UNITED STATES

DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

SELECTED WELL INVENTORY AND CHEMICAL ANALYSES OF GROUND WATER, PARTS OF MISSOULA AND POWELL COUNTIES, MONTANA

By K. R. Wilke

Open-File Report 79-1491

Prepared in cooperation with

Missoula County Commissioners and

Powell County Commissioners

Helena, Montana

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METRIC CONVERSION TABLE

The following factors can be used to convert the inch-pound units in this report to the International System (SI) of metric units.

Multiply inch-pound units	By	To obtain metric units
acre	4047	square meter (m^2)
inch (in.)	25.40	millimeter (mm)
foot (ft)	0.3048	meter (m)

temperature, degrees Celsius (^oC) = 0.556 (^oF-32)

SELECTED WELL INVENTORY AND CHEMICAL ANALYSES OF GROUND WATER, PARTS OF MISSOULA AND POWELL COUNTIES, MONTANA

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ABSTRACT

Ground-water data collected in 1975-76 in the Swan and Avon valleys of western Montana and in 1978 in southwest Missoula are presented in two tables. Table 1 is an inventory of 146 selected wells and table 2 lists chemical analyses of ground water from 52 wells.

INTRODUCTION

This report presents ground-water data collected during 1975-76 in the Swan and Avon valleys of western Montana and in 1978 in southwest Missoula (fig. 1). In the Swan and Avon valleys, 122 wells were inventoried and 28 wells were sampled for chemical analysis. In southwest Missoula, 24 wells were inventoried and sampled for chemical analysis. The cooperation of well owners who supplied information and granted access to wells in the two areas is greatly appreciated.

Two tables of data are included. Table 1 is an inventory of selected wells and table 2 lists chemical analyses of ground water. Most samples were analyzed for common chemical constituents. A few samples were analyzed only for nitrogen concentration.

