89	106	71
10 May 89	92	67	3 Aug 89	104	71
11 May 89	87	60	4 Aug 89	104	74
12 May 89	91	58	5 Aug 89	106	72
13 May 89	87	60	6 Aug 89	110	81
14 May 89	92	61	7 Aug 89	116	79
15 May 89	103	72	8 Aug 89	110	89
16 May 89	112	72	9 Aug 89	105	85
17 May 89	110	75	10 Aug 89	104	83
18 May 89	105	69	11 Aug 89	103	78
19 May 89	110	71	12 Aug 89	109	78
20 May 89	109	76	13 Aug 89	112	79
21 May 89	113	69	14 Aug 89	110	78
22 May 89	107	86	15 Aug 89	111	98
23 May 89	106	62	16 Aug 89	108	75
24 May 89	101	74	17 Aug 89	104	73
25 May 89	107	73	18 Aug 89	99	69
26 May 89	108	82	19 Aug 89	102	70
27 May 89	109	85	20 Aug 89	101	72
28 May 89	105	80	21 Aug 89	99	87
29 May 89	103	77	22 Aug 89	103	74
30 May 89	96	74	23 Aug 89	106	75
31 May 89	98	75	24 Aug 89	96	76
1 Jun 89	107	81	25 Aug 89	97	66
2 Jun 89	108	81	26 Aug 89	99	70
3 Jun 89	110	85	27 Aug 89	100	71

TABLE B-3 (Contd.)

Date	High	Low	Date	High	Low
28 Aug 89	107	90	14 Sep 89	103	75
29 Aug 89	108	78	15 Sep 89	104	75
30 Aug 89	105	71	16 Sep 89	94	79
31 Aug 89	100	68	17 Sep 89	84	69
1 Sep 89	101	69	18 Sep 89	80	64
2 Sep 89	102	70	19 Sep 89	92	61
3 Sep 89	105	71	20 Sep 89	97	71
4 Sep 89	107	73	21 Sep 89	107	85
5 Sep 89	103	78	22 Sep 89	104	75
6 Sep 89	105	87	23 Sep 89	104	72
7 Sep 89	100	70	24 Sep 89	102	73
8 Sep 89	97	75	25 Sep 89	96	70
9 Sep 89	98	70	26 Sep 89	100	75
10 Sep 89	101	70	27 Sep 89	98	74
11 Sep 89	102	94	28 Sep 89	98	68
12 Sep 89	102	79	29 Sep 89	92	66
13 Sep 89	98	70	30 Sep 89	89	59

NOTE: 9 Feb: Adjacent abandoned well casing blew out. Temperature rose from steam blowing across sensor.
13 Feb: Monitoring equipment moved from direct path of steam.
6 Jun: Removed monitoring equipment to facilitate well repair.
27 Jul: Installed monitoring equipment.

TABLE B-4. Coso Mud Pots Ambient Temperature, °F.

Date	High	Low	Date	High	Low
1 Oct 88	88	48	28 Oct 88	75	37
2 Oct 88	93	45	29 Oct 88	76	38
3 Oct 88	93	59	30 Oct 88	78	40
4 Oct 88	93	46	31 Oct 88	97	47
5 Oct 88	90	48	1 Nov 88	85	50
6 Oct 88	88	46	2 Nov 88	77	41
7 Oct 88	96	54	3 Nov 88	87	41
8 Oct 88	103	54	4 Nov 88	84	45
9 Oct 88	91	65	5 Nov 88	89	48
10 Oct 88	87	58	6 Nov 88	89	47
11 Oct 88	102	53	7 Nov 88	78	36
12 Oct 88	84	44	8 Nov 88	72	37
13 Oct 88	79	43	9 Nov 88	66	37
14 Oct 88	84	49	10 Nov 88	71	37
15 Oct 88	93	61	11 Nov 88	67	24
16 Oct 88	101	55	12 Nov 88 - 11 Dec 88	...	...
17 Oct 88	102	61	12 Dec 88	80	12
18 Oct 88	99	62	13 Dec 88 - 19 Dec 88	...	...
19 Oct 88	100	65	20 Dec 88	49	32
20 Oct 88	97	59	21 Dec 88	54	16
21 Oct 88	96	52	22 Dec 88	50	4
22 Oct 88	99	49	23 Dec 88	60	19
23 Oct 88	97	53	24 Dec 88	51	28
24 Oct 88	101	48	25 Dec 88	58	20
25 Oct 88	100	55	26 Dec 88 - 2 Jan 89	...	...
26 Oct 88	103	54	3 Jan 89	61	1
27 Oct 88	90	48	4 Jan 89 - 30 Sep 89	...	...

