CHEMICAL AND HYDROLOGIC DATA FOR SELECTED THERMAL-WATER WELLS AND NONTHERMAL SPRINGS IN THE BOISE AREA, SOUTHWESTERN IDAHO

By H.W. Young, D.J. Parliman, and R.H. Mariner

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CONTENTS

ILLUSTRATIONS

TABLES

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.)	25.40	millimeter
mile (mi)	1.609	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."

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 ¼ section (160-acre tract), ¼ - ¼ section (40-acre tract), ¼ - ¼ - ¼ section (10-acre tract), and ¼-¼-¼-¼ section (2 ½-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. 1). Forty-acre, 10-acre, and 2 ½ -acre tracts within each quarter section are lettered in the same manner. Well 3N-2E-2BBAA1, for example, is in the NE ¼ NE ¼ NW ¼ NW ¼ sec. 2, T. 3 N., R. 2 E., and is the first well inventoried in that tract. Springs are designated by the letter "S" following the last numeral; for example, 4N-3E-35CCDD1S.

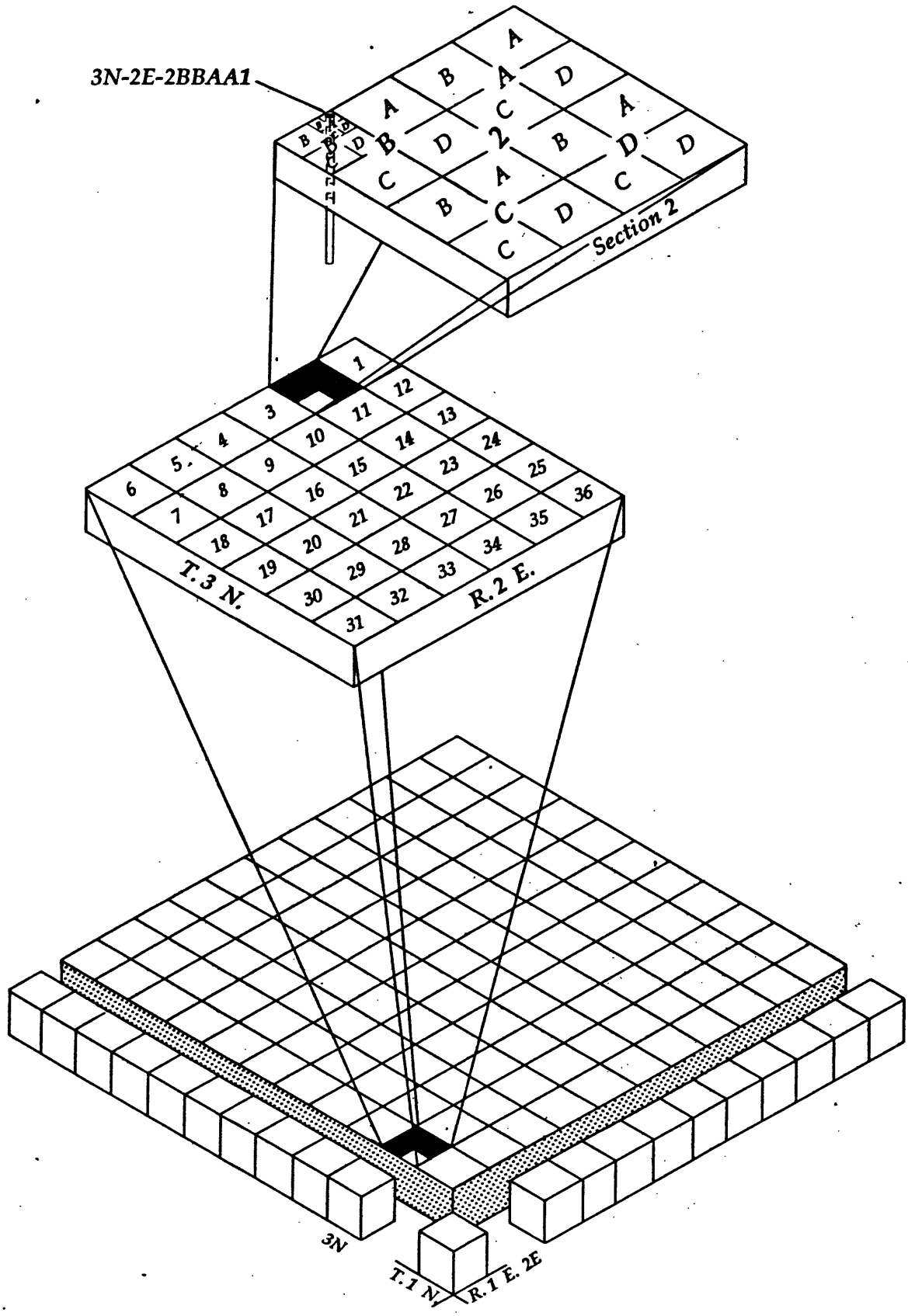

Figure 1.–Well- and spring-numbering system.

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ABSTRACT

This report presents data collected during January to July 1988 from 37 thermal-water wells and 3 nonthermal springs in the Boise area, southwestern Idaho. Included are well and spring locations; well-construction, water-level, and water-use information; hydrographs of water levels in 3 wells; chemical and isotopic analyses of water from 18 thermal-water wells and 3 nonthermal springs; and drillers' logs from 23 wells. The purpose of the report is to make these data conveniently available to the public.

INTRODUCTION

From January to April 1988, 37 thermal-water wells in the Boise, Idaho, area were inventoried. Water levels were measured where possible, and water samples were collected from 18 wells. Most of these wells are at the base of the Boise foothills at an altitude of about 2,800 feet above sea level. Three nonthermal springs in the Boise foothills at altitudes of about 4,500, 5,100 and 6,300 feet above sea level also were inventoried and sampled to provide data on local meteoric water. The study was conducted by the U.S. Geological Survey in cooperation with the U.S. Department of Energy. The purpose of this report is to make the data conveniently available to the public.

Location of the study area is shown in figure 2, and locations of wells are shown in figure 3. Because of space limitations, spring locations could not be plotted on figure 3, but township, range, and section designations are given.

Water-level measurements and other selected data for inventoried thermal-water wells in the study area are shown in table 1. Chemical and isotopic analyses of water from 18 thermal-water wells and 3 nonthermal springs are shown in table 2. Information from drillers' logs of 23 wells is shown in table 3.

A hydrograph of water-level fluctuations in well 3N-2E-11BABD1 during the period February 1986 to July 1988 is shown in figure 4. Hydrographs of water-level fluctuations in wells 3N-3E-30DDAA1 and 4N-2E-28CBBB1 during the period January to July 1988 are shown in figure 5.

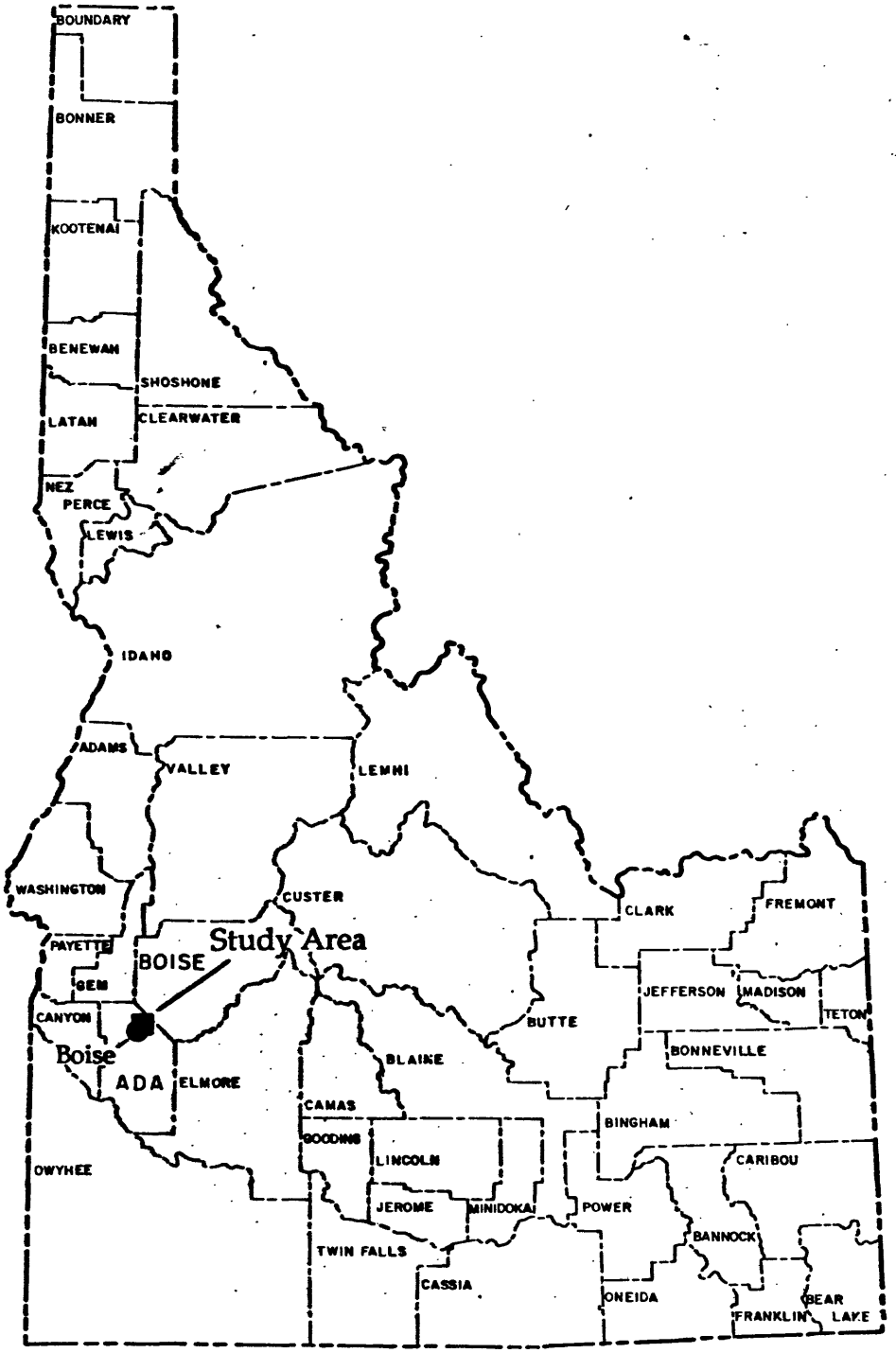

Figure 2.--Location of study area.

