HYDROLOGIC AND CHEMICAL DATA FOR SELECTED THERMAL-WATER WELLS AND SPRINGS IN THE INDIAN BATHTUB AREA, OWYHEE COUNTY, SOUTHWESTERN IDAHO

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CONVERSION FACTORS

For the convenience of readers who may prefer to use metric (International System) units rather than the inch-pound units used in this report, values may be converted by using the factors listed below. Chemical data are given in mg/L (milligrams per liter) or µg/L (micrograms per liter), which are, within the range of values presented, numerically equal to parts per million or parts per billion, respectively. Specific conductance is expressed as µS/cm (microsiemens per centimeter) at 25 degrees Celsius.

Multiply inch-pound unit	By	To obtain metric unit
acre	4,047	square meter
foot (ft)	0.3048	meter
inch (in.)	25.4	millimeter
mile (mi)	1.609	kilometer
square mile (mi^2)	2.590	square kilometer

Temperatures in °C (degrees Celsius) can be converted to °F (degrees Fahrenheit) as follows:

$$°F = (1.8)(°C) + 32$$

All water temperatures are reported to the nearest one-half °C.

Sea level: In this report, "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)--a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada and formerly called "Sea Level Datum of 1929."

HYDROLOGIC AND CHEMICAL DATA FOR SELECTED THERMAL-WATER WELLS AND SPRINGS IN THE INDIAN BATHTUB AREA, OWYHEE COUNTY, SOUTHWESTERN IDAHO

By H.W. Young and D.J. Parliman

ABSTRACT

This report presents data collected during the period January through September 1989 from 86 thermal-water wells and 5 springs in the Indian Bathtub area, southwestern Idaho. The data include well and spring locations, well-construction and water-level information, hydrographs of water levels in 9 wells, hydrographs of discharges in 4 springs, and chemical and isotopic analyses of water from 33 thermal-water wells and 5 springs. These data were collected as part of a continuing study to determine the cause or causes of decreased discharge at Indian Bathtub Spring and other thermal springs along Hot Creek.

INTRODUCTION

The Indian Bathtub area is about 60 mi southeast of Boise in southwestern Idaho. The area comprises about 120 mi^2 of valleys and uplands in the lower Bruneau River, Sugar Creek, and Jacks Creek (Little Valley) basins in northern Owyhee County (fig. 1). From January through September 1989, hydrologic and chemical data were collected from 91 thermal-water wells and springs. These data were collected as part of a continuing study to determine the cause or causes of decreased discharge at Indian Bathtub Spring and other thermal springs along Hot Creek. This study is being conducted by the U.S. Geological Survey in cooperation with the U.S. Fish and Wildlife Service. The purpose of this report is to make the data conveniently available.

Locations of inventoried thermal-water wells and springs are shown in figure 1. Hydrographs of water-level fluctuations for nine wells during the period January through September 1989 are shown in figure 2. Hydrographs of discharges for four springs during the period March through September 1989 are shown in figure 3.

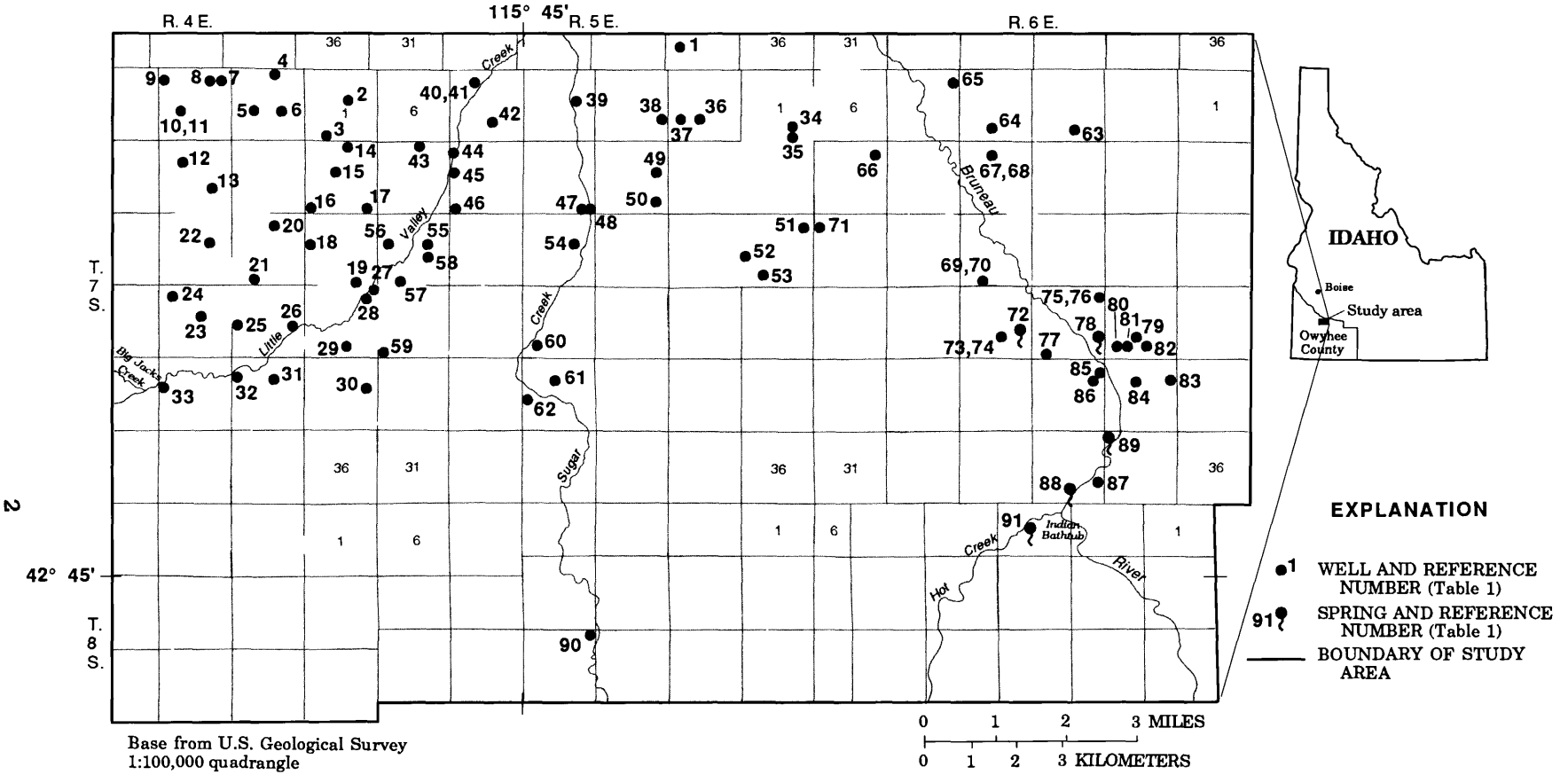

Figure 1.--Location of study area and inventoried thermal-water wells and springs.

