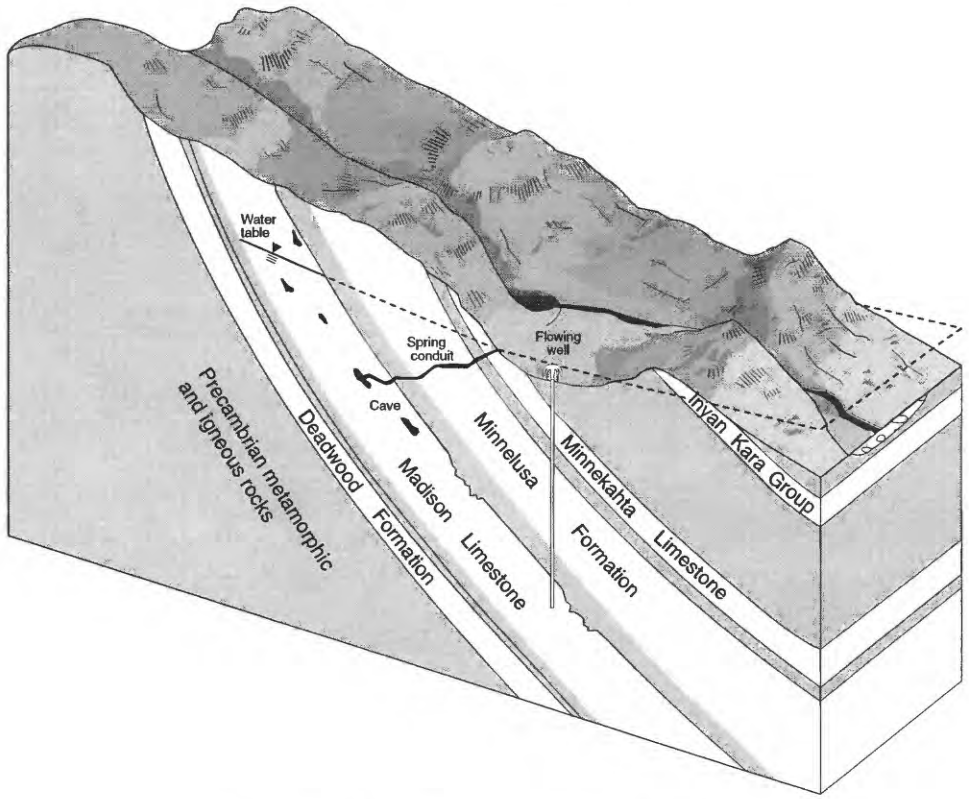
SELECTED HYDROLOGIC DATA, THROUGH WATER YEAR 1994, BLACK HILLS HYDROLOGY STUDY, SOUTH DAKOTA

U.S. GEOLOGICAL SURVEY

Open File Report 96-399



Prepared in cooperation with the
SOUTH DAKOTA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES and the
WEST DAKOTA WATER DEVELOPMENT DISTRICT

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ILLUSTRATIONS

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
acre	4,047	square meter
acre	0.4047	hectare
cubic foot per second (ft^3/s)	0.02832	cubic meter per second
foot (ft)	0.3048	meter
gallon (gal)	3.785	liter
gallon (gal)	0.003785	cubic meter
gallon per minute (gal/min)	0.06308	liter per second
gallon per minute per foot [(gal/min)/ft]	0.2070	liter per second per meter
inch (in.)	25.4	millimeter
mile (mi)	1.609	kilometer
pound	0.4536	kilogram
square mile (mi^2)	259.0	hectare
square mile (mi^2)	2.590	square kilometer
ton	907.2	kilogram

Temperature can be converted to degrees Fahrenheit (°F) or degrees Celsius (°C) by the following equations:

$$°F = 9/5\ (°C) + 32$$
$$°C = 5/9\ (°F-32)$$

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

Water year: Water year is the 12-month period, October 1 through September 30, and is designated by the calendar year in which it ends. Thus, the water year ending September 30, 1994, is called the "1994 water year."

Selected Hydrologic Data, Through Water Year 1994, Black Hills Hydrology Study, South Dakota

By Daniel G. Driscoll, Wendell L. Bradford, *and* Kathleen M. Neitzert

ABSTRACT

This report presents water-level, water-quality, and spring data that have been collected or compiled, through water year 1994, for the Black Hills Hydrology Study. This study is a long-term cooperative effort between the U.S. Geological Survey, the South Dakota Department of Environment and Natural Resources, and the West Dakota Water Development District (which represents various local and county cooperators). This report is the second in a series of biennial project data reports produced for the study.

Daily water-level data are presented for 39 observation wells and 2 cave sites in the Black Hills area of western South Dakota. The wells are part of a network of observation wells maintained by the Department of Environment and Natural Resources and are completed in various bedrock formations that are utilized as aquifers in the Black Hills area. Both cave sites are located within outcrops of the Madison Limestone. Data presented include site descriptions, hydrographs, and tables of daily water levels.

Annual measurements of water levels collected during water years 1993-94 from a network of 20 additional, miscellaneous wells are presented. These wells are part of a Statewide network of wells completed in bedrock aquifers that was operated from 1959 through 1989 in cooperation with the Department of Environment and Natural Resources. Site descriptions and hydrographs for the entire period of record for each site also are presented.

Drawdown and recovery data are presented for five wells that were pumped (or flowed) for collection of water-quality samples. These wells are part of the network of observation wells for which daily water-level records are compiled.

Water-quality data are presented for 20 surface-water sites and 22 ground-water sites. Data presented include field parameters, bacteria counts, and concentrations of common ions, solids, nutrients, trace elements, radiometrics and isotopes, cyanide, phenols, and suspended sediment.

Spring data are presented for 94 springs and 21 stream reaches with significant springflow components. Data presented include site information, discharge, and field water-quality parameters including temperature, specific conductance, dissolved oxygen, and pH.

INTRODUCTION

The Black Hills Hydrology Study is a long-term investigation that was initiated in 1990 as a cooperative effort between the U.S. Geological Survey (USGS), the South Dakota Department of Environment and Natural Resources (DENR), and the West Dakota Water Development District. West Dakota represents various local and county cooperators. The study is planned as a 10-year investigation to assess the quantity, quality, and distribution of surface and

ground water in the Black Hills area of western South Dakota (Driscoll, 1992).

An extensive data-collection network has been established for the Black Hills Hydrology Study. Streamflow and precipitation data, which are collected at numerous sites throughout the study area, have been published annually in Water Resources Data for South Dakota (U.S. Geological Survey, 1991-95). Water-level, water-quality, and spring data that were collected or compiled for the Black Hills Hydrology Study, through water year 1992 (ending September 30, 1992), were published in the first of a series of biennial project data reports (Driscoll and Bradford, 1994). This report is the second report in that series, and presents selected hydrologic data that have been collected or compiled during water years 1993-94. In some cases, data collected prior to water year 1993 are included for the purposes of comparison or supplementation.

Description of Study Area

The study area includes the topographically defined Black Hills and adjacent areas as shown in figure 1. The boundaries of the study area have been modified slightly since publication of the original plan of study (Driscoll, 1992).

The Black Hills are a dome-shaped uplift of Laramide age, about 125 mi long and 60 mi wide (Feldman and Heimlich, 1980). Elevations range from about 7,200 ft at the higher peaks to about 3,000 ft in the surrounding plains, resulting in an orographically induced microclimate characterized by generally greater precipitation and lower temperatures at the higher elevations. The overall climate of the area is continental, generally with low precipitation amounts, hot summers, cold winters, and extreme variations in both precipitation and temperatures (Johnson, 1933). Average annual precipitation for the Black Hills area is 21.30 in., and ranges from 15.08 in. at Hot Springs to 28.65 in. at Lead. The average annual temperature is 43.9 degrees Fahrenheit, and ranges from 47.6 degrees at Hot Springs to approximately 37 degrees near Deerfield Reservoir (U.S. Department of Commerce, 1994).

The oldest geologic units in the stratigraphic sequence are the Precambrian metamorphic and igneous rocks (fig. 2), which are exposed in the central core of the Black Hills, extending from near Lead to south of Custer. Surrounding the Precambrian core is a layered series of sedimentary rocks including limestones, sandstones, and shales that are exposed in roughly concentric rings around the uplifted flanks of the Black Hills (DeWitt and others, 1989). The generalized outcrop of the Pahasapa (Madison) Limestone is shown as an example in figure 3. The generalized outer extent of the Inyan Kara Group, which approximates the outer extent of the Black Hills uplift, also is shown in figure 3. The bedrock sedimentary formations typically dip away from the uplifted Black Hills at angles that approach or exceed 10 degrees near the outcrops, and decrease with distance from the uplift (fig. 4).

Many of the sedimentary formations commonly are used as aquifers, both within and beyond the study area. Recharge to these aquifers is from precipitation upon the outcrops and from stream infiltration along the flanks of the Black Hills (Greene, 1993; Kyllonen and Peter, 1987; Peter, 1985). Within the Paleozoic section, the Deadwood Formation, Madison Limestone, Minnelusa Formation, and Minnekahta Limestone commonly are used as aquifers. These aquifers are collectively confined by the underlying Precambrian rocks and the overlying Spearfish Formation. Individually the aquifers are separated by minor confining layers, or by relatively impermeable layers within the individual formations. Leakance between the aquifers is extremely variable (Greene, 1993; Peter, 1985). Within the Mesozoic section, the Inyan Kara Group, which includes the Lakota and Fall River Formations, is used extensively as an aquifer, with various other units used locally to lesser degrees. A series of Cretaceous shales acts as the upper confining layer to the Mesozoic aquifer units.

Artesian conditions generally exist within the aforementioned aquifers, where an upper confining layer is present. This means that water in a well will rise above the top of the aquifer in which it is completed. If the water level, or potentiometric surface, is above the land surface, a flowing well will result. Similarly, artesian springs that originate from confined aquifers are common around the periphery of the Black Hills. The hydrogeologic setting of the Black Hills area is schematically illustrated in figure 5.

Streamflow within the study area is affected by both topography and geology. The base flow of most Black Hills streams originates in the higher elevations, where increased precipitation and reduced evapotranspiration result in excess water being available for springflow and streamflow. Numerous streams have

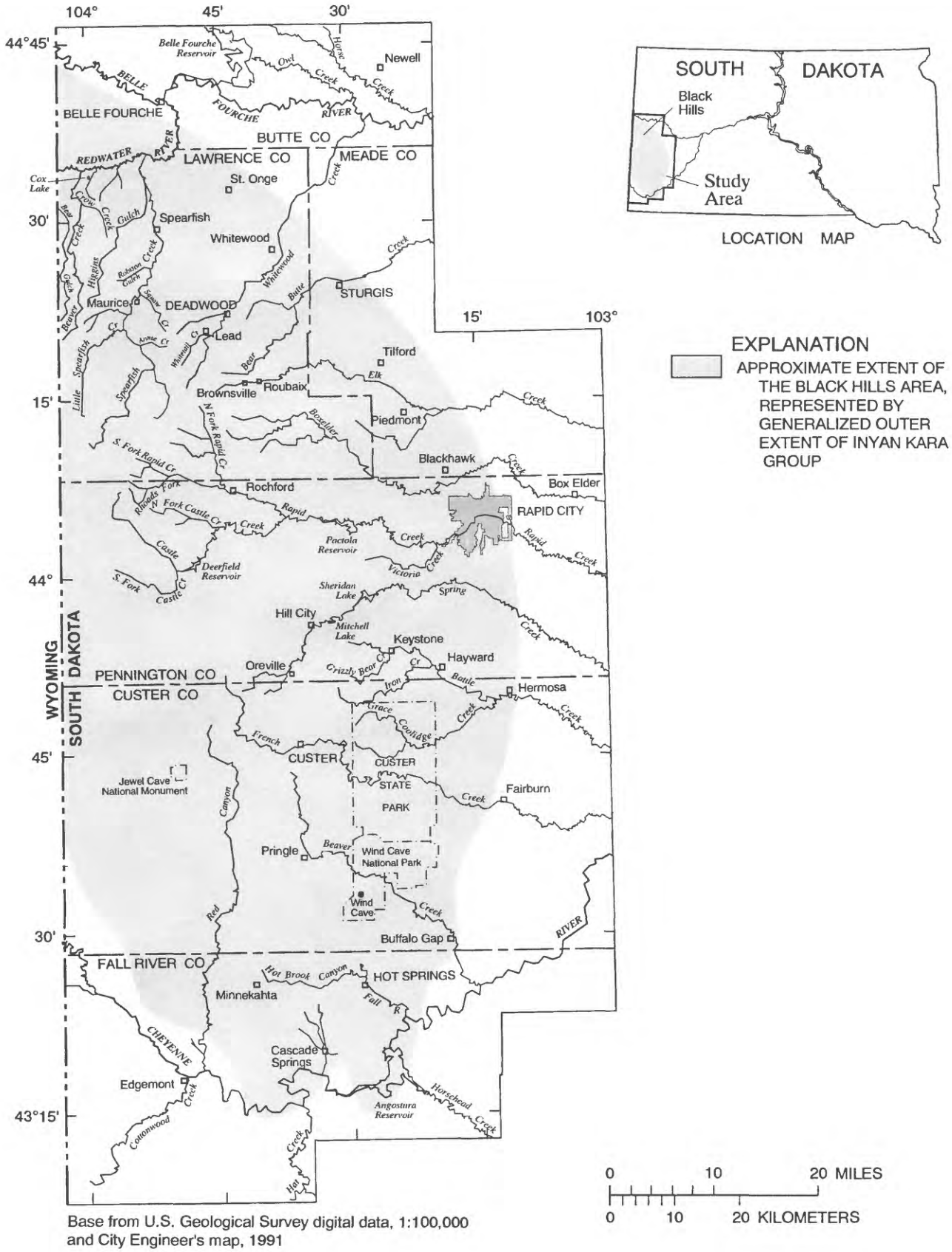


Figure 1. Area of investigation for the Black Hills Hydrology Study.

ERA	PERIOD	ABBREVIATION FOR STRATIGRAPHIC INTERVAL	FORMATION	SECTION	THICKNESS IN FEET	DESCRIPTION	TAPPED BY OBSERVATION WELL?
CENOZOIC	QUATERNARY & TERTIARY (?)	Qal, Qw, Qt	SANDS AND GRAVELS		0-50	Sand, gravel, and boulders	NO
		Tw	WHITE RIVER GROUP		0-600	Light colored clays with sandstone channel fillings and local limestone lenses.	NO
	TERTIARY	Kp	PIERRE SHALE Sharon Spnngs Mem.		1200-2000	Principal horizon of limestone lenses giving teepee buttes. Dark-gray shale containing scattered concretions. Widely scattered limestone masses, giving small teepee buttes. Black fissile shale with concretions.	NO
MESOZOIC	UPPER CRETACEOUS		NIOBRARA FORMATION		100-225	Impure chalk and calcareous shale.	NO
		Kng	Turner Sand Member CARLILE FORMATION Wall Creek Sands		400-750	Light-gray shale with numerous large concretions and sandy layers. Dark-gray shale	NO
			GREENHORN FORMATION		(25-30) (200-350)	Impure slabby limestone. Weathers buff. Dark-gray calcareous shale, with thin Orman Lake limestone at base.	NO
		Kb	GRANEROS GROUP: BELLE FOURCHE SHALE		300-550	Gray shale with scattered limestone concretions. Clay spur bentonite at base.	NO
	LOWER CRETACEOUS	Kms	GRANEROS GROUP: MOWRY SHALE		150-250	Light-gray siliceous shale. Fish scales and thin layers of bentonite.	
			GRANEROS GROUP: MUDDY SANDSTONE: DYNNESON		20-60	Brown to light yellow and white sandstone.	
			GRANEROS GROUP: MUDDY SANDSTONE: NEWCASTLE				
			GRANEROS GROUP: SKULL CREEK SHALE		170-270	Dark gray to black siliceous shale.	
		KJm	INYAN KARA GROUP: FALL RIVER FORMATION		10-200	Massive to slebby sandstone.	
			INYAN KARA GROUP: LAKOTA FM: Fuson Shale Minnewaste Limestone		10-188 0-25 25-485	Coarse gray to buff cross-bedded conglomeratic sandstone, interbedded with buff, red, and gray clay, especially toward top. Local fine-grained limestone.	YES
	JURASSIC		MORRISON FORMATION		0-220	Green to maroon shale. Thin sandstone.	NO
			UNKPAPA SS		0-225	Massive fine-grained sandstone.	NO
		Jsg	SUNDANCE FORMATION: Redwater Member Lak Member Hulett Member Stockade Beaver Canyon Spr Member		250-450	Greenish-gray shale, thin limestone lenses. Glauconitic sandstone; red sandstone near middle.	NO
			GYPSUM SPRING FORMATION		0-45	Red siltstone, gypsum, and limestone.	NO
	TRIASSIC ?	TrPs	SPEARFISH FORMATION Goose Egg Equivalent		250-700	Red sandy shale, soft red sandstone and siltstone with gypsum and thin limestone layers. Gypsum locally near the base.	NO
PALEOZOIC	PERMIAN	Pmo	MINNEKAHTA LIMESTONE		30-50	Massive gray, laminated limestone.	YES
			OPECHE FORMATION		50-135	Red shale and sandstone.	NO
		PIPm	MINNELUSA FORMATION		350-850	Yellow to red cross-bedded sandstone, limestone, and anhydrite locally at top. Interbedded sandstone, limestone, dolomite, shale, and anhydrite. Red shale with interbedded limestone and sandstone at base.	YES
	PENNSYLVANIAN						
	MISSISSIPPIAN	MDpe	PAHASAPA (MADISON) LIMESTONE		300-630	Massive light-colored limestone. Dolomite in part. Cavernous in upper part.	YES
	DEVONIAN		ENGLEWOOD LIMESTONE		30-60	Pink to buff limestone. Shale locally at base.	NO
	ORDOVICIAN	OЄwd	WHITEWOOD (RED RIVER) FORMATION		0-60	Buff dolomite and limestone.	NO
			WINNEPEG FORMATION		0-100	Green shale with siltstone.	NO
	CAMBRIAN		DEADWOOD FORMATION		10-400	Massive to thin-bedded buff to purple sandstone. Greenish glauconitic shale flaggy dolomite and flatpebble limestone conglomerate. Sandstone, with conglomerate locally at the base.	YES
PRECAMBRIAN		pЄu	UNDIFFERENTIATED METAMORPHIC AND IGNEOUS ROCKS			Schist, slate, quartzite, and arkosic grit. Intruded by diorite, metamorphosed to amphibolite, and by granite and pegmatite.	YES

Modified from information furnished by the Department of Geology and Geological Engineering, South Dakota School of Mines and Technology (written commun., January 1994)

Figure 2. Stratigraphic section for the Black Hills.

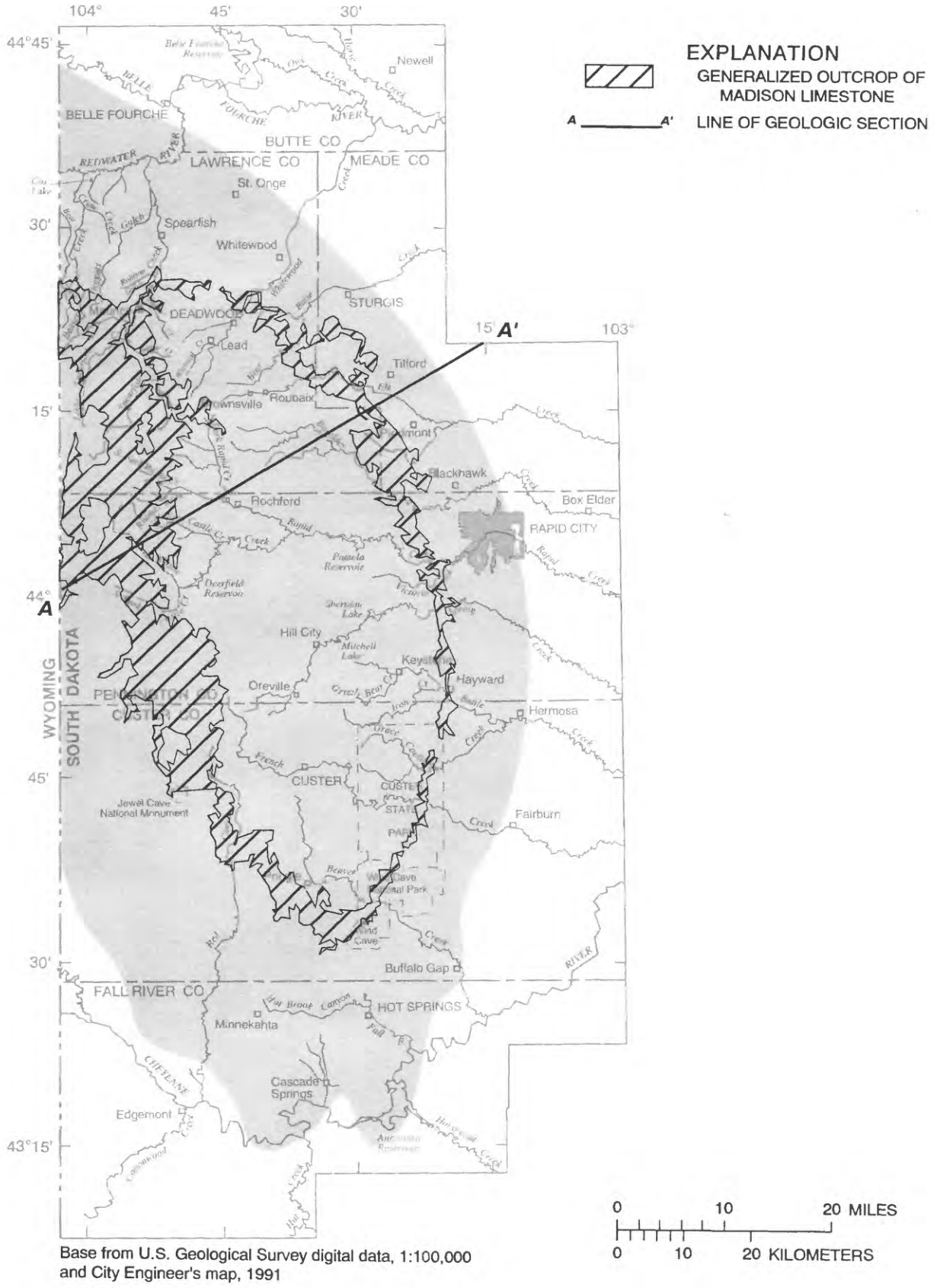


Figure 3. Generalized outcrop of Madison Limestone and outer extent of Inyan Kara Group within the study area.

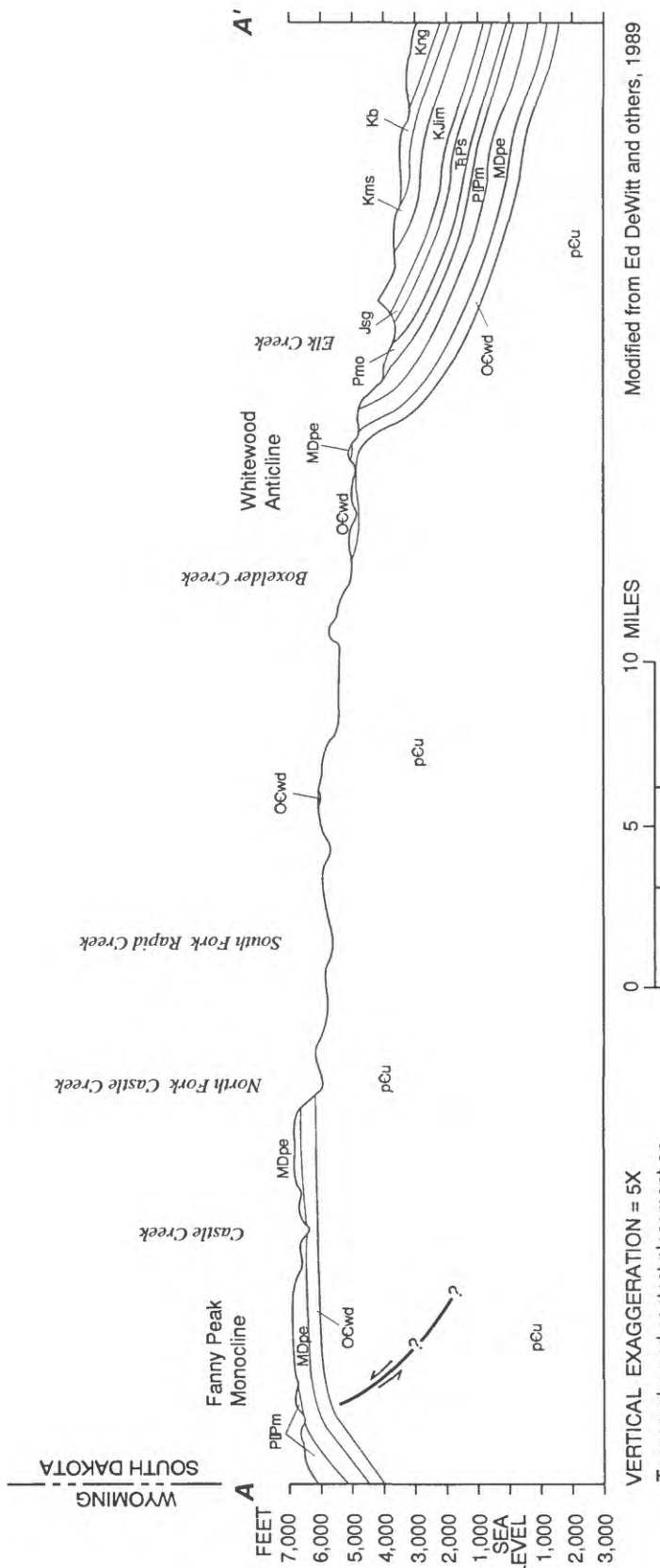


Figure 4. Geologic cross section A-A'. (Location of section is shown in figure 3. Abbreviations for stratigraphic intervals are explained in figure 2).

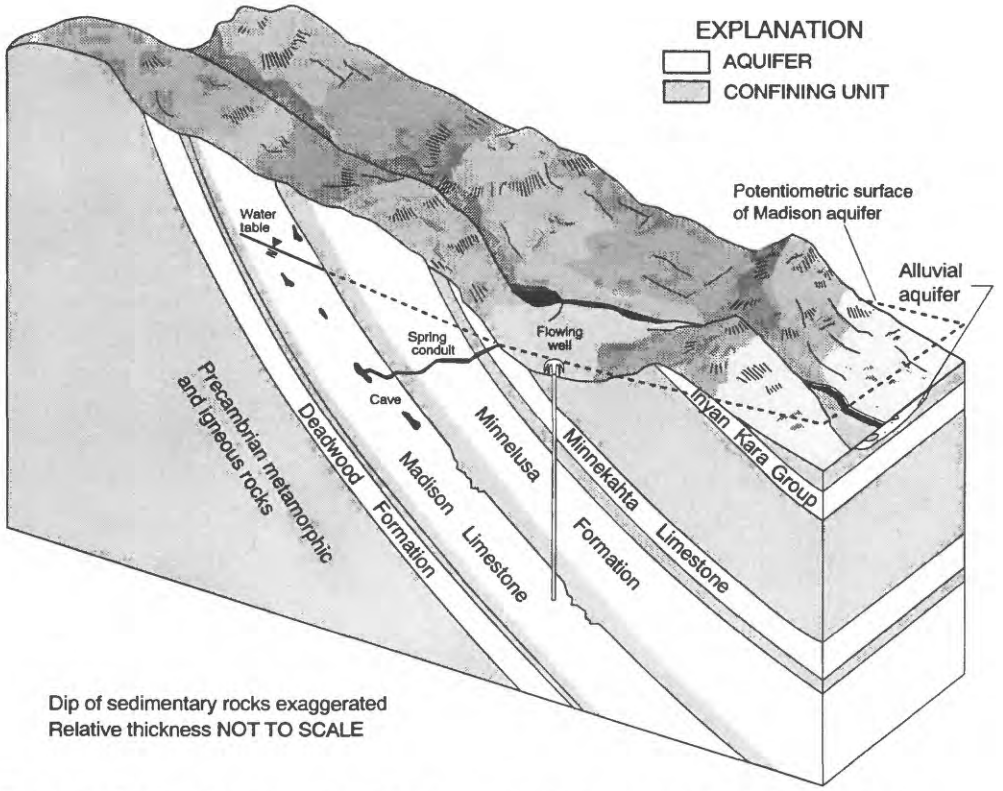


Figure 5. Schematic showing simplified hydrogeologic setting of the Black Hills area.

significant headwater springs originating from the Paleozoic formations on the western side of the study area (figs. 3 and 4). Most Black Hills streams generally lose all or part of their flow as they cross the outcrop of the Madison Limestone (Driscoll, 1994; Rahn and Gries, 1973). Karst features of the Madison Limestone, including sinkholes, collapse features, solution cavities, and caves are responsible for the Madison's capacity to accept recharge from streamflow. Large springs occur in many locations downgradient from the streamflow-loss zones, most commonly within or near the outcrop of the Spearfish Formation, providing an important source of base flow in many streams beyond the periphery of the Hills (Rahn and Gries, 1973).

Water quality within the study area also is affected by geologic conditions. Water within streams draining the Paleozoic formations on the western side of the study area typically is hard and of a calcium carbonate type. Streams draining the Precambrian core, by comparison, typically are softer, with significantly lower concentrations of dissolved solids and lower associated values of specific conductance (Driscoll and Bradford, 1994; Meyer, 1984; U.S. Geological Survey and U.S. Bureau of Reclamation, 1975). The quality of ground water within the study area is extremely variable. Concentrations of dissolved solids in the sedimentary aquifers generally are relatively low, in and near the recharge areas, but increase with distance from the recharge areas. Water within the Madison, Minnelusa, and Minnekahta aquifers generally is of a calcium carbonate type near the recharge areas, which is typical of carbonate aquifers (Driscoll and Bradford, 1994; Whalen, 1994). Within the Madison and Minnelusa aquifers, concentrations of sulfate and other ions generally increase in the downgradient direction. Within downgradient Minnelusa wells, sulfate generally is the dominant anion (Whalen, 1994). Many of the large springs around the periphery of the Hills, which originate from the Madison and/or Minnelusa, reflect this change in water quality.