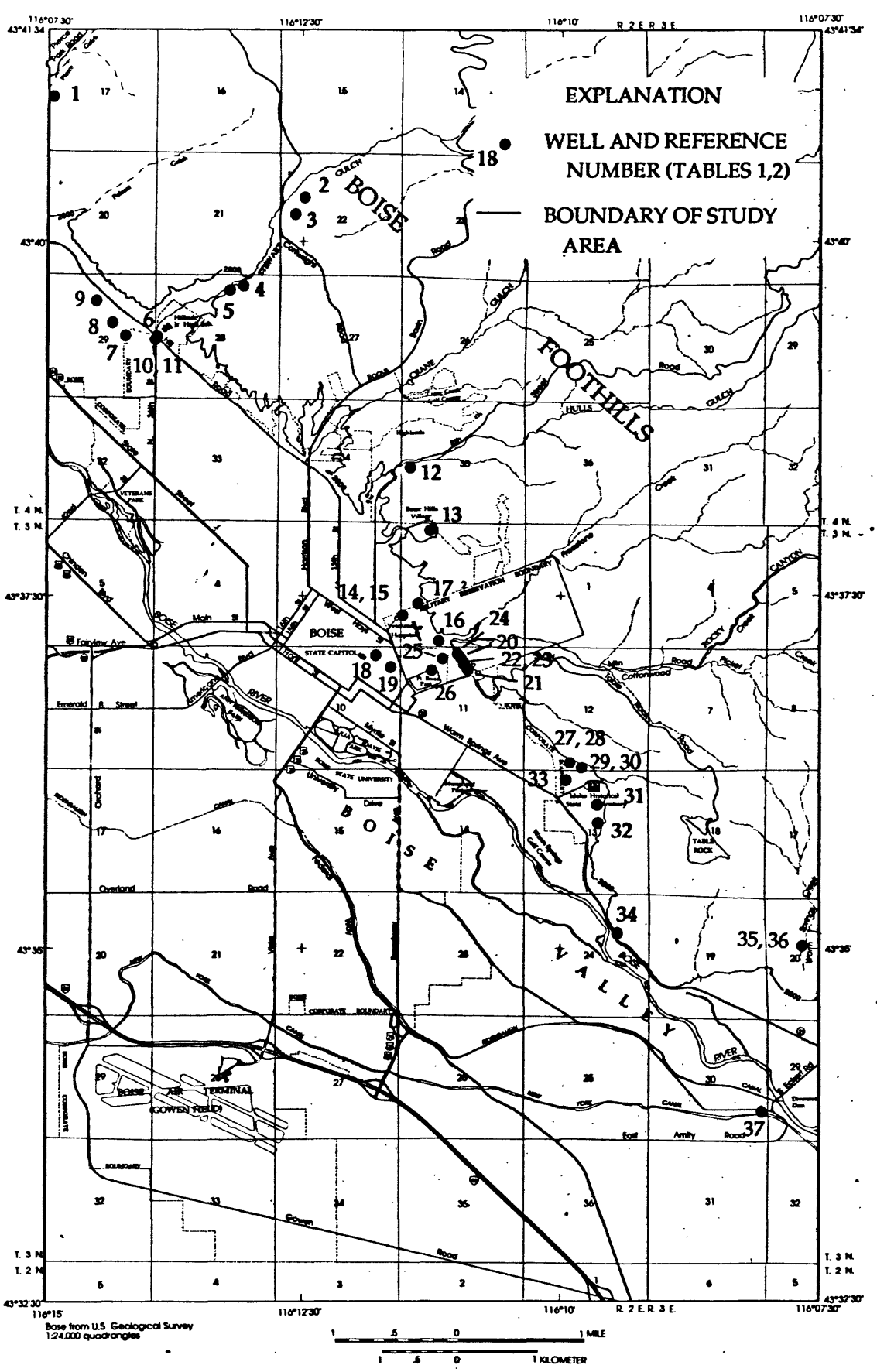

Figure 3.–Locations of thermal-water wells inventoried during the period January to April 1988.

Table 1.--Records of wells

[Altitude of land surface, estimated from topographic maps; well finish--S-screen, P-perforated, X-open hole, O-open end; water level--P-pumping, F-flowing; use--H-domestic, A-heating, I-irrigation, U-unused, XX-injection, P-public supply; remarks--log-driller's log, WC-water chemistry]

Ref. number	Well location	Altitude of land surface (feet above sea level)	Reported depth of well (feet below land surface)	Casing			Water level (feet above (+) or below land surface)				Use	Remarks
				Diameter (inches)	Feet below land surface to first perforation	Well Finish	Measured water level	Date	Reported water level	Date		
1	4N-2E-17CBB1	2,890	1,240	6	919	P	120.34	3/11/71			H	log, Barnes
2	22BCDA1	2,920	595	6	514	X					A	Terteling
3	22CBBA1	2,871	600	10	510	X	84.50	2/ 2/88			I	log, Terteling
4	28ABAD1	2,790	1,000	16	934	X	79.06	1/28/88			I	WC, Quail Hollow
5	28ABBD1	2,770	1,200	8			55.38	1/28/88			I	WC, Quail Hollow
6	28CBBB1	2,695	1,240	4	900	X	+33.03	1/29/88			A	WC, Milstead
7	29ACDB1	2,670	1,195	4			[2]+48.09	1/26/88			A	WC, Edwards
8	29ADCC1	2,670	1,420	4	1,420	O	F	2/ 2/88			A	WC, Church
9	29BADD1	2,660	1,145	4			F	2/ 2/88			A	WC, Ryan
10	29DAAA1	2,695	1,200	2			F	2/ 2/88			A	Milstead
11	29DAAA2	2,695	1,224	4			F	2/ 2/88			A	Milstead
12	35CBBA1	2,818	781	6	737	S	87.86	1/29/88			U	log, Boise Water Corporation
13	3N-2E-2BBAA1	2,865	282	8	226	S,X	[1]119 P	1/29/88			P	log, WC Hills Village

Table 1.--Records of wells--Continued

Ref. number	Well location	Altitude of land surface (feet above sea level)	Reported depth of well (feet below land surface)	Casing: Diameter (inches)	Casing: Feet below land surface to first perforation	Well Finish	Water level (feet above (+) or below land surface): Measured water level	Measured: Date	Reported water level	Reported: Date	Use	Remarks
14	2CBCC2	2,719	1,840	7	1,280	P,X			F	9/29/83	T	log, Veterans Administration Test
15	2CBCC3	2,179	2,300	16	1,240	P			+12	1/ 8/87	X	log, Veterans Administration Injection
16	2CDCD1	2,760	1,666	8	1,100	P,X	[1]40 P	1/26/88			A	log, WC, Veterans Administration Production
17	2CBDB1	2,760	1,143	4	630	P	64.77	1/26/88			H,A	log, WC, Koch
18	10AABB1	2,710	3,030	8	1,300	P,X			F	9/ 4/81	A	log, WC, Capitol Mall No. 2
19	10AADA1	2,715	2,152	8	1,750	X			+35	12/18/80	X	log, Capitol Mall No. 1
20	11ABBC1	2,775	880	12	642	X			F	5/ 8/81	A	log, WC, Boise Geothermal No. 2

Table 1.--Records of wells--Continued

Ref. number	Well location	Altitude of land surface (feet above sea level)	Reported depth of well (feet below land surface)	Casing: Diameter (inches)	Casing: Feet below land surface to first perforation	Well Finish	Water level (feet above (+) or below land surface): Measured water level	Measured: Date	Reported water level	Reported: Date	Use	Remarks
21	11ABCA1	2,775	2,008	8	874	P,X	24.75	1/27/88			U	log, Boise Geothermal No. 1
22	11ABCB1	2,765	1,283	4	823	S,P			+19	12/21/76	U	log, Beard Well
23	11ABCB2	2,775	1,103	8	720	P,X			F	9/15/81	A	log, WC, Boise Geothermal No. 4
24	11BAAA1	2,775	1,897	8	680	P,X			F	6/ 9/81	A	log, WC, Boise Geothermal No. 3
25	11BABD1	2,743	1,222	3	781	P,X	28.70	1/27/88			U	log, Bureau of Land Management
26	11BBDD1	2,735	385	8	256	X					I	WC
27	12CDDC1	2,788	587	16	--	X	111.85	1/25/88			U	log, Boise Warm Springs No. 3
28	12CDDC2	2,738	--	--	--	--	--	--			U	Behrman