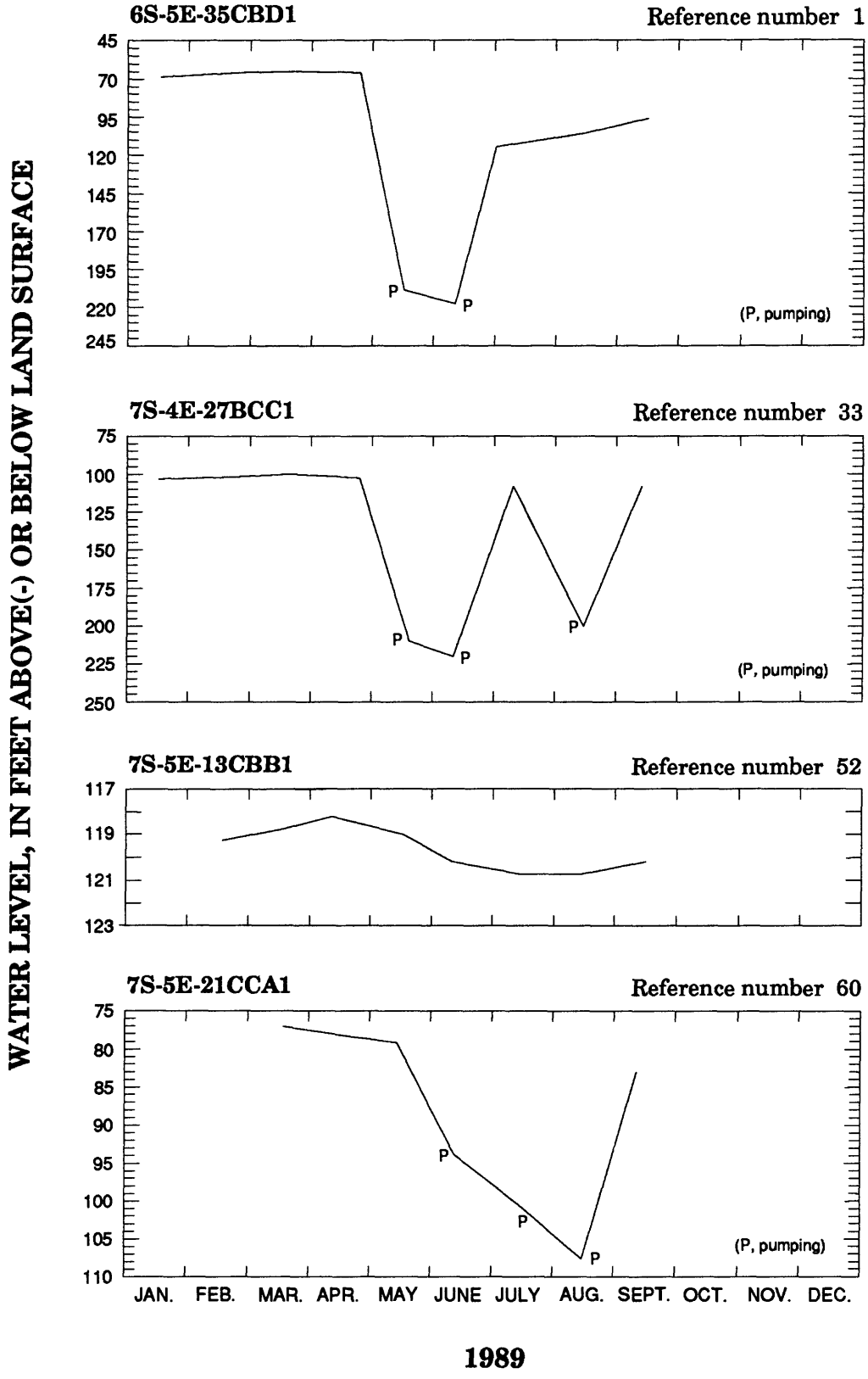

Figure 2.--Water levels in selected wells during the period January through September 1989.