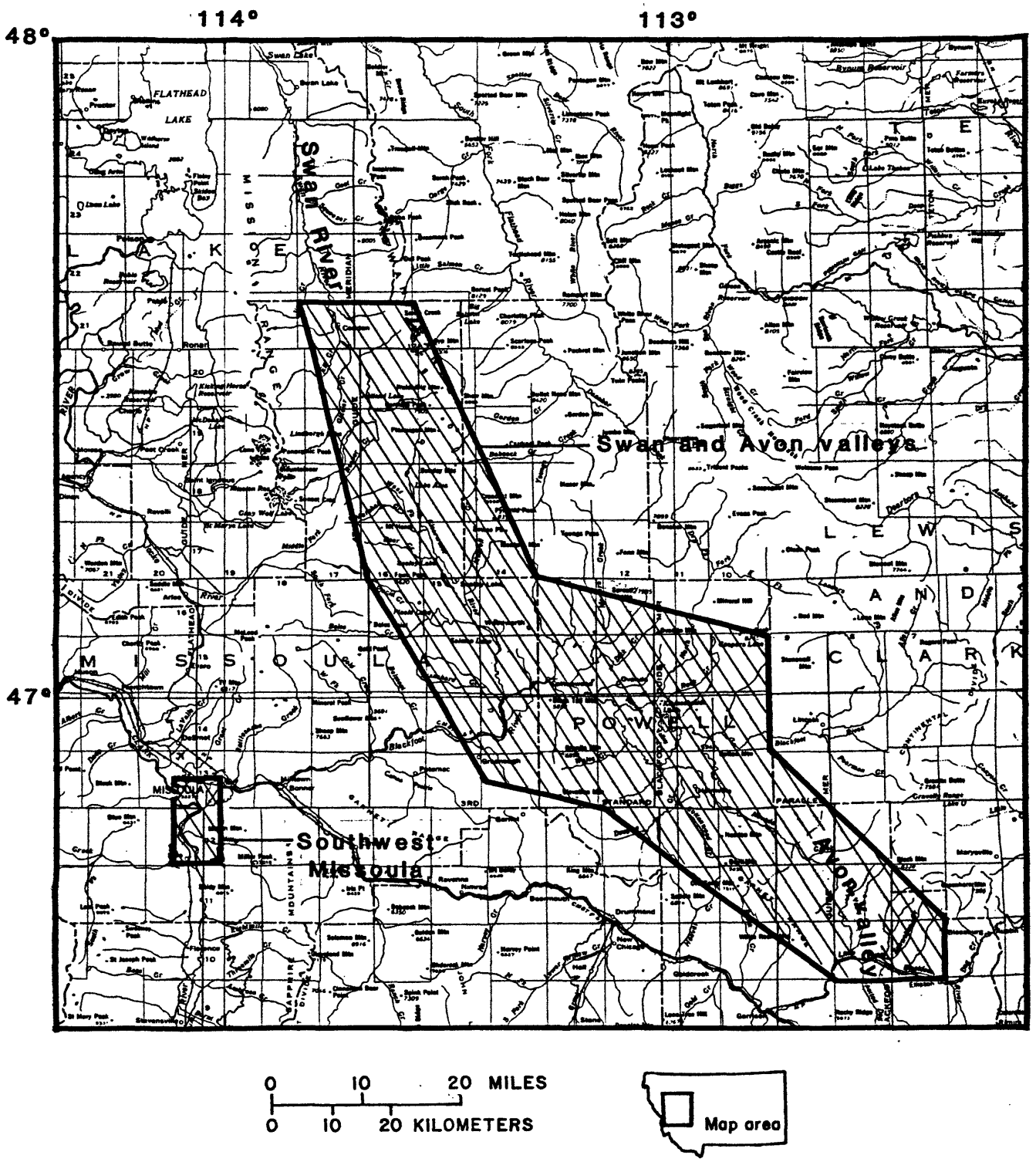

Figure 1.--Location of areas of data collection.

Well locations are numbered according to the U.S. Bureau of Land Management system of land subdivision (fig. 2). The location number consists of as many as 13 characters. The first three characters specify the township and its position north (N) of the Montana Base Line. The next three characters specify the range and its position west (W) of the Montana Principal Meridian. The next two characters are the section number. The next four characters designate the quarter section (160-acre tract), quarter-quarter section (40-acre tract), quarter-quarter-quarter section (10-acre tract), and quarter-quarter-quarter-quarter section (2½-acre tract), respectively, in which the well is located. The subdivisions of the section are designated A, B, C, and D in a counterclockwise direction, beginning in the northeast quadrant. When more than one well is described within a 2½-acre tract, consecutive digits beginning with 2 are added to the well number. For example, as shown on figure 2, well 13N20W25AACC is the first well inventoried in the SW¼SW¼NE¼NE¼ sec.25, T.13 N., R.20 W.