Table 1.--Records of wells--Continued

Ref. number	Well location	Altitude of land surface (feet above sea level)	Reported depth of well (feet below land surface)	Casing: Diameter (inches)	Casing: Feet below land surface to first perforation	Casing: Well Finish	Water level (feet above (+) or below land surface): Measured water level	Date	Reported water level	Date	Use	Remarks
29	12CDDD1	2,775	400	12	160	X	[1]220 P	1/25/88			A	WC Boise Warm Springs West Well
30	12CDDD2	2,775	400	12	160	X	[1]220 P	1/25/88			A	Boise Warm Springs East Well
31	13ACBA1	2,790	1,015	8	635	X	73.77	2/ 5/88			U	log, Kanta
32	13ACCA1	2,780	872	12	220	P	78.78	1/27/88			I	log, Botanical Gardens, Old Pen Well
33	13BABA1	2,730	865	8	498	X	44.70	1/28/88			I	log, WC, Quarry View
34	24ACAD1	2,760	495	8	263	P	29.11	1/20/67			P	log, WC, Warm Springs Mesa
35	3N-3E-20BDBD1	2,890	742	8	548	X			75	6/26/86	I	log, Harris
36	20BDBD2	2,890	644		70	X	73.75	1/29/88			U	Harris
37	30DDAA1	2,800	940	6	246	X	150.75	2/ 5/88			U	log, Boise Water Corporation

[1] Air line measurement.
[2] Well not completely shut in.

Table 2.--Chemical and isotopic analyses of water from selected thermal-water wells and nonthermal springs

(--, data not available; <, less than; P, pumping; S, spring)

Ref. number	Well or spring location	County	Date sampled	Total depth of well (feet)	Onsite: Water level (feet) below land surface)	Onsite: Temperature (C)	Onsite: pH (standard units)	Onsite: Alkalinity, total (mg/L as CaCO3)
2	4N- 2E-22BCDA1	Ada	2- 2-88	595	--	43.5	9.0	98
4	4N- 2E-28ABAD1	Ada	1-28-88	991	79.06	--	--	--
			4- 4-88		--	44.5	8.9	100
			6-22-88		273.70 P	--	--	--
5	4N- 2E-28ABBD1	Ada	1-28-88	1,200	55.38	--	--	--
			4- 4-88		--	35.5	9.0	110
			6-22-88		62.68 P	--	--	--
6	4N- 2E-28CBBB1	Ada	1-28-88	1,240	--	42.5	9.2	110
			1-29-88		-33.26	--	--	--
			3- 8-88		--	--	--	--
			3- 8-88		-31.88	--	--	--
			4- 4-88		-33.03	--	--	--
			5- 4-88		-33.50	--	--	--
			6- 2-88		-28.18	--	--	--
			6-21-88		-23.56	--	--	--
7	4N- 2E-29ACDB1	Ada	1-25-88	1,195	--	47.5	8.9	110
8	4N- 2E-29ADCC1	Ada	2- 2-88	1,420	--	45.5	9.0	110
9	4N- 2E-29BADD1	Ada	2- 2-88	1,145	--	46.5	9.2	110
	4N- 3E-10BDCB1S	Boise	4-29-88	spring	--	3.5	5.8	18
	4N- 3E-11DDAA1S	Boise	4- 5-88	spring	--	7.5	6.2	26
	4N- 3E-35CCDD1S	Ada	3-11-88	spring	--	10.0	7.2	74
13	3N- 2E- 2BBAA1	Ada	1-29-88	282	--	24.5	7.7	110
17	3N- 2E- 2CBDB1	Ada	1-26-88	1,143	--	39.0	9.0	97
16	3N- 2E- 2CDCD1	Ada	1-26-88	1,666	--	72.0	8.6	130
			3- 8-88		--	--	--	--
18	3N- 2E-10AAB31	Ada	1-26-88	3,030	--	67.5	8.4	130
			3- 8-88		--	--	--	--
20	3N- 2E-11ABBC1	Ada	1-27-88	880	--	76.0	9.0	130
23	3N- 2E-11ABCB2	Ada	1-27-88	1,103	--	79.5	8.8	130
24	3N- 2E-11BAAA1	Ada	1-27-88	1,897	--	71.5	8.9	110
26	3N- 2E-11BBDD1	Ada	4- 4-88	385	--	25.0	8.8	66
29	3N- 2E-12CDDD1	Ada	1-25-88	400	--	77.5	8.5	140
			3- 7-88		--	--	--	--
33	3N- 2E-13BABA1	Ada	1-28-88	865	44.70	--	--	--
			4- 5-88		--	50.5	8.9	76
34	3N- 2E-24ACAD1	Ada	1-28-88	495	--	28.5	7.6	77

Table 2.--Chemical and isotopic analyses of water from selected thermal-water wells and nonthermal springs--Continued

Date sampled	Solids, sum of constituents, dissolved (mg/L)	Nitrogen, NO2+NO3 dissolved (mg/L as N)	Phosphorous, total (mg/L as P)	Hardness, total (mg/L as CaCO3)	Calcium, dissolved (mg/L as Ca)	Magnesium, dissolved (mg/L as Mg)	Sodium, dissolved (mg/L as Na)	Potassium, dissolved (mg/L as K)	Chloride, dissolved (mg/L as Cl)
				Laboratory					
2- 2-88	205	<.100	--	6	2.3	0.04	58	1.1	2.6
1-28-88	--	--	--	--	--	--	--	--	--
4- 4-88	229	<.100	--	6	2.3	.01	67	1.1	3.1
6-22-88	--	--	--	--	--	--	--	--	--
1-28-88	--	--	--	--	--	--	--	--	--
4- 4-88	247	<.100	--	15	5.6	.16	66	1.3	3.2
6-22-88	--	--	--	--	--	--	--	--	--
1-28-88	231	<.100	<.010	4	1.7	.02	66	.70	3.9
1-29-88	--	--	--	--	--	--	--	--	--
3- 8-88	--	--	--	--	--	--	--	--	--
3- 8-88	--	--	--	--	--	--	--	--	--
4- 4-88	--	--	--	--	--	--	--	--	--
5- 4-88	--	--	--	--	--	--	--	--	--
6- 2-88	--	--	--	--	--	--	--	--	--
6-21-88	--	--	--	--	--	--	--	--	--
1-25-88	229	<.100	.010	4	1.6	.01	65	.70	4.3
2- 2-88	228	<.100	--	4	1.7	.03	67	.80	3.6
2- 2-88	--	<.100	--	--	1.7	<.01	67	.80	3.9
4-29-88	54	1.10	.040	18	5.3	1.2	3.5	.30	.90
4- 5-88	61	.210	--	17	5.6	.66	5.2	.50	.60
3-11-88	150	.980	.010	83	30	2.0	8.5	4.8	3.8
1-29-88	215	<.100	.020	76	28	1.4	37	1.4	3.3
1-26-88	244	<.100	<.010	16	6.0	.22	69	.70	6.6
1-26-88	--	<.100	.010	--	1.6	<.01	80	1.1	8.6
3- 8-88	--	--	--	--	--	--	--	--	--
1-26-88	260	<.100	--	5	1.6	.13	81	.80	7.2
3- 8-88	--	--	--	--	--	--	--	--	--
1-27-88	308	<.100	.010	4	1.7	.04	84	1.4	8.7
1-27-88	--	<.100	.010	--	1.4	<.10	84	1.5	8.2
1-27-88	273	<.100	.010	4	1.6	.06	82	1.0	8.1
4- 4-88	240	<.100	--	24	9.4	.02	70	.70	7.1
1-25-88	303	<.100	--	5	1.8	.02	86	1.6	8.6
3- 7-88	--	--	--	--	--	--	--	--	--
1-28-88	--	--	--	--	--	--	--	--	--
4- 5-88	198	<.100	--	5	2.1	.02	66	.60	6.9
1-28-88	146	.550	.010	36	13	.78	24	2.3	2.3

Table 2.--Chemical and isotopic analyses of water from selected thermal-water wells and nonthermal springs--Continued