Methods of Station Identification

Various methods of station identification are used within this report to identify sites for which data are presented. The most commonly used method for ground-water sites is the local number, which is based on the Federal land-survey system for western South Dakota (fig. 6). The local number consists of the

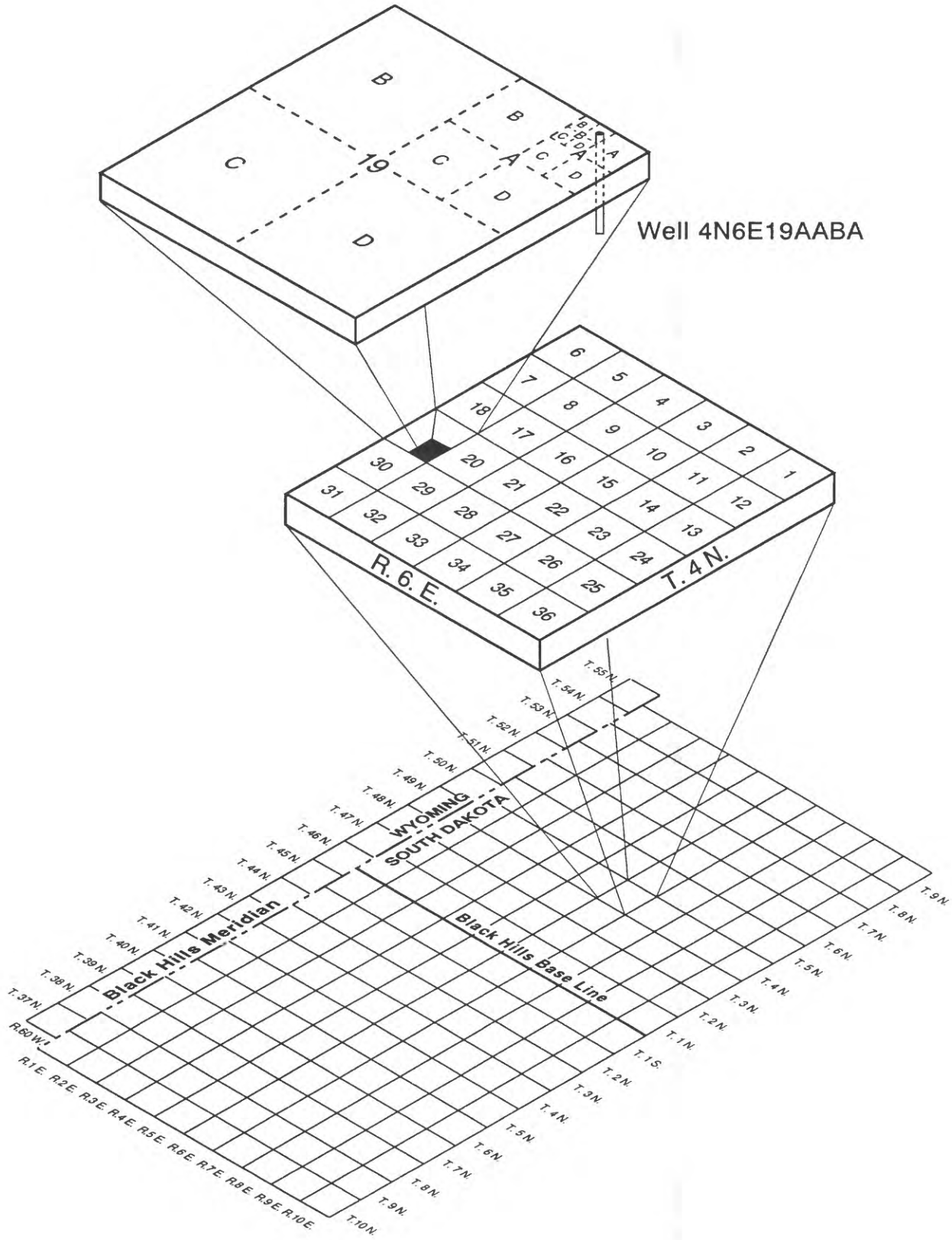


Figure 6. System for assignment of local numbers.

township number followed by "N" or "S" (north or south of the Black Hills Baseline), the range number followed by "E" or "W" (east or west of the Black Hills Meridian), and the section number, followed by a maximum of four uppercase letters that indicate, respectively, the 160-, 40-, 10-, and 2.5-acre tract in which the site is located. These letters are assigned in a counterclockwise direction beginning with "A" for the northeast quarter. A serial number following the last letter is used to distinguish between wells or springs located in the same 2.5-acre tract. Thus, well 4N6E19AABA (fig. 6) is in the NE¼NW¼NE¼NE¼, sec. 19, T. 4 N., R. 6 E.

Another method is the station identification number, which is based on the international system of latitude and longitude. The number contains 15 digits. The first six digits denote the degrees, minutes, and seconds of latitude north of the equator. The next seven digits denote the degrees, minutes, and seconds of longitude west of the prime (Greenwich) meridian. The last two digits are sequential numbers for sites located at the same latitude and longitude. The latitudes or longitudes originally assigned to sites occasionally are determined to be incorrect. In these cases, the latitude or longitude is corrected, but the station identification number generally remains unchanged. Thus, the latitude or longitude for an occasional site may not correspond exactly with the station identification number.

Another method of station identification is the use of any other identifier(s) that may be associated with a site. In the case of many of the observation wells, the other identifier is a name assigned by DENR that denotes the county in which the well is located and the year and sequence in which it was drilled. In some cases, an additional identifier referring to a nearby geographic feature is used.

Two methods of station identification are used to identify surface-water sites for which water-quality data are presented. Sites that are used only for water-quality sampling are identified by the 15-digit station identification number based on latitude and longitude that was described previously. Sites for which streamflow records also are available are identified by an 8-digit station identification number that increases in a downstream direction.

In addition to the aforementioned methods of station identification, sequential site numbers are assigned to various sites in several subsequent sections of this report. The sequential site numbers are used to display locations of sites on several figures, where displaying longer identification numbers is not feasible because of the close proximity of some sites.

Acknowledgments

The authors wish to acknowledge the efforts of the West Dakota Water Development District for helping make the Black Hills Hydrology Study a reality. West Dakota's coordination of various local and county cooperators has been a key element in making this study possible.

The authors also wish to recognize the efforts of the Water Rights Program of DENR for making possible the publication of numerous water-level records included in this report. The foresightedness of DENR staff in development of the observation-well network has been extremely valuable. The cooperation of DENR staff in sharing responsibilities for collection of field data also is greatly appreciated.

The cooperation of the National Park Service for providing access to Windy City Lake in Wind Cave is appreciated. Their interest in this activity and assistance with installation and operation of the recording equipment has been very valuable. The authors also wish to recognize the members of the Paha Sapa Grotto Club for their assistance. Numerous local spelunkers have assisted in installation and operation of recording equipment within two caves where water levels are measured, as well as with associated activities such as determination of elevations within the caves.

WATER-LEVEL DATA

Water-level data are presented for two different networks of wells that are completed in various bedrock formations in the Black Hills area. Drawdown and recovery data also are presented for five wells that were pumped (or flowed) for collection of water-quality samples.

The first set of water-level data consists of daily records for a network of observation wells that generally have been constructed by DENR specifically for the purpose of collecting water-level data in the Black Hills area. Most of these observation wells are instrumented with some type of continuous recorder, from which daily water-level records are compiled. This network also includes two cave sites for which daily water-level records are compiled.

The second set of water-level data is for a network of selected, miscellaneous wells at which a single, annual measurement of water level is collected. These wells are a part of a former Statewide network of wells completed in bedrock aquifers, that was operated from 1959 through 1989, in cooperation with DENR (Bradford, 1981; Winter, 1994). Many of the wells in this network are privately owned production wells.

Drawdown and recovery data are presented for five wells that were pumped (or flowed) for collection of water-quality samples. All of these wells are part of the network of observation wells for which daily water-level records are compiled.

Water levels within wells can be affected by several factors. Short-term declines in water levels can result from pumping of nearby wells or dry climatic conditions. Long-term declines generally indicate that the discharge rate from the aquifer exceeds recharge for a given period of time. Conversely, increases in water levels generally correspond with periods of wetter climatic conditions when aquifer recharge exceeds discharge. Changes in barometric pressure also can cause short-term (hourly and daily) changes in water levels in artesian aquifers. Measured water levels are further affected by the recording equipment and methods used to monitor wells.

Observation Wells and Cave Sites

This section presents daily water-level data for a network of 39 observation wells and 2 cave sites. The wells generally have been constructed by DENR and are instrumented with some type of recorder. DENR and USGS personnel have shared responsibility for collection of field data; however, since 1989, most field data collection has been performed by DENR personnel. The USGS generally has been responsible for compilation of the water-level records. Both cave sites are located within the Madison Limestone and are the only known caves in the Black Hills area that extend to a level at which the Madison is saturated. The locations of these sites, with assigned site numbers and local well numbers, are presented in figure 7. Additional information for these sites is presented in table 1.

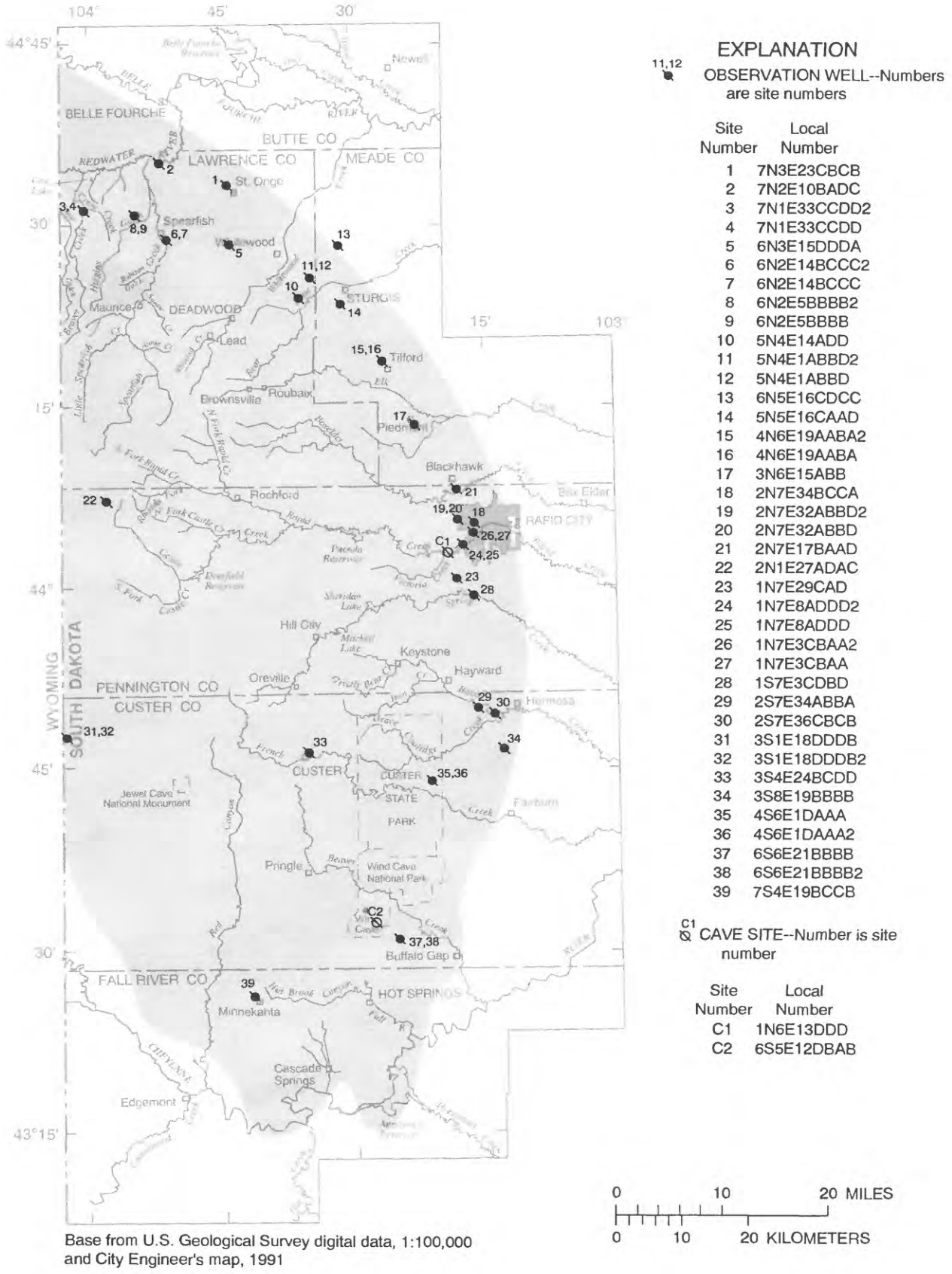
Site descriptions, water-level hydrographs for the entire period of record that is available, and tabulations of daily water-levels records for water years 1993-94 are presented for most of the sites. Hydrographs are not presented for sites 31 and 32 because data are too sparse to generate hydrographs. Some data for periods prior to water year 1993 are included in tabulations for several sites. These data generally represent revisions or additions to records that have been published previously. A rating of the record for each site is provided in the REMARKS section of each station description. This rating is somewhat subjective, as no formal criteria exist for rating of water-level records. The rating is based on the type and relative accuracy of recording equipment, the amount of missing record, and various other problems encountered for each site.

Data through water year 1992 for 32 of the observation wells and both cave sites were published by Driscoll and Bradford (1994). Data for sites 2, 18, 26, and 27 have been published previously by Bradford (1981) and Winter (1994). Data for seven of the sites have not been published previously.

Data presented in the following section are stored in one or both of two different USGS data bases. Most of the tabular water-level data for water years 1993-94 are presented in a daily format. These data generally were collected using a digital water-level recorder or a data logger, are either the lowest daily water levels or the noon values, and are stored in the "Automated Data Processing System" (ADAPS) data base. Values for more frequent intervals than daily usually are available for ADAPS data. Some of the data presented in hydrographs for periods prior to water year 1991 are stored in the "Ground Water Site Inventory" (GWSI) data base. These data generally were collected using circular-chart pressure recorders, are the noon value for every fifth day, and are available in a 5-day format.

Numerous days of missing record exist in the data. Periods of missing record of six or more days generally are shown as discontinuous, or as a dashed line, on the hydrographs. Dashes are used only where the discontinuous period is sufficiently long for dashes to be visible. There is no implication that the dashed lines are representative of the actual hydrograph.

Some of the daily values presented in the tabular format are noted as "estimated." In many cases, these values were obtained from an instantaneous reading taken during a site visit on a day when the recording equipment at a site was inoperable. In such cases, the instantaneous reading was not necessarily the lowest daily water level (ADAPS) or the noon value (GWSI), and therefore was noted as an estimate.



Site Number	Local Number
1	7N3E23CBCB
2	7N2E10BADC
3	7N1E33CCDD2
4	7N1E33CCDD
5	6N3E15DDDA
6	6N2E14BCCC2
7	6N2E14BCCC
8	6N2E5BBBB2
9	6N2E5BBBB
10	5N4E14ADD
11	5N4E1ABBD2
12	5N4E1ABBD
13	6N5E16CDCC
14	5N5E16CAAD
15	4N6E19AABA2
16	4N6E19AABA
17	3N6E15ABB
18	2N7E34BCCA
19	2N7E32ABBD2
20	2N7E32ABBD
21	2N7E17BAAD
22	2N1E27ADAC
23	1N7E29CAD
24	1N7E8ADDD2
25	1N7E8ADDD
26	1N7E3CBAA2
27	1N7E3CBAA
28	1S7E3CDBD
29	2S7E34ABBA
30	2S7E36CBCB
31	3S1E18DDDB
32	3S1E18DDDB2
33	3S4E24BCDD
34	3S8E19BBBB
35	4S6E1DAAA
36	4S6E1DAAA2
37	6S6E21BBBB
38	6S6E21BBBB2
39	7S4E19BCCB

Site Number	Local Number
C1	1N6E13DDD
C2	6S5E12DBAB

Figure 7. Location of observation wells and cave sites for which daily water-level records are presented.

Table 1. Observation wells and cave sites for which daily water-level records are presented

Site number	USGS local number	Station identification number	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)	Other identifier(s)	Aquifer	Beginning date of record
			Lawrence County				
1	7N 3E23CBCB	443306103434001	443306	1034340	LA-90B	Inyan Kara	03-19-91
2	7N 2E10BADC	443515103513901	443515	1035139	LA-62A Redwater 1	Minnelusa	06-30-62
3	7N 1E33CCDD2	443100104002002	443105	1040020	LA-87B	Minnelusa	09-24-87
4	7N 1E33CCDD	443100104002001	443105	1040020	LA-87A	Madison	10-05-87
5	6N 3E15DDDA	442833103434601	442833	1034346	LA-88A Frawley Ranch	Minnelusa	08-10-88
6	6N 2E14BCCC2	442854103505602	442854	1035056	LA-88C	Madison	08-26-88
7	6N 2E14BCCC	442854103505601	442854	1035056	LA-88B	Minnelusa	08-04-88
8	6N 2E 5BBBB2	443100103543002	443105	1035436	LA-86B	Minnekahta	07-25-86
9	6N 2E 5BBBB	443100103543001	443105	1035436	LA-86A	Minnelusa	07-12-86
10	5N 4E14ADD	442344103253401	442344	1033527	LA-63A	Minnelusa	05-15-63
11	5N 4E 1ABBD2	442545103343702	442545	1033437	LA-90A	Madison	11-27-90
12	5N 4E 1ABBD	442545103343701	442545	1033437	LA-86C	Minnelusa	07-17-86
			Meade County				
13	6N 5E16CDCC	442828103312001	442828	1033120	MD-89A	Lakota	09-08-89
14	5N 5E16CAAD	442335103311001	442335	1033110	MD-86A	Madison	07-20-86
15	4N 6E19AABA2	441759103261202	441759	1032612	MD-90A Tilford 2	Madison	07-10-91
16	4N 6E19AABA	441759103261201	441759	1032612	MD-84B Tilford 1	Minnelusa	07-17-84
17	3N 6E15ABB	441337103225001	441337	1032250	MD-84A	Minnelusa	07-17-84
			Pennington County				
18	2N 7E34BCCA	440528103161001	440528	1031610	PE-64A Cement Plant	Minnelusa	06-30-64
19	2N 7E32ABBD2	440544103180002	440544	1031800	PE-89C City Quarry 2	Madison	02-23-90
20	2N 7E32ABBD	440544103180001	440544	1031800	PE-89D City Quarry 1	Minnelusa	02-23-90
21	2N 7E17BAAD	440818103180801	440818	1031808	PE-84B	Minnelusa	07-07-84
22	2N 1E27ADAC	440623103583701	440623	1035737	PE-91A Blind Park	Deadwood	09-18-91
23	1N 7E29CAD	440052103181201	440052	1031812	PE-84A Countryside	Deadwood	07-17-84
24	1N 7E 8ADDD2	440338103173302	440338	1031733	PE-89A Canyon Lake 2	Madison	11-02-89
25	1N 7E 8ADDD	440338103173301	440338	1031733	PE-89B Canyon Lake 1	Minnelusa	01-20-90
26	1N 7E 3CBAA2	440430103160202	440430	1031602	PE-65A Sioux Park 2	Madison	07-15-65
27	1N 7E 3CBAA	440430103160201	440430	1031602	PE-64B Sioux Park 1	Minnelusa	07-01-64

Table 1. Observation wells and cave sites for which daily water-level records are presented—Continued

Site number	USGS local number	Station identification number	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)	Other identifier(s)	Aquifer	Beginning date of record
			Pennington County—Continued				
[1]C1	1N 6E13DDD	440228103195701	440223	1031957	Private Cave	Madison	01-29-88
28	1S 7E 3CDBD	435916103161801	435916	1031618	PE-86A Reptile Gardens	Madison	08-21-86
			Custer County				
29	2S 7E34ABBA	435018103155801	435018	1031558	CU-83A	Minnelusa	10-20-83
30	2S 7E36CBCB	434946103140501	434946	1031416	CU-83B	Inyan Kara	10-02-83
31	3S 1E18DDDB	434700104021401	434700	1040214	CU-93C Boles Canyon 1	Madison	09-09-93
32	3S 1E18DDDB2	434700104021402	434700	1040214	CU-93D Boles Canyon 2	Minnelusa	09-16-93
33	3S 4E24BCDD	434634103351801	434630	1033522	CU-86A Custer Test	Precambrian	11-14-86
34	3S 8E19BBBB	434652103130501	434652	1031305	CU-83C	Lakota	09-27-83
35	4S 6E 1DAAA	434350103201901	434350	1032019	CU-93A CSP Airport 1	Madison	08-06-93
36	4S6E 1DAAA2	434350103201902	434350	1032019	CU-93B CSP Airport 2	Minnelusa	08-09-93
[1]C2	6S 5E12DBAB	433302103281501	433257	1032827	Windy City Lake	Madison	01-22-88
37	6S 6E21BBBB	433115103251401	433115	1032514	CU-91A 7-11 Ranch 1	Madison	02-13-92
38	6S 6E21BBBB2	433115103251402	433115	1032514	CU-91B 7-11 Ranch 2	Minnelusa	02-13-92
			Fall River County				
39	7S 4E19BCCB	432548103414801	432548	1034148	FR-92A	Madison	09-16-92

[1]Cave site.

Site Descriptions and Hydrographs

SITE NUMBER FROM LOCATION MAP.—1.

COUNTY.—Lawrence.

LOCAL WELL NUMBER.—7N3E23CBCB.

SITE ID (STATION NUMBER).—443306103434001.

OTHER IDENTIFIER.—LA-90B.

LOCATION.—Lat 44°33′06″, long 103°43′40″, in NW¼SW¼NW¼SW¼ sec. 23, T. 7 N., R. 3 E., Hydrologic Unit 10120203, 0.5 mi northwest of St. Onge. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Inyan Kara.

WELL CHARACTERISTICS.—Drilled observation well, 390 ft deep with 290 ft of 5-in. steel casing. Below 290 ft, 3-in. plastic casing, screened from 270 to 290 ft and from 350 to 370 ft.

INSTRUMENTATION.—Electronic data logger with submersible pressure transducer -- 60-minute interval.

DATUM.—Elevation of land-surface datum is 3,420 ft above sea level. Measuring point: Top of steel casing, 1.0 ft above land-surface datum.

REMARKS.—Records fair.

PERIOD OF RECORD.—March 1991 to September 1994.

EXTREMES.—Highest daily water level, 53.86 ft below land-surface datum, Aug. 27-28, 1991; lowest daily water level, 66.40 ft below land-surface datum, July 13, 1992.

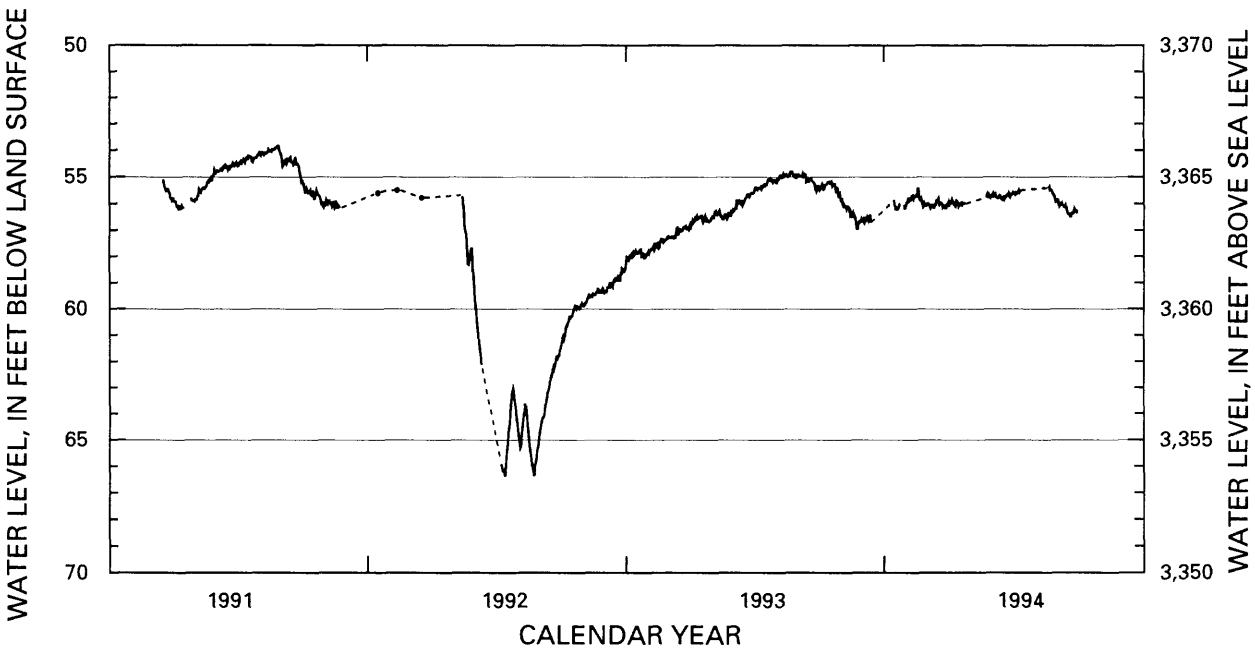


Figure 8. Hydrograph for observation well 7N3E23CBCB (site number 1).

SITE NUMBER 1—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
INSTANTANEOUS VALUE AT 1200 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61.39	59.89	59.38	58.29	57.85	57.28	56.88	56.66	56.25	55.60	55.20	54.90
2	61.27	59.78	59.33	58.07	57.81	57.25	56.78	56.55	56.31	55.54	55.15	55.04
3	61.14	59.89	59.34	58.13	57.90	57.31	56.87	56.53	56.30	55.41	55.20	54.95
4	61.06	59.87	59.40	58.08	57.82	57.30	56.76	56.44	56.23	55.41	55.14	54.98
5	61.16	59.77	59.21	58.14	57.79	57.31	56.66	56.58	56.16	55.47	55.12	55.01
6	61.07	59.76	59.19	57.98	57.74	57.31	56.75	56.41	56.18	55.49	55.03	54.99
7	61.02	59.64	59.18	57.96	57.74	57.25	56.72	56.31	55.89	55.43	54.95	55.01
8	60.73	59.59	59.05	57.94	57.69	57.25	56.65	56.30	55.89	55.43	54.95	54.91
9	60.64	59.52	58.99	58.11	57.62	57.26	56.53	56.41	56.00	55.43	55.03	55.02
10	60.65	59.62	59.13	57.92	57.77	57.31	56.55	56.44	55.97	55.43	54.99	55.01
11	60.52	59.52	59.05	57.85	57.69	57.28	56.50	56.39	55.90	55.45	54.94	54.91
12	60.49	59.54	59.11	57.99	57.56	57.35	56.61	56.36	55.92	55.31	55.07	54.94
13	60.28	59.49	59.17	57.97	57.61	57.13	56.58	56.29	56.02	55.43	54.94	55.19
14	60.36	59.53	58.97	57.88	57.55	56.97	56.55	56.37	56.08	55.37	54.94	55.15
15	60.34	59.44	58.89	57.78	57.68	56.90	56.51	56.49	55.92	55.31	54.97	55.05
16	60.28	59.47	58.94	57.84	57.72	57.22	56.50	56.50	55.91	55.30	54.94	55.18
17	60.27	59.47	58.84	57.90	57.66	57.09	56.52	56.56	55.98	55.35	55.00	55.18
18	60.17	59.48	58.86	57.90	57.46	56.94	56.44	56.60	55.94	55.31	55.02	55.14
19	60.04	59.40	58.89	57.85	57.45	57.06	56.64	56.61	55.83	55.32	55.01	55.08
20	59.98	59.37	58.76	57.81	57.31	57.05	56.71	56.52	55.80	55.21	54.99	55.07
21	59.90	59.43	58.80	57.83	57.42	57.05	56.62	56.43	55.76	55.14	54.85	55.11
22	59.91	59.20	58.77	57.69	57.41	57.03	56.55	56.43	55.68	55.15	54.82	55.18
23	60.01	59.35	58.97	58.03	57.47	56.91	56.48	56.50	55.66	55.12	54.83	55.21
24	59.93	59.39	58.63	58.00	57.41	56.90	56.58	56.58	55.70	55.08	54.82	55.22
25	59.99	59.37	58.72	57.93	57.44	56.91	56.72	56.54	55.75	55.13	54.92	55.25
26	59.96	59.38	58.50	58.00	57.40	56.87	56.62	56.38	55.69	55.10	54.96	55.44
27	60.03	59.32	58.53	57.88	57.38	56.86	56.68	56.41	55.62	55.13	55.01	55.40
28	60.01	59.25	58.64	58.09	57.35	56.97	56.70	56.44	55.61	55.20	54.94	55.53
29	59.86	59.43	58.46	58.01	---	56.95	56.66	56.35	55.62	55.15	54.94	55.46
30	59.80	59.31	58.56	57.95	---	56.94	56.65	56.43	55.63	55.14	55.10	55.31
31	59.88	---	58.54	57.93	---	56.98	---	56.35	---	55.15	54.98	---
MAX	61.39	59.89	59.40	58.29	57.90	57.35	56.88	56.66	56.31	55.60	55.20	55.53

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INSTANTANEOUS VALUE AT 1200 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55.42	55.86	56.65	---	56.08	56.09	56.00	---	55.68	55.65	---	55.94
2	55.49	55.92	56.63	---	55.98	56.07	56.13	---	55.79	55.58	---	55.92
3	55.42	55.79	56.67	---	55.93	56.03	55.95	---	55.68	55.62	---	55.82
4	55.44	56.05	56.52	---	55.88	56.01	56.02	---	55.63	55.60	---	55.94
5	55.36	56.17	56.69	---	55.77	56.03	56.02	---	55.71	55.66	---	56.11
6	55.29	56.04	56.62	---	55.92	56.09	55.96	---	55.65	55.61	---	56.08
7	55.38	56.07	56.62	---	55.88	56.19	55.85	---	55.64	55.64	---	56.03
8	55.48	56.16	56.52	---	55.87	56.14	55.94	---	55.73	55.60	---	56.02
9	55.46	56.23	56.56	---	55.73	56.05	55.97	---	55.78	55.58	---	55.99
10	55.32	56.14	56.66	---	55.71	56.05	56.08	---	55.81	55.51	---	56.10
11	55.31	56.11	56.56	---	55.70	56.06	56.11	---	55.81	55.58	---	56.12
12	55.30	56.13	56.43	---	55.83	56.20	55.98	---	55.79	55.54	---	56.15
13	55.26	56.22	56.72	---	55.75	56.08	55.89	---	55.69	---	---	56.13
14	55.20	56.43	---	---	55.73	56.05	55.91	---	55.72	---	---	56.07
15	55.21	56.37	---	55.87	55.71	56.06	56.01	---	55.82	---	---	56.22
16	55.24	56.47	---	56.05	55.73	55.89	56.09	---	55.82	---	---	56.35
17	55.20	56.43	---	56.26	55.56	55.87	56.02	---	55.85	---	---	56.40
18	55.24	56.37	---	56.17	55.42	55.87	56.06	---	55.76	---	---	56.40
19	55.21	56.55	---	56.20	55.69	55.83	56.06	---	55.75	---	---	56.44
20	55.35	56.46	---	56.23	55.84	56.02	56.00	---	55.84	---	---	56.43
21	55.29	56.52	---	56.17	55.90	55.97	56.06	---	55.76	---	55.43	56.53
22	55.30	56.71	---	56.11	55.90	55.99	55.99	---	55.77	---	55.39	56.43
23	55.28	56.88	---	56.04	55.83	55.99	56.03	---	55.70	---	55.51	56.36
24	55.27	57.01	---	56.06	55.93	56.14	56.02	---	55.68	---	55.49	56.38
25	55.47	56.92	---	---	56.13	56.06	56.01	55.78	55.70	---	55.52	56.37
26	55.60	56.77	---	---	56.09	56.07	56.04	55.75	55.63	---	55.53	56.22
27	55.40	56.69	---	---	56.01	56.21	---	55.66	55.73	---	55.64	56.29
28	55.47	56.72	---	---	56.09	56.10	---	55.73	55.76	---	55.69	56.27
29	55.73	56.67	---	56.06	---	56.22	---	55.68	55.66	---	55.69	56.28
30	55.71	56.58	---	56.23	---	56.08	---	55.75	55.68	---	55.84	56.38
31	55.66	---	---	56.11	---	56.04	---	55.78	---	---	55.95	---
MAX	55.73	57.01	56.72	56.26	56.13	56.22	56.13	55.78	55.85	55.66	55.95	56.53

SITE NUMBER FROM LOCATION MAP.—2.