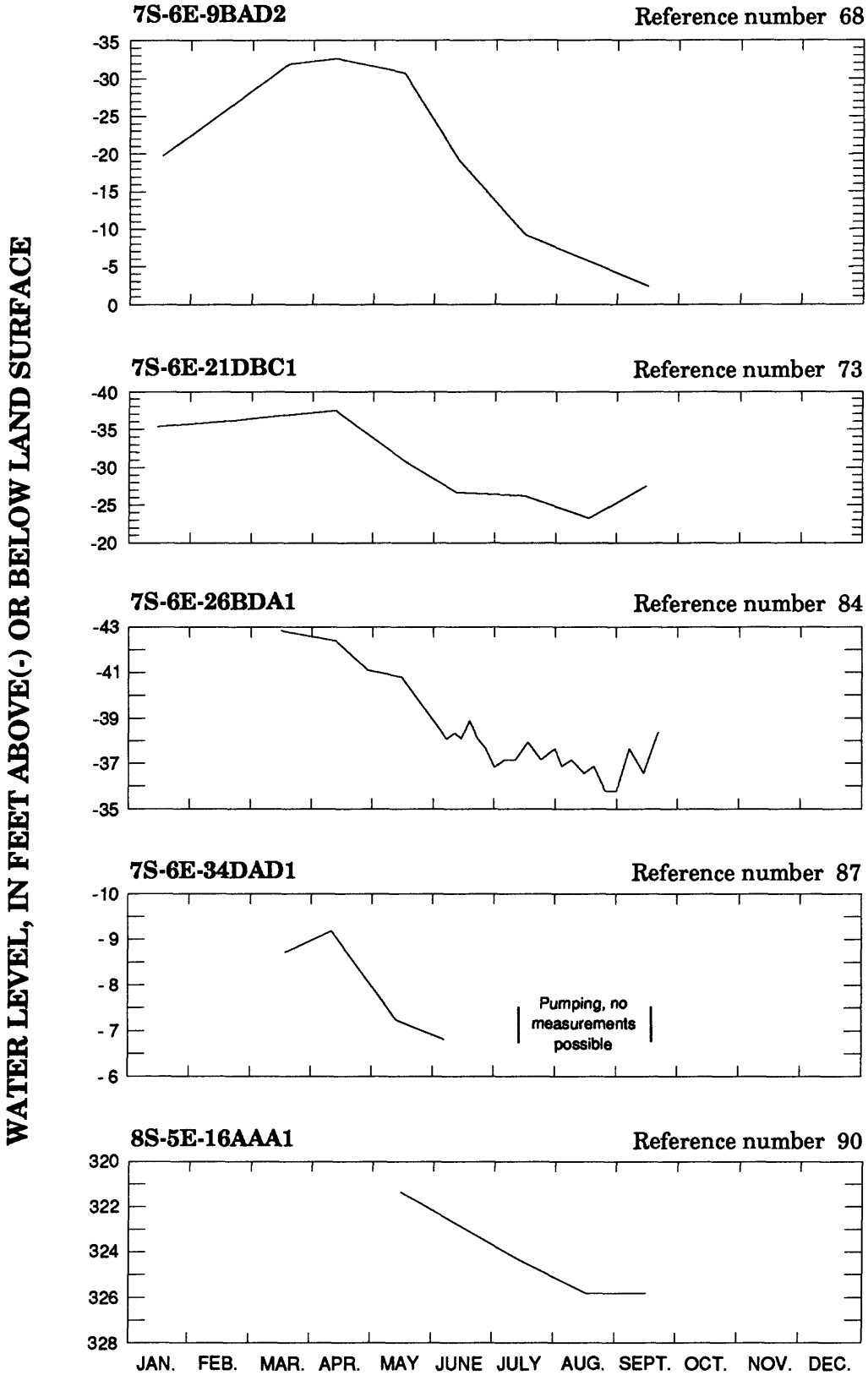

Figure 2.--Water levels in selected wells during the period January through September 1989--continued.

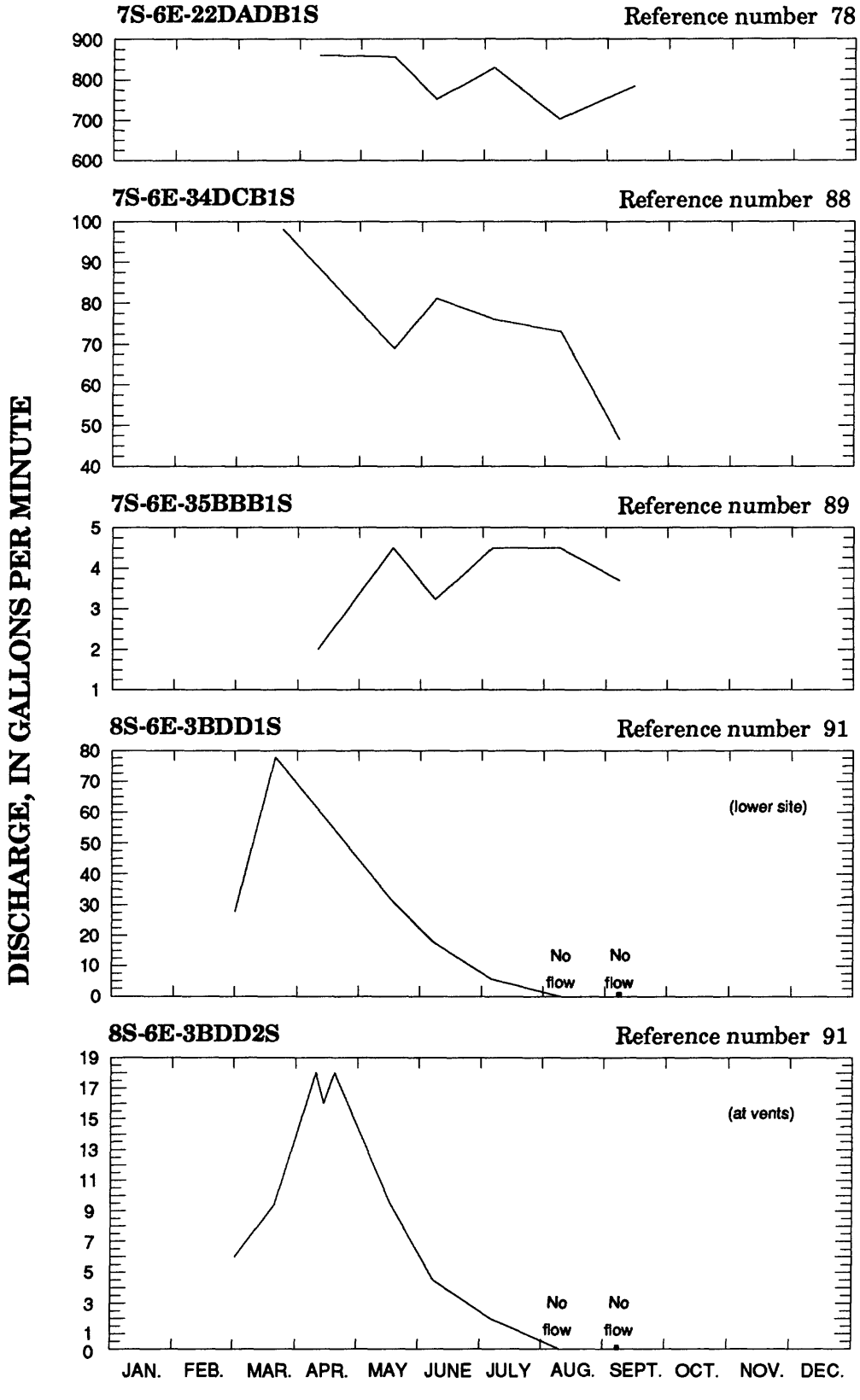

Figure 3.--Discharge of selected springs during the period March through September, 1989.