Date sampled	Sulfate, dissolved (mg/L as SO4)	Fluoride, dissolved (mg/L as F)	Silica, dissolved (mg/L as SiO2)	Boron, dissolved (ug/L as B)	Lithium, dissolved (ug/L as Li)	H-2/H-1 stable isotope ratio permil	O-18/O-16 stable isotope ratio permil	C-13/C-12 stable isotope ratio permil
			Laboratory					
2- 2-88	19	7.2	41	60	23	-128.0	-16.70	-10.80
1-28-88	--	--	--	--	--	--	--	--
4- 4-88	29	9.6	43	70	48	-124.0	-16.80	-9.80
6-22-88	--	--	--	--	--	--	--	--
1-28-88	--	--	--	--	--	--	--	--
4- 4-88	38	9.2	46	70	50	-127.0	-16.80	-9.40
6-22-88	--	--	--	--	--	--	--	--
1-28-88	25	9.8	38	70	22	-131.0	-17.40	-9.90
1-29-88	--	--	--	--	--	--	--	--
3- 8-88	--	--	--	--	--	--	--	--
3- 8-88	--	--	--	--	--	--	--	--
4- 4-88	--	--	--	--	--	--	--	--
5- 4-88	--	--	--	--	--	--	--	--
6- 2-88	--	--	--	--	--	--	--	--
6-21-88	--	--	--	--	--	--	--	--
1-25-88	25	10	39	70	21	-129.0	-17.20	-10.00
2- 2-88	22	10	41	60	23	-132.0	-16.90	-10.30
2- 2-88	22	10	40	60	24	-131.0	-16.90	-9.90
4-29-88	5.2	.20	22	<10	<4	-123.0	-16.70	-20.00
4- 5-88	3.6	.20	28	<10	20	-119.0	-16.00	-16.10
3-11-88	25	.20	27	10	19	-122.0	-16.10	-14.80
1-29-88	47	1.3	31	30	23	-121.0	-15.40	-10.90
1-26-88	31	16	38	30	19	-133.0	-16.90	-12.00
1-26-88	23	12	64	80	36	-133.0	-17.00	-10.50
3- 8-88	--	--	--	--	--	--	--	--
1-26-88	21	12	55	80	34	-133.0	-17.20	-10.40
3- 8-88	--	--	--	--	--	--	--	--
1-27-88	23	19	74	90	43	-134.0	-17.20	-9.40
1-27-88	23	19	59	90	50	-133.0	-17.20	-9.80
1-27-88	23	18	63	80	38	-132.0	-17.10	-9.50
4- 4-88	77	9.2	23	60	48	-134.0	-17.40	-6.60
1-25-88	22	12	78	90	47	-133.0	-17.00	-10.70
3- 7-88	--	--	--	--	--	--	--	--
1-28-88	--	--	--	--	--	--	--	--
4- 5-88	28	12	28	80	39	-130.0	-17.10	-10.10
1-28-88	12	1.2	42	<10	9	-127.0	-16.80	-14.10

Table 3.--Drillers' logs of selected wells

Note: These logs were obtained from the Idaho Department of Water Resources. The terminology is that of the drillers but has been slightly modified for uniformity.

4N- 2E-17CBB1 BARNES
(CASING: 6-INCH, 0 TO 1,174 FEET;
PERFORATED FROM 919 TO 1,174 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
CLAY, YELLOW	22	0
SHALE, BLUE	14	22
SHALE, BLUE, SOFT SPOT	51	36
SHALE, BLUE	66	87
SAND, WHITE	1	153
SHALE, BLUE	41	154
SOFT SPOT	10	195
SHALE, BLUE, SOFT	40	205
SHALE, BLUE, HARD	155	245
SHALE, BLUE; TRACE OF SAND, BLUE	50	400
SHALE, BLUE; TRACE OF SAND, BLUE	10	450
SOFT SPOT	45	460
SHALE, BLUE, HARD	80	505
TRACE OF SAND, FINE, WHITE	5	585
SHALE, BLUE, HARD	10	590
TRACE OF CINDERS, BLACK	10	600
SHALE, BLUE	30	610
SHALE, HARD	250	640
SHALE, CAVING	35	890
SOFT SPOT	10	925
SHALE, BLUE	20	935
SHALE, CAVING	15	955
SHALE, BLUE	55	970
SHALE, BLUE	35	1,025
SHALE, BLUE	25	1,060
SHALE, BLUE; TRACE OF CINDERS, BLACK	5	1,085
SHALE, BLUE	40	1,090
SHALE, BLUE; SAND	10	1,130
SHALE, HARD	10	1,140
BENTONITE, BROWN, SLICK	22	1,150
SAND, BLUE	2	1,172
LAVA ROCK	36	1,174
ROCK, HARD	15	1,210
CAVITY AND CAVE IN	15	1,225
TOTAL DEPTH		1,240

Table 3.--Drillers' logs of selected wells--Continued

4N- 2E-22C88A1 TERTELING
(CASING: 10-INCH, 0 TO 810 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
TOPSOIL	3	0
SILT, CLAY, SAND	13	3
CLAY, BLUE	14	16
CLAY AND SAND	20	30
SHALE, BLUE	35	50
SHALE	5	85
SHALE, BLUE	105	90
SHALE, BLUE	268	195
GRANITE, HARD, DRY, AND SAND	41	463
LAVA, BLACK	36	504
LAVA AND SHALE LAYERS	10	540
LAVA, HARD	15	550
LAVA CREVICE	1	565
LAVA	12	566
CLAY, RED	5	578
CINDERS AND SHALE, BLUE	11	583
SHALE, VERY HARD	6	594
TOTAL DEPTH		600

Table 3.--Drillers' logs of selected wells--Continued

4N- 2E-28ABAD1 QUAIL HOLLOW
(CASING: 20-INCH, 2 TO 45 FEET;
1982 AND 1983: WELL DEEPENED SEVERAL
TIMES. TOTAL WELL DEPTH IN 1988
REPORTED TO BE ABOUT 1,000 FEET, WITH
ABOUT 900 FEET OF CASING)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
TOPSOIL	2	0
CLAY, BROWN, SANDY	44	2
SHALE, BLUE	219	46
SHALE, LIGHT GRAY	403	265
SHALE, DARK GRAY	18	668
SHALE, HARD, BROKEN, GRAY	2	686
SHALE, GRAY	22	688
NO INFORMATION	290	710
TOTAL DEPTH		1,000

Table 3.--Drillers' logs of selected wells--Continued

4N- 2E-35CBBA1 BOISE WATER CORPORATION, GAMBLE WELL
(CASING: 12-INCH, 2 TO 439 FEET;
6-INCH, 419 TO 737 FEET;
6-INCH, 771 TO 781 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
TOPSOIL, SANDY	13	0
SAND, REDDISH, DIRTY	55	13
CLAY, BLUE-GRAY	9	68
CLAY, GREEN, LAYERS OF SAND	25	77
CLAY, BLUE, AND SAND, CEMENTED	10	102
SAND, BROWN, CEMENTED	13	112
SAND, BLUE, CEMENTED	64	125
CLAY, BLUE	165	189
SAND, BLUE, CEMENTED	23	354
CLAY, BLUE, SHALY; SOME SAND	50	377
CLAY, BLUE-GRAY, STICKY	50	427
CLAY, BLUE, FINE, SANDY	50	477
CLAY, LIGHT BLUE, HARD AND STICKY	5	527
ROCK, HARD, BLACK, AND CLAY	9	532
ROCK, HARD, BLACK	34	541
ROCK, HARD, GRAY	39	575
CLAY, RED, STICKY	4	614
CLAY, BLUE	42	618
SAND, COARSE	10	660
CLAY, BLUE, STICKY	8	670
CLAY, BLUE, AND ROCK, BLACK	4	678
ROCK, BLACK; CLAY, GREENISH-BLUE AND WHITE; PEBBLES, BLACK	23	682
SOAPSTONE AND CLAY	5	705
ROCK, GRAY, HARD	10	710
ROCK, BLACK, AND CLAY, STICKY	12	720
ROCK, GRAY, HARD	6	732
SAND, COARSE, CLEAN	33	738
CLAY, DARK BLUE	10	771
TOTAL DEPTH		781

Table 3.--Drillers' logs of selected wells--Continued

3N- 2E- 28BAA1 HILLS VILLAGE
(CASING: 8-INCH, 0 TO 226 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
TOPSOIL	10	0
TOPSOIL, GENERAL MIXTURE	20	10
SANDSTONE, SOFT	20	30
SANDSTONE, SOFT	4	50
CLAY, YELLOW, WITH SMALL ROCKS	6	54
SANDSTONE, HARD	2	60
SANDSTONE, BLACK	2	62
SHALE, BLUE, STICKY	16	64
QUICKSAND, SOME SHALE MIXED	7	80
SHALE, STICKY	33	87
SHALE WITH FINE SAND, INCREASING	30	120
SHALE AND SAND, DECREASING	12	150
SHALE, BLACK	3	162
SHALE, HARD, BROWN	5	165
SHALE, HARD, BROWN	5	170
QUARTZ SAND, BLUE	5	175
SAND, COARSE, WITH WATER; SHALE, WHITE	20	180
SAND, COARSE	28	200
SHALE, HARD, BLUE	12	228
SHALE, HARD, BLUE	10	240
SHALE, HARD, BLUE	6	250
SHALE, VERY HARD, BLUE; ROCK	4	256
SHALE, VERY HARD, LIGHT BLUE TO NEARLY WHITE-BLUE	10	260
SAND, COARSE	12	270
TOTAL DEPTH		282