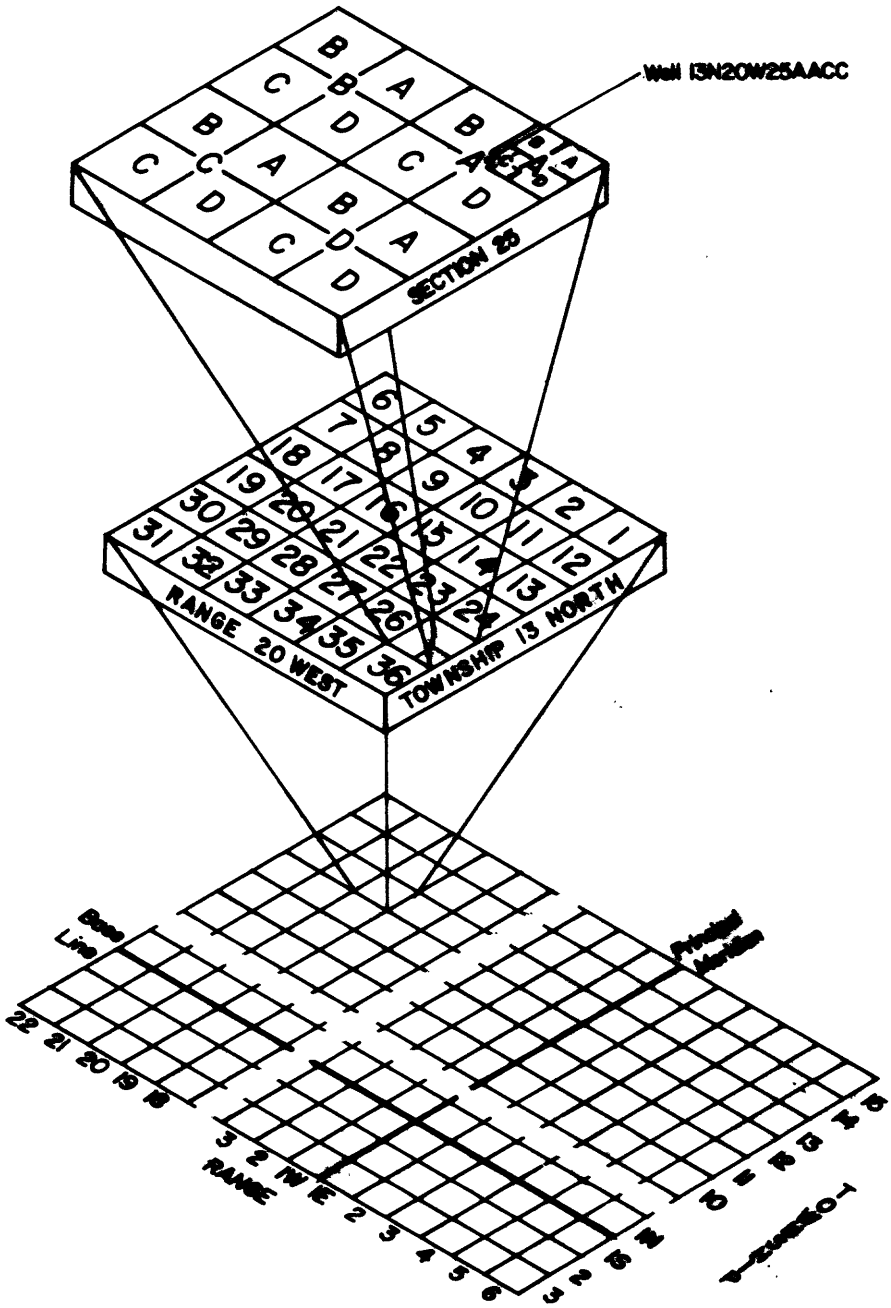

Figure 2.--System of specifying well locations.

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Table 1.--Inventory of selected wells, Missoula and Powell Counties, Montana

[County: M, Missoula; P, Powell

Use of water: H, domestic; T, institution; P, public supply; I, irrigation; U, unused; S, stock; N, industrial; C, commercial

Altitude of land surface: In feet above national geodetic vertical datum of 1929

Depth to water below or above(+) land surface: F, flowing; R, reported

Remarks: C76 and C78, chemical analysis for common constituents in water (table 2) for indicated year; P, chemical analysis for nitrogen (table 2) in 1976]