Water-level measurements and other selected data for all inventoried thermal-water wells in the study area are shown in tables 1 and 2. Chemical and isotopic analyses of water from 33 thermal-water wells and 5 springs are shown in table 3 (data tables in back of report).

Acknowledgments

The authors are grateful to the many landowners in the study area who allowed access to their property, supplied information, and permitted measurements to be made in their wells and springs. Special thanks are given to L.D. White, M.A. Huebner, and C.A. Maley, U.S. Geological Survey, Isotope Laboratory, Menlo Park, Calif., for providing stable-isotope analyses.

Well- and Spring-Numbering System

The well- and spring-numbering system used by the U.S. Geological Survey in Idaho indicates the location of wells within the official rectangular subdivision of public lands, with reference to the Boise base line and Meridian. The first two segments of the number designate the township (north or south) and range (east or west). The third segment gives the section number; four letters, which indicate the 1/4 section (160-acre tract), 1/4-1/4 section (40-acre tract), 1/4-1/4-1/4 section (10-acre tract), and 1/4-1/4-1/4-1/4 section (2 1/2-acre tract); and serial number of the well within the tract.

Quarter sections are designated by the letters A, B, C, and D in counterclockwise order from the northeast quarter of each section (fig. 4). Forty-acre, 10-acre, and 2 1/2-acre tracts within each quarter section are lettered in the same manner. Well 7S-6E-22CCDA1, for example, is in the NE 1/4 SE 1/4 SW 1/4 SW 1/4 sec. 22, T. 7 S., R. 6 E., and is the first well inventoried in that tract. Springs are designated by the letter "S" following the last numeral; for example, 8S-6E-3BDD1S.

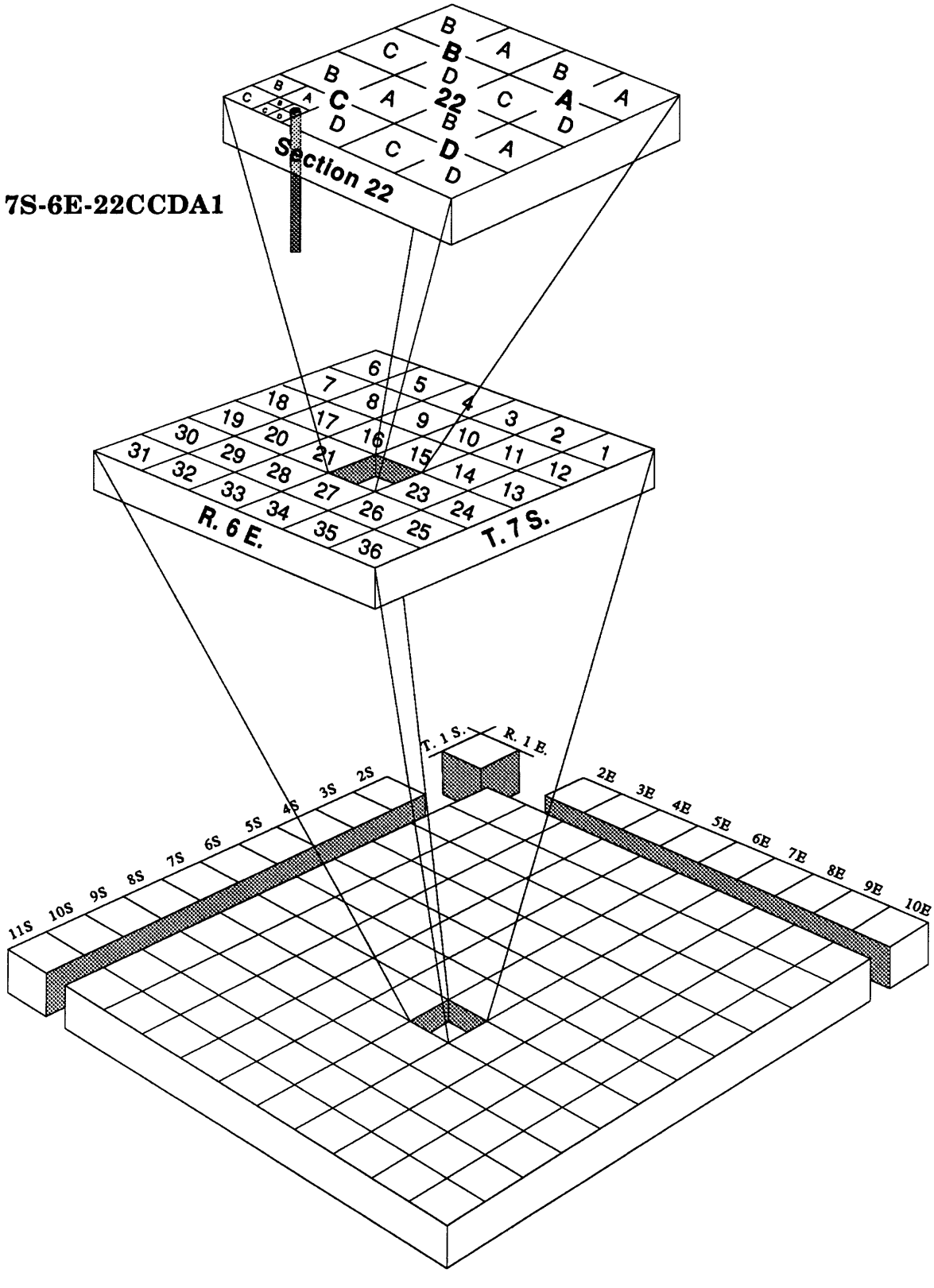

Figure 4.--Well- and spring-numbering system.