Table 3.--Drillers' logs of selected wells--Continued

3N- 2E- 2CBCC2 VETERANS ADMINISTRATION, TEST
(CASING: 10-INCH, 1 TO 130 FEET;
7-INCH, 2 TO 1,480 FEET;
PERFORATED FROM 1,280 TO 1,480 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
TOPSOIL, SANDY	24	0
GRAVEL, CEMENTED	1	24
SAND AND GRAVEL	33	25
SAND, MUDDY, AND GRAVEL	12	58
SAND, CEMENTED	9	70
CLAY, BLUE, SANDY	5	79
SAND, BLUE, CEMENTED	32	84
SAND, BLUE	12	116
CLAY, BLUE	4	128
SAND, BLACK, DARK	8	132
CLAY, GRAY, DARK	68	140
SILT, GRAY	147	208
SAND AND SILT, GRAY, DARK	30	355
CLAY, GRAY, DARK	17	385
SAND, GRAY, FINE	32	402
CLAY, GRAY, SOME SAND	113	434
BASALT, SOME ALTERED	186	547
SAND, WHITE	60	733
BASALT, BROWN TO BROWNISH-GRAY	29	793
CLAY, SANDY	62	822
BASALT AND CLAY, ALTERED	204	884
SAND AND CLAY, SANDY	41	1,088
BASALT, GRAY	126	1,129
CLAY, GREEN	16	1,255
SAND, GREEN, AND CLAY, SANDY	81	1,271
CLAY, RED-BROWN, SANDY	6	1,352
BASALT	54	1,358
CLAY, RED AND GREEN	12	1,412
VOLCANICS, DARK	399	1,424
CLAY, GREEN AND RED-BROWN	11	1,823
SAND, RED-BROWN	6	1,834
TOTAL DEPTH		1,840

Table 3.--Drillers' logs of selected wells--Continued

3N- 2E- 2CBCC3 VETERANS ADMINISTRATION, INJECTION
(CASING: 16-INCH, -7 TO 140 FEET;
10-INCH, -5 TO 1,240 FEET;
7-INCH, 1,180 TO 2,300 FEET;
PERFORATED FROM 1,240 TO 2,300 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
SAND, GRANITE, AND GRAVEL	57	0
SAND, GRANITE	53	57
SAND AND CLAY	30	110
SAND AND CLAY LENSES	421	140
BASALT, BLACK, HARD	151	561
SAND AND CLAY, INTERBED	172	712
BASALT, BLACK, HARD	131	884
CLAY, GRAY	76	1,015
CLAY, GRAY, SANDY	149	1,091
CLAY, GRAY, SANDY	47	1,240
SAND, QUARTZ, CLEAN	20	1,287
CLAY, GRAY	100	1,307
BASALT, BLACK	123	1,407
ANDESITE, GRAY	30	1,530
CLAY, GRAY	10	1,560
BASALT, BLACK	130	1,570
CLAY, GRAY	10	1,700
BASALT, GRAY	81	1,710
CLAY, GRAY	21	1,791
SAND, CLEAN	78	1,812
RHYOLITE, LIGHT GRAY	410	1,890
TOTAL DEPTH		2,300

Table 3.--Drillers' logs of selected wells--Continued

3N- 2E- 2C8D81 KOCH
(CASING: 6-INCH, 1 TO 632 FEET;
4-INCH, 618 TO 1,143 FEET;
PERFORATED FROM 1,065 TO 1,105 FEET AND
630 TO 670 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
SOIL, RUBBLE	2	0
SANDSTONE, BROWN	56	2
CLAY, BROWN, HEAVY	5	58
CLAY, BLUE, HEAVY	6	63
SHALE, GRAY qg111	34	69
SAND AND CLAY, COARSE; WATER	31	103
CLAY, BLUE, STICKY	84	134
SHALE, VERY HARD	2	218
CLAY, BLUE, SANDY	50	220
SAND AND CLAY, COARSE	30	270
CLAY, BLUE, STICKY	8	300
CLAY, FINE, SANDY	32	308
SAND, COARSE, CLAY STREAKS; TALC, WHITE	68	340
CLAY, BLUE, VERY STICKY	4	408
CLAY, SANDY	35	412
SAND, COARSE; WATER	4	447
CLAY, BLUE, STICKY	34	451
PEA GRAVEL	1	485
CLAY, BLUE, STICKY	88	486
SAND	4	574
SHALE, BLUE	20	578
SAND	2	598
SHALE, BLUE, HARD	20	600
MAGNETITE	18	620
SHALE, BLACK, HARD	3	638
SILT, SAND, GRAY, AND CLAY	39	641
SAND	40	680
CLAY, BLUE TO GRAY, OR SHALE	65	720
CLAY, GREEN, GRAY	10	785
SHALE, GREEN, GRAY	105	795
SHALE, GREEN, SOME SAND	20	900
SAND, COARSE, CLEAN, SOME SHALE	20	920
SHALE, DARK GRAY; SILTY CLAY, LIGHT	20	940
SHALE, DARK GREEN; SILTY CLAY, LIGHT	10	960
SHALE, DARK GREEN AND DARK GRAY, HARD	20	970
SHALE, DARK GREEN AND DARK GRAY, SOFTER	10	990
SHALE, GREEN, DARK GRAY	20	1,000
HARD LAYER	5	1,020
SHALE	10	1,025
CLAY, REDDISH-BROWN, OR SHALE	25	1,035
CLAY, SILTY, WHITE	5	1,060
SHALE, DARK GRAY, COARSE	10	1,065
ROCK, HARD, FEW SOFT SEAMS, SOME SHALE, GRAY	20	1,075
CLAY, SILTY, WHITE, SOFTER	10	1,095
SHALE, WHITE, HARD, AND SILTY CLAY, SOME SOFT SEAMS	35	1,105
SHALE, WHITE, HARD	3	1,140
TOTAL DEPTH		1,143

Table 3.--Drillers' logs of selected wells--Continued

3N- 2E- 2CDCD1 VETERANS ADMINISTRATION, PRODUCTION
(CASING: 16-INCH, -6 TO 140 FEET;
12-INCH, 2 TO 802 FEET;
8-INCH, 780 TO 1,500 FEET;
PERFORATED FROM 1,100 TO 1,500 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
TOPSOIL	6	0
TOPSOIL	14	6
SANDSTONE, YELLOW, COARSE	45	20
SANDSTONE, TAN AND YELLOW, MEDIUM GRAINED	75	65
SILTSTONE, DARK GRAY	100	140
CLAY, GRAY	15	240
SANDSTONE, GRAY, MEDIUM-GRAINED, AND CLAY, DARK GRAY	190	255
SILTSTONE, BLUE-GRAY	50	445
SAND, GRAY	15	495
BASALT, GRAY, ALTERED	98	510
CLAYSTONE, DARK GRAY	14	608
BASALT, BLACK	40	622
CLAY, DARK GRAY	20	662
BASALT, BLACK, HARD	38	682
CLAY, DARK GRAY WITH SAND	25	720
SAND, GRAY, MEDIUM- AND COARSE-GRAINED	75	745
RHYOLITE, GRAY TO LAVENDER	150	820
RHYOLITE, TUFF, WHITE TO GRAY	375	970
RHYOLITE, TUFF, WHITE, GLASSY	35	1,345
RHYOLITE, TUFF, GRAY	286	1,380
TOTAL DEPTH		1,666

Table 3.--Drillers' logs of selected wells--Continued

3N- 2E-10AAB81 CAPITOL MALL NO. 2
(CASING: 20-INCH, 0 TO 130 FEET;
12-INCH, 0 TO 1,260 FEET;
8-INCH, 1,220 TO 2,550 FEET;
PERFORATED FROM 1,300 TO 1,420 FEET, 1,420
TO 1,460 FEET, 1,460 TO 1,606 FEET, AND
1,606 TO 2,558 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
TOPSOIL	40	0
SAND, GRAVEL, AND COBBLES	41	40
SAND, SILTY, AND COARSE	49	81
CLAY WITH SILT AND SAND	21	130
SAND, COARSE, CLEAN	27	151
SAND, GRANITIC, CLAY	122	178
CLAY, SILTY	464	300
BASALT WITH CLAY AND SAND	171	764
SAND WITH QUARTZ, CLEAN	70	935
BASALT WITH CLAY	83	1,005
SAND WITH QUARTZ AND CLAY	82	1,088
BASALT WITH CLAY	96	1,170
CLAY AND SAND WITH BASALT CHIPS	287	1,266
VOLCANICS WITH CLAY	82	1,553
SAND, COARSE	20	1,635
CLAY, SANDY, AND CLAY	35	1,655
SAND, GRANITIC	40	1,690
CLAY, SOFT, GRITTY	45	1,730
SAND, COARSE, VOLCANIC	18	1,775
VOLCANIC ROCK, SILICEOUS	397	1,793
CLAY, GRITTY	30	2,190
SAND AND CLAY	20	2,220
SAND, GRANITIC, CEMENTED	27	2,240
SANDSTONE AND CLAY	23	2,267
SAND, GRANITIC AND VOLCANIC	145	2,290
CLAY, SOME SAND	75	2,435
VOLCANIC ROCK, GLASSY	440	2,510
VOLCANIC ROCK, SOAPSTONE	80	2,950
TOTAL DEPTH		3,030