Well location	County	Year drilled	Depth of well (feet)	Diameter of well (inches)	Use of water	Altitude of land surface (feet)	Depth to water below or above (+) land surface (feet)	Date of measurement (Yr-Mo-Day)	Remarks
10N07W30BBCC	P	--	69.6	6	U	4,835	30.3	76-07-21	
10N08W04ADDA	P	1973	52	6	H	5,035	9.7	76-07-21	
10N08W06AADD	P	1974	75	6	H	4,900	9.9	76-07-22	
10N08W08DDCB	P	1973	100	6	H	4,810	27.6	76-07-21	C76
10N08W21ABDB	P	1960	187	6	U	4,740	16.7	76-07-21	
10N08W28AABA	P	1952	23.4	6	U	4,695	5.0	76-07-21	
11N08W34AACC	P	1962	72	6	H	5,200	33.0	76-07-21	
11N08W34BBAB	P	--	--	6	H	5,210	7.2	76-07-21	C76
12N09W21CCBC	P	1929	27	-	H	4,720	23.2	76-07-22	
12N09W25CBCA	P	--	--	-	H	4,880	7.2	76-07-22	
12N09W34AAAA	P	--	30	6	U	4,802	5.3	76-07-22	
12N10W05CAAB	P	1973	80	6	H	4,510	12.3	75-09-26	
12N19W05BACB	M	1910	90	-	H	3,250	75.7	78-08-01	C78
12N19W06BBAB	M	1925	50	-	H	3,155	30 R	--	C78
12N19W19AC	M	1972	119	6	H	3,455	106.5	78-07-31	C78
12N19W20DBDC	M	--	130	6	H	3,560	120 R	--	C78
12N20W12BABC	M	1969	40	6	H	3,139	22.9	78-07-27	C78
12N20W12BCDA	M	1972	287	6	H	3,193	--	--	C78
12N20W12DAAD	M	1971	210	45	H	3,440	--	--	C78
12N20W13CAAA	M	--	59	6	H	3,380	--	--	C78
12N20W14BCAB	M	1870	26	-	H	3,160	17.3	78-07-31	C78
12N20W25ABCC	M	1972	69.5	6	H	3,260	--	--	C78
12N20W26CCDD	M	1920	116	6	T	3,192	40 R	--	C78
12N20W34BDBD	M	--	--	6	H	3,182	--	--	C78
12N20W35CBAB	M	1950	55	6	H	3,181	15.2	78-08-01	C78
13N10W32CADC	P	1953	40	6	H	4,420	12.1	75-09-26	
13N11W02ADCA	P	1920	12	60	H	4,395	3.4	75-09-24	
13N11W15DCDC	P	--	48	6	H	4,288	F	75-09-25	
13N11W22AABA	P	1893	12	12	H	4,283	6.1	75-09-25	
13N11W23CCBB	P	1957	57	6	P	4,310	3.6	75-09-26	C76
13N11W24AABB	P	1946	--	6	H	4,335	F	75-09-26	
13N12W12CAAB	P	1955	65	6	H	4,253	22.4	75-09-24	C76
13N12W12DCDD	P	1935	185	6	H	4,328	9.0	75-09-25	
13N14W06BCAB	M	--	--	-	H	3,775	5.6	75-09-18	
13N19W19DBDB	M	--	85	4	H	3,147	11.2	78-07-26	C78
13N19W20BDBD	M	1974	46	6	H	3,160	18 R	--	C78
13N19W30BDA	M	1970	120	12	I	3,158	23.1	78-07-13	C78
13N19W30DDAD	M	--	--	-	P	3,165	--	--	C78
13N19W31BDB	M	1977	68.3	12	I	3,150	25.6	78-07-13	C78
13N20W24DADA	M	1956	51	4	H	3,122	6.9	78-07-13	C78
13N20W25AACC	M	--	--	6	H	3,138	7.7	78-07-26	C78
13N20W25BCBB	M	--	51.5	6	H	3,128	9.9	78-07-26	C78
13N20W25DCDD	M	1953	70	-	H	3,140	--	--	C78
13N20W26DDCC	M	--	--	6	H	3,127	21.3	78-07-26	C78
13N20W36BBBB	M	1972	90	6	P	3,132	19.9	78-07-26	C78
14N11W08ADAC	P	--	18	30	H	4,200	3.7	75-09-23	
14N11W16AAAD	P	1969	287	6	S	4,345	43.4	75-09-23	
14N11W33CDAB	P	1974	170	6	H	4,280	8.8	75-09-24	C76
14N11W33CDAC	P	--	--	6	H	4,280	6.0	75-09-24	
14N11W34ACCA	P	--	200	6	H	4,298	7.5	75-09-24	
14N11W35BAAA	P	--	180	6	H	4,302	13.0	75-09-23	
14N12W22DBAD	P	1920	20	-	H	4,365	15.0	75-09-25	
14N12W36DCCC	P	--	180	6	H	4,318	32.5	75-09-23	C76
14N15W24DDAC	M	1975	148	6	N	3,740	125.8	75-09-18	C76
14N15W24DDCD	M	1968	110	6	H	3,700	98.0	75-09-18	

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Table 1.--Inventory of selected wells, Missoula and Powell Counties, Montana--Continued