DATA TABLES

Table 1.--*Records of wells and springs*

[Well finish: G-screen, gravel packed; O-open end; P-perforated or slotted; X-open hole. Primary use of water: H-domestic, I-irrigation, S-stock, U-unused. Notations: --, no data]

Reference number	Well or spring location	Altitude of land surface (feet above sea level)	Depth of well (feet below land surface)	Diameter of casing (inches)	Top of open interval (feet below land surface)	Well finish	Date well construction completed	Primary use of water
1	6S-5E-35CBD1	2,620	476	16	230	G	5- 7-73	I
				—	350	—		
2	7S-4E- 1ACC1	2,652	1,800	16	—	O	1- 1-55	I
3	1CDC1	2,676	—	—	—	—	—	I
4	2ABB1	2,700	342	16	197	X	4-20-69	I
5	2CAB1	2,676	890	20	330	X	2-20-74	I
6	2DBA1	2,680	—	16	—	—	—	I
7	3AAC1	2,736	—	—	—	—	—	I
8	3ABD1	2,736	1,140	16	399	X	3-23-67	I
				14	910	X		
				—	941	—		
9	3BBC1	2,772	1,050	18	100	X	11-25-65	I
				14	538	X		
				10	780	—		
				—	775	—		
				—	901	—		
10	3CAB1	2,772	1,050	10	775	P	6-19-69	I
				—	901	—		
11	3CAB2	2,772	975	24	216	P	5-23-73	I
				16	478	—		
				—	862	—		
12	10BDB1	2,760	1,140	16	537	P	5-29-70	I
				20	616	—		
				—	738	—		
13	10DBD1	2,736	—	—	—	—	--	I

Table 1.--*Records of wells and springs*--Continued

Reference number	Well or spring location	Altitude of land surface (feet above sea level)	Depth of well (feet below land surface)	Diameter of casing (inches)	Top of open interval (feet below land surface)	Well finish	Date well construction completed	Primary use of water
14	12ABB1	2,660	1,600	—	—	—	—	I
15	12BDD1	2,664	1,100	14	675	X	1- 1-53	I
				8	675	X		
				14	—	—		
16	12CCC1	2,700	900	18	475	X	11-20-67	I
				14	—	—		
17	12DDC1	2,664	1,350	14	339	X	12-13-66	I
				18	—	—		
				12.7	—	—		
18	13BCC1	2,688	1,060	12	194	X	6- 1-55	I
19	13DCD1	2,676	1,000	12	194	X	1- 1-54	I
20	14ABC1	2,724	1,150	16	223	X	10-12-62	I
				—	398	—		
21	14CDC1	2,760	950	16	200	X	6- 2-62	I
				—	655	—		
22	15ACD1	2,796	1,060	16	246	X	7- 3-65	I
				—	755	—		
23	22ACC1	2,796	—	—	—	—	—	I
24	22BBD1	2,820	1,000	16	330	X	4- 5-66	I
25	23CBB1	2,760	810	16	326	X	1- 1-58	I
26	7S-4E-23DAB1	2,712	—	—	—	—	—	I
27	24AAA1	2,664	—	10	—	—	—	I
28	24AAC1	2,676	—	6	—	—	—	I
29	24DCB1	2,688	750	8	—	—	—	I
30	25ADC1	2,748	735	12	60	X	3- 1-57	I
31	26ACB1	2,736	—	—	—	—	—	I
32	26BCB1	2,748	867	16	130	P	7-13-63	I
				—	181	—		
				—	340	—		
33	27BCC1	2,772	1,390	20	19	X	2-16-68	I

Table 1.--*Records of wells and springs*--Continued

Reference number	Well or spring location	Altitude of land surface (feet above sea level)	Depth of well (feet below land surface)	Diameter of casing (inches)	Top of open interval (feet below land surface)	Well finish	Date well construction completed	Primary use of water
				—	250	—		
				—	920	—		
				—	1,230	—		
34	7S-5E- 1DCA1	2,664	—	—	—	—	—	I
35	1DCD1	2,676	—	—	—	—	—	I
36	2CAD1	2,660	—	—	—	—	—	I
37	2CBD1	2,650	300	12.7	100	P	11- 1-74	I
38	3DAD1	2,640	300	—	—	—	—	I
39	4ACD1	2,580	700	16	700	X	1- 1-49	I
40	5BAC1	2,579	906	4	—	—	1- 1-20	I
41	5BAC2	2,573	920	4	—	—	1- 1-16	I
42	5DBC1	2,604	2,400	16	160	X	1- 1-57	I
				12	651	X		
				10	1,300	—		
				8	—	—		
43	7ABB1	2,600	1,620	16	632	X	1- 1-51	I
44	8BBC1	2,594	580	4	140	X	1- 1-12	H
45	8BCC1	2,604	1,390	18	310	X	11- 1-75	I
46	8CCC1	2,640	1,500	16	200	X	1- 1-67	I
				14	690	—		
47	9DDC1	2,652	2,170	20	96	X	—	I
48	9DDD1	2,664	2,060	20	550	X	4- 1-64	I
				18	1,030	—		
				14	1,620	—		
				12	2,020	—		
				8	—	—		
49	10ADC1	2,628	564	16	78	G	4- 8-73	I
				—	168	—		
50	10DDB1	2,640	190	26	66	G	7-24-73	I
				16	100	—		
				—	180	—		

Table 1.--*Records of wells and springs*--Continued

Reference number	Well or spring location	Altitude of land surface (feet above sea level)	Depth of well (feet below land surface)	Diameter of casing (inches)	Top of open interval (feet below land surface)	Well finish	Date well construction completed	Primary use of water
51	7S-5E-13AAC1	2,688	400	12	70	X	1- 1-71	I
				16	240	P		
				8	—	—		
52	13CBB1	2,772	1,950	20	180	P	6- 5-68	I
				10	1,070	—		
				8	1,560	—		
				—	1,680	—		
53	13CDB1	2,796	—	—	—	—	—	I
54	16ACD1	2,700	1,510	16	520	P	6-30-67	I
				12	1,140	—		
				10	1,250	—		
				8	1,470	—		
55	18ACD1	2,664	—	—	—	—	—	I
56	18BCD1	2,640	517	14	254	X	1- 1-51	I
57	18CDC1	2,664	—	—	—	—	—	I
58	18DBA1	2,688	937	12	526	X	6-15-74	I
				10	—	—		
59	19CCC1	2,724	760	12	309	X	1- 1-50	I
60	21CCA1	2,772	1,130	20	406	P	11-26-76	I
				16	—	—		
61	28BDA1	2,820	1,000	16	116	X	6-29-51	I
				12	234	—		
				10	700	—		
62	28CBB1	2,796	245	8	18	—	1- 1-50	H
				12	—	X		
63	7S-6E- 3DCB1	2,676	1,510	16	304	X	2-15-79	I
				—	810	X		
64	4CDA1	2,600	1,040	—	—	—	—	S
65	5AAD1	2,568	158	6	80	X	5-29-70	S
66	7AAC1	2,580	1,090	6	342	X	1- 1-15	H