Table 3.--Drillers' logs of selected wells--Continued

3N- 2E-10AADA1 CAPITOL MALL NO. 1
(CASING: 16-INCH, 0 TO 118 FEET;
12-INCH, 0 TO 370 FEET;
10-INCH, GATE VALVE TO 340 FEET;
8-INCH, 340 TO 1,640 FEET,
CEMENT PLUG, 1,640 TO 1,750 FEET;
OPEN HOLE, 1,750 TO 2,152 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
GRAVEL AND SAND	80	0
SAND AND CLAY, INTERBEDDED	290	80
CLAY, GRAYISH-GREEN	240	370
CLAY, SANDY	20	610
CLAY	15	630
SAND WITH CLAY STRINGERS	25	645
CLAY	60	670
CLAY, BROWN, SANDY	5	730
BASALT, ALTERED	12	735
BASALT	143	747
CLAY, BLUISH-TAN, GRAY	15	890
SAND	3	905
CLAY, BROWN	4	908
BASALT	41	912
SAND WITH CLAY STRINGERS	25	953
CLAY, BROWNISH-GRAY	17	978
SAND	5	995
BASALT, STRINGERS	2	1,000
CLAY, BROWN, SANDY	33	1,002
SAND AND CLAY LAYERS	28	1,035
BASALT	9	1,063
SAND WITH CLAY STRINGERS	65	1,072
BASALT	93	1,137
CLAY, REDDISH-BROWN	5	1,230
BASALT, ALTERED AND FRACTURED	131	1,235
SAND WITH CLAY STRINGERS	26	1,366
BASALT, ALTERED, FRACTURED	76	1,392
BASALT, HARD, FRACTURED (SECONDARY SILICA)	64	1,468
SAND AND CLAY (MOSTLY SAND)	34	1,532
CLAY, RED-BROWN	24	1,566
SAND	22	1,590
TUFF, WELDED, HARD	13	1,612
SAND, CLEAN	37	1,625
VOLCANIC ROCK, SILICA-RICH, ALTERED	8	1,662
RHYOLITE, HIGHLY FRACTURED, SILICA-RICH	482	1,670
PORPHYRITIC VOLCANIC ROCK WITH VEIN FILLING OR FRACTURE FILLED WITH CHALCEDONY		
TOTAL DEPTH		2,152

Table 3.--Drillers' logs of selected wells--Continued

3N- 2E-11ABBC1 BOISE GEOTHERMAL NO. 2
(CASING: 16-INCH, 0 TO 40 FEET;
12-INCH, 0 TO 642 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
FILL AND SANDSTONE	40	0
SILTSTONE, GRAY	62	40
SANDSTONE WITH CLAY	45	102
SILTSTONE AND CLAYSTONE	71	147
BASALT WITH CLAY	112	218
SANDSTONE, COARSE	30	330
BASALT, GRAY-BLACK, WITH CLAY	30	360
SANDSTONE WITH CLAY	55	390
CLAY, RED-BROWN	30	445
SANDSTONE AND SILTSTONE	55	475
BASALT, BROWN-BLACK, WITH CLAY	90	530
SANDSTONE WITH PYRITE AND CLAY	38	620
VOLCANIC ROCK, ALTERED AND BROKEN, LOST CIRCULATION	197	658
SANDSTONE, COARSE	25	855
TOTAL DEPTH		880

Table 3.--Drillers' logs of selected wells--Continued

3N- 2E-11ABCA1 BOISE GEOTHERMAL NO. 1
(CASING: 16-INCH, 0 TO 40 FEET;
12-INCH, 0 TO 874 FEET;
8-INCH, 837 TO 1,657 FEET;
PERFORATED FROM 874 TO 1,023 FEET,
1,054 TO 1,074 FEET, 1,399 TO 1,561 FEET,
1,647 TO 1,657 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
SAND, CLAYEY	40	0
SAND, RED-BROWN-GRAY, CLAYEY	40	40
CLAY, LIGHT GRAY	10	80
SANDSTONE WITH CLAY	60	90
BASALT, GRAY, WITH CLAY	115	150
SANDSTONE, GRAY, WITH PYRITE	25	265
BASALT WITH PYRITE; CLAY	190	290
CLAY, GREASY, WITH PYRITE	10	480
SANDSTONE WITH SAND, COARSE	35	490
CLAY, GREASY, WITH PYRITE	25	525
VOLCANIC ROCK WITH RED-BROWN AND GRAY ZONES; ROCK, HARD, CHIPPY	310	550
CLAY, RED-BROWN	10	860
SANDSTONE, RED-BROWN AND GRAY-BROWN, COARSE; PEBBLES	195	870
VOLCANIC ASH AND PUMICE	195	1,065
SANDSTONE WITH CLAY AND BASALT FRAGMENTS	140	1,260
SANDSTONE WITH SAND, COARSE	100	1,400
CLAY, GREASY, WITH SOME QUARTZ	60	1,500
SANDSTONE WITH SAND, COARSE	120	1,560
GRANODIORITE WITH CLAY, SOME INTERBEDS	328	1,580
TOTAL DEPTH		2,008

Table 3.--Drillers' logs of selected wells--Continued

3N- 2E-11ABCB2 BOISE GEOTHERMAL NO. 4
(CASING: 20-INCH, 0 TO 40 FEET;
12-INCH, 0 TO 601 FEET;
8-INCH, 580 TO 1,055 FEET;
PERFORATED FROM 720 TO 800 FEET,
850 TO 870 FEET, 900 TO 1,040 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
TOPSOIL, SANDY	40	0
SAND AND CLAY, SOME QUARTZ	45	40
CLAY WITH SANDSTONE	10	85
SANDSTONE AND SILTSTONE WITH QUARTZITE AND PYRITES	50	95
BASALT, GREEN TO GREEN-BLACK	55	145
VOLCANIC ROCK	25	200
CLAY WITH SAND AND BASALT CHIPS	45	225
SANDSTONE WITH SOME CLAY	15	270
CLAY, MULTICOLORED	106	285
SANDSTONE WITH CLAY	53	391
SAND AND CLAY, SANDY	38	444
CLAY, GREEN AND GRAY, SANDY	11	482
SANDSTONE AND ROCK, HARD, GRANULAR	17	493
CLAY, ASH, SOAPSTONE	42	510
VOLCANIC ROCK, FRACTURED	58	552
VOLCANIC ROCK	170	610
SAND AND CLAY	120	780
SAND AND GRAVEL	140	900
BASALT, MEDIUM-GRAINED	46	1,040
SAND	17	1,086
TOTAL DEPTH		1,103

Table 3.--Drillers' logs of selected wells--Continued

3N- 2E-11BAAA1 BOISE GEOTHERMAL NO. 3
(CASING: 20-INCH, 0 TO 40 FEET;
12-INCH, 0 TO 653 FEET;
8-INCH, 640 TO 1,050 FEET;
PERFORATED FROM 680 TO 840 FEET,
886 TO 901 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
SOIL, SAND, AND SANDSTONE	40	0
SANDSTONE, GRANITIC	30	40
CLAY WITH QUARTZ AND SAND	145	70
CLAY AND SANDSTONE	39	215
SILTSTONE, HARD, FRACTURED	21	254
BASALT, GRAY-BLACK, WITH PYRITE	55	275
CLAY, GRAY, WITH PYRITE	70	330
BASALT, GRAY, WITH PYRITE	10	400
CLAY; BASALT, ALTERED; SILTSTONE OR CLAYSTONE	80	410
CLAYSTONE, GRAY, WITH SOME PYRITE AND QUARTZ	40	490
VOLCANIC ROCK WITH PYRITE AND CLAYEY ZONES	15	530
CLAY, GRAY-GREEN, WITH CHIPS OF VOLCANIC ROCK	120	545
VOLCANIC ROCK, RHYOLITE	195	665
CLAY, MULTICOLORED	25	860
SANDSTONE, MEDIUM- TO COARSE-GRAINED	21	885
SANDSTONE, MULTICOLORED	24	906
CLAY, MULTICOLORED	115	930
VOLCANIC ROCK, MULTICOLORED, FLINTY, GLASSY, WITH PUMICE	675	1,045
SANDSTONE, GRAY, WITH GRANITIC SAND	177	1,720
TOTAL DEPTH		1,897

Table 3.--Drillers' logs of selected wells--Continued

3N- 2E-12CDDC1 BOISE WARM SPRINGS NO. 3

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
FILL MATERIAL, BROWN, CLAYEY	10	0
CLAY, BROWN, SOME GRAVEL	38	10
CLAY, BLUE, SOME GRAVEL	34	48
CLAY, BLUE, HARD	22	82
CLAY, BLUE, SOFTER	22	104
CLAYSTONE, BLUE-WHITE; ROCK, HARD	7	126
CLAYSTONE, GRAY, VERY HARD	7	133
CLAY, WHITE, SANDY	12	140
SAND, WHITE, CLEAN	3	152
CLAYSTONE, BLUE; ROCK, HARD	9	155
SAND	3	164
CLAYSTONE, BLUE, HARD	23	167
SILT, GRAY, CLAYEY, SOFT, FRIABLE	10	190
SILT, GRAY AND BROWN IN LAYERS (VARVED)	5	200
CLAYSTONE, GRAY	7	205
SILT, GRAY AND BROWN IN LAYERS (VARVED)	2	212
SANDSTONE AND CONGLOMERATE, GRAY, GRANITIC, WITH COBBLES, HARD, WELL-CEMENTED	101	214
FAULT ZONE WITH MIXED SANDSTONE AND VOLCANIC ROCK FROM 315 TO 324 FEET	9	315
CLAY, BLUE-GRAY, WITH RED-BROWN CHERTY VEIN MATERIAL, ALTERED VOLCANIC ROCK	8	324
VOLCANIC ROCK, DARK GREEN, VITRIC, GLASSY QUARTZ GRAINS	121	332
VOLCANIC ROCK, BLACK TO VERY DARK GREEN, SOME NEARLY BLACK; CLAY	18	453
CLAY, WHITE, WITH ROCK CHIPS	16	471
RHYOLITE, BLUE TO PINKISH-GRAY, CLAY STREAKS AND CHALCEDONY VEIN FILLING; PORPHYRITIC, WITH GLASSY QUARTZ	100	487
TOTAL DEPTH		587