COUNTY.—Lawrence.

LOCAL WELL NUMBER.—7N2E10BADC.

SITE ID (STATION NUMBER).—443515103513901.

OTHER IDENTIFIERS.—LA-62A and Redwater 1.

LOCATION.—Lat 44°35′15″, long 103°51′39″, in SW¼SE¼NE¼NW¼ sec. 10, T. 7 N., R. 2 E., Hydrologic Unit 10120203, 6 mi north of Spearfish. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 1,306 ft deep with 1,266 ft of 2-in. steel casing, perforated from 1,226 to 1,266 ft; open hole from 1,266 to 1,310 ft.

INSTRUMENTATION.—Electronic data logger with pressure transducer. Prior to November 1990, circular-chart pressure recorder.

DATUM.—Elevation of land-surface datum is 3,205 ft above sea level. Measuring point: Base of gage, 2.5 ft above land-surface datum.

REMARKS.—Records fair. Water level affected by pumping of nearby wells.

PERIOD OF RECORD.—June 1962 to September 1994. Note: Tabular data through Dec. 31, 1962, that were omitted by Winter (1994) are included with the following tabulation.

EXTREMES.—Highest daily water level, 304.72 ft above land-surface datum, May 24, 1974, Apr. 30, 1977, and May 3, 1977; lowest daily water level, 256.27 ft above land-surface datum, Aug. 30, 1962, Sept. 3, 1962, July 30, 1985, and Sept. 20, 1988.

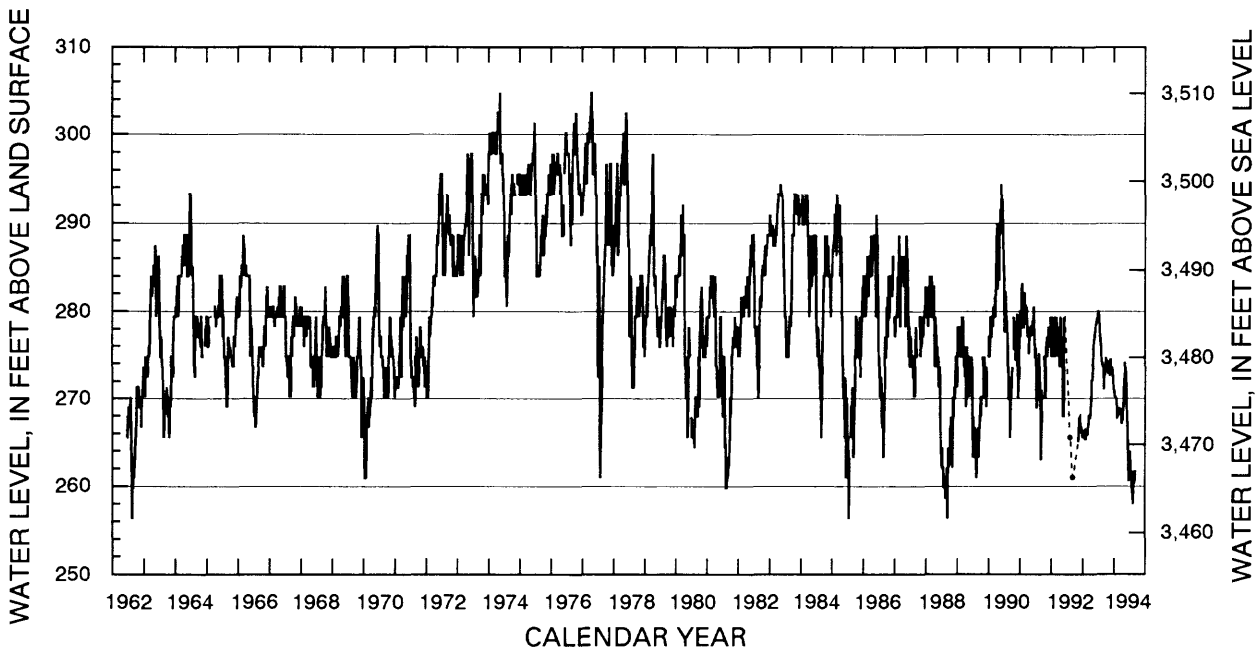


Figure 9. Hydrograph for observation well 7N2E10BADC (site number 2).

SITE NUMBER 2—Continued

WATER LEVEL, IN FEET ABOVE (+) LAND-SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JUN 30, 1962	+265.50	AUG 20, 1962	+264.34	OCT 10, 1962	+266.65	NOV 30, 1962	+270.11
JUL 05	+265.50	25	+262.04	15	+265.50	DEC 05	+270.11
10	+267.81	31	+259.73	20	+270.11	10	+268.96
15	+267.81	SEP 05	+259.73	25	+271.27	15	+266.65
20	+268.96	10	+259.73	31	+271.27	20	+270.11
25	+267.81	15	+263.19	NOV 05	+271.27	25	+270.11
31	+266.65	20	+262.04	10	+271.27	31	+271.27
AUG 05	+268.96	25	+260.88	15	+268.96		
10	+270.11	30	+260.88	20	+268.96		
15	+267.81	OCT 05	+264.34	25	+270.11		

WATER LEVEL, IN FEET ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
INSTANTANEOUS VALUE AT 1200 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	+267.00	+265.15	+266.49	+267.11	+267.18	+273.69	+275.99	+279.11	+278.19	+274.38
2	---	---	+267.00	+266.03	+265.45	+267.11	+267.00	+273.53	+275.49	+279.11	+277.79	+273.53
3	---	---	+266.84	+265.84	+265.80	+265.91	+267.34	+273.41	+275.65	+279.11	+276.92	+273.87
4	---	---	+266.84	+266.37	+266.65	+266.95	+267.87	+273.41	+276.69	+279.11	+276.71	+274.38
5	---	---	+267.69	+265.84	+266.31	+266.42	+268.04	+272.12	+277.33	+279.29	+277.03	+273.53
6	---	---	+268.04	+265.96	+266.31	+266.77	+267.00	+273.07	+277.33	+279.64	+277.03	+274.56
7	---	---	+267.87	+266.14	+266.31	+266.77	+267.69	+273.69	+277.33	+279.80	+277.73	+274.73
8	---	---	+267.46	+265.11	+265.84	+266.42	+267.99	+272.90	+277.68	+279.64	+277.73	+274.73
9	---	---	+267.46	+264.41	+266.03	+265.91	+268.15	+273.18	+278.37	+279.80	+276.99	+272.95
10	---	---	+267.80	+265.45	+265.34	+265.73	+267.64	+273.69	+277.96	+279.66	+276.46	+272.60
11	---	---	+267.80	+265.27	+265.50	+265.73	+267.81	+274.10	+278.14	+279.66	+276.64	+272.60
12	---	---	+266.77	+264.92	+266.72	+265.38	+267.64	+274.10	+278.30	+279.85	+276.29	+272.26
13	---	---	+266.42	+265.27	+266.19	+266.61	+267.81	+274.50	+278.65	+279.50	+276.11	+270.18
14	---	---	+266.95	+265.11	+266.19	+266.77	+268.50	+274.68	+278.07	+279.52	+275.95	+270.87
15	---	---	+266.77	+265.96	+265.34	+267.11	+268.80	+274.33	+278.42	+280.06	+276.11	+271.03
16	---	---	+266.77	+266.14	+264.99	+265.57	+269.14	+275.42	+278.07	+279.55	+276.11	+270.69
17	---	---	+266.61	+264.92	+265.84	+265.91	+270.00	+275.26	+277.56	+279.20	+275.53	+270.76
18	---	---	+266.26	+265.96	+266.88	+267.30	+270.18	+275.42	+277.84	+279.06	+275.19	+271.10
19	---	---	+266.26	+265.80	+265.50	+266.77	+269.14	+275.65	+278.53	+279.41	+274.68	+271.50
20	---	+264.92	+266.77	+266.31	+266.19	+266.77	+269.84	+275.83	+278.49	+279.78	+274.84	+272.53
21	---	+266.12	+266.95	+265.80	+265.68	+267.11	+270.69	+276.06	+278.42	+279.59	+275.19	+271.91
22	---	+265.59	+266.61	+265.27	+266.03	+267.30	+271.03	+275.88	+278.72	+279.46	+275.37	+272.26
23	---	+265.38	+265.50	+265.11	+266.03	+267.80	+270.92	+275.88	+278.99	+278.58	+275.19	+272.30
24	---	+265.89	+266.54	+265.11	+265.68	+267.76	+271.96	+276.29	+278.79	+278.44	+274.68	+272.88
25	---	+266.58	+266.72	+266.14	+265.68	+267.92	+272.03	+276.40	+278.88	+279.29	+274.26	+272.74
26	---	+266.72	+266.88	+266.49	+266.61	+268.10	+272.53	+276.29	+279.18	+279.32	+274.10	+272.17
27	---	+267.39	+267.07	+266.31	+266.61	+267.92	+272.37	+276.46	+279.13	+279.18	+273.76	+273.00
28	---	+267.23	+264.99	+265.11	+267.11	+267.23	+272.77	+275.53	+279.29	+279.18	+273.76	+272.93
29	---	+266.86	+265.50	+265.61	---	+267.23	+273.11	+276.41	+278.60	+279.32	+273.92	+273.18
30	---	+267.53	+264.81	+266.31	---	+267.23	+272.26	+276.06	+278.95	+278.58	+273.06	+273.57
31	---	---	+264.99	+266.49	---	+266.84	---	+276.76	---	+278.74	+274.45	---
MIN	---	+264.92	+264.81	+264.41	+264.99	+265.38	+267.00	+272.12	+275.49	+278.44	+273.06	+270.18

WATER LEVEL, IN FEET ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INSTANTANEOUS VALUE AT 1200 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	+272.88	+273.99	+273.80	+272.49	+269.49	+268.50	+268.84	+268.96	+274.22	+261.92	+261.11	+258.69
2	+273.46	+273.64	+273.64	+271.61	+269.30	+268.50	+267.81	+269.19	+273.18	+261.76	+261.11	+259.73
3	+273.64	+274.50	+274.38	+272.30	+269.84	+268.68	+268.68	+269.72	+273.18	+261.23	+261.65	+260.95
4	+273.18	+272.77	+274.56	+272.14	+269.77	+268.84	+267.46	+270.23	+272.83	+261.07	+261.30	+261.30
5	+273.34	+272.77	+273.53	+272.07	+270.11	+268.27	+268.34	+269.37	+272.19	+260.54	+261.23	+261.65
6	+273.92	+273.46	+273.87	+271.22	+268.91	+268.45	+268.68	+269.72	+271.68	+260.19	+261.23	+261.81
7	+273.30	+273.11	+273.87	+271.38	+267.81	+267.23	+268.45	+271.15	+270.80	+261.07	+261.23	+261.81
8	+272.60	+273.11	+274.38	+271.73	+268.15	---	+267.92	+271.15	+270.46	+261.58	+260.88	+261.23
9	+273.18	+273.53	+274.03	+271.50	+268.68	---	+268.10	+271.33	+269.26	+262.11	+261.07	+261.07
10	+274.03	+273.53	+274.56	+271.15	+269.88	---	+267.76	+271.33	+269.60	+262.11	+260.19	+260.88
11	+274.96	+273.69	+274.45	+271.33	+268.61	---	+268.10	+271.68	+269.60	+262.11	+260.03	+261.23
12	+274.61	+272.49	+274.96	+271.50	+268.80	+267.69	---	+272.26	+269.26	+261.76	+259.50	+261.41
13	+275.37	+272.83	+274.26	+270.64	+269.14	+268.38	---	+272.26	+268.57	+261.23	+259.15	+261.23
14	+274.50	+272.49	+273.76	+270.57	+269.65	+268.04	---	+272.60	+268.04	+263.42	+259.15	+261.07
15	+274.68	+273.18	+273.07	+270.92	+269.26	+268.57	+267.00	+272.60	+268.04	+263.61	+259.15	+260.38
16	+273.99	+273.18	+273.07	+270.23	+268.91	+268.57	+268.57	+272.95	+267.34	+263.77	+259.15	+260.88
17	+275.07	+273.92	+273.18	+269.72	+269.60	+268.22	+268.68	+273.18	+268.04	+263.95	+258.92	+260.88
18	+275.07	+273.76	+273.69	+270.00	+268.68	+268.91	+268.84	+273.00	+268.22	+264.11	+259.45	+261.41
19	+275.07	+273.76	+273.34	+270.00	+268.68	+269.26	+268.45	+273.34	+267.69	+264.11	+259.45	+261.76
20	+274.38	+274.26	+273.53	+270.34	+267.78	+268.38	+268.61	+273.00	+266.84	+263.95	+258.92	+261.69
21	+275.26	+274.10	+273.00	+271.73	+267.55	+268.91	+268.22	+273.34	+266.84	+264.11	+258.76	+260.65
22	+275.07	+272.88	+272.95	+271.73	+267.30	+268.22	+268.38	+273.76	+266.14	+264.11	+258.76	+261.35
23	+274.91	+272.53	+272.26	+271.68	+268.13	+268.34	+268.50	+273.76	+266.26	+263.77	+258.58	+261.88
24	+274.91	+272.37	+272.77	+269.95	+267.53	+268.84	+268.34	+273.76	+266.42	+263.42	+258.42	+261.69
25	+274.26	+272.60	+273.46	+270.11	+267.81	+268.84	+267.41	+274.10	+265.57	+262.68	+257.88	+261.53
26	+274.45	+273.11	+273.07	+269.95	+267.74	+268.15	+267.23	+273.92	+265.57	+262.68	+258.07	+261.88
27	+274.96	+274.33	+271.50	+269.37	+268.57	+267.99	+267.92	+274.50	+264.53	+262.34	+257.72	+262.22
28	+274.10	+274.33	+272.72	+269.88	+268.04	+268.34	+268.27	+274.33	+265.04	+262.84	+257.49	+262.22
29	+273.57	+273.80	+272.53	+269.72	---	+267.99	+268.96	+274.68	+264.88	+263.19	+258.00	+262.38
30	+274.45	+273.99	+273.23	+269.37	---	+268.68	+269.14	+274.68	+262.61	+262.34	+258.53	+262.04
31	+274.45	---	+272.14	+269.49	---	+268.84	---	+274.73	---	+261.65	+258.00	---
MIN	+272.60	+272.37	+271.50	+269.37	+267.30	+267.23	+267.00	+268.96	+262.61	+260.19	+257.49	+258.69

e Estimated

SITE NUMBER FROM LOCATION MAP.—3.

COUNTY.—Lawrence.

LOCAL WELL NUMBER.—7N1E33CCDD2.

SITE ID (STATION NUMBER).—443100104002002.

OTHER IDENTIFIER.—LA-87B.

LOCATION.—Lat 44°31′05″, long 104°00′20″, in SE¼SE¼SW¼SW¼ sec. 33, T. 7 N., R. 1 E., Hydrologic Unit 10120203, 7 mi west of Spearfish. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 458 ft deep with 434 ft of 5-in. steel casing; open hole from 434 to 458 ft.

INSTRUMENTATION.—Digital water-level recorder -- 60-minute interval.

DATUM.—Elevation of land-surface datum is 3,666.2 ft above sea level. Measuring point: Top of steel casing, 2.30 ft above land-surface datum.

REMARKS.—Current records good. Air pumping during February 1991 may have changed well characteristics, improving sensitivity to water-level changes. Records prior to February 1991 considered poor.

PERIOD OF RECORD.—September 1987 to September 1994.

EXTREMES.—Highest daily water level, 10.02 ft below land-surface datum, July 13, 1988; lowest daily water level, 25.37 ft below land-surface datum, Mar. 17, 1993.

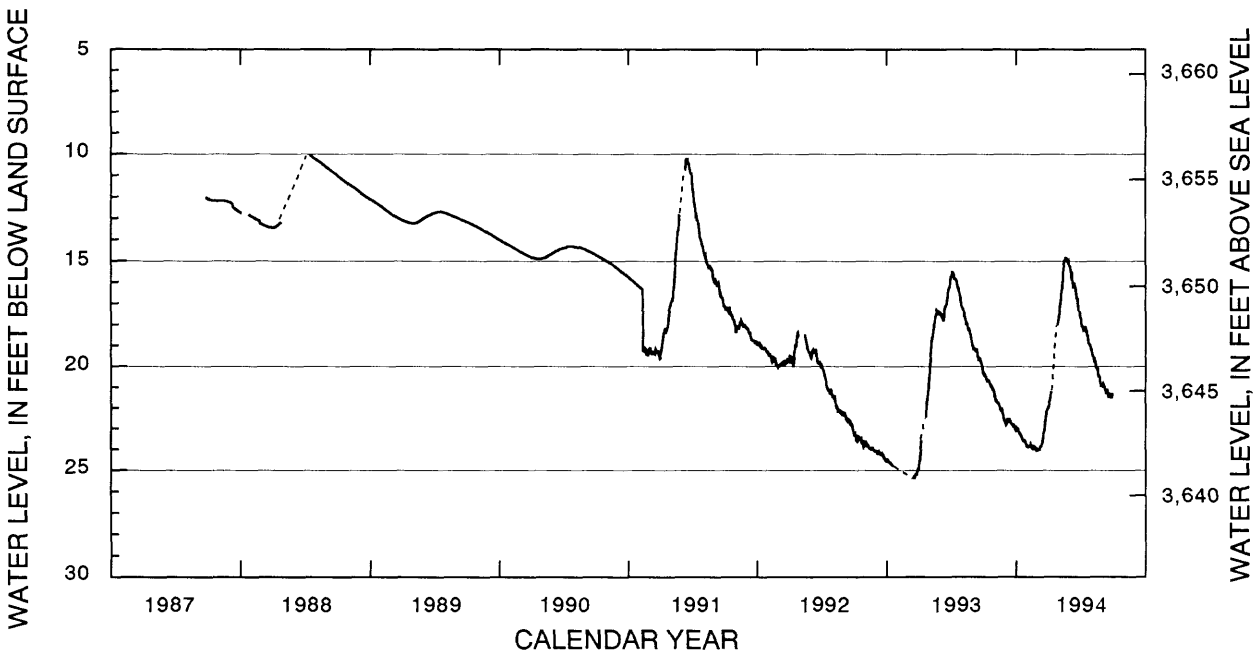


Figure 10. Hydrograph for observation well 7N1E33CCDD2 (site number 3).

SITE NUMBER 3—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23.28	23.69	24.10	24.57	---	---	24.87	20.53	17.44	15.73	17.14	19.03
2	23.38	23.66	24.10	24.45	---	---	24.58	20.32	17.47	15.69	17.19	19.05
3	23.24	23.81	24.14	24.50	---	---	24.58	20.01	17.54	15.64	17.21	19.16
4	23.22	23.83	24.22	24.52	---	---	24.45	19.71	17.58	15.51	17.27	19.16
5	23.33	23.84	24.22	24.58	---	---	24.23	19.45	17.59	15.50	17.25	19.13
6	23.34	23.86	24.17	24.59	---	---	24.12	19.24	17.66	15.54	17.45	19.16
7	23.56	23.85	24.17	24.59	---	---	23.88	18.92	17.66	15.58	17.39	19.19
8	23.56	23.76	24.12	24.62	---	---	e23.58	18.77	17.64	15.59	17.46	19.23
9	23.62	23.79	24.10	24.66	---	---	---	18.64	17.79	15.68	17.68	19.22
10	23.65	23.84	24.14	24.66	---	---	---	18.58	17.79	15.83	17.74	19.23
11	23.65	23.87	24.11	24.60	---	---	---	18.50	17.64	15.82	17.73	19.23
12	23.53	23.95	24.19	24.69	---	---	---	18.36	17.38	15.86	17.81	19.12
13	23.40	23.97	24.26	24.71	---	---	---	18.25	17.30	15.85	17.91	19.22
14	23.42	23.99	24.26	24.71	---	---	---	18.03	17.23	15.86	17.90	19.32
15	23.46	23.98	24.18	24.68	---	---	---	17.93	17.18	15.88	17.93	19.45
16	23.47	23.94	24.24	24.76	---	---	---	17.82	17.10	15.89	17.97	19.69
17	23.52	23.95	24.24	24.76	---	e25.37	---	17.65	17.11	15.95	18.05	19.70
18	23.54	24.00	24.22	24.78	---	25.32	---	17.62	17.08	16.11	18.18	19.66
19	23.50	24.00	24.28	24.78	---	25.35	---	17.56	17.00	16.14	18.15	19.62
20	23.50	23.98	24.28	24.75	---	25.35	---	17.51	16.85	16.27	18.18	19.61
21	23.49	23.98	24.25	---	---	25.26	22.49	17.41	16.72	16.27	18.25	19.62
22	23.66	23.93	24.29	---	---	25.26	22.14	17.31	16.62	16.27	18.25	19.71
23	23.71	23.93	24.46	---	---	25.21	21.88	17.33	16.47	16.41	18.25	19.78
24	23.71	23.99	24.43	---	---	25.19	21.73	17.40	16.42	16.47	18.43	19.84
25	23.77	24.03	24.46	---	---	25.19	21.69	17.45	16.31	16.51	18.45	19.84
26	23.78	24.09	24.43	---	---	25.19	21.54	17.41	16.27	16.59	18.52	19.95
27	23.86	24.11	24.45	---	---	25.08	21.32	17.34	16.19	16.62	18.64	20.05
28	23.90	24.02	24.49	---	---	25.07	21.21	17.36	16.16	16.74	18.71	20.12
29	23.84	24.06	24.41	---	---	25.04	21.05	17.40	15.91	16.88	18.77	20.33
30	23.64	24.05	24.54	---	---	24.95	20.77	17.48	15.75	17.01	18.90	20.34
31	23.67	---	24.58	---	---	24.94	---	17.50	---	17.09	19.00	---
MAX	23.90	24.11	24.58	24.78	---	25.37	24.87	20.53	17.79	17.09	19.00	20.34

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20.26	21.44	22.74	23.00	23.87	24.02	21.95	17.53	15.27	17.69	19.24	20.98
2	20.33	21.49	22.79	23.04	23.85	24.04	21.95	17.47	15.45	17.72	19.29	20.98
3	20.38	21.47	22.83	23.07	23.89	24.02	21.93	17.35	15.44	17.94	19.37	20.86
4	20.44	21.63	22.78	23.08	23.89	24.01	21.74	17.27	15.61	18.02	19.47	20.88
5	20.47	21.66	22.78	22.96	23.88	24.00	21.72	17.11	15.72	18.10	19.47	20.98
6	20.44	21.66	22.75	23.12	23.87	24.01	21.59	16.98	15.67	18.13	19.50	20.93
7	20.46	21.66	22.56	23.12	23.87	24.02	21.49	16.82	15.89	18.12	19.70	20.97
8	20.50	21.73	22.55	23.14	23.85	23.98	21.33	16.52	15.95	18.12	19.66	21.10
9	20.61	21.79	22.63	23.16	23.85	23.90	21.28	16.41	16.03	18.25	19.65	21.18
10	20.66	21.79	22.65	23.24	23.81	23.85	21.24	16.32	16.25	18.24	19.71	21.20
11	20.64	21.77	22.62	23.24	23.77	23.85	21.21	16.15	16.15	18.10	19.75	21.33
12	20.68	21.75	22.52	23.28	23.83	23.90	---	15.83	16.14	18.10	19.85	21.26
13	20.68	21.86	22.62	23.29	23.86	23.85	---	15.51	16.01	18.18	20.06	21.17
14	20.68	21.92	22.63	23.33	23.94	23.76	---	15.32	16.15	18.09	20.06	21.07
15	20.66	21.94	22.65	23.35	23.95	23.77	---	15.22	16.19	18.09	20.09	21.17
16	20.69	22.08	22.70	23.40	23.99	23.67	---	15.00	16.20	18.23	20.05	21.34
17	20.73	22.10	22.75	23.48	23.98	23.46	---	14.99	16.30	18.37	20.05	21.39
18	20.77	22.15	22.76	23.49	23.79	23.46	---	14.96	16.44	18.24	20.14	21.36
19	20.83	22.18	22.81	23.53	23.91	23.22	---	14.94	16.56	18.38	20.36	21.34
20	20.90	22.10	22.81	23.58	23.98	23.20	---	14.84	16.75	18.51	20.54	21.28
21	20.87	22.08	22.85	23.59	23.98	23.15	---	14.86	16.68	18.53	20.48	21.46
22	20.92	22.16	22.85	23.59	23.96	22.91	---	14.85	16.74	18.63	20.46	21.49
23	20.93	22.30	22.93	23.59	23.96	22.65	---	14.90	16.78	18.84	20.49	21.49
24	20.93	22.36	22.92	23.57	23.95	22.64	---	14.92	17.05	18.87	20.56	21.34
25	21.03	22.38	22.92	23.59	24.01	22.48	---	14.92	17.29	18.91	20.77	21.35
26	21.08	22.47	22.88	23.59	23.99	22.30	---	15.02	17.32	18.92	20.82	21.43
27	21.06	22.55	22.93	23.69	23.93	22.18	18.03	15.01	17.35	18.97	20.95	21.49
28	21.07	22.65	23.01	23.71	23.99	22.09	17.91	15.07	17.39	19.02	20.95	21.48
29	21.14	22.66	23.05	23.75	---	22.11	17.82	15.04	17.52	19.00	20.93	21.34
30	21.15	22.68	22.99	23.84	---	22.08	17.70	15.19	17.65	19.15	20.92	21.29
31	21.23	---	22.97	23.84	---	22.02	---	15.24	---	19.15	20.93	---
MAX	21.23	22.68	23.05	23.84	24.01	24.04	21.95	17.53	17.65	19.15	20.95	21.49

e Estimated

SITE NUMBER FROM LOCATION MAP.—4.

COUNTY.—Lawrence.

LOCAL WELL NUMBER.—7N1E33CCDD.

SITE ID (STATION NUMBER).—443100104002001.

OTHER IDENTIFIER.—LA-87A.

LOCATION.—Lat 44°31′05″, long 104°00′20″, in SE¼SE¼SW¼SW¼ sec. 33, T. 7 N., R. 1 E., Hydrologic Unit 10120203, 7 mi west of Spearfish. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Madison.

WELL CHARACTERISTICS.—Drilled observation well, 1,100 ft deep with 1,026 ft of 5-in. steel casing; open hole from 1,026 to 1,100 ft.

INSTRUMENTATION.—Electronic data logger with pressure transducer -- 60-minute interval. Prior to August 1990, circular-chart pressure recorder.

DATUM.—Elevation of land-surface datum is 3,665.48 ft above sea level. Measuring point: Base of gage, 4.2 ft above land-surface datum.

REMARKS.—Records poor.

PERIOD OF RECORD.—October 1987 to September 1994.

EXTREMES.—Highest daily water level, 93.02 ft above land-surface datum, May 20, 1994; lowest daily water level, 58.30 ft above land-surface datum, Mar. 17, 1993.