Table 1.--*Records of wells and springs*--Continued

Refer-ence number	Well or spring location	Altitude of land surface (feet above sea level)	Depth of well (feet below land surface)	Diameter of casing (inches)	Top of open interval (feet below land surface)	Well finish	Date well construction completed	Primary use of water
67	9BAD1	2,580	910	5	42	X	1- 1-12	I
68	9BAD2	2,580	960	8	80	X	1- 1-36	H
69	16CDC1	2,592	513	12	389	X	8- 1-60	I
				10	—	—		
70	16CDC2	2,606	353	8	80	X	1- 1-17	I
71	18BBC1	2,676	1,480	12	376	X	1- 1-53	I
				10	475	X		
72	21DABC1S	2,625	—	—	—	—	—	S
73	21DBC1	2,628	760	10	167	X	5- 2-65	I
				14	—	—		
74	21DBC2	2,640	611	8	—	—	1- 1-18	I
75	22AAD1	2,640	1,410	14	400	X	8-20-65	I
76	22AADA2	2,645	585	—	—	—	1- 1-50	I
77	22CCDA1	2,605	630	16	158	X	4-19-78	I
				—	250	—		
				—	580	—		
78	22DADB1S	2,590	—	—	—	—	—	U
79	23CAD1	2,676	1,300	6	40	X	1- 1-14	U
				—	900	X		
80	23CCA1	2,628	460	6	107	X	1- 1-30	I
81	23CDB1	2,640	1,030	10	341	X	11-21-59	I
				—	1,000	X		
82	23DCB1	2,710	1,220	6	365	X	1- 1-22	I
83	26ADA1	2,700	1,000	12	171	X	1- 1-62	I
				—	280	—		
				—	800	—		
84	26BDA1	2,652	—	8	—	—	—	I
85	27AAD1	—	350	10	—	—	1- 1-37	H
86	27ADB1	2,628	400	6	—	—	—	I
87	34DAD1	2,724	300	20	46	X	9- 1-76	I
				16	100	—		
88	34DCB1S	2,640	—	—	—	—	—	U
89	35BBB1S	2,616	—	—	—	—	—	U
90	8S-5E-16AAA1	3,010	410	—	—	—	—	S
91	8S-6E- 3BDD1S	2,700	—	—	—	—	—	U

Table 2.--*Water-level data for selected wells, 1989*

[Status: E, recently flowing; F, flowing; P, pumping; R, recently pumped; --, no information]

Reference number	Well location	Date measured (1989)	Water level (feet below land surface)	Status
1	6S-5E-35CBD1	1-19	68.55	V
		2-21	68.05	V
		3-21	67.79	V
		3-22	67.36	V
		4-25	70.80	V
		5-17	206.78	P
		6-12	217.71	P
		7-12	115.84	V
		8-15	100.71	V
		9-14	94.34	V
2	7S-4E- 1ACC1	3-23	-8.02	E
3	1CDC1	3-23	-.72	--
4	2ABB1	3-30	54.83	--
5	2CAB1	3-22	31.17	--
6	2DBA1	3-23	-4.84	--
7	3AAC1	3-22	70.82	V
9	3BBC1	3-22	107.29	--
10	3CAB1	3-23	106.67	--
12	10BDB1	3-21	81.20	V
13	10DBD1	3-21	72.55	--
14	12ABB1	3-23	-20.02	E
15	12BDD1	3-23	-12.82	E
16	12CCC1	3-20	10.88	--
17	12DDC1	3-24	--	F
18	13BCC1	3-20	12.92	--
19	13DCD1	3-21	-9.42	E
20	14ABC1	3-20	47.78	--
21	14CDC1	3-20	75.94	--
27	24AAA1	3-20	--	F
29	24DCB1	3-20	21.85	--
31	26ACB1	3-22	56.82	--
32	26BCB1	3-22	72.35	V
33	27BCC1	1-19	103.23	--
		2-21	102.55	--
		3-21	101.93	--
		4-25	102.26	--
		5-23	210.60	P
		6-12	221.05	P
		7-12	107.82	--

Table 2.--*Water-level data for selected wells, 1989--Continued*

Reference number	Well location	Date measured (1989)	Water level (feet below land surface)	Status
		8-15	200.10	P
		9-14	108.02	--
37	7S-5E- 2CBD1	3-22	115.67	--
38	3DAD1	3-22	115.05	--
39	4ACD1	3-23	16.60	--
40	5BAC1	3-23	--	F
41	5BAC2	3-23	--	F
42	5DBC1	3-23	--	F
43	7ABB1	3-24	--	F
44	8BBC1	3-23	--	F
45	8BCC1	3-23	-60.06	--
46	8CCC1	3-23	-12.32	E
47	9DDC1	3-22	--	F
48	9DDD1	3-22	-15.12	E
		4-17	-12.40	E
52	13CBB1	2-21	119.23	--
		3-21	119.18	--
		3-22	118.80	--
		4-11	118.13	--
		5-16	119.01	--
		6-12	120.24	--
		7-12	120.64	--
		8-15	120.65	--
		9-14	120.45	--
53	13CBD1	3-21	126.82	--
56	18BCD1	3-24	-33.62	--
57	18CDC1	3-23	--	F
59	19CCC1	3-21	42.42	--
60	21CCA1	3-22	77.25	V
		4-27	78.72	V
		5-16	79.13	V
		6-12	93.90	P
		7-12	100.28	P
		8-15	107.70	P
		9-12	83.06	V
62	28CBB1	3-22	121.28	--
63	7S-6E- 3DCB1	3-22	44.68	--
64	4CDA1	3-21	-2.12	E
65	5AAD1	3-21	30.08	R
66	7AAC1	3-22	--	F