Table 3.--Drillers' logs of selected wells--Continued

3N- 2E-13ACBA1 KANTA
(CASING: 8-INCH, 2 TO 635 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
LOAM, BROWN, SANDY	6	0
CLAY, BROWN, SANDY	2	6
SAND, BROWN, CEMENTED	11	8
SAND, BROWN, CEMENTED	3	19
SAND, BROWN, AND GRAVEL, SMALL	22	22
SAND, BROWN, FINE	7	44
SAND, GRAVEL, AND BOULDERS	33	51
CLAYSTONE, BLUE; SAND, MUDDY; GRAVEL AND BOULDERS	5	84
CLAYSTONE, BLUE, AND SAND, COARSE	23	89
CLAY, BROWN	15	112
CLAYSTONE, BLUE, WITH SAND STRINGERS	8	127
SANDSTONE, COARSE, AND BOULDERS	65	135
CLAY, BLUE	8	200
SANDSTONE, BLUE	24	208
CLAY, BROWN	3	232
SANDSTONE, BLUE	55	235
CLAYSTONE, BROWN	1	290
SANDSTONE, BLUE	34	291
SANDSTONE, BLUE, COARSE, AND SEAMS OF CLAY, BLUE	10	325
CLAY, BLUE, STICKY	15	335
SANDSTONE, BLUE, FINE	60	350
SANDSTONE, BLUE, FINE	5	410
CLAYSTONE, BROWN	4	415
SANDSTONE, BLUE, COARSE	6	419
BASALT, BLACK, AND SANDSTONE, QUARTZ	12	425
CLAY, BLUE, SANDY, STICKY	8	437
SANDSTONE, BLUE, FINE, WITH CLAY	29	445
SANDSTONE, BLUE, COARSE	28	474
SANDSTONE, BLUE-GREEN	8	502
BASALT, BLUE, ALTERED	52	510
SANDSTONE, BLUE	18	562
BASALT, BLUE, ALTERED	35	580
SANDSTONE, BLUE, COARSE	15	615
CLAYSTONE, BROWN AND BLUE	4	630
SANDSTONE, GRAY	21	634
CLAYSTONE, GREEN AND BROWN	5	655
BASALT, BLUE	55	660
BASALT TUFFS	7	715
BASALT, BROWN AND BLUE	31	722
CLAYSTONE, LIGHT BLUE, SANDY	24	753
RHYOLITE, GRAY	15	777
SANDSTONE, BLUE	53	792
VOLCANIC ROCK, BLUE AND GREEN	62	845
RHYOLITE, BLUE AND GRAY	24	907
CLAYSTONE, REDDISH-BROWN	6	931
RHYOLITE, BLUE-GRAY	34	937
RHYOLITE, BLUE, ALTERED	29	971
RHYOLITE, BLUE-GRAY	15	1,000
TOTAL DEPTH		1,015

Table 3.--Drillers' logs of selected wells--Continued

3N- 2E-13ACCA1 BOTANICAL GARDENS, OLD PENITENTIARY WELL
(CASING: 16-INCH, 0 TO 117 FEET;
12-INCH, 0 TO 872 FEET;
PERFORATED FROM 220 TO 862 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
SOIL	17	0
GRAVEL	3	17
CLAY, BLUE, AND SAND	175	20
CLAY, BLUE	25	195
SEAMS OF CLAY, BLUE, AND SAND	27	220
SEAMS OF QUARTZ SAND AND CLAY	70	247
CLAY, BLUE	268	317
STRINGERS OF SAND, CLAY	58	585
CLAY, BLUE	42	643
CLAY, GREEN	13	685
SEAMS OF CLAY, BROWN AND GREEN	67	698
CLAY, GRAY	34	765
CLAY, BLUE, SEAMS OF QUARTZ SAND	20	799
SHALE, RED, STICKY	21	819
QUARTZ SAND, HARD	17	840
CLAY, GRAY, HARD	15	857
TOTAL DEPTH		872

Table 3.--Drillers' logs of selected wells--Continued

3N- 2E-13BABA1 QUARRY VIEW
(CASING: 10-INCH, 6 TO 45 FEET;
8-INCH, 18 TO 498 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
TOPSOIL	6	0
GRAVEL, CEMENTED	19	6
SAND AND GRAVEL, LIGHTLY CEMENTED	14	25
SAND AND GRAVEL	3	39
CLAY, BROWN	6	42
CLAY, BLUISH-GRAY, SILTY	17	48
SAND, BLUE, CEMENTED	35	65
CLAY, BLUISH-GRAY	20	100
SAND AND CLAY, LIGHT BLUE, CEMENTED	48	120
CLAY, DARK BLUISH-GRAY, SANDY	35	168
SAND, BLUE, HARD	42	203
SAND, BLUE, SOFTER	27	245
CLAY, DARK	31	272
CLAY, BLUE-GRAY, SANDY	32	303
CLAY, BLUE-GRAY, HARD, STICKY	14	335
SAND, BLUE-GRAY, CLAY WITH HARD BLUE SHALE STREAKS	99	349
CLAY, DARK BLUE-GRAY, SANDY	12	448
CLAY, HARD, STICKY	15	460
GRANITE, GRAY; CLAY, SANDY	20	475
CLAY, DARK GRAY, HARD, STICKY	23	495
CLAY, LIGHT BLUE, COARSE, SANDY	12	518
CLAY, LIGHT BLUE, FINE, SANDY	19	530
CLAY, BLUE, STICKY	11	549
BASALT, DARK GRAY, ALTERED; CLAY; SOME PLATY ZEOLITES	10	560
BASALT, BLACK, FRESH	25	570
CLAY, GRAY TO BROWN; SOME BASALT, ALTERED	50	595
SAND, GRAY, MEDIUM- TO VERY COARSE-GRAINED; CLAY STREAKS; SAND	60	645
CLAY, DARK GRAY; SOME VOLCANIC ROCK, DARK GREENISH-BLACK	20	705
VOLCANIC ROCK, DARK GREENISH-BLACK, PORPHYRITIC, WITH ZEOLITE	75	725
VOLCANIC ROCK, DARK GREENISH-BLACK, PORPHYRITIC	60	800
CLAY, DARK GRAY; VOLCANICS, ALTERED	5	860
TOTAL DEPTH		865

Table 3.--Drillers' logs of selected wells--Continued

3N- 2E-24ACAD1 WARM SPRINGS MESA
(CASING: 12-INCH, 0 TO 280 FEET;
8-INCH, 262 TO 495 FEET;
PERFORATED FROM 263 TO 389 FEET,
474 TO 490 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
GRAVEL, RED, WITH CLAY	3	0
CLAY, BROWN, SANDY	15	3
SAND, BROWN	28	18
SHALE, BLUE	19	46
WATER, SAND, AND GRAVEL	2	65
SAND, RED AND BROWN	18	67
SAND, BLUE, MUDDY	10	85
SHALE, BLUE	5	95
SAND AND GRAVEL, BLUE, COARSE	20	100
SAND, BLUE, MUCKY	10	120
SAND, BLUE, MUCKY	15	130
SHALE, BLUE	30	145
SHALE, BLUE	15	175
SAND, BLUE, AND GRAVEL, WATER	7	190
SAND, MUCKY	33	197
SAND, MUCKY	25	230
SAND, MUCKY, AND CLAY	25	255
SAND, WHITE, COARSE	50	280
SAND, WHITE	60	330
SAND, BROWN, WITH CLAY	25	390
SHALE, BLUE, STICKY	13	415
CLAY, SILTY	4	428
SHALE, BLUE, STICKY	28	432
SHALE, BLUE	15	460
SAND, COARSE, SOME GRAVEL	17	475
SHALE, BLUE, STICKY	3	492
TOTAL DEPTH		495

Table 3.--Drillers' logs of selected wells--Continued

3N- 3E-20BDBD1 HARRIS
(CASING: 16-INCH, 1 TO 105 FEET;
12-INCH, 209 TO 287 FEET;
10-INCH, 283 TO 442 FEET;
8-INCH, 488 TO 548 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
HARDPAN	5	0
SAND AND GRAVEL	49	5
ROCK, BROKEN	45	54
SHALE, BLUE	74	99
ROCK	24	173
CLAY	6	197
ROCK, GRAY	52	203
GRANITE	26	255
SANDSTONE	16	281
SANDSTONE	33	297
LAYERS OF CLAY AND SANDSTONE	122	330
SANDSTONE	13	452
GRANITE WITH CAVING ROCKS	45	465
CLAY LAYERS	40	510
SANDSTONE	8	550
QUARTZITE	54	558
GRANITE, HARD	99	612
CREVICE	2	711
GRANITE, HARD	29	713
TOTAL DEPTH		742