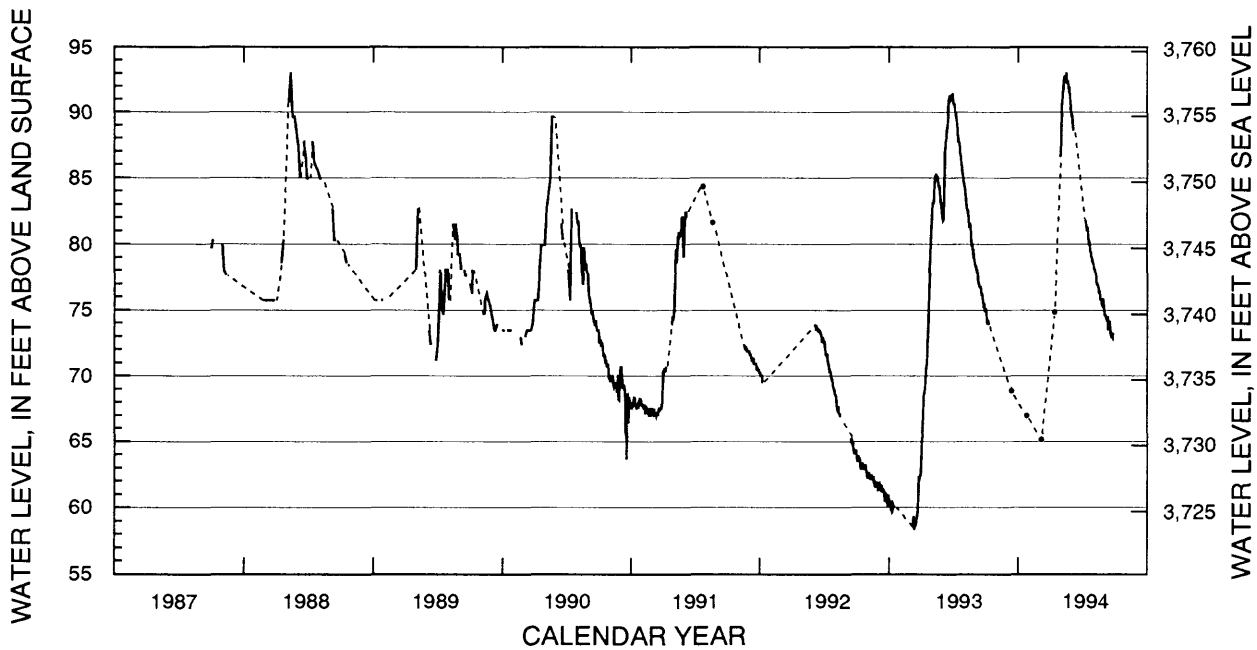


Figure 11. Hydrograph for observation well 7N1E33CCDD (site number 4).

SITE NUMBER 4—Continued

WATER LEVEL, IN FEET (+) ABOVE LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MINIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	+64.25	+62.57	+61.76	+60.38	---	---	+62.17	+78.79	+82.82	+90.90	+85.18	+79.29
2	+64.25	+62.75	+61.60	+60.95	---	---	+62.41	+79.52	+82.52	+91.01	+84.97	+78.90
3	+64.25	+62.29	+61.53	+60.72	---	---	+62.29	+80.33	+82.25	+91.40	+84.71	+78.83
4	+64.18	+62.17	+61.18	+60.38	---	---	+62.80	+81.14	+82.02	+91.13	+84.55	+78.67
5	+63.72	+62.11	+61.46	+60.14	---	---	+63.77	+81.60	+82.06	+90.78	+84.48	+78.49
6	+63.61	+62.29	+61.71	+60.31	---	---	+64.60	+82.25	+81.78	+90.55	+84.25	+78.37
7	+63.37	+62.29	+61.64	+60.38	---	---	+65.17	+82.98	+81.83	+90.48	+84.32	+78.25
8	+63.61	+62.61	+61.88	+60.31	---	---	+65.17	+83.05	+82.18	+90.67	+83.98	+78.32
9	+63.67	+62.45	+61.71	+59.98	---	---	+65.57	+83.05	+83.98	+90.44	+83.63	+77.98
10	+63.61	+62.22	+61.37	+60.03	---	---	+66.37	+83.05	+85.64	+90.09	+83.40	+77.79
11	+63.67	+62.29	+61.71	+60.26	---	---	+67.23	+83.45	+86.86	+89.67	+83.05	+78.09
12	+63.61	+62.11	+61.41	+59.87	---	e+58.53	+67.80	+84.02	+87.71	+89.91	+82.71	+77.68
13	+63.72	+62.11	+61.18	+59.64	---	+58.58	+68.38	+84.48	+87.83	+89.44	+82.59	+77.29
14	+63.49	+62.22	+61.14	+59.68	---	+58.95	+68.68	+84.90	+87.83	+89.17	+82.64	+76.99
15	+62.98	+62.29	+61.64	+60.26	---	+59.29	+68.80	+85.06	+88.29	+89.05	+82.48	+77.10
16	+62.87	+62.41	+61.25	+60.21	---	+58.41	+69.03	+85.06	+88.71	+88.75	+82.48	+76.82
17	+62.87	+62.11	+61.18	+59.98	---	+58.30	+69.26	+85.24	+88.71	+88.41	+82.06	+76.76
18	+62.80	+62.29	+61.25	+59.98	---	+58.88	+69.83	+85.13	+88.87	+88.06	+81.78	+76.71
19	+63.26	+62.11	+61.07	+60.10	---	+58.65	+70.41	+85.06	+89.28	+87.71	+81.37	+76.71
20	+63.14	+62.17	+61.30	+60.10	---	+58.53	+70.71	+85.01	+89.86	+87.71	+81.21	+76.71
21	+63.33	+61.83	+61.25	---	---	+58.76	+70.87	+85.01	+90.37	+87.60	+81.55	+76.59
22	+63.10	+62.29	+61.18	---	---	+58.65	+71.52	+84.90	+90.90	+87.67	+81.44	+76.29
23	+62.80	+61.88	+60.38	---	---	+59.06	+72.44	+84.67	+91.06	+87.44	+81.21	+76.13
24	+62.98	+61.71	+60.95	---	---	+59.15	+73.06	+84.37	+91.01	+86.91	+81.09	+76.13
25	+63.10	+61.53	+60.84	---	---	+59.41	+73.71	+84.25	+90.78	+86.68	+80.52	+76.02
26	+63.10	+61.53	+61.07	---	---	+59.57	+74.63	+84.37	+90.83	+86.56	+80.16	+75.72
27	+62.98	+61.60	+60.95	---	---	+60.21	+75.60	+83.98	+91.13	+86.28	+79.82	+75.72
28	+62.87	+61.94	+60.49	---	---	+60.56	+76.48	+83.68	+91.24	+85.98	+80.05	+75.37
29	+62.98	+61.64	+60.56	---	---	+61.83	+77.33	+83.51	+91.24	+85.94	+79.73	+75.14
30	+63.19	+61.88	+60.26	---	---	+62.34	+78.32	+83.17	+91.01	+85.64	+79.29	+75.48
31	+62.80	---	+59.98	---	---	+62.17	---	+82.94	---	+85.24	+79.25	---
MIN	+62.80	+61.53	+59.98	+59.64	---	+58.30	+62.17	+78.79	+81.78	+85.24	+79.25	+75.14

WATER LEVEL, IN FEET (+) ABOVE LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MINIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	+75.21	---	---	---	---	---	---	---	+90.60	---	+78.67	+75.79
2	+74.98	---	---	---	---	---	---	---	+90.09	---	+78.90	+75.37
3	+75.02	---	---	---	---	---	---	+86.51	+89.63	---	+78.67	+75.49
4	+75.02	---	---	---	---	---	---	+87.21	+89.63	---	+78.55	+74.98
5	+75.02	---	---	---	---	---	---	+87.44	+89.33	---	+78.44	+74.68
6	+74.86	---	---	---	---	---	---	+89.10	+89.40	---	+78.37	+74.56
7	+74.56	---	---	---	---	---	---	+89.91	+89.10	---	+78.09	+74.52
8	+74.06	---	---	---	---	e+65.10	---	+90.67	+88.52	---	+78.02	+74.45
9	+73.87	---	---	---	---	---	---	+90.78	---	---	+78.09	+74.63
10	+74.17	---	---	---	---	---	---	+91.52	---	---	+77.75	+74.29
11	+74.06	---	---	---	---	---	---	+91.47	---	---	+77.75	+74.17
12	+74.06	---	---	---	---	---	e+73.87	+91.98	---	---	+77.45	+74.17
13	+73.94	---	---	---	---	---	---	+92.63	---	+81.83	+77.10	+74.10
14	+73.83	---	e+68.80	---	---	---	e+74.79	+92.74	---	+81.58	+76.99	+74.29
15	---	---	---	---	---	---	---	+92.40	---	+81.48	+76.99	+74.33
16	---	---	---	---	---	---	---	+92.44	---	+81.30	+76.87	+73.48
17	---	---	---	---	---	---	---	+92.79	---	+81.09	+76.87	+73.48
18	---	---	---	---	---	---	---	+92.51	---	+81.12	+76.76	+73.48
19	---	---	---	---	---	---	---	+92.40	---	+81.21	+76.59	+73.53
20	---	---	---	---	---	---	---	+93.02	---	+81.12	+76.36	+73.48
21	---	---	---	---	---	---	---	+92.74	---	+80.56	+76.41	+74.10
22	---	---	---	---	---	---	---	+92.21	---	+80.33	+76.36	+73.48
23	---	---	---	---	---	---	---	+92.21	---	+80.17	+76.06	+73.13
24	---	---	---	---	---	---	---	+92.33	---	+79.87	+75.79	+72.90
25	---	---	---	e+66.95	---	---	---	+92.33	---	+80.17	+75.72	+72.83
26	---	---	---	---	---	---	---	+91.98	---	+79.71	+75.67	+73.25
27	---	---	---	---	---	---	---	+91.70	---	+79.52	+75.60	+72.90
28	---	---	---	---	---	---	---	+91.94	---	+79.41	+75.37	+72.83
29	---	---	---	---	---	---	---	+91.40	---	+79.29	+75.32	+73.02
30	---	---	---	---	---	---	---	+91.36	---	+79.06	+75.44	+73.18
31	---	---	---	---	---	---	---	+91.01	---	+78.95	+75.79	---
MIN	+73.83	---	+68.80	+66.95	---	+65.10	+73.87	+86.51	+88.52	+78.95	+75.32	+72.83

e Estimated

SITE NUMBER FROM LOCATION MAP.—5.

COUNTY.—Lawrence.

LOCAL WELL NUMBER.—6N3E15DDDA.

SITE ID (STATION NUMBER).—442833103434601.

OTHER IDENTIFIER.—LA-88A and Frawley Ranch.

LOCATION.—Lat 44°28′33″, long 103°43′46″, in NE¼SE¼SE¼SE¼, sec. 15, T. 6 N., R. 3 E., Hydrologic Unit 10120203, 6 mi east of Spearfish. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 320 ft deep with 273 ft of 5-in. steel casing; open hole from 273 to 320 ft.

INSTRUMENTATION.—Digital water-level recorder -- 60-minute interval.

DATUM.—Elevation of land-surface datum is 3,760 ft above sea level. Measuring point: Top of steel casing, 2.10 ft above land-surface datum.

REMARKS.—Records good.

PERIOD OF RECORD.—August 1988 to September 1994.

EXTREMES.—Highest daily water level, 226.86 ft below land-surface datum, Aug. 11, 1988; lowest daily water level, 249.67 ft below land-surface datum, Feb. 12-13, 1994.

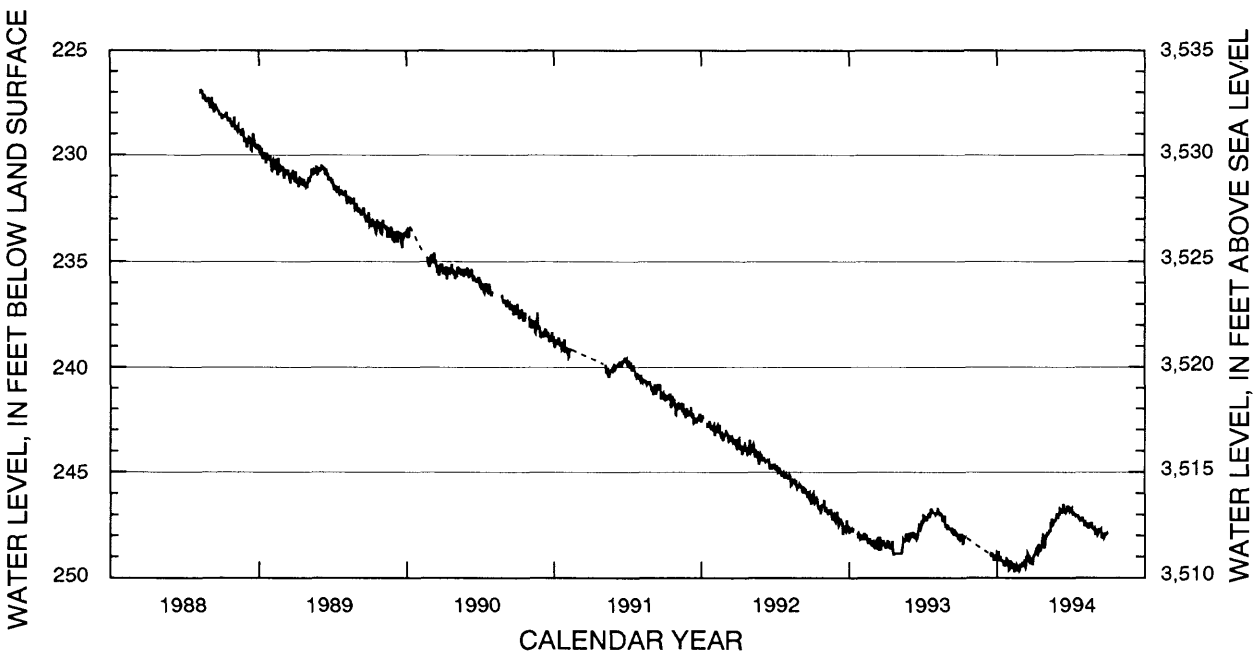


Figure 12. Hydrograph for observation well 6N3E15DDDA (site number 5).

SITE NUMBER 5—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	246.26	246.53	246.98	247.90	248.01	248.26	248.55	248.86	247.85	247.39	247.00	247.46
2	246.09	246.85	246.85	247.67	247.97	248.34	248.37	248.86	247.94	247.32	246.97	247.68
3	246.05	246.75	247.31	247.72	248.18	248.55	248.54	248.86	248.03	247.06	246.97	247.68
4	246.01	246.73	247.32	247.78	248.18	248.58	248.50	248.86	248.03	247.07	246.97	247.59
5	246.45	246.62	247.16	247.79	248.03	248.51	248.22	248.86	247.91	247.18	246.92	247.67
6	246.46	246.73	247.51	247.68	247.93	248.48	248.49	248.86	247.94	247.27	246.89	247.69
7	246.43	246.84	247.49	247.65	247.92	248.33	248.54	248.86	247.83	247.27	246.66	247.70
8	246.41	246.85	247.23	247.71	247.92	248.29	248.54	248.86	247.92	247.18	246.75	247.70
9	246.17	246.97	247.29	247.78	247.95	248.50	248.26	248.86	248.08	247.20	246.92	247.77
10	246.33	246.96	247.29	247.78	248.18	248.50	248.49	248.86	248.08	247.25	246.92	247.79
11	246.33	246.89	247.17	247.63	248.18	248.54	248.55	248.79	247.93	247.25	246.92	247.60
12	246.37	246.85	247.31	---	247.95	248.62	248.61	248.52	247.94	247.13	247.05	247.69
13	246.24	246.73	247.32	---	248.05	248.62	248.59	248.37	248.13	247.13	246.99	247.85
14	246.28	246.83	247.42	---	248.19	248.09	248.55	248.20	248.16	247.13	246.95	247.85
15	246.61	246.82	247.32	---	248.21	248.08	248.55	248.24	247.89	246.98	246.96	247.77
16	246.64	246.96	247.94	---	248.35	248.66	248.49	248.23	248.00	246.97	246.93	247.95
17	246.61	246.72	247.91	---	248.35	248.66	248.51	248.23	248.15	247.03	247.09	247.95
18	246.61	247.08	247.60	---	248.22	248.05	248.27	248.25	248.11	247.10	247.18	247.92
19	246.61	247.15	247.55	---	248.18	248.58	248.81	248.21	247.95	247.11	247.29	247.77
20	246.60	247.21	247.56	---	248.18	248.59	248.89	248.18	247.75	246.98	247.28	247.79
21	246.61	247.21	247.65	247.87	248.18	248.43	248.89	247.95	247.73	246.77	247.15	247.96
22	246.96	247.01	247.50	247.87	248.31	248.44	248.86	247.95	247.53	246.73	247.07	247.99
23	246.86	247.03	247.72	248.13	248.38	248.25	248.86	248.21	247.56	246.73	247.09	247.99
24	246.69	246.98	247.78	248.04	248.34	248.22	248.86	248.24	247.72	246.78	247.09	247.95
25	246.54	247.08	247.67	247.93	248.40	248.35	248.86	248.24	247.74	246.87	247.40	247.98
26	246.54	247.07	247.25	247.96	248.47	248.35	248.86	248.12	247.64	246.87	247.55	248.17
27	246.53	247.31	247.51	247.92	248.47	248.21	248.86	248.04	247.50	246.92	247.56	248.06
28	246.53	247.33	247.72	248.19	248.29	248.36	248.86	248.10	247.35	---	247.48	248.17
29	---	247.10	247.72	248.18	---	248.40	248.86	248.01	247.38	246.96	247.48	248.17
30	246.30	246.98	247.57	248.05	---	248.54	248.86	248.17	247.45	246.95	247.67	247.91
31	246.57	---	247.59	248.03	---	248.56	---	248.13	---	246.97	247.67	---
MAX	246.96	247.33	247.94	248.19	248.47	248.66	248.89	248.86	248.16	247.39	247.67	248.17

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	247.99	---	---	248.85	249.42	249.47	248.92	248.09	247.03	246.68	247.30	247.90
2	248.14	---	---	249.13	249.17	249.47	249.03	247.98	246.99	246.66	247.30	247.81
3	248.11	---	---	249.13	249.25	249.37	248.94	247.95	246.99	246.70	247.36	247.67
4	248.01	---	---	249.13	249.25	249.31	248.80	247.99	246.71	246.67	247.56	247.90
5	247.95	---	---	248.74	249.21	249.24	248.80	247.95	246.74	246.92	247.49	247.98
6	247.94	---	---	249.17	249.51	249.36	248.78	247.93	246.74	246.98	247.26	247.97
7	248.05	---	---	249.17	249.51	249.47	248.64	247.93	246.78	246.99	247.45	247.84
8	248.38	---	---	249.09	249.43	249.41	248.62	247.81	246.89	246.99	247.45	247.70
9	248.38	---	---	249.05	249.43	249.24	248.75	247.82	246.89	246.99	247.37	247.65
10	248.22	---	---	249.18	249.30	249.12	248.90	247.80	246.87	246.94	247.56	247.74
11	248.05	---	---	249.18	249.53	249.46	248.91	247.80	246.87	246.98	247.55	247.73
12	248.07	---	---	249.17	249.67	249.53	248.87	247.78	246.62	247.03	247.40	247.76
13	248.08	---	---	249.13	249.67	249.46	248.39	247.35	246.51	247.09	247.62	247.77
14	e247.99	---	248.81	249.23	249.63	249.07	248.57	247.53	246.57	247.09	247.62	247.71
15	248.06	---	248.82	249.23	249.63	249.11	248.68	247.53	246.84	247.06	247.55	247.99
16	248.07	---	248.87	249.24	249.52	249.00	248.79	247.24	246.84	247.09	247.41	248.10
17	---	---	248.96	249.39	249.50	248.83	248.67	247.24	246.89	247.09	247.43	248.10
18	---	---	248.96	249.39	249.38	248.88	248.61	247.48	246.89	247.00	247.51	247.98
19	---	---	248.85	249.22	249.41	248.94	248.62	247.48	246.70	247.08	247.57	247.96
20	---	---	248.85	249.41	249.63	249.10	248.48	247.24	246.85	247.17	247.57	247.95
21	---	---	248.94	249.41	249.63	249.07	248.43	247.32	246.81	247.19	247.49	248.13
22	---	---	248.94	249.28	249.58	248.95	248.27	247.32	246.61	247.18	247.35	248.11
23	---	---	249.15	249.20	249.48	249.22	248.03	247.29	246.61	247.23	247.64	247.90
24	---	---	249.14	249.03	249.47	249.36	247.97	247.29	246.59	247.21	247.64	247.98
25	---	---	249.01	249.14	249.63	249.28	247.98	247.21	246.61	247.24	247.66	247.99
26	---	---	248.94	249.14	249.60	249.21	248.31	247.15	246.62	247.28	247.67	247.92
27	---	---	249.09	249.36	249.38	249.23	248.56	246.98	246.72	247.28	247.72	247.89
28	---	---	249.13	249.36	249.38	249.19	248.56	246.97	246.82	247.20	247.72	247.89
29	---	---	249.20	249.43	---	249.35	248.50	246.96	246.81	247.14	247.66	247.88
30	---	---	249.01	249.63	---	249.35	248.35	247.11	246.67	247.10	247.91	247.97
31	---	---	248.83	249.61	---	249.04	---	247.19	---	247.22	247.92	---
MAX	248.38	---	249.20	249.63	249.67	249.53	249.03	248.09	247.03	247.28	247.92	248.13

e Estimated

SITE NUMBER FROM LOCATION MAP.—6.

COUNTY.—Lawrence.

LOCAL WELL NUMBER.—6N2E14BCCC2.

SITE ID (STATION NUMBER).—442854103505602.

OTHER IDENTIFIER.—LA-88C.

LOCATION.—Lat 44°28′54″, long 103°50′56″, in SW¼SW¼SW¼NW¼ sec. 14, T. 6 N., R. 2 E., Hydrologic Unit 10120203, at Spearfish. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Madison.

WELL CHARACTERISTICS.—Drilled observation well, 680 ft deep with 570 ft of 5-in. steel casing; open hole from 570 to 680 ft.

INSTRUMENTATION.—Digital water-level recorder -- 60-minute interval.

DATUM.—Elevation of land-surface datum is 3,725 ft above sea level. Measuring point: Top of steel casing, 1.75 ft above land-surface datum.

REMARKS.—Records prior to February 1991 fair. Air pumping in February 1991 may have caused change in water level of about 7 ft. Records since pumping are good.

PERIOD OF RECORD.—August 1988 to September 1994.

EXTREMES.—Highest daily water level, 78.91 ft below land-surface datum, June 25, 1991; lowest daily water level, 115.48 ft below land-surface datum, Mar. 28, 1993.

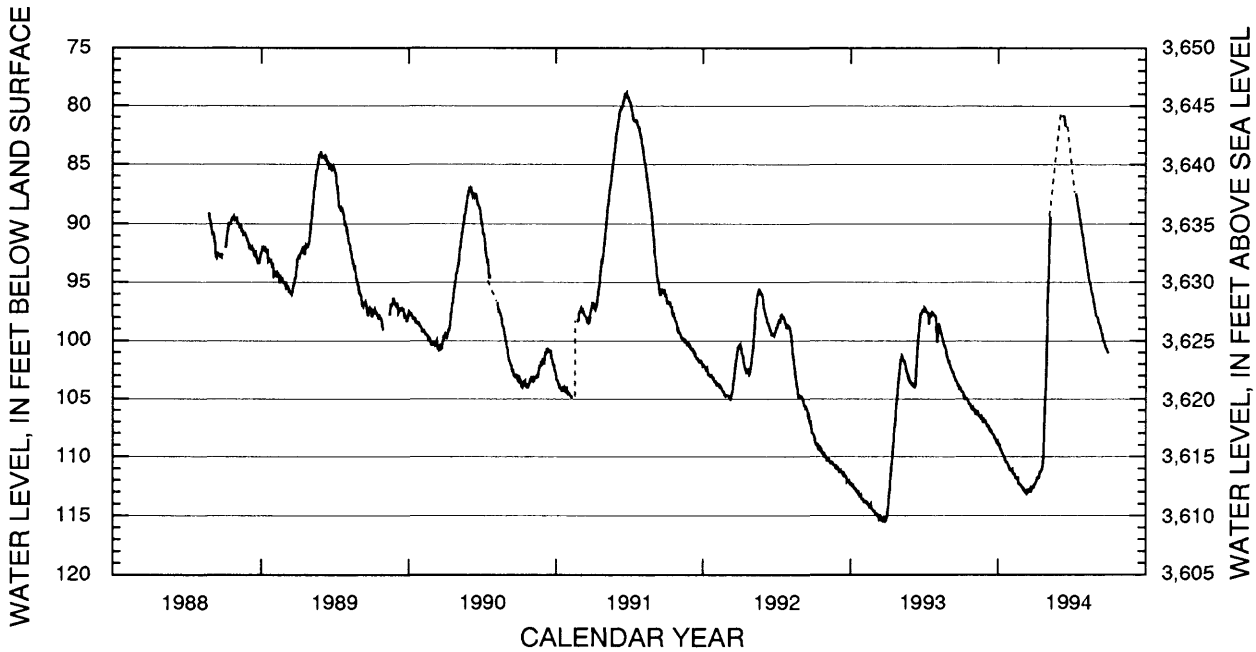


Figure 13. Hydrograph for observation well 6N2E14BCCC2 (site number 6).

SITE NUMBER FROM LOCATION MAP.—7.

COUNTY.—Lawrence.

LOCAL WELL NUMBER.—6N2E14BCCC.

SITE ID (STATION NUMBER).—442854103505601.

OTHER IDENTIFIER.—LA-88B.

LOCATION.—Lat 44°28′54″, long 103°50′56″, in SW¼SW¼SW¼NW¼ sec. 14, T. 6 N., R. 2 E., Hydrologic Unit 10120203, at Spearfish. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 222 ft deep with 5-in. steel casing to 189 ft. Originally drilled to 497 ft but lost drill stem and was plugged back to 222 ft with cement grout. Open hole from 189 to 222 ft.

INSTRUMENTATION.—Digital water-level recorder -- 60-minute interval.

DATUM.—Elevation of land-surface datum is 3,725 ft above sea level. Measuring point: Top of steel casing, 1.07 ft above land-surface datum.

REMARKS.—Records good. Water levels affected by pumping of nearby well.

PERIOD OF RECORD.—August 1988 to September 1994.

EXTREMES.—Highest daily water level, 67.52 ft below land-surface datum, May 15, 1994; lowest daily water level, 89.20 ft below land-surface datum, Sept. 25-27, 30 and Oct. 21-23, 1992.

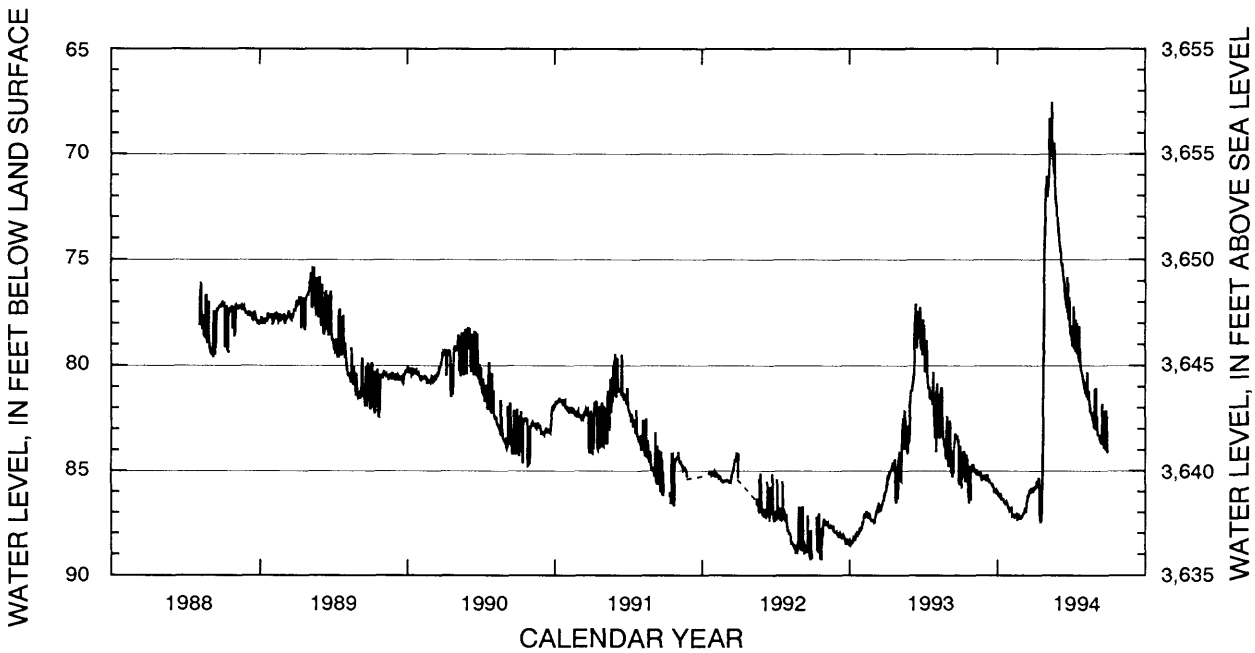


Figure 14. Hydrograph for observation well 6N2E14BCCC (site number 7).