Well location	County	Year drilled	Depth of well (feet)	Diameter of well (inches)	Use of water	Altitude of land surface (feet)	Depth to water below or above (+) land surface (feet)	Date of measurement (Yr-Mo-Day)	Remarks
15N11W02BCBA	P	1972	40	6	H	4,560	17.6	75-09-22	
15N11W02CBBD	P	1970	74	7	H	4,520	54.2	75-09-22	
15N11W28BBBB	P	1971	120	6	H	4,260	29.5	75-09-22	
15N11W28DBBC	P	--	60.5	6	H	4,260	32.9	75-09-22	C76
15N11W29BDCA	P	--	--	6	H	4,215	6.7	75-09-19	
15N11W31CDBA	P	1969	9	2	H	4,162	6.3	75-09-19	
15N11W32BBAB	P	1970	20	1.25	H	4,202	10.0	75-09-19	
15N12W05CDCA	P	1955	165	6	S	4,125	33.4	75-09-16	
15N12W25CDAD	P	1971	47	6	H	4,340	6.3	75-09-18	
15N12W29BDBD	P	1968	160	6	H	4,075	9.1	75-09-16	
15N12W32CABC	P	1940	--	32	H	4,080	7.2	75-09-17	
15N12W33BBAA	P	--	--	-	P	4,120	--	--	P
15N12W33BBBA	P	1969	48	6	H	4,098	9.1	75-09-17	C76; P
15N12W33BBBA2	P	--	30	-	C	4,100	12 R	--	P
15N12W36BCDD	P	1964	206	6	P	4,278	105.9	75-09-22	C76
15N12W36DDDA	P	1924	12.3	48	H	4,158	9.9	75-09-19	
15N13W20BABB	P	--	--	6	H	3,982	18.6	75-09-15	
15N13W29CDBD	P	1967	88	6	H	3,920	33.6	75-09-15	C76
15N14W09CBBC	M	1971	56	6	P	3,940	31.4	75-08-12	C76
15N14W36BCDB	M	1972	80	6	H	3,850	22.7	75-09-16	
16N12W30AACC	P	1969	750	6	H	4,135	60.4	75-09-16	
16N15W01ABCD	M	1974	12	24	H	4,150	10.3	75-08-06	
16N15W01BADB	M	1973	80	6	H	4,183	14.8	75-08-06	C76
16N15W01BDCC	M	1971	86	6	H	4,165	13.1	75-08-06	
16N15W01CCAA	M	1973	90	6	H	4,140	17.2	75-08-06	
16N15W02AAAD	M	--	--	6	P	4,198	22.9	75-08-06	
16N15W03ABBA	M	1954	19	24	H	4,018	14.0	75-08-04	
16N15W03ABBD	M	--	--	48	U	4,022	16.2	75-08-05	
16N15W03CDCC	M	1954	--	18	H	4,007	9.7	75-08-04	
16N15W03CDDD	M	1960	25	36	U	4,020	20.9	75-08-05	
16N15W04ABAD	M	1967	20	36	H	4,005	5.2	75-08-05	C76; P
16N15W10BACA	M	--	18	24	H	4,025	12.0	75-08-05	P
16N15W10BDBB	M	--	14	18	H	4,020	7.1	75-08-05	
16N15W10BDBD	M	--	15	-	H	4,010	12 R	76-09-21	P
16N15W10BDCB	M	1945	15	18	H	4,000	4.2	75-08-04	C76; P
16N15W14DBAA	M	--	12	18	H	3,860	9.3	75-08-08	
16N15W28BCDB	M	--	--	12	H	4,122	4.2	75-08-08	
16N15W30DACB	M	1951	78	-	H	4,130	F	--	C76
16N15W30DBDA	M	1958	--	36	H	4,130	7.0	75-08-08	C76
16N16W14DDCC	M	1975	200	6	U	4,250	33.3	75-08-11	
16N16W24AABA	M	1968	8.5	36	H	4,210	7.9	75-08-11	
17N15W08DBDB	M	1973	400	6	U	4,150	44.4	75-07-30	
17N15W16CCBB	M	--	365	6	H	4,025	56.8	75-08-01	C76; P
17N15W17ABBC	M	--	--	6	H	4,018	7.2	75-07-30	
17N15W17ADCC	M	1974	114	6	H	4,025	13.6	75-07-30	
17N15W17BBCD	M	1971	60	6	H	4,020	16.0	75-07-31	
17N15W17BCAC	M	1973	12	24	U	2,020	4.3	75-07-30	
17N15W17BDBA	M	1973	40	6	H	4,005	1.6	75-07-30	C76
17N15W20BBAD	M	1974	14	18	H	4,022	5.4	75-07-31	
17N15W28DACA	M	1935	20	32	H	4,000	2.2	75-08-01	
17N15W34ACDC	M	1963	670	8	U	4,010	.2	75-07-31	
17N15W34CCCC	M	1925	289	6	H	4,000	33.6	75-08-11	
17N15W34DAAD	M	1958	20	48	U	4,020	5.6	75-08-01	
18N15W31CBBC	M	1972	33	6	H	4,080	12.8	75-07-30	
19N16W05ABCC	M	--	--	6	H	3,970	+.8	75-07-25	
19N16W05ABCC	M	--	--	6	U	3,970	6.1	75-07-25	
19N16W06BDBA	M	1974	96	6	H	4,040	16.0	75-07-25	
19N16W07DBDD	M	1975	163	6	H	4,155	39.6	75-07-25	C76
19N16W35ACBD	M	1974	33	6	H	4,125	10.1	75-07-29	
20N16W06CBAA	M	--	8.5	24	H	3,795	4.2	75-07-22	
20N16W07ADAA	M	1973	47	6	H	3,900	23.9	75-07-22	
20N16W07CABB	M	1968	50	6	H	3,780	25.1	75-07-22	
20N16W07CACB	M	1974	57	6	H	3,780	30.1	75-07-23	
20N16W18DCDB	M	1973	28	6	H	3,835	17.6	75-07-23	
20N16W20BCCB	M	1967	108	6	H	3,920	92.5	75-07-22	