Table 3.--Drillers' logs of selected wells--Continued

3N- 3E-20BDBD2 HARRIS
(CASING: 16-INCH, 1 TO 105 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
NOT LOGGED	245	0
GRANITE	26	245
SANDSTONE	16	271
SANDSTONE	33	287
LAYERS OF CLAY AND SANDSTONE	122	320
SANDSTONE	13	442
GRANITE WITH CAVING ROCKS	45	455
CLAY LAYERS	40	500
SANDSTONE	8	540
QUARTZITE	54	548
GRANITE, HARD	42	602
TOTAL DEPTH		644

Table 3.--Drillers' logs of selected wells--Continued

3N- 3E-30ODAA1 BOISE WATER CORPORATION, BARBER TEST
(CASING: 8-INCH, 1 TO 17 FEET;
6-INCH, 2 TO 246 FEET)

ROCK DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET BELOW LAND SURFACE)
TOPSOIL; CLAY, DARK BROWN	6	0
SAND, CEMENTED; GRAVEL; BOULDERS	32	6
CLAY, BROWN, SANDY	27	38
SAND, BROWN, CEMENTED; CLAY, BROWN	25	65
CLAY, BROWN, SANDY, STICKY	31	90
CLAY, DARK BROWN	12	121
CLAY, BROWN	36	133
CLAY, BLUE, SANDY	16	169
CLAY, BROWN, SANDY	13	185
CLAY, TAN	44	198
CLAY, TAN, CEMENTED	6	242
SANDSTONE, HARD	58	248
CLAY, BROWN, STICKY	7	306
CLAY, BLUE, SHALEY, STICKY	14	313
CLAY, BROWN; SAND, CEMENTED	63	327
CLAY, BLUE	18	390
CLAY, DARK BROWN	12	408
CLAY, RUSTY-BROWN, SANDY	11	420
CLAY, LIGHT BROWN, SANDY	51	431
SANDSTONE, BROWN	16	482
CLAY, REDDISH-BROWN, SANDY	3	498
SANDSTONE, BROWN	7	501
CLAY, REDDISH-BROWN, SHALEY	39	508
CLAY, REDDISH, AND SAND	33	547
CLAY, LIGHT GRAY	5	580
SAND, BROWN, FINE	7	585
CLAY, BROWN, AND GRAY	18	592
CLAY, BROWN, AND SAND	10	610
CLAY, BLUE	40	620
ROCK, BLACK, HARD	50	660
ROCK, BLACK AND REDDISH, SOFTER	12	710
ROCK, BLACK AND REDDISH, HARD	20	722
CINDERS, REDDISH, BROKEN	16	742
LAVA TUFF	182	758
TOTAL DEPTH		940

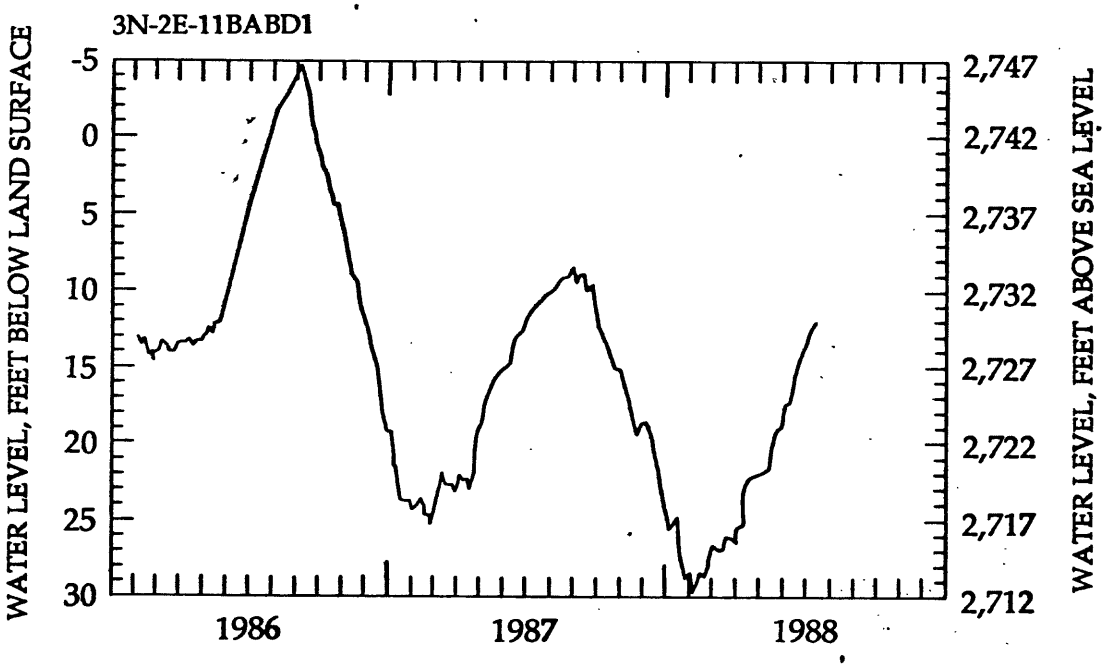

Figure 4.--Hydrograph of well 3N-2E-11BABD1 during the period February 1986 to July 1988.

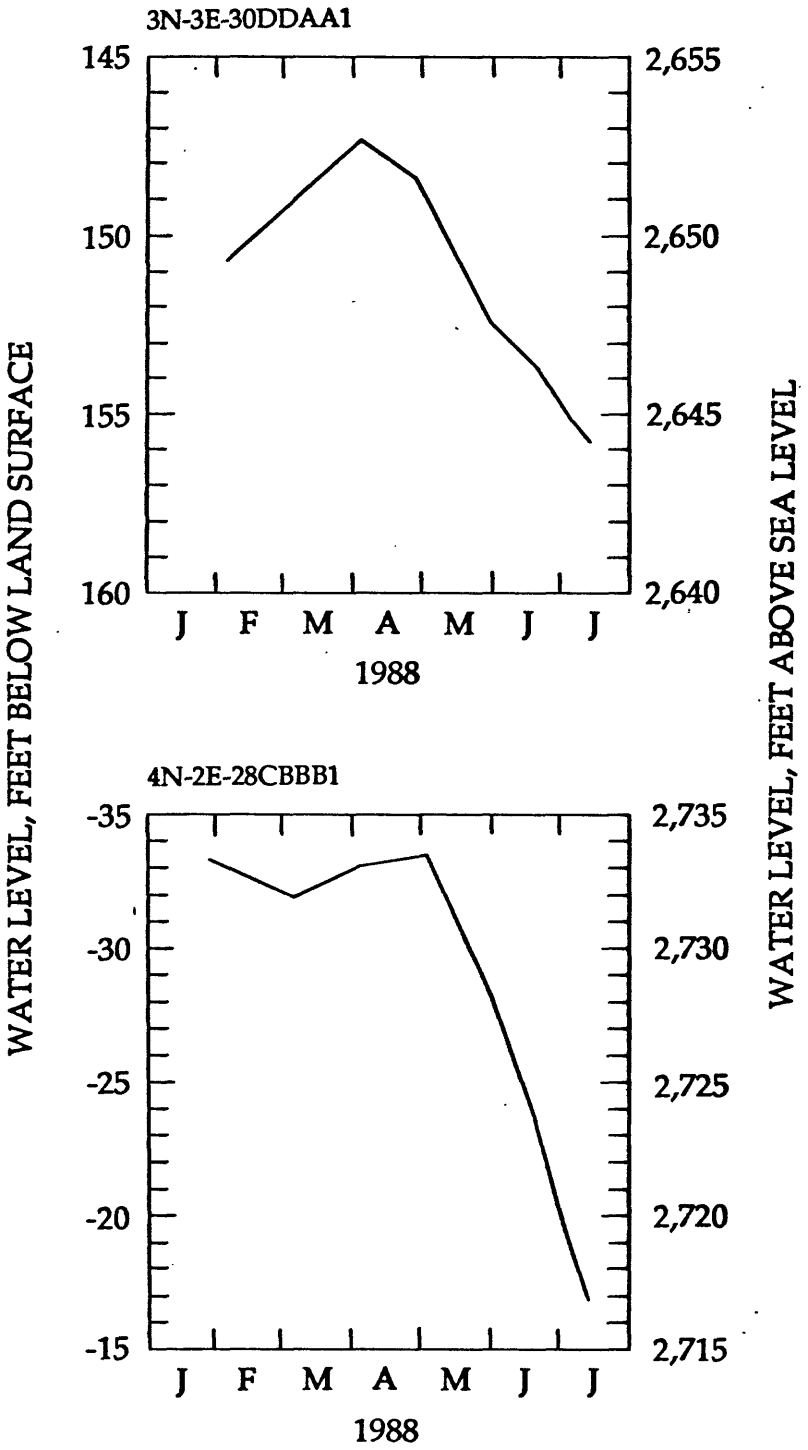

Figure 5.--Hydrographs of wells 3N-3E-30DDAA1 and 4N-2E-28CBBB1 during the period January to July 1988.