SITE NUMBER 7—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	87.48	88.00	88.41	87.74	87.36	85.88	84.80	81.22	77.82	82.61	84.53
2	---	87.39	88.00	88.33	87.51	87.43	85.67	84.45	81.21	79.23	84.08	84.80
3	---	87.60	88.09	88.40	87.51	87.49	85.73	84.21	81.16	79.46	83.12	83.16
4	---	87.60	88.12	88.40	87.44	87.48	85.62	84.14	81.15	78.07	81.20	82.76
5	---	87.52	88.06	88.51	87.28	87.32	85.37	84.15	80.91	79.91	80.85	82.69
6	---	87.55	88.05	88.44	87.15	87.23	85.41	85.30	80.91	80.29	82.42	82.70
7	---	87.50	88.05	88.34	87.07	87.06	85.41	85.46	80.74	80.08	82.74	84.07
8	---	87.48	88.00	88.45	87.07	86.96	85.34	85.50	80.47	78.94	83.10	84.59
9	---	87.66	88.16	88.45	87.07	86.91	85.13	85.52	80.33	80.04	83.30	85.05
10	---	87.69	88.16	88.36	87.15	86.91	85.16	83.76	79.12	78.79	83.38	85.10
11	---	87.72	88.08	88.26	87.13	86.84	85.10	83.07	78.01	80.41	83.43	84.99
12	87.21	87.73	88.16	88.30	86.95	86.89	85.07	82.48	77.28	80.55	82.13	85.29
13	88.85	87.73	88.19	88.30	87.02	86.68	84.98	83.54	77.07	80.85	81.54	84.03
14	88.92	87.71	88.12	88.25	87.09	86.53	84.90	83.81	78.68	80.99	81.18	84.76
15	87.30	87.68	88.10	88.16	87.11	86.70	84.85	83.96	78.90	81.09	81.10	85.12
16	87.27	87.64	88.14	88.23	87.24	86.97	84.77	82.58	79.19	80.99	81.03	83.95
17	87.09	87.65	88.09	88.18	87.24	86.91	84.77	82.13	77.91	81.21	81.20	83.55
18	87.09	87.73	88.16	88.12	87.14	86.64	84.60	82.14	77.55	81.51	82.95	83.38
19	88.90	87.72	88.23	88.03	87.07	86.87	84.89	83.68	77.44	81.60	83.42	83.25
20	89.18	87.77	88.20	87.97	87.10	86.86	84.90	83.81	78.26	81.32	83.50	83.25
21	89.20	87.78	88.26	88.01	87.25	86.70	84.89	83.87	78.59	81.20	83.50	83.35
22	89.20	87.61	88.42	87.99	87.36	86.69	84.54	83.94	78.59	81.32	83.75	83.38
23	89.20	87.89	88.55	88.05	87.39	86.53	84.44	84.07	78.67	81.58	83.84	83.38
24	88.20	87.94	88.37	88.01	87.36	86.47	86.34	84.12	77.22	81.65	83.91	83.31
25	88.68	87.94	88.36	87.87	87.39	86.45	86.51	84.07	78.76	81.84	84.22	83.43
26	87.72	87.96	88.26	87.88	87.42	86.41	86.50	82.81	79.06	80.30	84.36	83.56
27	88.18	87.96	88.37	87.75	87.42	86.19	85.07	83.43	79.22	81.80	84.43	83.52
28	87.56	87.93	88.38	87.91	87.37	86.21	86.09	83.59	79.30	82.05	83.06	85.49
29	87.40	87.94	88.32	87.87	---	86.14	86.26	83.56	79.51	82.83	82.38	85.65
30	87.29	87.90	88.53	87.76	---	86.02	86.34	81.81	78.02	83.40	83.97	84.07
31	87.48	---	88.54	87.77	---	86.00	---	81.57	---	82.15	84.22	---
MAX	89.20	87.96	88.55	88.51	87.74	87.49	86.51	85.52	81.22	83.40	84.43	85.65

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	83.83	84.84	85.30	85.99	86.84	87.28	85.86	71.63	73.86	78.59	80.84	81.04
2	83.85	84.84	85.35	86.16	86.81	87.24	85.92	71.46	74.15	78.63	80.82	82.21
3	85.49	84.67	85.36	86.17	86.89	87.15	85.79	71.05	74.23	78.77	81.03	82.67
4	85.81	84.99	85.16	86.17	86.88	87.11	85.81	71.99	74.39	78.83	81.16	83.11
5	85.44	84.99	85.37	86.04	86.85	87.06	85.78	71.99	74.63	79.05	81.13	83.28
6	85.24	84.91	85.37	86.30	87.11	87.05	85.68	71.77	74.67	79.06	81.13	83.27
7	84.09	84.94	85.24	86.25	87.10	87.04	85.61	71.43	75.09	77.37	81.27	83.29
8	84.21	85.02	85.19	86.28	87.09	86.95	85.67	70.83	75.27	77.20	81.37	83.31
9	84.21	85.08	85.45	86.22	87.09	86.86	85.67	70.65	75.15	78.83	81.47	83.32
10	84.03	85.03	85.49	86.36	87.10	86.79	85.75	68.30	75.27	78.94	80.30	83.50
11	84.06	84.97	85.42	86.36	87.20	86.92	85.74	69.55	75.54	79.26	81.09	83.55
12	84.14	84.97	85.43	86.36	87.24	86.93	85.59	69.55	75.78	79.35	81.50	83.63
13	84.21	85.17	85.55	86.35	87.23	86.75	85.31	69.48	75.79	77.82	81.62	83.67
14	85.52	85.23	85.55	86.37	87.21	86.52	85.40	69.53	75.97	79.08	81.19	83.69
15	84.36	85.12	85.56	86.37	87.21	86.51	87.16	67.52	76.51	79.37	81.56	83.72
16	84.25	85.16	85.59	86.44	87.18	86.28	87.37	69.19	76.74	79.46	81.80	82.03
17	84.21	85.16	85.67	86.50	87.10	86.19	87.38	69.95	76.90	78.01	81.92	81.80
18	84.51	85.19	85.67	86.49	86.99	86.19	87.49	70.46	76.68	79.13	82.14	83.29
19	84.39	85.20	85.68	86.55	87.21	86.10	87.40	70.53	77.09	79.57	82.22	83.63
20	84.44	85.09	85.67	86.60	87.31	86.12	86.90	70.68	77.26	79.76	82.28	83.75
21	86.03	85.05	85.79	86.56	87.30	85.99	86.00	70.95	77.29	79.84	82.23	83.90
22	86.44	85.19	85.76	86.49	87.18	85.86	85.56	69.45	77.47	78.13	82.26	82.14
23	86.55	85.42	85.93	86.47	87.16	85.97	83.17	71.54	75.82	79.67	82.56	83.09
24	84.84	85.44	85.89	86.55	87.25	85.99	80.00	71.85	77.34	79.94	82.59	83.84
25	84.77	85.41	85.89	86.60	87.34	85.83	79.21	72.20	77.80	80.16	82.73	83.95
26	86.36	85.31	85.94	86.60	87.26	85.79	75.83	72.36	77.83	80.26	82.75	83.98
27	86.42	85.31	85.97	86.74	87.16	85.93	74.63	72.51	76.78	80.30	82.94	82.50
28	84.80	85.39	86.05	86.74	87.25	85.93	73.50	72.91	78.04	80.37	82.95	82.12
29	84.85	85.38	86.06	86.83	---	86.04	72.73	73.10	78.18	80.47	81.10	83.69
30	84.81	85.28	85.94	86.90	---	85.95	72.10	73.40	78.49	80.58	82.30	84.17
31	84.65	---	85.98	86.86	---	85.85	---	73.62	---	80.76	82.73	---
MAX	86.55	85.44	86.06	86.90	87.34	87.28	87.49	73.62	78.49	80.76	82.95	84.17

SITE NUMBER 6—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	108.12	110.09	111.04	112.32	113.62	114.57	115.13	102.72	103.56	97.43	99.00	101.74
2	108.18	110.06	111.05	112.17	113.69	114.67	114.68	102.41	103.72	97.38	100.12	102.07
3	108.27	110.33	111.17	112.34	113.86	114.83	114.46	101.99	103.80	97.14	99.80	102.12
4	108.47	110.33	111.25	112.39	113.86	114.84	114.21	101.65	103.84	97.21	99.26	102.24
5	108.76	110.26	111.24	112.51	113.82	114.86	113.63	101.63	103.81	97.33	98.79	102.35
6	108.80	110.27	111.17	112.51	113.78	114.86	113.27	101.47	103.91	97.42	98.74	102.44
7	108.92	110.27	111.17	112.47	113.78	114.84	112.97	101.24	103.80	97.41	98.61	102.52
8	108.88	110.15	111.16	112.61	113.80	114.87	112.55	101.28	103.78	97.46	98.71	102.51
9	108.92	110.32	111.31	112.66	113.81	114.99	112.01	101.53	103.91	97.50	98.91	102.69
10	109.02	110.41	111.35	112.67	113.98	115.09	111.50	101.68	103.82	97.59	98.99	102.78
11	109.11	110.43	111.35	112.57	113.98	115.14	111.18	101.68	103.21	97.66	99.20	102.62
12	109.16	110.51	111.45	112.76	113.92	115.25	110.79	101.73	102.33	97.50	99.40	102.85
13	109.06	110.54	111.54	112.80	114.05	115.13	110.42	101.73	101.74	98.59	99.46	103.06
14	109.17	110.51	111.53	112.78	114.12	114.95	109.97	101.85	e101.25	97.76	99.63	103.12
15	109.37	110.50	111.42	112.76	114.18	114.96	109.55	102.07	e100.50	97.68	99.77	103.17
16	109.41	110.46	111.54	112.93	114.31	115.37	109.06	102.16	99.92	97.69	99.84	103.38
17	109.38	110.50	111.52	112.94	114.31	115.37	108.64	102.38	99.62	97.79	100.07	103.41
18	109.41	110.60	111.59	113.02	114.25	115.12	108.08	102.54	99.31	97.79	100.20	103.44
19	109.28	110.60	111.69	113.02	114.13	115.41	107.50	102.71	98.87	97.85	100.36	103.41
20	109.33	110.68	111.69	112.99	114.05	115.42	107.40	102.76	98.46	97.74	100.43	103.49
21	109.36	110.68	111.72	113.17	114.23	115.36	107.08	102.77	98.18	97.61	100.43	103.63
22	109.63	110.62	111.85	113.17	114.38	115.37	106.33	102.91	97.84	97.64	100.50	103.74
23	109.76	110.82	112.08	113.37	114.45	115.29	105.67	103.12	97.71	97.61	100.65	103.80
24	109.76	110.93	112.02	113.37	114.44	115.36	105.26	103.34	97.70	97.64	100.76	103.78
25	109.71	110.95	112.06	113.31	114.50	115.45	105.05	103.40	97.71	97.72	101.08	103.88
26	109.74	111.00	112.01	113.34	114.56	115.43	104.63	103.34	97.59	97.77	101.28	104.05
27	e109.61	111.02	112.11	113.31	114.56	115.36	104.11	103.44	97.49	97.75	101.44	104.04
28	e109.98	110.90	112.18	113.57	114.57	115.48	103.82	103.50	97.39	97.89	101.40	104.15
29	109.99	110.96	112.11	113.57	---	115.44	103.46	103.56	97.34	97.90	101.55	104.16
30	109.84	110.93	112.34	113.56	---	115.34	102.96	103.71	97.47	97.89	101.76	104.11
31	110.03	---	112.36	113.63	---	115.28	---	103.72	---	99.23	101.73	---
MAX	110.03	111.02	112.36	113.63	114.57	115.48	115.13	103.72	103.91	99.23	101.76	104.16

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	104.26	105.94	107.06	108.82	111.11	112.65	112.35	99.65	---	---	91.86	97.95
2	104.34	105.99	107.17	109.01	111.12	112.68	112.36	98.38	---	---	92.04	98.05
3	104.36	105.85	107.25	109.08	111.19	112.67	112.26	97.14	---	---	92.35	97.94
4	104.38	106.11	107.13	109.09	111.19	112.66	112.14	96.04	---	---	92.66	98.25
5	104.41	106.18	107.36	109.06	111.16	112.80	112.13	94.83	---	---	92.76	98.46
6	104.48	106.13	107.38	109.40	111.44	112.92	112.01	93.72	---	---	92.92	98.52
7	104.61	106.08	107.33	109.40	111.43	112.98	111.80	92.65	---	---	93.25	98.58
8	104.86	106.22	107.33	109.45	111.43	112.98	111.74	91.32	---	---	93.46	98.66
9	104.92	106.32	107.58	109.47	111.43	112.93	111.74	90.38	80.78	---	93.70	98.70
10	104.82	106.32	107.69	109.68	111.45	112.88	111.81	89.36	80.88	---	94.05	98.92
11	104.83	106.25	107.69	109.72	111.65	113.10	111.78	---	80.90	---	94.17	99.07
12	104.90	106.18	107.59	109.77	111.76	113.16	111.64	---	80.93	87.41	94.34	99.21
13	104.92	106.37	107.86	109.85	111.76	113.07	111.32	---	80.93	87.66	94.69	99.36
14	104.93	106.46	107.89	109.94	111.83	112.96	111.29	---	81.21	87.81	94.87	99.41
15	105.01	106.48	107.87	109.99	111.83	112.99	111.32	---	81.55	88.07	94.88	99.73
16	105.05	106.56	107.95	110.08	111.89	112.85	111.29	---	81.69	88.33	95.02	99.94
17	105.08	106.60	108.05	110.23	111.84	112.79	111.14	---	81.69	88.49	95.25	100.03
18	105.16	106.59	108.08	110.23	111.68	112.79	111.08	---	81.70	88.55	95.45	100.02
19	105.26	106.67	108.09	110.32	112.06	112.78	111.04	---	---	88.88	95.67	100.11
20	105.43	106.64	108.10	110.45	112.28	112.86	110.83	---	---	89.13	95.84	100.20
21	105.41	106.55	108.29	110.45	112.28	112.80	110.71	---	---	89.37	95.89	100.46
22	105.41	106.70	108.29	110.47	112.31	112.70	110.06	---	---	89.54	96.03	100.52
23	105.46	106.94	108.44	110.47	112.31	112.83	109.03	---	---	89.81	96.25	100.47
24	105.46	107.00	108.48	110.56	112.42	112.85	107.92	---	---	90.02	96.45	100.60
25	105.72	107.00	108.49	110.68	112.47	112.75	106.53	---	---	90.28	96.72	100.72
26	105.78	106.91	108.59	110.74	112.47	112.59	105.09	---	---	90.51	96.82	100.69
27	105.75	106.84	108.71	110.91	112.43	112.71	104.75	---	---	90.66	97.11	100.84
28	105.75	106.97	108.79	110.91	112.56	112.58	104.11	---	---	90.84	97.25	100.91
29	105.90	106.98	108.86	111.05	---	112.71	102.59	---	---	91.04	97.40	101.01
30	105.91	106.94	108.79	111.16	---	112.58	101.14	---	---	91.26	97.70	101.09
31	105.77	---	108.74	111.15	---	112.43	---	---	---	91.56	97.84	---
MAX	105.91	107.00	108.86	111.16	112.56	113.16	112.36	99.65	81.70	91.56	97.84	101.09

e Estimated

SITE NUMBER FROM LOCATION MAP.—8.

COUNTY.—Lawrence.

LOCAL WELL NUMBER.—6N2E5BBBB2.

SITE ID (STATION NUMBER).—443100103543002.

OTHER IDENTIFIER.—LA-86B.

LOCATION.—Lat 44°31′05″, long 103°54′36″, in NW¼NW¼NW¼NW¼ sec. 5, T. 6 N., R. 2 E., Hydrologic Unit 10120203, 1 mi west of Spearfish. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnekahta.

WELL CHARACTERISTICS.—Drilled observation well, 290 ft deep with 263 ft of 5-in. steel casing; open hole from 263 to 290 ft.

INSTRUMENTATION.—Digital water-level recorder -- 60-minute interval.

DATUM.—Elevation of land-surface datum is 3,675.23 ft above sea level. Measuring point: Top of steel casing, 0.97 ft above land-surface datum.

REMARKS.—Records good. Water levels affected by pumping of nearby well.

PERIOD OF RECORD.—July 1986 to September 1994.

EXTREMES.—Highest daily water level, 84.79 ft below land-surface datum, July 14, 1993; lowest daily water level, 143.90 ft below land-surface datum, Dec. 31, 1992.

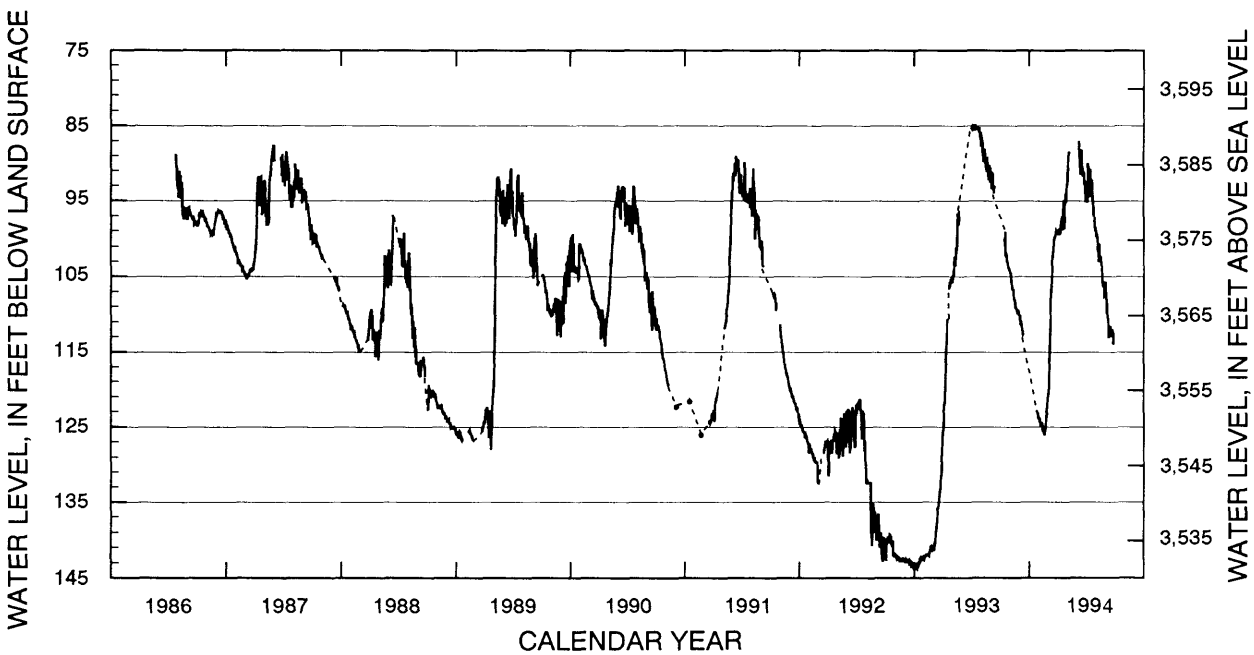


Figure 15. Hydrograph for observation well 6N2E5BBBB2 (site number 8).

SITE NUMBER 8—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	142.23	142.05	142.57	143.69	142.37	141.30	126.51	105.10	---	85.44	87.70	91.82
2	141.83	142.01	142.58	143.77	142.28	141.01	125.63	105.79	---	85.34	86.49	91.33
3	141.55	142.13	142.91	143.74	142.49	141.34	125.45	105.59	---	85.21	86.26	93.37
4	142.80	142.03	142.89	143.57	142.42	140.99	124.66	105.19	---	85.45	87.06	93.04
5	141.41	142.00	142.91	143.39	142.00	140.86	122.65	104.69	---	85.49	87.23	91.08
6	140.41	142.11	142.75	143.00	142.29	141.41	122.72	104.83	---	85.45	86.88	91.38
7	140.16	142.43	142.66	143.48	142.11	141.03	121.93	103.97	---	85.16	88.49	91.96
8	139.99	142.32	142.85	143.46	142.06	140.31	121.87	103.07	---	84.84	88.91	93.21
9	140.02	142.30	142.63	143.64	141.94	140.49	120.68	103.08	---	85.25	89.77	92.92
10	140.43	142.42	142.95	143.75	141.97	139.92	117.91	102.30	---	85.05	89.21	93.64
11	139.99	142.35	142.51	143.55	142.13	139.09	117.11	103.17	---	85.62	89.02	93.99
12	139.63	142.55	142.91	143.55	141.81	138.68	115.64	103.23	---	85.19	87.99	93.55
13	139.86	142.42	142.90	143.17	141.92	138.23	114.31	102.83	---	84.99	88.32	93.00
14	139.48	142.52	142.71	142.97	142.06	137.90	112.96	102.36	---	84.79	88.66	---
15	139.60	142.91	142.98	143.13	142.21	137.21	111.21	101.07	---	85.46	89.18	---
16	139.32	142.75	142.88	142.77	142.07	135.81	110.59	101.48	---	85.00	90.04	---
17	139.39	142.45	142.80	143.07	141.93	136.08	---	100.04	---	85.19	90.40	---
18	139.95	142.52	142.95	143.05	141.99	135.87	---	96.86	---	85.08	91.00	---
19	139.91	142.66	143.17	142.53	141.72	135.66	---	96.72	---	85.34	91.00	---
20	139.84	142.79	143.26	142.53	141.38	135.48	---	97.86	---	85.24	89.46	---
21	140.63	142.40	142.80	142.52	141.51	135.04	---	98.18	---	85.25	90.37	---
22	140.53	142.78	143.64	142.41	141.33	134.55	106.67	97.31	---	85.29	89.13	---
23	140.82	142.78	143.42	142.52	140.94	134.06	105.66	97.62	---	85.55	91.53	---
24	140.81	142.68	143.22	142.66	140.85	133.55	106.21	96.35	---	85.17	91.67	---
25	140.52	142.41	143.46	142.61	141.13	133.29	106.29	---	---	85.46	92.16	---
26	140.12	142.56	143.50	142.36	141.43	132.00	105.45	---	---	85.33	91.46	---
27	142.19	142.52	143.51	142.62	141.42	131.83	105.44	---	---	85.28	91.28	---
28	142.02	142.61	143.28	142.54	141.43	131.37	105.77	---	---	85.75	91.87	---
29	141.92	142.67	143.36	142.34	---	130.25	105.40	---	---	86.50	92.52	---
30	141.79	142.55	143.51	142.40	---	128.97	105.16	---	85.47	86.37	90.22	---
31	141.80	---	143.90	142.58	---	127.93	---	---	---	85.80	92.17	---
MAX	142.80	142.91	143.90	143.77	142.49	141.41	126.51	105.79	85.47	86.50	92.52	93.99

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	104.49	110.11	---	123.84	121.53	99.32	92.81	---	93.85	99.62	105.76
2	---	104.51	110.72	---	123.94	121.09	99.03	92.45	---	93.46	98.94	107.72
3	---	104.34	110.11	---	124.42	120.83	98.89	91.13	---	93.72	99.69	107.01
4	---	105.03	110.52	---	123.86	120.28	98.97	90.52	---	95.05	99.34	107.67
5	---	105.27	111.38	---	124.35	119.05	98.83	89.86	---	95.17	99.83	108.32
6	---	105.93	111.00	---	124.77	117.66	98.63	89.15	---	93.49	99.81	109.72
7	---	106.05	111.10	---	124.75	115.63	98.81	89.01	---	89.96	101.46	110.36
8	---	106.19	111.67	---	124.81	114.38	98.67	88.40	87.03	90.55	101.36	110.69
9	---	106.54	111.85	---	124.86	111.91	99.42	---	89.04	92.27	101.51	110.92
10	---	106.81	112.13	---	124.61	109.64	98.98	---	88.77	93.49	101.92	112.32
11	---	106.57	112.13	---	124.40	108.11	98.28	---	90.17	94.26	102.97	113.10
12	---	106.90	112.54	---	125.10	107.21	97.50	---	91.49	94.38	100.61	112.78
13	---	107.58	112.82	---	125.47	106.04	97.39	---	90.68	93.82	101.60	112.36
14	99.96	107.81	112.82	---	125.46	105.36	97.44	---	90.19	90.71	102.39	111.63
15	100.14	107.81	---	---	125.52	104.65	97.01	---	90.24	92.71	102.60	111.96
16	100.87	108.04	---	---	125.67	102.86	97.70	---	88.20	92.19	102.62	111.63
17	99.06	108.14	---	---	125.92	102.28	98.82	---	88.22	93.77	102.27	111.66
18	102.23	108.68	---	---	125.76	101.87	97.67	---	89.75	93.71	102.69	112.76
19	101.83	108.58	---	---	126.10	101.52	98.77	---	90.68	93.04	103.41	112.76
20	101.72	108.94	---	---	125.69	100.73	96.16	---	91.63	92.17	104.26	112.83
21	102.26	109.22	---	---	125.17	100.46	94.86	---	91.64	94.79	104.77	112.93
22	102.25	109.12	---	---	125.17	99.96	98.70	---	91.22	94.70	105.73	112.05
23	102.96	109.41	---	---	124.63	99.86	98.57	---	91.08	95.39	106.07	112.11
24	102.95	109.44	---	---	123.59	99.63	95.87	---	91.47	96.83	106.28	112.53
25	103.15	109.86	---	---	123.64	99.61	95.06	---	92.76	96.83	106.06	112.53
26	103.07	109.27	---	122.78	122.77	99.01	95.03	---	92.75	95.73	105.61	113.79
27	103.83	109.40	---	123.02	122.67	99.28	94.22	---	92.32	96.81	107.15	113.79
28	103.87	109.79	---	123.21	121.80	98.94	93.92	---	93.87	98.55	107.46	113.79
29	103.95	109.72	---	123.69	---	99.01	95.18	---	94.17	98.43	107.35	113.79
30	104.13	109.86	---	123.62	---	99.20	93.35	---	95.14	98.98	107.38	113.79
31	104.30	---	---	123.79	---	99.31	---	---	---	98.49	105.86	---
MAX	104.30	109.86	112.82	123.79	126.10	121.53	99.42	92.81	95.14	98.98	107.46	113.79

SITE NUMBER FROM LOCATION MAP.—9.

COUNTY.—Lawrence.

LOCAL WELL NUMBER.—6N2E5BBBB.

SITE ID (STATION NUMBER).—443100103543001.

OTHER IDENTIFIER.—LA-86A.

LOCATION.—Lat 44°31'05", long 103°54'36", in NW¼NW¼NW¼NW¼ sec. 5, T. 6 N., R. 2 E., Hydrologic Unit 10120203, 1 mi west of Spearfish. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 430 ft deep with 404 ft of 5-in. steel casing. Prior to May 24, 1994, open hole from 404 to 430 ft; after May 24, 1994, 3-in. PVC with 18-slot screen from 404 to 430 ft.

INSTRUMENTATION.—Digital water-level recorder -- 60-minute interval.

DATUM.—Elevation of land-surface datum is 3,675.86 ft above sea level. Measuring point: Top of steel casing, 1.06 ft above land-surface datum.

REMARKS.—Records fair. Air pumping in July 1989 may have changed well characteristics. Cleaning and screening on May 24, 1994, has improved sensitivity to water-level changes.

PERIOD OF RECORD.—July 1986 to September 1994.

EXTREMES.—Highest daily water level, 121.73 ft below land-surface datum, Dec. 25, 1986; lowest daily water level, 140.83 ft below land-surface datum, Aug. 27, 1994.

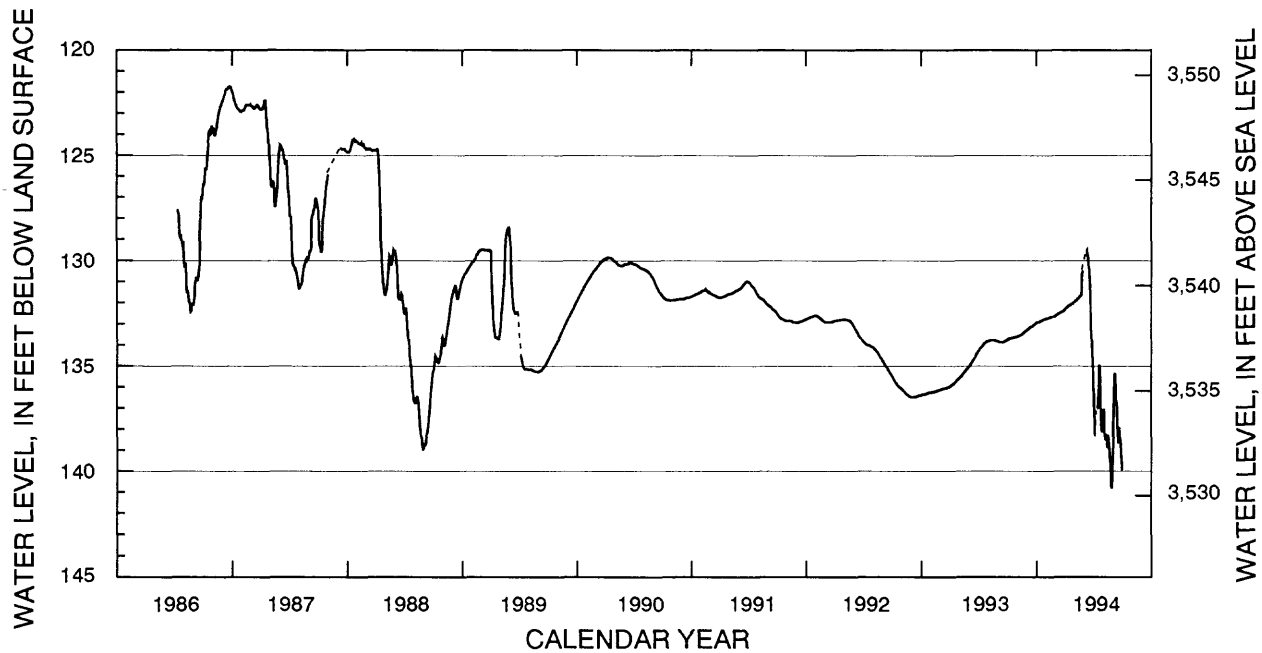


Figure 16. Hydrograph for observation well 6N2E5BBBB (site number 9).