NOTE: 12 Nov: Data collection interrupted due to deterioration of area.

TABLE B-5. Coso Mud Pots Mud Temperature, °F.

Date	High	Low	Date	High	Low
1 Oct 88	174	168	28 Oct 88	169	160
2 Oct 88	174	164	29 Oct 88	166	157
3 Oct 88	174	164	30 Oct 88	169	158
4 Oct 88	166	157	31 Oct 88	176	163
5 Oct 88	168	163	1 Nov 88	172	164
6 Oct 88	176	166	2 Nov 88	171	162
7 Oct 88	184	171	3 Nov 88	173	164
8 Oct 88	184	171	4 Nov 88	172	164
9 Oct 88	170	165	5 Nov 88	174	164
10 Oct 88	169	160	6 Nov 88	174	162
11 Oct 88	178	168	7 Nov 88	178	161
12 Oct 88	175	166	8 Nov 88	171	165
13 Oct 88	174	165	9 Nov 88	172	161
14 Oct 88	170	165	10 Nov 88	172	162
15 Oct 88	170	158	11 Nov 88	170	160
16 Oct 88	174	156	12 Nov 88 - 11 Dec 88	...	...
17 Oct 88	177	167	12 Dec 88	169	139
18 Oct 88	178	170	13 Dec 88 - 19 Dec 88	...	...
19 Oct 88	177	165	20 Dec 88	167	158
20 Oct 88	172	162	21 Dec 88	166	142
21 Oct 88	174	164	22 Dec 88	167	157
22 Oct 88	177	164	23 Dec 88	167	143
23 Oct 88	178	167	24 Dec 88	161	150
24 Oct 88	181	166	25 Dec 88 - 2 Jan 89	...	...
25 Oct 88	183	170	3 Jan 89	167	142
26 Oct 88	185	172	4 Jan 89 - 30 Sep 89	...	...
27 Oct 88	178	170			

NOTE: 12 Nov: Data collection interrupted due to deterioration of area.

Appendix C

WELL TEMPERATURE DATA

TABLE C-1. Well Temperatures Recorded on 2 August 1989.

4K-1		4P-1	
Depth, ft	Temp °F	Depth ft	Temp °F
0	204.26	0	203.00
10	204.44	60	204.80
20	204.44	65	206.78
30	204.44	66	207.14
40	204.44	75	208.40
50	204.44	80	208.58
60	204.98	90	211.28
65	208.76	95	215.42
70	209.84	100	216.86
75	211.28	105	216.86
76.5	210.56		

TABLE C-2. Coso 1 Well Temperatures Recorded on 2 August 1989 and 25 October 1989.

2 August 1989		25 October 1989	
Depth, ft	Temp °F	Depth ft	Temp °F
0	204.80	0	203.36
25	205.34	30	203.36
50	205.34	50	204.08
75	205.70	125	204.26
100	207.68	135	204.80
122	209.30	140	205.34
123	209.12	145	206.96
125	209.12	150	209.12
135	209.48	155	212.18
145	209.30	165	215.60
155	212.72	170	218.30
165	217.04	180	219.02
175	223.88	185	220.82
185	226.58	190	223.70
195	229.28	195	224.06
205	231.98	200	224.06
215	233.96	205	223.34
225	235.76	210	222.26
235	239.72	215	220.64
245	241.16	220	217.76
255	243.50	225	216.68
265	244.76	230	215.60
275	246.56	135	212.90
285	250.16	240	211.28
295	252.50	245	210.74

TABLE C-2. (Contd.)

2 August 1989		25 October 1989	
Depth, ft	Temp °F	Depth ft	Temp °F
305	254.30	250	210.74
315	255.74	255	210.20
325	257.72	260	211.10
335	260.42	265	211.64
345	261.14	270	213.44
355	261.32	275	216.68
		280	217.94
		285	226.76
		295	234.86
		305	244.76
		315	252.14
		325	257.36
		335	263.12
		340	263.84
		345	264.02
		350	264.20
		357	264.20

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