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Table 1.--Inventory of selected wells, Missoula and Powell Counties, Montana--Continued

Well location	County	Year drilled	Depth of well (feet)	Diameter of well (inches)	Use of water	Altitude of land surface (feet)	Depth to water below or above (+) land surface (feet)	Date of measurement (Yr-Mo-Day)	Remarks
20N16W20CCCB	M	1975	70	6	H	3,918	33.2	75-07-23	
20N16W29BCBB	M	1967	69	6	H	3,925	14.5	75-07-23	C76; P
20N16W32ABCA	M	--	--	2	H	3,945	6.6	75-07-24	
20N16W32BCDA	M	1958	10	4	U	3,938	2.4	75-07-23	
20N17W01ABCD	M	--	--	6	P	3,725	22.0	75-07-22	
20N17W01BAAB	M	1969	68	6	P	3,705	23.9	75-07-22	
20N17W01BDDD	M	1973	8	-	H	3,708	2.3	75-07-17	
20N17W01DCBD	M	1974	23	6	H	3,730	9.7	75-07-17	
20N17W02BAAA	M	1974	45	6	H	3,684	7.0	75-07-17	C76
20N17W02DCBA	M	1973	52	6	H	3,725	29.1	75-07-17	
20N17W12DADB	M	1974	74	6	H	3,820	63.0	75-07-22	C76
20N17W36BAAB	M	1967	90	6	H	4,050	52.7	75-07-24	
21N16W32ACBA	M	1971	90	6	H	3,955	16.8	75-07-22	
21N17W10ADCB	M	1956	--	-	U	3,533	2.4	75-07-15	
21N17W10DADA	M	1972	14.5	24	U	3,550	4.6	75-07-16	
21N17W14CABC	M	1963	9	-	H	3,575	3.8	75-07-16	
21N17W23BBDA	M	1965	23	18	H	3,575	3.7	75-07-16	
21N17W24DBDB	M	1967	60	6	H	3,640	18.6	75-07-16	
21N17W26ABCD	M	1974	37	6	H	3,613	4.6	75-07-16	C76
21N17W26ADBD	M	--	36.1	6	H	3,630	7.8	75-07-16	
21N17W26BADA	M	1965	30.5	6	H	3,604	4.1	75-07-16	
21N17W26DAAA	M	1972	28	6	H	3,640	13.4	75-07-16	
21N17W26DACC	M	1972	45	6	H	3,638	20.2	75-07-17	
21N17W26DDDB	M	1975	55	6	H	3,645	20.0	75-07-17	
21N17W36ACCA	M	1957	132	6	U	3,678	57.8	75-07-17	
21N17W36DDBA	M	--	10	24	H	3,690	3.0	75-07-17	