SITE NUMBER 9—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	135.52	136.11	136.49	136.40	136.26	136.14	135.98	135.61	135.03	134.31	133.82	133.84
2	135.54	136.14	136.49	136.39	136.25	136.13	135.97	135.60	135.02	134.30	133.81	133.84
3	135.58	136.14	136.49	136.36	136.25	136.13	135.96	135.57	135.00	134.26	133.81	133.85
4	135.60	136.15	136.49	136.36	136.25	136.12	135.95	135.55	134.98	134.23	133.81	133.86
5	135.62	136.17	136.49	136.36	136.24	136.12	135.94	135.51	134.95	134.21	133.80	133.86
6	135.64	136.19	136.49	136.36	136.24	136.11	135.93	135.50	134.93	134.19	133.80	133.87
7	135.67	136.21	136.49	136.36	136.23	136.11	135.93	135.50	134.91	134.17	133.79	133.87
8	135.71	136.23	136.49	136.36	136.23	136.11	135.91	135.49	134.87	134.16	133.78	133.87
9	135.73	136.24	136.47	136.36	136.23	136.10	135.90	135.49	134.85	134.13	133.78	133.87
10	135.76	136.26	136.47	136.36	136.23	136.09	135.88	135.44	134.85	134.11	133.78	133.87
11	135.79	136.27	136.47	136.35	136.23	136.09	135.87	135.43	134.82	134.10	133.78	133.87
12	135.81	136.29	136.46	136.35	136.22	136.09	135.85	135.40	134.78	134.10	133.78	133.87
13	135.82	136.31	136.46	136.35	136.22	136.09	135.85	135.39	134.77	134.07	133.78	133.87
14	135.83	136.32	136.46	136.34	136.21	136.09	135.85	135.37	134.74	134.05	133.78	133.87
15	135.87	136.34	136.46	136.33	136.21	136.09	135.84	135.35	134.72	134.03	133.79	133.87
16	135.88	136.35	136.46	136.33	136.21	136.06	135.82	135.33	134.69	134.01	133.79	133.87
17	135.89	136.36	136.46	136.32	136.21	136.06	135.80	135.29	134.69	134.00	133.79	133.87
18	135.92	136.37	136.45	136.32	136.20	136.06	135.80	135.29	134.68	133.97	133.79	133.87
19	135.94	136.38	136.45	136.31	136.19	136.05	135.76	135.28	134.64	133.96	133.79	133.87
20	135.96	136.39	136.44	136.31	136.19	136.05	135.76	135.26	134.61	133.95	133.79	133.86
21	135.99	136.41	136.42	136.31	136.18	136.05	135.75	135.23	134.58	133.93	133.79	133.84
22	135.99	136.42	136.42	136.28	136.18	136.05	135.72	135.20	134.54	133.92	133.79	133.84
23	135.99	136.43	136.41	136.28	136.17	136.05	135.71	135.20	134.52	133.90	133.79	133.84
24	136.01	136.44	136.41	136.28	136.17	136.03	135.68	135.18	134.50	133.90	133.80	133.83
25	136.02	136.45	136.40	136.28	136.17	136.02	135.68	135.17	134.45	133.89	133.80	133.81
26	136.03	136.46	136.40	136.27	136.16	136.01	135.67	135.14	134.43	133.87	133.80	133.80
27	136.04	136.47	136.40	136.27	136.15	136.01	135.64	135.12	134.41	133.85	133.81	133.78
28	136.05	136.47	136.40	136.26	136.15	136.01	135.63	135.11	134.39	133.84	133.81	133.78
29	136.07	136.47	136.40	136.26	---	136.00	135.62	135.10	134.35	133.84	133.82	133.78
30	136.08	136.48	136.40	136.26	---	136.00	135.62	135.07	134.33	133.83	133.82	133.75
31	136.09	---	136.40	136.26	---	135.98	---	135.06	---	133.82	133.83	---
MAX	136.09	136.48	136.49	136.40	136.26	136.14	135.98	135.61	135.03	134.31	133.83	133.87

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	133.75	133.62	133.33	132.97	132.77	132.65	132.34	131.98	---	136.02	137.67	138.62
2	133.75	133.61	133.32	132.97	132.76	132.64	132.32	131.96	---	136.42	137.28	137.76
3	133.74	133.60	133.30	132.95	132.75	132.63	132.30	131.95	---	136.87	137.04	136.89
4	133.73	133.60	133.30	132.93	132.75	132.62	132.28	131.94	---	137.32	137.49	136.09
5	133.73	133.59	133.26	132.93	132.74	132.60	132.27	131.92	---	137.95	138.02	135.61
6	133.71	133.59	133.26	132.93	132.73	132.60	132.26	131.91	---	138.27	138.37	135.39
7	133.70	133.58	133.26	132.93	132.73	132.57	132.25	131.90	---	138.28	138.48	135.33
8	133.70	133.57	133.25	132.93	132.73	132.57	132.23	131.89	129.56	138.28	138.48	135.77
9	133.70	133.57	133.22	132.93	132.73	132.55	132.22	131.88	129.56	---	138.26	136.04
10	133.70	133.56	133.21	132.93	132.72	132.55	132.21	131.86	129.54	---	138.25	136.56
11	133.70	133.56	133.21	132.92	132.71	132.54	132.20	131.85	129.63	---	138.42	136.70
12	133.70	133.55	133.18	132.91	132.71	132.53	132.20	131.84	129.78	---	138.75	136.69
13	133.70	133.54	133.17	132.88	132.70	132.52	132.17	131.80	129.82	137.00	138.85	136.81
14	133.68	133.53	133.17	132.88	132.69	132.51	132.15	131.80	129.94	137.02	138.85	137.29
15	133.68	133.52	133.15	132.88	132.69	132.51	132.14	131.79	130.23	136.93	138.46	137.91
16	133.68	133.51	133.15	132.86	132.69	132.50	132.13	131.76	130.33	136.52	138.27	138.43
17	133.68	133.50	133.15	132.86	132.69	132.49	132.13	131.74	130.33	136.26	138.33	138.63
18	133.68	133.50	133.14	132.86	132.68	132.48	132.12	131.73	130.64	135.60	138.61	138.63
19	133.67	133.47	133.12	132.85	132.67	132.47	132.11	131.71	130.97	134.94	138.89	138.38
20	133.66	133.45	133.12	132.84	132.67	132.47	132.10	131.68	131.33	134.99	139.14	137.91
21	133.65	133.44	133.10	132.83	132.67	132.46	132.10	131.67	131.67	135.34	139.34	137.97
22	133.65	133.44	133.10	132.82	132.67	132.45	132.09	131.67	132.38	135.88	139.38	138.26
23	133.65	133.44	133.08	132.82	132.67	132.44	132.06	131.65	132.87	136.69	139.72	138.43
24	133.64	133.42	133.07	132.81	132.67	132.44	132.06	e131.64	133.27	137.16	139.92	138.59
25	133.64	133.40	133.04	132.80	132.67	132.44	132.05	130.66	133.73	137.54	140.44	138.85
26	133.63	133.38	133.03	132.79	132.67	132.42	132.05	130.66	134.08	137.90	140.75	139.19
27	133.63	133.37	133.03	132.79	132.67	132.41	132.05	130.49	134.54	138.01	140.83	139.49
28	133.62	133.36	133.03	132.79	132.66	132.41	132.01	---	134.74	138.10	140.77	139.64
29	133.62	133.36	133.00	132.78	---	132.39	132.01	---	135.10	138.10	140.32	139.89
30	133.62	133.35	132.99	132.78	---	132.39	132.00	---	135.64	138.05	139.73	139.96
31	133.62	---	132.99	132.78	---	132.36	---	---	---	137.97	139.32	---
MAX	133.75	133.62	133.33	132.97	132.77	132.65	132.34	131.98	135.64	138.28	140.83	139.96

e Estimated

SITE NUMBER FROM LOCATION MAP.—10.

COUNTY.—Lawrence.

LOCAL WELL NUMBER.—5N4E14ADD.

SITE ID (STATION NUMBER).—442344103253401.

OTHER IDENTIFIER.—LA-63A.

LOCATION.—Lat 43°23′44″, long 103°35′27″, in SE¼SE¼NE¼ sec. 14, T. 5 N., R. 4 E., Hydrologic Unit 10120203, 6 mi west of Sturgis. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 507 ft deep with 388 ft of 3.5-in. steel casing; open hole from 388 to 507 ft.

INSTRUMENTATION.—Electronic data logger with pressure transducer. Prior to July 1, 1993, intermittent taped measurements.

DATUM.—Elevation of land-surface datum is 3,880 ft above sea level. Measuring point: Prior to June 30, 1993, top of PVC liner, 1.49 ft above land-surface datum; since then, top of steel casing, 0.7 ft above land-surface datum.

REMARKS.—Available records good. Water levels affected by pumping of nearby well.

PERIOD OF RECORD.—May 1963, April 1969 to September 1994.

EXTREMES.—Highest daily water level, 198.9 ft below land-surface datum, Dec. 10, 1973; lowest daily water level, 237.15 ft below land-surface datum, Aug. 24, 1994.

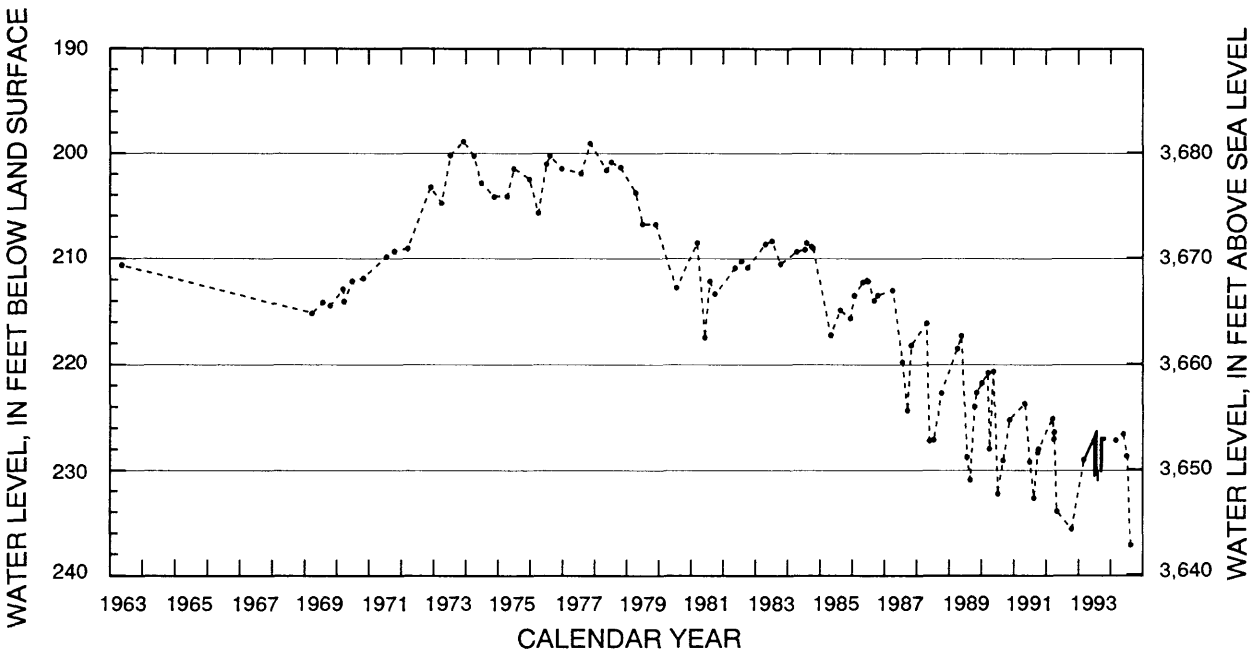


Figure 17. Hydrograph for observation well 5N4E14ADD (site number 10).

SITE NUMBER 10—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM
INSTANTANEOUS VALUES UNLESS OTHERWISE NOTED

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAY 15, 1963	210.7	AUG 03, 1982	210.3	SEP 05, 1990	229.1	AUG 06, 1993	[1]230.19
APR 01, 1969	215.2	OCT 12	210.9	NOV 20	225.2	07	[1]230.07
JUL 31	214.2	APR 26, 1983	208.7	MAY 09, 1991	223.7	08	[1]230.15
OCT 21	214.5	JUL 14	208.4	JUL 02	229.2	09	[1]230.71
MAR 16, 1970	212.9	OCT 18	210.6	AUG 21	232.7	10	[1]230.56
26	214.1	APR 13, 1984	209.4	OCT 01	228.4	11	[1]231.15
JUN 25	212.2	JUL 24	209.2	11	228.0	SEP 14	226.92
OCT 29	211.9	AUG 06	208.6	FEB 11, 1992	225.7	15	[1]229.90
JUL 23, 1971	209.9	OCT 02	208.9	MAR 16	225.1	16	[1]230.03
OCT 19	209.4	22	209.1	31	227.1	17	[1]230.29
MAR 21, 1972	209.1	MAY 07, 1985	217.3	APR 02	226.4	18	[1]227.10
NOV 30	203.3	AUG 21	214.9	MAY 05	234.0	19	[1]226.88
APR 03, 1973	204.8	DEC 17	215.7	OCT 22	235.7	20	[1]226.90
JUL 12	200.2	JAN 29, 1986	213.5	MAR 16, 1993	228.9	21	[1]226.97
DEC 10	198.9	MAY 02	212.3	JUN 30	226.86	22	[1]227.03
APR 03, 1974	200.3	JUN 13	212.1	JUL 01	[1]230.23	23	[1]229.09
JUN 26	202.9	JUL 02	212.2	02	[1]230.46	24	[1]229.71
NOV 20	204.2	SEP 08	214.0	03	[1]228.43	25	[1]229.83
APR 15, 1975	204.2	OCT 16	213.5	04	[1]230.70	26	[1]229.83
JUL 02	201.5	APR 08, 1987	213.0	05	[1]226.79	27	[1]226.95
DEC 26	202.5	JUL 28	219.8	06	[1]226.69	OCT 14	226.85
APR 09, 1976	205.8	SEP 22	224.4	07	[1]227.12	15	[1]226.95
JUL 08	201.1	NOV 03	218.2	08	[1]229.37	16	[1]226.95
AUG 14	200.3	APR 26, 1988	216.1	09	[1]229.97	17	[1]226.93
DEC 25	201.5	MAY 26	227.2	10	[1]229.79	18	[1]226.96
AUG 03, 1977	202.0	JUL 14	227.1	11	[1]227.35	19	[1]227.06
NOV 17	199.1	OCT 12	222.7	12	[1]229.84	20	[1]227.22
MAY 16, 1978	201.7	APR 06, 1989	218.5	13	[1]227.75	21	[1]227.14
JUL 11	200.9	MAY 23	217.3	14	[1]229.13	22	[1]227.07
OCT 23	201.4	JUL 25	228.75	15	[1]226.42	23	[1]226.96
APR 13, 1979	203.8	AUG 30	231.0	28	226.27	24	[1]226.96
JUL 03	206.8	OCT 18	224.0	29	[1]229.75	25	[1]227.17
NOV 28	206.8	25	223.8	30	[1]229.98	26	[1]227.21
JUL 22, 1980	212.8	NOV 14	222.68	31	[1]230.46	MAR 08, 1994	227.17
MAR 18, 1981	208.6	JAN 17, 1990	221.77	AUG 01	[1]230.31	JUN 07	226.69
JUN 10	217.5	MAR 21	220.8	02	[1]230.38	JUL 12	228.75
AUG 04	212.2	APR 05	228.0	03	[1]230.45	AUG 24	237.15
SEP 29	213.4	MAY 22	220.7	04	[1]230.17		
MAY 25, 1982	210.9	JUL 09	232.3	05	[1]230.50		

HIGHEST 198.9 DEC 10, 1973
LOWEST 237.15 AUG 24, 1994

[1]Daily maximum values

SITE NUMBER FROM LOCATION MAP.—11.

COUNTY.—Lawrence.

LOCAL WELL NUMBER.—5N4E1ABBD2.

SITE ID (STATION NUMBER).—442545103343702.

OTHER IDENTIFIER.—LA-90A.

LOCATION.—Lat 44°25′45″, long 103°34′37″, in SE¼NW¼NW¼NE¼ sec. 1, T. 5 N., R. 4 E., Hydrologic Unit 10120202, 2 mi west of Sturgis. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Madison.

WELL CHARACTERISTICS.—Drilled observation well, 822 ft deep with 794 ft of 5-in. steel casing; open hole 794 to 822 ft.

INSTRUMENTATION.—Electronic data logger with submersible pressure transducer -- one reading per day from July 1991 to January 1992. Monthly tape down from Nov. 27, 1990, to June 11, 1991, and Jan. 16 to Sept. 25, 1992.

DATUM.—Elevation of land-surface datum is 3,620 ft above sea level. Measuring point: Top of steel casing, 2.1 ft above land-surface datum.

REMARKS.—Electronic data logger records poor; tape down records good.

PERIOD OF RECORD.—November 1990 to September 1994.

EXTREMES.—Highest daily water level, 203.24 ft below land-surface datum, July 11, 1991; lowest daily water level, 229.75 ft below land-surface datum, Mar. 12, 1993.

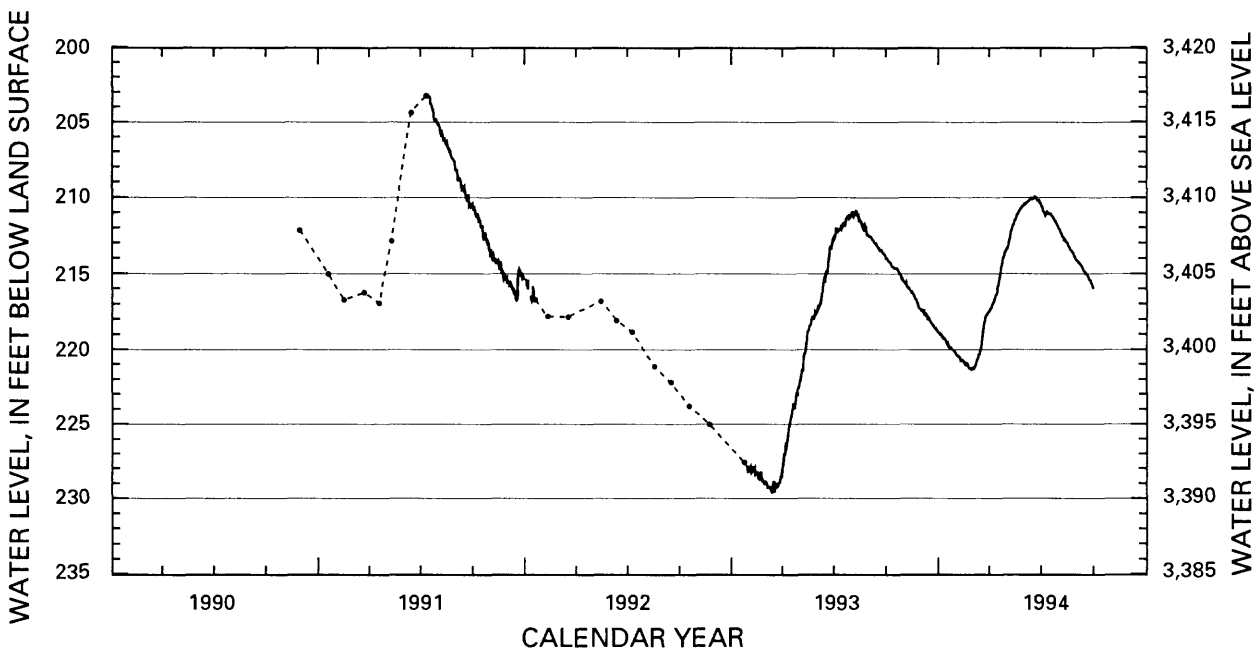


Figure 18. Hydrograph for observation well 5N4E1ABBD2 (site number 11).

SITE NUMBER 11—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
INSTANTANEOUS VALUE AT 1200 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	228.04	229.04	227.53	222.23	217.16	212.72	211.35	212.69
2	---	---	---	---	227.99	229.06	227.12	221.89	217.35	212.56	211.22	212.69
3	---	---	---	---	228.36	229.26	227.24	221.74	217.28	212.15	211.35	212.79
4	---	---	---	---	228.28	229.43	226.87	221.44	217.15	212.16	211.24	212.83
5	---	---	---	---	228.21	229.36	226.50	221.61	216.95	212.34	211.22	212.89
6	---	---	---	---	228.11	229.39	226.62	221.10	216.98	212.40	211.11	212.97
7	---	---	---	---	228.16	229.33	226.39	220.49	216.42	212.29	211.03	213.00
8	---	---	---	---	228.13	229.39	225.99	220.40	216.40	212.24	211.05	213.08
9	---	---	---	---	228.06	229.42	225.63	220.31	216.31	212.26	211.31	213.07
10	---	---	---	---	228.52	229.61	225.45	220.18	216.00	212.21	211.34	213.19
11	---	---	---	---	228.45	229.61	225.12	219.81	215.63	212.28	211.31	213.22
12	---	---	---	---	228.29	229.75	225.05	219.46	215.47	211.90	211.72	213.18
13	---	---	---	---	228.41	229.31	224.82	218.99	215.56	212.12	211.55	213.30
14	---	---	---	---	228.39	229.01	224.63	218.91	215.60	212.05	211.64	213.38
15	e223.81	---	---	---	228.69	228.99	224.44	218.83	215.09	211.85	211.73	213.42
16	---	---	---	---	228.79	229.71	224.21	218.64	215.04	211.81	211.71	213.42
17	---	---	---	---	228.82	229.40	224.10	218.56	215.18	211.92	211.87	213.53
18	---	---	---	---	228.53	229.06	223.70	218.53	214.95	211.85	212.04	213.58
19	---	e225.10	---	---	228.53	229.38	223.95	218.44	214.58	211.92	212.12	213.59
20	---	---	---	e227.59	228.30	229.32	224.08	218.21	214.26	211.68	212.18	213.56
21	---	---	---	---	228.68	229.36	223.74	217.98	213.96	211.48	211.94	213.57
22	---	---	---	---	228.81	229.30	223.42	217.95	213.48	211.44	211.88	213.65
23	---	---	---	---	229.03	229.08	222.99	217.97	213.36	211.36	212.00	213.72
24	---	---	---	---	228.86	229.08	223.10	218.14	213.39	211.33	212.04	213.78
25	---	---	---	---	229.07	229.07	223.22	218.03	213.42	211.44	212.33	213.80
26	---	---	---	---	229.11	228.86	222.83	217.67	213.22	211.28	212.49	213.85
27	---	---	---	e227.91	229.08	228.63	222.77	217.74	212.94	211.28	212.61	213.91
28	---	---	---	228.40	229.08	228.76	222.66	217.75	212.83	211.37	212.61	213.97
29	---	---	---	228.23	---	228.44	222.46	217.53	212.75	211.26	212.63	214.10
30	---	---	---	228.15	---	228.07	222.27	217.69	212.83	211.18	212.63	214.11
31	---	---	---	228.16	---	227.88	---	217.48	---	211.30	212.70	---
MAX	223.81	225.10	---	228.40	229.11	229.75	227.53	222.23	217.35	212.72	212.70	214.11

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INSTANTANEOUS VALUE AT 1200 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	214.15	215.66	217.52	219.07	220.52	221.27	217.40	213.42	210.53	210.82	212.29	214.27
2	214.20	215.77	217.54	219.03	220.55	221.41	217.38	213.32	210.47	210.98	212.39	214.31
3	214.27	215.81	217.61	219.07	220.54	221.42	217.31	213.14	210.47	211.04	212.46	214.39
4	214.32	215.74	217.69	219.20	220.56	221.37	217.14	212.94	210.43	211.11	212.55	214.42
5	214.32	215.89	217.62	219.17	220.61	221.27	217.09	212.76	210.37	211.21	212.66	214.43
6	214.37	216.00	217.79	219.23	220.64	221.17	216.99	212.54	210.38	211.30	212.69	214.48
7	214.43	216.00	217.76	219.34	220.89	221.02	216.96	212.40	210.36	211.25	212.75	214.54
8	214.45	216.04	217.83	219.32	220.87	220.91	216.79	212.21	210.30	211.12	212.88	214.59
9	214.60	216.09	217.80	219.40	220.84	220.79	216.68	212.09	210.21	211.05	212.87	214.68
10	214.66	216.21	217.89	219.38	220.81	220.68	216.55	211.99	210.17	211.11	212.90	214.75
11	214.68	216.28	218.04	219.47	220.88	220.51	216.49	211.87	210.15	211.13	213.01	214.82
12	214.69	216.34	217.97	219.51	220.89	220.45	216.42	211.83	210.17	211.15	213.01	214.91
13	214.74	216.31	218.02	219.63	220.98	220.39	216.25	211.70	210.23	211.20	213.05	214.97
14	214.77	216.38	218.12	219.70	220.97	220.20	216.02	211.60	210.19	211.19	213.12	215.04
15	214.75	216.45	218.20	219.81	221.10	220.05	215.86	211.52	210.20	211.19	213.23	215.09
16	214.75	216.46	218.26	219.75	221.07	219.86	215.65	211.40	210.15	211.22	213.29	215.07
17	214.75	216.61	218.31	219.89	221.18	219.59	215.50	211.31	210.11	211.29	213.37	215.13
18	214.76	216.64	218.40	219.98	221.17	219.22	215.23	211.21	210.14	211.35	213.43	215.19
19	214.78	216.73	218.42	219.93	221.08	218.87	215.03	211.19	210.08	211.41	213.52	215.26
20	214.88	216.82	218.49	219.95	221.11	218.60	214.76	211.12	210.14	211.47	213.56	215.32
21	214.95	216.83	218.49	219.98	221.31	218.36	214.54	211.02	210.23	211.50	213.60	215.41
22	215.02	216.97	218.60	220.01	221.35	218.22	214.35	210.94	210.31	211.58	213.66	215.50
23	215.08	217.02	218.62	220.08	221.40	217.99	214.15	210.90	210.33	211.65	213.70	215.53
24	215.17	217.17	218.68	220.11	221.39	217.89	214.05	210.87	210.27	211.70	213.74	215.55
25	215.18	217.33	218.74	220.16	221.39	217.85	213.95	210.81	210.30	211.79	213.78	215.66
26	215.34	217.38	218.71	220.18	221.46	217.79	213.80	210.76	210.45	211.85	213.95	215.77
27	215.48	217.42	218.85	220.20	221.43	217.71	213.68	210.71	210.45	211.91	213.98	215.86
28	215.44	217.43	218.84	220.27	221.43	217.68	213.61	210.66	210.50	211.98	214.08	215.94
29	215.54	217.50	218.96	220.30	---	217.60	213.52	210.61	210.62	212.09	214.17	216.05
30	215.62	217.53	219.01	220.39	---	217.57	213.49	210.55	210.71	212.15	214.19	216.10
31	215.66	---	219.01	220.48	---	217.50	---	210.57	---	212.24	214.27	---
MAX	215.66	217.53	219.01	220.48	221.46	221.42	217.40	213.42	210.71	212.24	214.27	216.10

e Estimated

SITE NUMBER FROM LOCATION MAP.—12.

COUNTY.—Lawrence.

LOCAL WELL NUMBER.—5N4E1ABBD.

SITE ID (STATION NUMBER).—442545103343701.

OTHER IDENTIFIER.—LA-86C.

LOCATION.—Lat 44°25′45″, long 103°34′37″, in SE¼NW¼NW¼NE¼ sec. 1, T. 5 N., R. 4 E., Hydrologic Unit 10120202, 2 mi west of Sturgis. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 300 ft deep with 281 ft of 5-in. steel casing; open hole from 281 to 300 ft.

INSTRUMENTATION.—Electronic data logger with submersible pressure transducer -- 60-minute interval. Digital water-level recorder with 60-minute interval prior to Feb. 14, 1992.

DATUM.—Elevation of land-surface datum is 3,620 ft above sea level. Measuring point: Top of steel casing, 1.50 ft above land-surface datum.

REMARKS.—Records good. Unusual fluctuations in water level during October 1991 probably caused by drilling adjacent observation well (LA-90A).

PERIOD OF RECORD.—July 1986 to September 1994.

EXTREMES.—Highest daily water level, 178.84 ft below land-surface datum, July 28, 29, 1986; lowest daily water level, 220.06 ft below land-surface datum, Apr. 20, 1993.

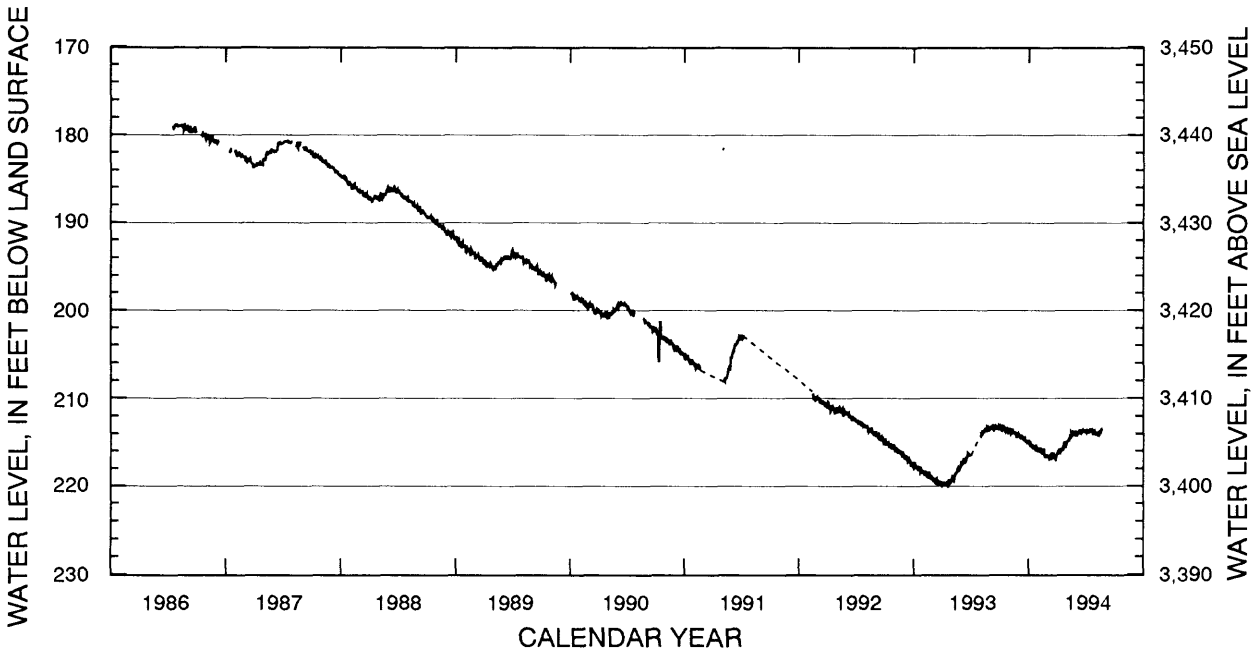


Figure 19. Hydrograph for observation well 5N4E1ABBD (site number 12).