Table 2.--*Water-level data for selected wells, 1989--Continued*

Reference number	Well location	Date measured (1989)	Water level (feet below land surface)	Status
67	9BAD1	3-20	-32.12	--
68	9BAD2	1-19	-19.70	E
		3-20	-32.12	E
		4-11	-32.68	E
		5-16	-30.71	E
		6-12	-19.32	E
		7-12	-9.52	E
		9-14	-2.52	E
69	16CDC1	3-20	-73.52	--
70	16CDC2	3-20	-12.92	--
		2-21	-36.12	--
		3-20	-36.94	E
		4-11	-37.40	E
		5-16	-31.022	E
		6-12	-26.44	E
		7-12	-26.34	E
		8-15	-23.34	E
		9-14	-27.64	E
73	21DBC1	1-19	-35.32	E
		2-21	-36.12	--
		3-20	-36.94	E
		4-11	-37.40	E
		5-16	-31.02	E
		6-12	-26.44	E
		7-12	-26.34	E
		8-15	-23.34	E
		9-14	-27.64	E
74	21DBC2	3-20	--	F
75	22AADA1	3-21	--	F
76	22AADA2	3-21	-19.42	E
77	22CCDA1	3-20	-57.62	--
79	23CAD1	3-22	-19.72	--
80	23CCA1	3-21	-17.62	--
81	23CDB1	3-22	--	F
		3-22	-7.92	E
83	26ADA1	3-24	16.84	--
84	26BDA1	3-20	-42.72	--
		4-11	-42.38	--
		5- 1	-41.09	--
		5-16	-40.82	--

Table 2.--*Water-level data for selected wells, 1989--Continued*

Reference number	Well location	Date measured (1989)	Water level (feet below land surface)	Status
		6- 7	-38.10	--
		6-10	-38.3	--
		6-15	-38.1	--
		6-20	-38.8	--
		6-25	-37.9	--
		6-30	-37.4	--
		7- 5	-36.7	--
		7-10	-37.0	--
		7-15	-37.0	--
		7-20	-37.4	--
		7-25	-37.9	--
		7-31	-37.4	--
		8- 5	-37.0	--
		8-10	-37.2	--
		8-15	-36.5	--
		8-20	-36.7	--
		8-25	-35.8	--
85	27AAD1	3-22	--	F
86	27ADB1	3-22	--	F
87	34DAD1	3-20	-8.72	--
		4-11	-9.18	--
		5-16	-7.40	--
		6- 7	-6.90	--
90	8S-5E-16AAA1	5-16	321.40	--
		6-13	322.80	--
		7-12	324.40	--
		8-15	325.78	--
		9-15	325.78	--

Table 3.--*Chemical and isotopic analyses of water from selected thermal-water wells and springs, 1989*

[µS/cm, microsiemens per centimeter at 25 degrees Celsius; mg/L, milligrams per liter; µg/L, micrograms per liter; permil, parts per thousand; <, less than; --, no data available; $^{13}C/^{12}C$, carbon-13/carbon-12; $^{2}H/H$, deuterium; $^{18}O/^{16}O$, oxygen-18/oxygen-16]

Reference number	Well or spring location	Sample date (1989)	Water temperature (°C)	Specific conductance (µS/cm)	pH (standard units)	Alkalinity (mg/L as $CaCO_3$)	Nitrogen, NO_2+NO_3, dissolved (mg/L as N)	Phosphorous, total (mg/L as P)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)
1	6S-5E-35CBD1	5- 9	22.5	533	7.9	126	<0.10	0.71	36	4.1	58
2	7S-4E- 1ACC1	3-30	39.0	275	8.6	79	.33	<.01	6.6	.18	52
5	2CAB1	5-25	29.0	469	8.0	95	.15	<.01	25	1.8	66
6	2DBA1	4-12	39.5	273	8.5	80	.30	<.01	6.8	.11	51
12	10BDB1	4-12	41.0	273	8.5	78	.29	<.01	7.2	.11	49
17	12DDC1	3-30	40.5	277	8.5	80	.35	<.01	7.0	.12	52
19	13DCD1	3- 8	38.5	304	8.6	86	.42	<.01	8.8	.07	54
20	14ABC1	4-20	38.5	289	8.5	83	.41	<.01	8.1	.12	51
24	22BBD1	4-12	38.5	294	8.5	84	.31	<.01	7.7	.13	54
32	26BCB1	4-27	30.5	360	8.1	100	1.5	.01	21	1.1	49
33	27BCC1	5- 1	26.0	272	7.9	83	.81	.03	12	1.2	43
34	7S-5E- 1DCA1	4-27	21.0	350	8.1	95	<.10	<.01	20	2.4	46
42	5DBC1	4-12	32.0	316	8.8	81	<.10	.01	4.7	.09	64
43	7ABB1	3- 8	39.0	282	8.8	81	.30	<.01	6.5	.25	52
46	8CCC1	3- 8	38.5	281	8.6	81	.27	<.01	6.2	.22	53
48	9DDD1	3-30	39.0	280	8.7	80	.30	<.01	6.3	.21	53
59	19CCC1	6- 6	35.5	323	8.6	83	.40	<.01	9.5	.17	61
60	21CCA1	6- 6	40.0	309	8.6	81	.49	<.01	8.8	.11	58
61	28BDA1	4-27	33.5	301	8.6	77	.44	<.01	8.5	.38	51
63	7S-6E- 3DCB1	5- 2	49.0	442	9.4	123	<.10	<.01	1.1	.06	98
66	7AAC1	5- 9	27.5	308	9.0	88	<.10	.01	2.5	.04	64
68	9BAD2	3- 7	49.5	439	9.3	130	<.10	<.01	1.4	.04	99
69	16CDC1	3- 7	41.0	275	8.4	82	.36	<.01	7.7	.53	51
72	21DABC1S	4-11	39.5	285	8.6	84	.32	<.01	6.3	.32	56
73	21DBC1	2-28	44.5	280	8.4	89	.38	<.01	6.1	.41	55
76	22AADA2	3- 6	44.0	281	8.0	106	.62	<.01	14	1.6	42
77	22CCDA1	3- 6	41.5	277	8.2	98	.61	<.01	9.2	1.1	48
78	22DADB1S	3- 8	46.0	288	8.1	97	.59	<.01	11	1.2	49
80	23CCA1	4-19	37.5	280	8.2	100	.71	<.01	15	2.3	39
82	23DCB1	3-28	42.0	285	8.0	105	.68	<.01	16	2.3	41
83	26ADA1	4-19	37.0	285	8.2	105	.76	.01	17	3.0	36
84	26BDA1	3- 1	34.0	280	8.1	103	.67	<.01	15	3.0	40
86	27ADB1	3- 6	40.5	282	8.2	104	.70	<.01	12	1.3	47
87	34DAD1	2-28	35.5	285	8.2	103	.75	<.01	16	2.9	41
88	34DCB1S	3-28	40.0	279	8.7	90	.58	<.01	6.1	.43	56
89	35BBB1S	3-28	41.5	279	8.2	102	.75	<.01	13	1.8	43
90	8S-5E-16AAA1	4-13	43.0	354	8.9	92	.19	<.01	3.2	<.01	79
91	8S-6E- 3BDD1S	3- 1	33.0	283	8.6	95	.79	.01	6.2	.33	54