SITE NUMBER 12—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	214.85	215.56	216.53	217.57	218.33	218.99	219.91	219.54	217.43	---	e214.36	213.22
2	214.73	215.53	216.54	217.20	218.33	219.08	219.72	219.33	217.51	---	214.21	213.47
3	214.68	215.96	216.71	217.46	218.58	219.33	219.85	219.09	217.56	---	214.23	213.46
4	214.87	215.99	216.89	217.53	218.57	219.38	219.78	219.00	217.55	---	214.15	213.36
5	215.21	215.86	216.75	217.77	218.44	219.27	219.50	219.11	217.28	---	213.98	213.43
6	215.21	215.90	216.55	217.69	218.35	219.26	219.71	219.09	217.32	---	213.90	213.43
7	215.22	215.78	216.53	217.60	218.32	219.18	219.80	218.76	217.08	---	213.61	213.44
8	215.02	215.56	216.41	217.81	218.31	219.24	219.78	219.04	217.13	---	213.70	213.34
9	215.00	215.86	216.63	217.99	218.37	219.46	219.52	219.38	217.33	---	213.86	213.40
10	215.05	216.02	216.84	217.83	218.71	219.52	219.70	219.42	217.32	---	213.79	213.40
11	215.16	216.04	216.75	217.64	218.68	219.66	219.78	219.29	217.15	---	213.77	212.95
12	215.18	216.16	216.95	217.96	218.45	219.78	219.88	219.06	217.16	---	213.89	213.18
13	215.08	216.16	217.12	217.98	218.59	219.51	219.79	218.84	217.32	---	213.74	213.40
14	215.14	216.15	217.02	217.88	218.76	219.18	219.79	218.59	217.38	---	213.57	213.39
15	215.51	216.06	216.79	217.63	218.85	219.15	219.78	218.60	217.11	---	213.59	213.22
16	215.47	216.00	216.98	217.91	219.05	219.85	219.69	218.56	216.96	---	213.53	213.42
17	215.44	216.03	216.88	217.87	219.04	219.82	219.69	218.47	217.08	---	213.65	213.39
18	215.42	216.16	216.96	217.96	218.83	219.26	219.41	218.49	217.01	---	213.65	213.31
19	215.17	216.14	217.08	217.85	218.57	219.81	219.92	218.41	216.80	---	213.73	213.15
20	215.16	216.16	217.03	217.85	218.38	219.81	220.06	218.27	216.58	---	213.64	213.21
21	215.15	216.24	217.01	218.03	218.74	219.70	220.05	218.04	216.50	---	213.43	213.34
22	215.62	215.91	217.09	218.00	219.01	219.70	219.51	217.94	216.22	---	213.26	213.42
23	215.75	216.33	217.73	218.40	219.09	219.47	219.21	218.16	216.24	---	213.29	213.42
24	215.62	216.55	217.37	218.31	219.06	219.48	219.63	218.26	216.36	---	213.27	213.26
25	215.52	216.57	217.41	218.18	219.17	219.65	219.73	218.25	216.38	---	213.53	213.31
26	215.49	216.60	217.26	218.25	219.15	219.63	219.57	217.95	216.43	---	213.64	213.47
27	215.50	216.58	217.47	218.11	219.14	219.50	219.54	217.88	216.25	---	213.66	213.37
28	215.52	216.37	217.57	218.52	219.04	219.69	219.60	217.92	216.63	e214.50	213.37	213.56
29	215.32	216.47	217.40	218.50	---	219.72	219.57	217.74	---	---	213.46	213.47
30	215.15	216.38	217.80	218.37	---	219.88	219.49	217.90	---	---	213.60	213.14
31	215.51	---	217.83	218.38	---	219.95	---	217.78	---	---	213.54	---
MAX	215.75	216.60	217.83	218.52	219.17	219.95	220.06	219.54	217.56	214.50	214.36	213.56

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	213.22	213.65	214.13	214.79	215.86	216.57	216.33	215.01	214.14	213.68	213.89	---
2	213.43	213.66	214.26	215.08	215.64	216.56	216.41	214.93	214.27	213.61	213.86	---
3	213.32	213.33	214.28	215.10	215.75	216.47	216.26	214.89	214.15	213.59	213.97	---
4	213.37	213.84	214.05	215.09	215.75	216.49	216.20	214.91	213.84	213.57	214.13	---
5	213.14	213.96	214.42	214.81	215.62	216.55	216.20	214.86	213.89	213.79	214.02	---
6	213.18	213.80	214.42	215.25	216.06	216.71	216.04	214.85	213.81	213.77	213.77	---
7	213.36	213.63	214.22	215.23	216.05	216.82	215.91	214.81	213.95	213.87	214.08	---
8	213.71	213.78	214.08	215.23	216.01	216.75	215.98	214.64	213.91	213.84	214.11	---
9	213.70	213.86	214.40	215.04	216.00	216.66	216.07	214.64	213.90	213.81	214.10	---
10	213.42	213.76	214.54	215.31	215.94	216.52	216.27	214.52	213.87	213.67	214.26	---
11	213.28	213.59	214.40	215.28	216.07	216.85	216.27	214.58	213.85	213.75	214.15	---
12	213.30	213.41	214.20	215.27	216.25	216.94	216.09	214.47	213.61	213.74	213.98	---
13	213.31	213.72	214.57	215.36	216.24	216.76	215.64	214.15	213.57	213.82	214.08	---
14	213.21	213.92	214.59	215.49	216.26	216.58	215.87	214.28	213.66	213.74	214.02	---
15	213.25	213.78	214.56	215.43	216.26	216.65	215.95	214.28	213.89	213.65	213.77	---
16	213.31	213.97	214.61	215.49	216.15	216.35	216.04	213.88	213.90	213.70	213.69	---
17	213.27	213.95	214.74	215.69	216.07	216.32	215.85	213.95	213.95	213.65	213.70	---
18	213.38	213.95	214.72	215.58	215.68	216.35	215.88	214.18	213.88	213.44	213.82	---
19	213.59	214.01	214.64	215.59	216.20	216.36	215.88	214.15	213.82	213.69	213.83	---
20	213.76	213.84	214.59	215.69	216.54	216.52	215.61	213.99	213.89	213.74	213.82	---
21	213.66	213.75	214.74	215.57	216.57	216.46	215.63	214.06	213.81	213.76	213.59	---
22	213.58	214.00	214.72	215.42	216.51	216.43	215.39	214.01	213.69	213.71	213.41	---
23	213.46	214.36	215.01	215.33	216.47	216.71	215.12	214.08	213.66	213.83	213.67	---
24	213.44	214.44	214.82	215.35	216.47	216.81	215.00	214.08	213.59	213.75	e213.72	---
25	213.73	214.32	214.83	215.50	216.76	216.64	215.00	213.90	213.69	213.83	---	---
26	213.81	214.08	214.87	215.48	216.62	216.45	215.52	213.88	213.69	213.89	---	---
27	213.66	213.89	215.08	215.68	216.38	216.71	215.55	213.62	213.73	213.82	---	---
28	213.57	214.06	215.06	215.65	216.52	216.62	215.48	213.79	213.82	213.70	---	---
29	213.79	214.06	215.16	215.87	---	216.82	215.47	213.80	213.75	213.71	---	---
30	213.70	214.00	214.85	216.07	---	216.71	215.33	214.21	213.68	213.64	---	---
31	213.39	---	214.78	215.94	---	216.46	---	214.30	---	213.79	---	---
MAX	213.81	214.44	215.16	216.07	216.76	216.94	216.41	215.01	214.27	213.89	214.26	---

e Estimated

SITE NUMBER FROM LOCATION MAP.—13.

COUNTY.—Meade.

LOCAL WELL NUMBER.—6N5E16CDCC.

SITE ID (STATION NUMBER).—442828103312001.

OTHER IDENTIFIER.—MD-89A.

LOCATION.—Lat 44°28′28″, long 103°31′20″, in SW¼SW¼SE¼SW¼ sec. 16, T. 6 N., R. 5 E., Hydrologic Unit 10120202, 4 mi north of Sturgis. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Lakota.

WELL CHARACTERISTICS.—Drilled observation well, 482 ft deep with 447 ft of 5-in. steel casing; screened from 447 to 477 ft with 18-slot, 3-in. PVC.

INSTRUMENTATION.—Digital water-level recorder -- 60-minute interval.

DATUM.—Elevation of land-surface datum is 3,265 ft above sea level. Measuring point: Top of steel casing, 1.80 ft above land-surface datum.

REMARKS.—Records good.

PERIOD OF RECORD.—September 1989 to September 1994.

EXTREMES.—Highest daily water level, 63.17 ft below land-surface datum, Feb. 28, 1991; lowest daily water level, 70.98 ft below land-surface datum, Sept. 22, 1989.

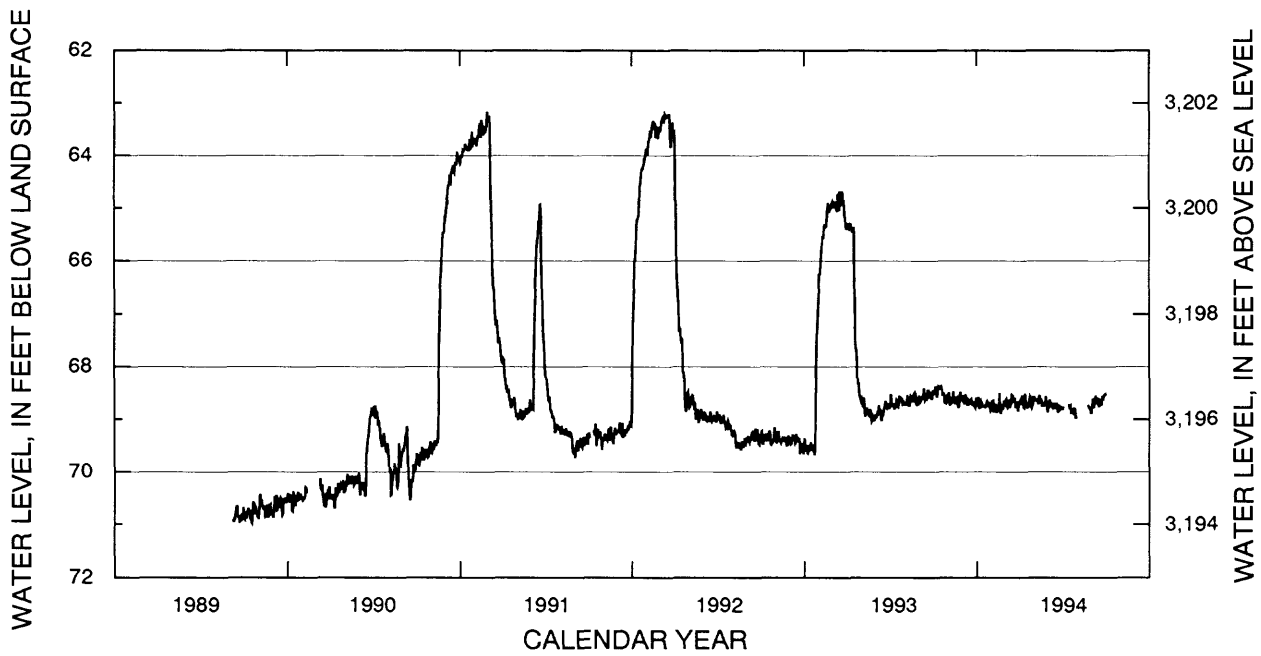


Figure 20. Hydrograph for observation well 6N5E16CDCC (site number 13).

SITE NUMBER 13—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	69.33	69.32	69.39	69.52	66.56	64.90	65.36	68.66	68.90	68.75	68.74	68.54
2	69.24	69.23	69.41	69.36	66.26	64.89	65.34	68.64	68.97	68.70	68.67	68.67
3	69.23	69.44	69.45	69.48	66.25	64.98	65.41	68.61	68.96	68.52	68.73	68.68
4	69.35	69.44	69.48	69.51	66.23	64.98	65.39	68.66	68.93	68.63	68.70	68.64
5	69.47	69.37	69.47	69.58	66.05	64.92	65.28	68.77	68.84	68.73	68.69	68.64
6	69.47	69.38	69.35	69.58	65.88	64.92	65.36	68.65	68.92	68.76	68.69	68.62
7	69.41	69.36	69.35	69.49	65.73	64.89	65.39	68.59	68.80	68.73	68.54	68.59
8	69.34	69.22	69.29	69.64	65.69	64.89	65.36	68.69	68.73	68.72	68.68	68.57
9	69.28	69.37	69.33	69.65	65.53	64.99	65.29	68.89	68.86	68.73	68.73	68.59
10	69.31	69.40	69.39	69.60	65.59	65.01	65.36	68.95	68.85	68.78	68.73	68.59
11	69.36	69.42	69.34	69.49	65.56	65.01	65.39	68.91	68.80	68.81	68.69	68.41
12	69.37	69.44	69.39	69.58	65.35	65.07	65.42	68.85	68.86	68.73	68.76	68.55
13	69.29	69.46	69.46	69.59	65.33	64.93	65.40	68.81	68.97	68.74	68.65	68.63
14	69.29	69.42	69.44	69.58	65.34	64.75	65.39	68.79	69.03	68.75	68.57	68.61
15	69.39	69.39	69.28	69.43	65.34	64.74	65.39	68.84	68.94	68.64	68.59	68.55
16	69.41	69.35	69.37	69.57	65.36	65.05	65.37	68.86	68.83	68.66	68.54	68.62
17	69.35	69.36	69.35	69.54	65.35	65.02	65.97	68.88	68.94	68.72	68.64	68.62
18	69.35	69.40	69.35	69.56	65.20	64.69	66.59	68.93	68.87	68.76	68.65	68.54
19	69.23	69.40	69.41	69.51	65.05	64.93	67.27	68.94	68.79	68.77	68.65	68.45
20	69.23	69.37	69.41	69.48	64.90	64.93	67.63	68.87	68.74	68.69	68.65	68.45
21	69.26	69.39	69.36	69.59	65.00	64.82	67.64	68.80	68.71	68.55	68.52	68.51
22	69.48	69.33	69.39	69.59	65.07	64.82	67.70	68.84	68.66	68.61	68.50	68.56
23	69.49	69.39	69.66	69.68	65.09	64.70	67.86	68.94	68.69	68.60	68.54	68.55
24	69.47	69.46	69.50	69.34	65.05	64.70	68.22	69.04	68.77	68.57	68.53	68.47
25	69.44	69.51	69.52	68.56	65.03	64.83	68.33	69.02	68.79	68.64	68.67	68.51
26	69.44	69.49	69.45	68.04	65.02	64.85	68.30	68.93	68.76	68.64	68.71	68.60
27	69.39	69.49	69.55	67.63	64.99	65.03	68.46	68.95	68.75	68.63	68.74	68.53
28	69.42	69.30	69.58	67.38	64.91	65.16	68.56	68.98	68.71	68.71	68.60	68.62
29	69.30	69.39	69.47	67.24	---	65.20	68.56	68.93	68.71	68.70	68.65	68.57
30	69.16	69.36	69.63	66.94	---	65.31	68.61	69.03	68.80	68.69	68.73	68.44
31	69.29	---	69.66	66.70	---	65.37	---	68.99	---	68.71	68.68	---
MAX	69.49	69.51	69.66	69.68	66.56	65.37	68.61	69.04	69.03	68.81	68.76	68.68

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68.49	68.65	68.59	68.65	68.71	68.72	68.69	68.58	68.78	68.80	---	68.78
2	68.52	68.65	68.64	68.73	68.64	68.71	68.72	68.58	68.79	68.80	---	68.70
3	68.49	68.49	68.66	68.73	68.69	68.64	68.66	68.59	68.78	68.76	---	68.60
4	68.47	68.69	68.54	68.73	68.69	68.63	68.68	68.62	68.62	---	---	68.68
5	68.40	68.74	68.69	68.58	68.62	68.75	68.65	68.63	68.71	---	---	68.79
6	68.38	68.66	68.69	68.79	68.85	68.76	68.60	68.64	68.67	---	---	68.74
7	68.44	68.59	68.56	68.79	68.85	68.78	68.54	68.64	68.72	---	---	68.62
8	68.56	68.65	68.52	68.69	68.74	68.74	68.64	68.63	68.74	---	---	68.59
9	68.56	68.68	68.69	68.67	68.74	68.73	68.68	68.66	68.76	---	---	68.55
10	68.43	68.66	68.70	68.77	68.70	68.62	68.78	68.61	68.78	---	---	68.64
11	68.39	68.56	68.68	68.77	68.79	68.76	68.79	68.71	68.74	---	---	68.68
12	68.40	68.47	68.59	68.75	68.86	68.79	68.70	68.66	68.76	---	---	68.69
13	68.41	68.65	68.70	68.72	68.86	68.71	68.51	68.54	68.73	68.76	---	68.66
14	68.38	68.67	68.74	68.76	68.82	68.64	68.69	68.61	68.69	68.75	---	68.59
15	68.38	68.64	68.66	68.76	68.82	68.66	68.71	68.61	68.79	68.71	---	68.69
16	68.39	68.69	68.69	68.76	68.77	68.54	68.78	68.67	68.79	68.79	---	68.77
17	68.38	68.69	68.67	68.77	68.72	68.55	68.71	68.61	68.79	68.79	---	68.73
18	68.41	68.67	68.68	68.77	68.50	68.56	68.78	68.74	68.76	68.77	---	68.68
19	68.45	68.69	68.62	68.75	68.76	68.61	68.78	68.74	68.69	68.88	---	68.64
20	68.55	68.61	68.61	68.77	68.88	68.67	68.71	68.68	68.79	68.88	---	68.65
21	68.52	68.55	68.69	68.76	68.88	68.64	68.72	68.73	68.84	68.86	---	68.74
22	68.53	68.64	68.68	68.69	68.79	68.59	68.63	68.73	68.88	68.88	---	68.70
23	68.51	68.77	68.74	68.66	68.76	68.76	68.57	68.76	68.80	68.89	---	68.55
24	68.51	68.77	68.69	68.68	68.73	68.79	68.59	68.73	68.72	68.83	68.72	68.60
25	68.68	68.72	68.69	68.69	68.82	68.72	68.59	68.69	68.83	68.78	68.76	68.63
26	68.70	68.57	68.75	68.69	68.77	68.66	68.76	68.67	68.82	68.88	68.79	68.57
27	68.65	68.48	68.76	68.76	68.64	68.79	68.79	68.57	68.75	68.88	68.79	68.55
28	68.63	68.63	68.77	68.76	68.70	68.75	68.75	68.69	68.79	68.86	68.82	68.53
29	68.68	68.63	68.79	68.79	---	68.85	68.74	68.69	68.78	68.99	68.76	68.52
30	68.66	68.55	68.66	68.84	---	68.80	68.71	68.82	68.79	68.94	68.88	68.55
31	68.51	---	68.59	68.82	---	68.66	---	68.87	---	---	68.88	---
MAX	68.70	68.77	68.79	68.84	68.88	68.85	68.79	68.87	68.88	68.99	68.88	68.79

SITE NUMBER FROM LOCATION MAP.—14.

COUNTY.—Meade.

LOCAL WELL NUMBER.—5N5E16CAAD.

SITE ID (STATION NUMBER).—442335103311001.

OTHER IDENTIFIER.—MD-86A.

LOCATION.—Lat 44°23'35", long 103°31'10", in SE¼NE¼NE¼SW¼ sec. 16, T. 5 N., R. 5 E., Hydrologic Unit 10120202, 1 mi southwest of Sturgis. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Madison.

WELL CHARACTERISTICS.—Drilled observation well, 839 ft deep with 712 ft of 5-in. steel casing; open hole from 712 to 839 ft.

INSTRUMENTATION.—Electronic data logger with submersible pressure transducer -- 60-minute interval. Digital water-level recorder prior to February 1991.

DATUM.—Elevation of land-surface datum is 3,604.81 ft above sea level. Measuring point: Top of steel casing, 1.90 ft above land-surface datum.

REMARKS.—Records fair. Problems with transducer drift since February 1991. Few check measurements prior to February 1991. Additional problems with stuck float prior to June 26, 1987. Rapid changes in reported water level during 1986-87 probably are a result of stuck float coming loose. Previously unpublished records from June 16, 1986, through June 25, 1987, are presented with the following tabulation.

PERIOD OF RECORD.—June 1986 to September 1994.

EXTREMES.—Highest daily water level, 531.38 ft below land-surface datum, June 26, 1987; lowest daily water level, 575.40 ft below land-surface datum, Mar. 12, 1993.

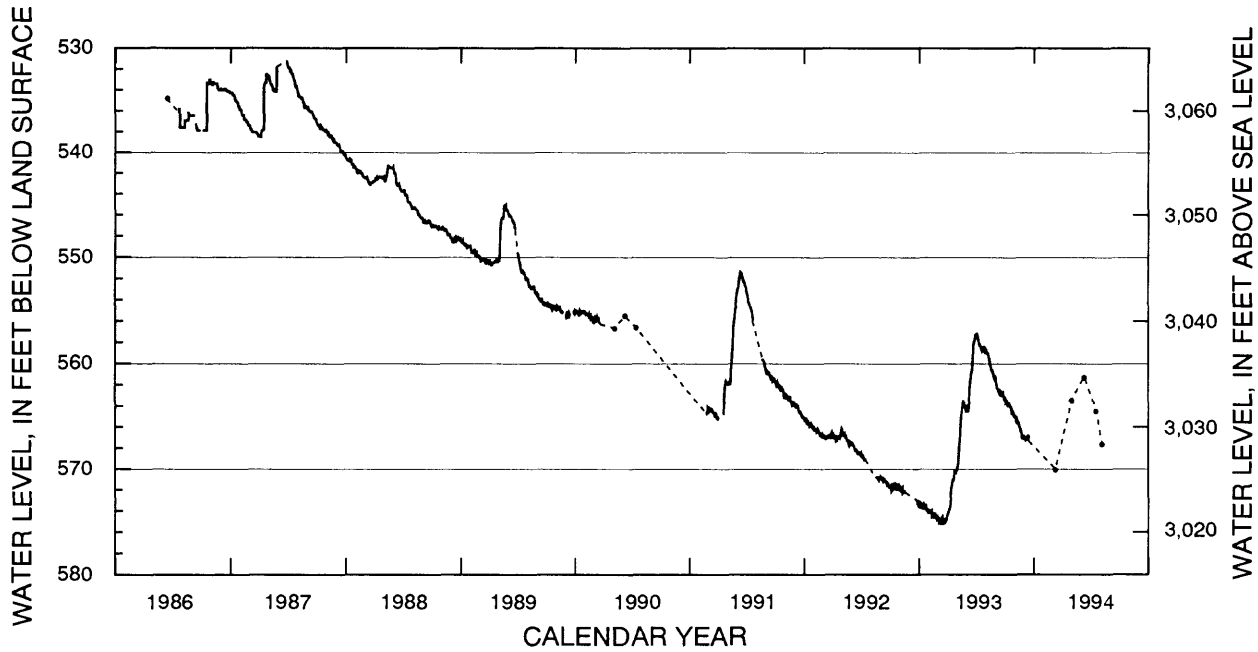


Figure 21. Hydrograph for observation well 5N5E16CAAD (site number 14).

SITE NUMBER 14—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	---	537.66	536.53
2	---	---	---	---	---	---	---	---	---	---	537.66	536.53
3	---	---	---	---	---	---	---	---	---	---	537.66	536.53
4	---	---	---	---	---	---	---	---	---	---	537.66	536.53
5	---	---	---	---	---	---	---	---	---	---	537.66	536.53
6	---	---	---	---	---	---	---	---	---	---	537.66	536.53
7	---	---	---	---	---	---	---	---	---	---	536.96	536.53
8	---	---	---	---	---	---	---	---	---	---	536.96	---
9	---	---	---	---	---	---	---	---	---	---	536.96	537.30
10	---	---	---	---	---	---	---	---	---	---	536.96	537.33
11	---	---	---	---	---	---	---	---	---	---	536.96	537.39
12	---	---	---	---	---	---	---	---	---	---	536.96	537.64
13	---	---	---	---	---	---	---	---	---	---	536.96	537.70
14	---	---	---	---	---	---	---	---	---	---	536.96	537.70
15	---	---	---	---	---	---	---	---	---	---	536.96	537.95
16	---	---	---	---	---	---	---	---	e534.85	---	536.96	537.95
17	---	---	---	---	---	---	---	---	---	535.90	536.96	537.95
18	---	---	---	---	---	---	---	---	---	535.90	536.96	537.95
19	---	---	---	---	---	---	---	---	---	535.90	536.16	537.95
20	---	---	---	---	---	---	---	---	---	535.90	536.53	537.95
21	---	---	---	---	---	---	---	---	---	535.90	536.53	537.95
22	---	---	---	---	---	---	---	---	---	535.89	536.53	537.95
23	---	---	---	---	---	---	---	---	---	537.66	536.53	537.95
24	---	---	---	---	---	---	---	---	---	537.66	536.53	537.95
25	---	---	---	---	---	---	---	---	---	537.66	536.53	537.95
26	---	---	---	---	---	---	---	---	---	537.66	536.53	537.95
27	---	---	---	---	---	---	---	---	---	537.66	536.53	---
28	---	---	---	---	---	---	---	---	---	537.66	536.53	---
29	---	---	---	---	---	---	---	---	---	537.66	536.53	---
30	---	---	---	---	---	---	---	---	---	537.66	536.53	---
31	---	---	---	---	---	---	---	---	---	537.66	536.53	---
MAX	---	---	---	---	---	---	---	---	534.85	537.66	537.66	537.95

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	533.57	534.07	534.34	535.95	537.49	538.55	532.72	---	531.81	534.24	535.89
2	537.93	533.57	534.04	534.34	535.95	537.58	538.57	532.79	---	531.92	534.37	535.89
3	537.93	533.57	534.06	534.34	536.05	537.70	538.57	533.09	---	531.92	534.64	535.83
4	537.93	533.57	534.06	534.34	536.24	537.83	538.57	533.21	---	531.92	534.67	535.98
5	537.93	533.57	534.06	534.34	536.46	537.83	538.56	533.26	---	531.93	534.63	535.98
6	537.93	533.29	534.06	534.34	536.47	537.83	538.55	533.50	---	532.11	534.64	535.98
7	537.93	533.29	534.06	534.51	536.47	537.90	538.10	533.51	---	532.26	534.74	536.08
8	537.93	533.42	534.06	534.51	536.48	538.06	538.00	533.51	---	532.24	534.74	536.08
9	537.93	533.44	534.06	534.59	536.48	538.06	537.98	533.51	---	532.13	534.74	536.05
10	537.93	533.44	534.06	534.59	536.48	538.06	537.95	533.55	---	532.16	534.74	536.11
11	537.93	533.44	533.98	534.59	536.91	538.11	537.90	533.69	---	532.38	534.73	536.14
12	537.93	533.44	534.00	534.59	536.91	538.11	537.89	533.69	---	532.53	534.88	536.14
13	537.93	533.44	534.00	534.61	536.91	538.11	537.88	533.79	---	532.53	534.87	536.12
14	537.93	533.44	534.00	534.87	536.91	538.11	537.87	534.02	---	532.53	534.82	536.12
15	537.93	533.44	534.00	535.08	536.88	538.11	537.85	534.02	---	532.53	534.78	536.15
16	533.38	533.44	534.00	535.09	536.90	538.11	533.68	534.02	---	532.63	534.93	536.34
17	533.37	533.44	534.13	535.09	536.92	538.11	533.57	534.18	---	532.84	535.14	536.44
18	533.33	533.44	534.13	535.09	537.00	538.11	533.46	534.18	---	532.87	535.26	536.44
19	533.33	533.57	534.13	535.17	537.11	538.11	533.41	534.19	---	533.00	535.26	536.54
20	533.34	533.91	534.13	535.18	537.12	538.11	533.39	534.19	---	533.07	535.25	536.66
21	533.34	533.93	534.20	535.26	537.15	538.11	533.39	534.19	---	533.18	535.52	536.77
22	533.40	533.98	534.20	535.27	537.15	538.11	533.38	534.19	---	533.25	535.75	536.78
23	533.44	534.07	534.20	535.27	537.31	538.18	532.59	534.19	---	533.60	535.75	536.78
24	533.39	534.07	534.20	535.32	537.35	538.24	532.59	534.19	---	533.69	535.64	536.82
25	533.07	534.07	534.20	535.61	537.49	538.24	532.59	534.19	---	533.67	535.47	536.83
26	533.07	534.07	534.20	535.65	537.49	538.24	532.64	534.19	531.38	533.64	535.57	536.75
27	533.07	534.07	534.20	535.65	537.49	538.41	532.72	531.93	531.39	533.68	535.61	536.99
28	533.37	534.07	534.20	535.65	537.49	538.51	532.72	531.92	531.52	533.83	535.62	537.12
29	533.44	534.07	534.34	535.94	---	538.53	532.72	---	531.73	533.87	535.75	537.20
30	533.44	534.07	534.34	535.95	---	538.53	532.72	---	531.73	534.02	535.79	537.23
31	533.53	---	534.34	535.95	---	---	---	---	---	534.11	535.80	---
MAX	537.93	534.07	534.34	535.95	537.49	538.53	538.57	534.19	531.73	534.11	535.80	537.23

e Estimated

SITE NUMBER 14—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
INSTANTANEOUS VALUE AT 1200 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	571.83	571.92	---	573.36	573.98	574.60	574.34	570.22	564.32	557.65	558.95	561.38
2	571.77	571.68	---	573.06	573.97	574.64	574.05	569.90	564.58	557.58	558.88	561.80
3	571.77	572.10	---	573.32	574.30	574.84	574.23	569.79	564.64	557.22	559.01	561.87
4	571.72	572.20	---	573.36	574.22	575.05	574.10	569.46	564.58	557.35	559.02	562.10
5	572.16	572.12	---	573.66	574.18	575.02	573.84	569.60	564.46	557.49	559.07	562.29
6	572.11	572.20	---	573.40	574.19	574.99	573.98	568.84	564.58	557.57	559.02	562.37
7	572.19	571.98	---	573.45	574.27	574.93	573.92	567.95	564.05	557.74	559.01	562.48
8	571.79	571.96	---	573.35	574.18	574.97	573.71	567.62	563.74	557.92	559.12	562.38
9	571.75	571.90	---	573.87	574.12	574.97	573.46	567.27	563.34	558.09	559.45	562.63
10	571.92	572.26	---	573.51	574.48	575.19	573.28	566.80	562.70	558.21	559.48	562.63
11	571.77	572.19	---	573.35	574.37	575.19	572.66	566.25	562.09	558.36	559.51	562.46
12	571.76	572.32	---	573.74	574.19	575.40	572.27	565.70	561.71	558.16	559.95	562.41
13	571.36	572.32	---	573.78	574.33	574.99	571.90	565.09	561.60	558.38	559.91	562.89
14	571.77	572.38	---	573.59	574.26	574.70	571.69	564.84	561.48	558.49	560.06	562.91
15	571.83	572.24	---	573.46	574.51	574.66	571.46	564.60	560.96	558.42	560.23	562.79
16	571.82	572.22	---	573.60	574.69	575.27	571.24	564.26	560.81	558.48	560.26	563.12
17	571.86	572.31	---	573.66	574.70	575.15	571.27	564.05	560.93	558.71	560.42	562.91
18	571.76	572.38	---	573.76	574.40	574.82	570.97	563.92	560.61	558.69	560.62	562.78
19	571.59	---	---	573.63	574.35	575.09	571.15	563.77	559.98	558.82	560.76	562.70
20	571.61	---	---	573.66	574.19	575.12	571.16	563.69	559.43	558.68	560.84	562.74
21	571.58	---	---	573.71	574.49	575.20	570.91	563.62	558.97	558.55	560.69	562.78
22	571.81	---	---	573.39	574.52	575.18	570.62	563.63	558.38	558.57	560.72	563.01
23	572.12	---	---	574.00	574.75	575.03	570.31	563.76	558.08	558.58	560.88	562.99
24	571.87	---	---	573.96	574.59	575.09	570.33	564.04	558.02	558.54	560.96	562.93
25	571.87	---	573.43	573.82	574.80	575.10	570.43	564.14	557.95	558.67	561.25	562.87
26	571.74	---	572.98	574.00	574.75	575.01	570.05	564.00	557.71	558.62	561.41	563.18
27	571.86	---	573.26	573.80	574.72	574.88	570.23	564.18	557.45	558.70	561.45	563.09
28	571.90	---	573.54	574.23	574.72	574.96	570.30	564.39	557.37	558.83	561.19	563.41
29	571.73	---	573.32	574.21	---	574.70	570.16	564.28	557.34	558.78	561.13	563.38
30	571.64	---	573.62	574.11	---	574.53	570.13	564.57	557.35	558.70	561.39	563.14
31	571.79	---	573.75	574.12	---	574.53	---	564.48	---	558.81	561.35	---
MAX	572.19	572.38	573.75	574.23	574.80	575.40	574.34	570.22	564.64	558.83	561.45	563.41

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INSTANTANEOUS VALUE AT 1200 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	563.61	565.11	567.15	---	---	---	---	---	---	---	---	---
2	563.59	565.18	567.14	---	---	---	---	---	---	---	---	---
3	563.54	564.98	567.25	---	---	---	---	---	---	---	---	---
4	563.65	565.38	566.93	---	---	---	---	---	---	---	e567.60	---
5	563.55	565.64	567.17	---	---	---	---	---	---	---	---	---
6	563.56	565.43	567.13	---	---	---	---	---	---	---	---	---
7	563.73	565.41	567.17	---	---	---	---	---	e561.30	---	---	---
8	564.02	565.64	567.04	---	---	e570.15	---	---	---	---	---	---
9	564.03	565.80	567.12	---	---	---	---	---	---	---	---	---
10	563.86	565.68	567.35	---	---	---	---	---	---	---	---	---
11	563.90	565.62	567.13	---	---	---	---	---	---	---	---	---
12	563.94	565.64	566.79	---	---	---	---	---	---	---	---	---
13	563.98	565.76	567.33	---	---	---	---	---	---	e564.52	---	---
14	563.94	566.09	e566.85	---	---	---	---	---	---	---	---	---
15	564.02	566.00	---	---	---	---	---	---	---	---	---	---
16	564.09	566.16	---	---	---	---	---	---	---	---	---	---
17	564.09	566.23	---	---	---	---	---	---	---	---	---	---
18	564.20	566.16	---	---	---	---	---	---	---	---	---	---
19	564.19	566.58	---	---	---	---	---	---	---	---	---	---
20	564.53	566.43	---	---	---	---	---	---	---	---	---	---
21	564.50	566.52	---	---	---	---	---	---	---	---	---	---
22	564.55	566.72	---	---	---	---	---	---	---	---	---	---
23	564.56	567.01	---	---	---	---	---	---	---	---	---	---
24	564.50	567.21	---	---	---	---	---	---	---	---	---	---
25	564.78	567.12	---	---	---	---	---	---	---	---	---	---
26	565.00	567.02	---	---	---	---	---	---	---	---	---	---
27	564.70	566.99	---	---	---	---	e563.52	---	---	---	---	---
28	564.75	567.14	---	---	---	---	---	---	---	---	---	---
29	565.18	567.14	---	---	---	---	---	---	---	---	---	---
30	565.09	567.05	---	---	---	---	---	---	---	---	---	---
31	564.91	---	---	---	---	---	---	---	---	---	---	---
MAX	565.18	567.21	567.35	---	---	570.15	563.52	---	561.30	564.52	567.60	---

e Estimated

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SITE NUMBER FROM LOCATION MAP.—15.