Table 3.--*Chemical and isotopic analyses of water from selected thermal-water wells and springs, 1989*--Continued

Reference number	Well or spring location	Sample date (1989)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)	Sulfate, dissolved (mg/L as SO_4)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO_2)	Arsenic, dissolved (µg/L as As)	Boron, dissolved (µg/L as B)	Lithium, dissolved (µg/L as Li)	$^{13}C/^{12}C$ Stable-isotope ratio (permil)	$^{2}H/H$ Stable-isotope ratio (permil)	$^{18}O/^{16}O$ Stable-isotope ratio (permil)
1	6S-5E-35CBD1	5- 9	8.9	11	75	8.0	<66	18	110	57	-10.8	-135.0	-17.6
2	7S-4E- 1ACC1	3-30	6.2	8.3	20	9.9	83	18	100	6	-10.5	-131.0	-17.1
5	2CAB1	5-25	9.8	19	87	5.1	86	14	110	54	-11.3	-135.0	-17.4
6	2DBA1	4-12	7.8	7.8	18	9.2	92	16	110	10	--	-135.0	-17.1
12	10BDB1	4-12	7.8	8.8	21	8.4	87	12	110	10	-10.6	-135.0	-17.2
17	12DDC1	3-30	6.6	8.4	20	9.2	87	16	110	7	-11.1	-137.0	-17.1
19	13DCD1	3- 8	8.3	9.4	18	11	84	13	100	4	-10.9	-139.0	-17.1
20	14ABC1	4-20	8.1	9.0	22	9.7	84	13	100	6	-11.6	-133.0	-17.1
24	22BBD1	4-12	7.4	9.0	22	9.6	88	14	110	9	-10.8	-135.0	-17.1
32	26BCB1	4-27	8.3	16	30	6.8	78	9	90	12	-12.2	-134.0	-16.9
33	27BCC1	5- 1	6.6	9.5	18	6.3	67	11	90	7	-11.3	-131.0	-16.7
34	7S-5E- 1DCA1	4-27	6.2	9.1	38	10	66	44	110	33	-9.0	-137.0	-17.3
42	5DBC1	4-12	5.8	8.6	39	8.4	69	20	160	18	-10.2	-140.0	-17.6
43	7ABB1	3- 8	7.3	8.7	20	10	82	16	100	<4	-10.2	-135.0	-17.1
46	8CCC1	3- 8	7.3	8.7	20	10	83	17	100	<4	-11.0	-135.0	-17.1
48	9DDD1	3-30	5.8	8.5	18	11	79	19	110	7	-10.3	-134.0	-17.0
59	19CCC1	6- 6	8.1	10	25	14	87	20	130	9	-9.9	-132.0	-17.1
60	21CCA1	6- 6	8.2	9.6	23	13	83	19	110	9	-9.6	-133.0	-17.0
61	28BDA1	4-27	8.5	8.9	25	11	82	2	100	9	-10.2	-133.0	-17.1
63	7S-6E- 3DCB1	5- 2	.9	8.7	27	23	72	47	190	8	-6.9	-144.0	-18.2
66	7AAC1	5- 9	6.2	8.9	21	11	<87	34	130	9	-9.8	-136.0	-16.8
68	9BAD2	3- 7	2.7	9.0	29	24	94	77	200	4	-6.7	-144.0	-18.1
69	16CDC1	3- 7	5.1	8.4	19	9.2	72	23	110	<4	-10.5	-132.0	-17.2
72	21DABC1S	4-11	4.7	8.1	16	11	79	22	120	6	-10.4	-134.0	-16.9
73	21DBC1	2-28	5.3	8.3	17	10	76	22	110	6	-10.3	-136.0	-16.9
76	22AADA2	3- 6	7.2	8.4	17	4.4	79	15	100	13	-9.0	-132.0	-17.1
77	22CCDA1	3- 6	5.9	8.6	17	6.3	77	20	90	5	-9.4	-133.0	-17.1
78	22DADB1S	3- 8	6.1	8.9	20	6.2	78	20	100	8	-9.4	-134.0	-17.1
80	23CCA1	4-19	6.9	8.7	15	4.0	76	14	100	16	-9.3	-134.0	-17.1
82	23DCB1	3-28	6.8	8.5	15	4.1	82	18	100	21	-9.0	-132.0	-17.2
83	26ADA1	4-19	7.2	9.5	15	3.0	74	10	90	21	-8.8	-135.0	-17.0
84	26BDA1	3- 1	7.3	8.6	12	3.8	75	11	90	20	-8.9	-134.0	-17.0
86	27ADB1	3- 6	5.8	8.8	17	4.9	77	10	90	10	-9.4	-131.0	-17.0
87	34DAD1	2-28	6.3	8.9	16	4.0	70	17	90	20	-9.2	-130.0	-17.0
88	34DCB1S	3-28	4.7	8.3	17	8.2	77	2	110	4	-9.4	-133.0	-17.0
89	35BBB1S	3-28	5.7	8.7	15	4.1	77	19	90	14	-9.2	-129.0	-17.1
90	8S-5E-16AAA1	4-13	3.6	9.7	23	16	100	22	120	10	--	-135.0	-17.0
91	8S-6E- 3BDD1S	3- 1	6.4	8.6	16	5.8	74	15	90	8	-9.6	-135.0	-17.0