COUNTY.—Meade.

LOCAL WELL NUMBER.—4N6E19AABA2.

SITE ID (STATION NUMBER).—441759103261202.

OTHER IDENTIFIERS.—MD-90A and Tilford 2.

LOCATION.—Lat 44°17′59″, long 103°26′12″, in NE¼NW¼NE¼NE¼ sec. 19, T. 4 N., R. 6 E., Hydrologic Unit 10120111, at Tilford. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Madison.

WELL CHARACTERISTICS.—Drilled observation well, 840 ft deep with 750 ft of 5-in. steel casing; open hole from 750 to 840 ft.

INSTRUMENTATION.—Digital water-level recorder -- 60-minute interval.

DATUM.—Elevation of land-surface datum is 3,630 ft above sea level. Measuring point: Top of steel casing, 2.20 ft above land-surface datum.

REMARKS.—Records good.

PERIOD OF RECORD.—July 1991 to September 1994.

EXTREMES.—Highest daily water level, 10.82 ft below land-surface datum, Aug. 6, 22, 1994; lowest daily water level, 54.96 ft below land-surface datum, Mar. 31, Apr. 1, 3, 7, 1993.

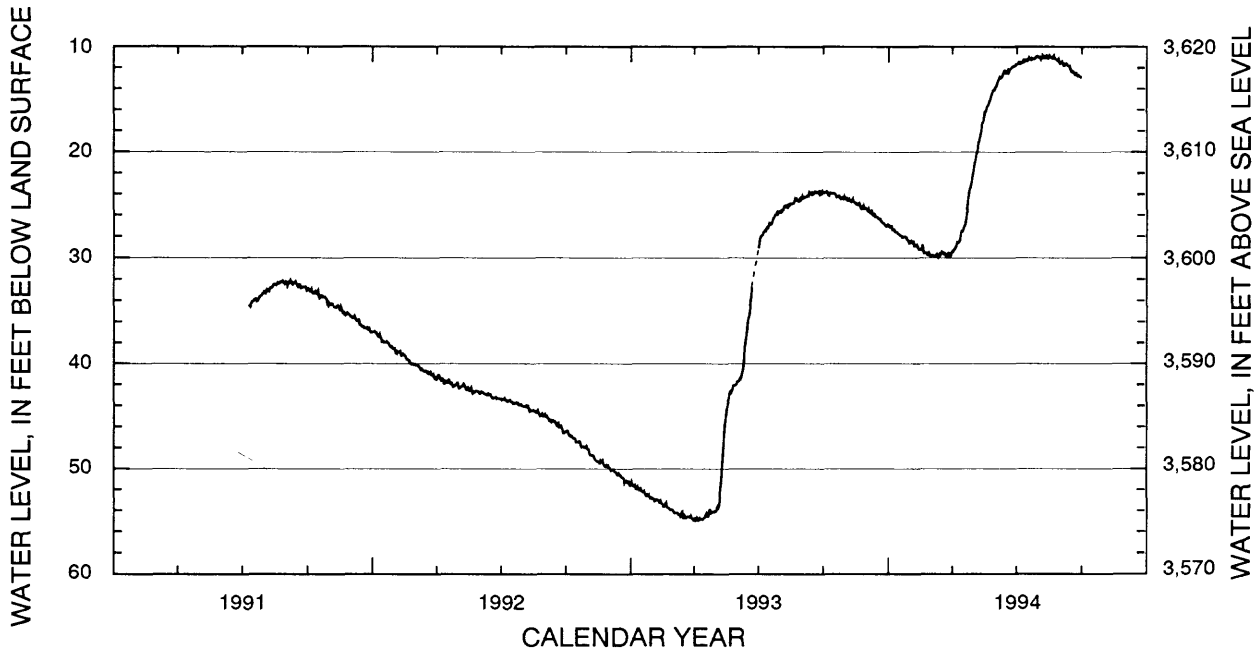

Figure 22. Hydrograph for observation well 4N6E19AABA2 (site number 15).

SITE NUMBER 15—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46.46	48.14	49.90	51.47	52.85	53.91	54.96	54.12	41.77	29.11	25.76	24.20
2	46.37	48.14	49.90	51.24	52.88	54.02	54.83	54.05	41.73	28.78	25.59	24.40
3	46.39	48.50	50.07	51.51	53.13	54.21	54.96	53.79	41.72	28.31	25.65	24.38
4	46.53	48.72	50.20	51.56	53.13	54.23	54.94	53.62	41.67	28.00	25.56	24.26
5	46.86	48.72	50.18	51.72	53.05	54.23	54.69	53.76	41.45	28.00	25.46	24.26
6	46.87	48.72	50.08	51.72	52.99	54.22	54.83	53.61	41.46	27.94	25.40	24.27
7	46.94	48.72	50.08	51.63	53.00	54.19	54.96	52.95	41.27	27.84	25.16	24.23
8	46.85	48.72	50.07	51.92	53.02	54.21	54.92	52.23	40.84	27.62	25.13	24.18
9	46.88	48.74	50.29	51.97	53.03	54.34	54.74	51.59	40.70	27.58	25.23	24.13
10	46.98	49.01	50.35	51.95	53.25	54.42	54.82	50.72	40.15	27.43	25.23	24.15
11	47.11	49.05	50.36	51.76	53.25	54.44	54.83	49.56	39.27	27.48	25.11	23.81
12	47.12	49.14	50.51	51.99	53.13	54.57	54.88	48.31	38.39	27.27	25.24	23.82
13	47.10	49.21	50.60	52.05	53.28	54.39	54.88	47.21	37.81	27.17	25.11	23.99
14	47.14	49.30	50.60	52.02	53.40	54.16	54.81	46.07	37.34	27.20	24.99	24.00
15	47.48	49.30	50.46	51.92	53.47	54.11	54.76	45.45	36.75	26.97	25.00	23.89
16	47.49	49.30	50.62	52.15	53.64	54.72	54.60	44.92	35.89	26.80	24.88	24.00
17	47.49	49.30	50.59	52.15	53.64	54.72	54.48	44.23	35.67	26.87	24.89	24.01
18	47.49	49.57	50.66	52.24	53.55	54.31	54.30	44.00	35.37	26.80	24.93	23.91
19	47.44	49.19	50.82	52.24	53.36	54.75	54.48	43.64	34.78	26.85	24.90	23.75
20	47.39	49.28	50.82	52.16	53.26	54.75	54.58	43.36	34.15	26.68	24.90	23.73
21	47.49	49.31	50.82	52.41	53.55	54.67	54.57	42.98	33.55	26.46	24.72	23.79
22	47.88	49.18	50.95	52.41	53.74	54.67	54.10	42.69	32.81	26.28	24.44	23.87
23	47.97	49.52	51.36	52.65	53.80	54.55	53.85	42.67	---	26.19	24.50	23.90
24	47.95	49.69	51.16	52.65	53.79	54.60	54.12	42.73	---	26.02	24.44	23.78
25	47.95	49.70	51.20	52.52	53.87	54.68	54.27	42.63	---	25.95	24.57	23.77
26	47.90	49.78	51.16	52.62	53.92	54.68	54.17	42.35	---	25.91	24.65	23.96
27	47.99	49.79	51.33	52.54	53.92	54.54	54.11	42.12	---	25.77	24.71	23.86
28	48.00	49.68	51.36	52.88	53.91	54.74	54.17	42.12	---	25.89	24.46	24.03
29	47.95	49.75	51.26	52.88	---	54.76	54.17	42.06	---	25.76	24.40	23.99
30	47.85	49.72	51.56	52.80	---	54.88	54.06	42.07	---	25.65	24.56	23.73
31	48.08	---	51.60	52.88	---	54.96	---	42.02	---	25.70	24.48	---
MAX	48.08	49.79	51.60	52.88	53.92	54.96	54.96	54.12	41.77	29.11	25.76	24.40

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23.87	24.45	25.44	26.93	28.49	29.84	29.39	21.83	13.91	11.68	11.01	11.57
2	23.93	24.47	25.59	27.13	28.44	29.84	29.44	21.46	13.74	11.64	10.96	11.53
3	23.90	24.25	25.64	27.17	28.56	29.78	29.35	20.97	13.72	11.59	11.02	11.42
4	23.87	24.60	25.49	27.17	28.56	29.75	29.12	20.70	13.39	11.50	11.19	11.63
5	23.79	24.63	25.76	26.95	28.50	29.74	29.12	20.31	13.18	11.63	11.06	11.81
6	23.76	24.59	25.78	27.37	28.87	29.83	28.94	19.99	13.13	11.53	10.82	11.79
7	23.85	24.47	25.65	27.37	28.87	29.87	28.75	19.70	12.89	11.60	10.99	11.67
8	24.12	24.63	25.62	27.35	28.82	29.86	28.52	19.10	12.97	11.57	11.02	11.68
9	24.15	24.74	25.93	27.34	28.82	29.76	28.52	18.93	12.97	11.51	10.93	11.62
10	23.98	24.73	26.02	27.58	28.80	29.65	28.55	18.60	12.88	11.36	11.06	11.72
11	23.90	24.59	26.01	27.58	28.96	29.89	28.50	18.25	12.75	11.41	11.02	11.80
12	23.95	24.46	25.80	27.59	29.17	29.98	28.26	18.01	12.52	11.30	10.89	11.86
13	23.95	24.75	26.17	27.63	29.19	29.85	27.74	17.37	12.35	11.37	11.05	11.94
14	23.92	24.81	26.18	27.74	29.21	29.66	27.53	17.16	12.30	11.32	11.12	11.88
15	23.94	24.81	26.17	27.78	29.24	29.75	27.57	17.06	12.46	11.25	10.97	12.19
16	23.95	24.97	26.22	27.80	29.24	29.57	27.51	16.55	12.50	11.32	10.86	12.38
17	23.94	24.98	26.36	27.92	29.18	29.43	27.27	16.18	12.52	11.26	10.98	12.41
18	24.01	24.95	26.40	27.92	28.77	29.49	27.01	16.20	12.45	11.03	10.97	12.35
19	24.14	25.02	26.36	27.99	29.28	29.49	26.99	16.13	12.25	11.11	11.08	12.43
20	24.30	24.97	26.35	28.09	29.55	29.67	26.55	15.76	12.42	11.21	11.09	12.43
21	24.26	24.87	26.55	28.09	29.55	29.67	26.16	15.64	12.27	11.23	10.95	12.68
22	24.23	25.05	26.55	28.02	29.53	29.59	25.65	15.53	12.15	11.12	10.82	12.68
23	24.16	25.34	26.71	28.01	29.53	29.84	24.93	15.32	12.07	11.19	11.09	12.58
24	24.16	25.41	26.74	28.03	29.50	29.94	24.50	15.16	11.98	11.13	11.11	12.77
25	24.42	25.41	26.74	28.13	29.76	29.87	24.02	14.92	11.94	11.10	11.19	12.80
26	24.48	25.24	26.83	28.13	29.75	29.64	23.54	14.74	11.88	11.14	11.24	12.72
27	24.43	25.13	26.96	28.31	29.56	29.82	23.49	14.49	11.82	11.09	11.28	12.80
28	24.32	25.37	27.04	28.32	29.74	29.71	23.13	14.29	11.88	10.98	11.32	12.82
29	24.48	25.37	27.07	28.47	---	29.89	22.77	14.16	11.84	10.93	11.22	12.86
30	24.48	25.33	26.97	28.63	---	29.79	22.35	14.07	11.68	10.88	11.50	13.01
31	24.25	---	26.89	28.61	---	29.52	---	14.10	---	10.92	11.60	---
MAX	24.48	25.41	27.07	28.63	29.76	29.98	29.44	21.83	13.91	11.68	11.60	13.01

SITE NUMBER FROM LOCATION MAP.—16.

COUNTY.—Meade.

LOCAL WELL NUMBER.—4N6E19AABA.

SITE ID (STATION NUMBER).—441759103261201.

OTHER IDENTIFIERS.—MD-84B and Tilford 1.

LOCATION.—Lat 44°17′59″, long 103°26′12″, in NE¼NW¼NE¼NE¼ sec. 19, T. 4 N., R. 6 E., Hydrologic Unit 10120111, at Tilford. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 302 ft deep with 296 ft of 5-in. steel casing; open hole from 296 to 302 ft.

INSTRUMENTATION.—Digital water-level recorder -- 60-minute interval.

DATUM.—Elevation of land-surface datum is 3,630 ft above sea level. Measuring point: Top of steel casing, 2.10 ft above land-surface datum.

REMARKS.—Records good. Previously unpublished records from July 17, 1984, through October 31, 1984, are presented with the following tabulation. Unusual fluctuations in water level during 1990 probably caused by drilling adjacent observation well (MD-90A).

PERIOD OF RECORD.—July 1984 to September 1994.

EXTREMES.—Highest daily water level, 2.70 ft below land-surface datum, Oct. 31, 1984; lowest daily water level, 62.89 ft below land-surface datum, Apr. 6-7, 1993.

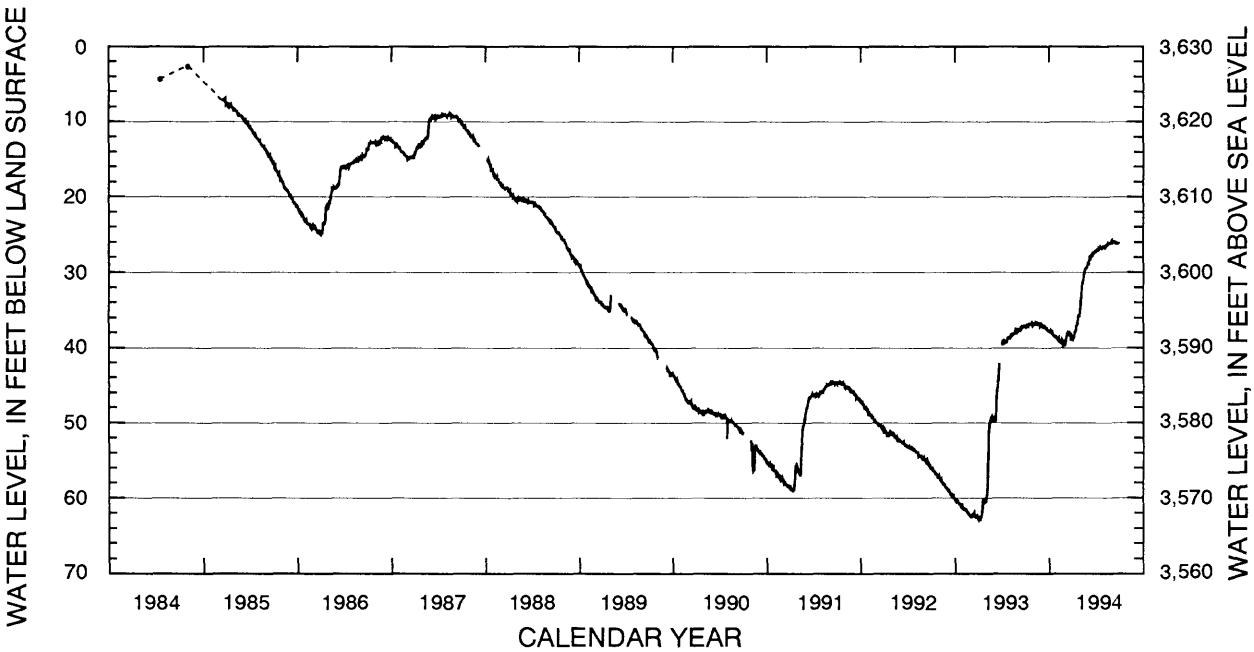

Figure 23. Hydrograph for observation well 4N6E19AABA (site number 16).

SITE NUMBER 16—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
17	---	---	---	---	---	---	---	---	---	e4.40	---	---

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	7.61	8.46	9.47	10.82	12.31	13.93
2	---	---	---	---	---	---	7.53	8.38	9.53	10.82	12.26	13.83
3	---	---	---	---	---	---	7.51	8.28	9.56	10.76	12.34	13.90
4	---	---	---	---	---	---	7.48	8.27	9.63	10.86	12.42	13.97
5	---	---	---	---	---	---	7.58	8.40	9.52	10.89	12.49	13.93
6	---	---	---	---	---	---	7.89	8.50	9.59	10.92	12.53	14.10
7	---	---	---	---	---	---	8.05	8.54	9.65	10.99	12.54	14.41
8	---	---	---	---	---	---	8.06	8.55	9.76	11.10	12.56	14.45
9	---	---	---	---	---	---	7.74	8.58	9.80	11.19	12.76	14.41
10	---	---	---	---	---	---	7.72	8.46	9.84	11.18	12.76	14.54
11	---	---	---	---	---	---	7.74	8.58	10.01	11.17	12.66	14.54
12	---	---	---	---	---	---	8.00	8.80	10.00	11.20	12.83	14.51
13	---	---	---	---	---	---	8.02	8.87	9.73	11.33	13.05	14.67
14	---	---	---	---	---	7.14	7.88	8.88	9.90	11.50	13.05	14.63
15	---	---	---	---	---	7.16	7.98	9.06	9.89	11.50	12.91	14.50
16	---	---	---	---	---	7.15	7.97	9.13	10.08	11.48	13.04	14.47
17	---	---	---	---	---	7.08	7.75	9.07	10.20	11.51	13.21	14.56
18	---	---	---	---	---	7.04	7.78	8.91	10.24	11.70	13.22	14.69
19	---	---	---	---	---	7.13	7.73	8.92	10.18	11.80	13.23	15.02
20	---	---	---	---	---	7.12	7.84	9.03	9.90	11.71	13.23	15.07
21	---	---	---	---	---	7.02	7.87	9.09	10.18	11.77	13.22	14.91
22	---	---	---	---	---	7.02	8.04	9.17	10.20	11.75	13.27	15.14
23	---	---	---	---	---	7.17	8.10	9.19	10.31	11.70	13.43	15.20
24	---	---	---	---	---	7.18	8.14	9.15	10.22	11.85	13.49	15.14
25	---	---	---	---	---	7.07	8.14	9.05	10.41	12.00	13.45	15.30
26	---	---	---	---	---	7.12	8.27	9.21	10.56	12.00	13.59	15.26
27	---	---	---	---	---	7.08	8.22	9.21	10.64	12.07	13.63	15.53
28	---	---	---	---	---	7.41	8.22	9.15	10.65	12.18	13.62	15.63
29	---	---	---	---	---	7.63	8.35	9.17	10.67	12.23	13.70	15.65
30	---	---	---	---	---	7.57	8.47	9.24	10.72	12.25	13.70	15.65
31	e2.70	---	---	---	---	7.61	---	9.37	---	12.31	13.89	---
MAX	2.70	---	---	---	---	7.63	8.47	9.37	10.72	12.31	13.89	15.65

e Estimated

SITE NUMBER 16—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55.95	57.37	58.85	60.11	61.33	62.39	62.80	60.54	49.53	39.57	38.60	37.60
2	55.95	57.40	58.85	60.01	61.34	62.43	62.76	60.39	49.62	39.42	38.52	37.76
3	55.96	57.65	58.98	60.19	61.52	62.53	62.87	59.94	49.71	39.10	38.55	37.76
4	56.13	57.65	59.06	60.22	61 52	62.55	62.84	59.65	49.71	39.10	38.55	37.67
5	56.37	57.63	59.03	60.38	61.47	62.52	62.72	59.65	49.61	39.19	38.45	37.67
6	56.37	57.69	58.96	60.34	61.42	62.47	62.89	59.37	49.68	39.25	38.43	37.67
7	56.40	57.65	58.96	60.32	61.42	62.42	62.89	56.87	49.61	39.24	38.21	37.62
8	56.31	57.59	58.94	60.55	61.42	62.24	62.87	55.49	48.83	39.17	38.19	37.55
9	56.36	57.83	59.19	60.62	61.49	62.15	62.59	53.89	48.08	39.20	38.30	37.51
10	56.41	57.93	59.27	60.53	61.65	62.13	62.51	52.79	46.94	39.29	38.28	37.52
11	56.50	57.96	59.23	60.45	61.65	62.12	62.49	52.04	46.16	39.31	38.21	37.20
12	56.52	58.03	59.34	60.64	61.60	62.18	62.42	51.41	45.62	39.20	38.32	37.26
13	56.55	58.02	59.45	60.71	61.67	62.15	62.33	50.91	45.46	39.29	38.23	37.38
14	56.56	58.09	59.38	60.67	61.79	62.03	62.13	50.36	45.30	39.29	38.09	37.39
15	56.82	58.05	59.36	60.62	61.85	61.98	61.71	50.17	45.07	39.13	38.09	37.27
16	56.82	58.09	59.47	60.76	62.01	62.44	61.25	50.03	44.50	39.14	38.04	37.35
17	56.80	58.10	59.42	60.76	62.03	62.44	60.99	49.69	44.49	39.20	38.08	37.35
18	56.83	58.20	59.46	60.82	62.03	62.14	60.66	49.67	44.28	39.27	38.12	37.27
19	56.75	58.20	59.57	60.80	62.02	62.46	60.71	49.52	43.62	39.28	38.12	37.13
20	56.75	58.28	59.55	60.79	61.79	62.48	60.70	49.43	42.72	39.22	38.12	37.08
21	56.83	58.31	59.59	61.00	62.04	62.43	60.68	49.26	42.07	39.08	37.97	37.14
22	57.16	58.10	59.83	61.00	62.19	62.43	60.23	49.20	---	38.78	37.77	37.18
23	57.22	58.47	60.08	61.22	62.22	62.37	60.08	49.36	e39.92	38.73	37.79	37.17
24	57.15	58.57	59.87	61.21	62.22	62.37	60.38	49.40	---	38.62	37.76	37.06
25	57.15	58.59	59.89	61.11	62.36	62.47	60.45	49.40	---	38.65	37.92	37.07
26	57.15	58.63	59.82	61.22	62.39	62.48	60.38	49.40	---	38.65	37.95	37.21
27	57.23	58.64	60.02	61.13	62.39	62.43	60.41	49.46	---	38.60	37.97	37.10
28	57.23	58.66	60.06	61.37	62.39	62.56	60.51	49.56	---	38.64	37.78	37.24
29	57.17	58.70	59.95	61.36	---	62.58	60.51	49.52	---	38.60	37.77	37.21
30	57.09	58.67	60.23	61.30	---	62.72	60.50	49.68	e39.60	38.58	37.89	36.93
31	57.35	---	60.25	61.34	---	62.80	---	49.68	---	38.59	37.84	---
MAX	57.35	58.70	60.25	61.37	62.39	62.80	62.89	60.54	49.71	39.57	38.60	37.76

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37.04	36.85	37.02	37.73	38.86	39.64	38.75	34.68	28.82	27.23	26.58	26.13
2	37.14	36.85	37.06	37.92	38.78	39.64	38.79	34.20	28.79	27.19	26.55	26.04
3	37.09	36.65	37.08	37.95	38.89	39.44	38.72	33.61	28.76	27.16	26.56	25.93
4	37.06	36.76	36.96	37.95	38.89	39.21	38.61	33.24	28.48	27.09	26.65	25.97
5	36.93	36.77	37.05	37.73	38.82	38.86	38.61	32.80	28.44	27.17	26.56	26.12
6	36.91	36.77	37.05	37.79	39.13	38.70	38.49	32.46	28.36	27.11	26.33	26.09
7	36.99	36.74	37.02	37.81	39.13	38.52	38.35	32.21	28.13	27.08	26.50	25.94
8	37.21	36.84	36.94	37.81	39.06	38.40	38.07	31.67	28.26	27.07	26.50	25.91
9	37.21	36.90	37.15	37.82	39.06	38.21	38.06	31.57	28.26	27.01	26.37	25.88
10	37.01	36.88	37.20	37.82	39.09	38.05	37.91	31.27	28.19	26.88	26.48	25.94
11	36.89	36.71	37.17	37.82	39.20	38.28	37.86	31.01	28.07	26.90	26.43	25.95
12	36.90	36.58	37.00	38.17	39.34	38.33	37.61	30.84	27.88	26.85	26.23	25.95
13	36.91	36.60	37.25	38.20	39.34	38.21	37.14	30.35	27.76	26.89	26.41	25.97
14	36.87	36.61	37.26	38.28	39.40	38.02	37.10	30.29	27.67	26.85	26.42	25.95
15	36.79	36.76	37.25	38.28	39.40	38.08	37.11	30.24	27.81	26.80	26.25	26.10
16	36.81	36.94	37.28	38.36	39.40	37.93	37.07	29.88	27.81	26.82	26.18	26.20
17	36.80	36.94	37.39	38.45	39.33	37.91	36.93	29.69	27.79	26.79	26.21	26.20
18	36.81	36.72	37.39	38.45	38.95	37.94	36.81	29.62	27.77	26.65	26.19	26.12
19	36.93	36.75	37.37	38.49	39.02	38.01	36.81	29.62	27.63	26.70	26.21	26.11
20	37.02	36.75	37.37	38.58	39.03	38.16	36.56	29.50	27.71	26.71	26.18	26.09
21	36.94	36.71	37.52	38.54	39.46	38.16	36.49	29.48	27.63	26.71	26.10	26.25
22	36.89	36.75	37.52	38.48	39.39	38.17	36.27	29.48	27.47	26.70	25.95	26.24
23	36.83	36.76	37.69	38.45	39.39	38.37	35.90	29.38	27.46	26.79	26.15	26.12
24	36.81	37.08	37.65	38.46	39.40	38.62	35.79	29.38	27.32	26.74	26.14	26.24
25	36.98	37.05	37.65	38.53	39.63	38.58	35.68	29.29	27.32	26.76	26.16	26.25
26	37.02	36.89	37.69	38.53	39.58	38.53	35.74	29.23	27.31	26.76	26.16	26.15
27	36.94	36.79	37.78	38.68	39.45	38.74	35.74	29.05	27.26	26.72	26.11	26.18
28	36.83	36.99	37.81	38.68	39.60	38.77	35.59	28.94	27.33	26.68	26.12	26.18
29	36.96	36.99	37.91	38.70	---	38.96	35.40	28.88	27.29	26.59	26.03	26.14
30	36.94	36.93	37.74	38.71	---	38.94	35.14	28.93	27.23	26.51	26.19	26.25
31	36.71	---	37.72	38.83	---	38.78	---	28.98	---	26.56	26.19	---
MAX	37.21	37.08	37.91	38.83	39.63	39.64	38.79	34.68	28.82	27.23	26.65	26.25

e Estimated

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SITE NUMBER FROM LOCATION MAP.—17.

COUNTY.—Meade.

LOCAL WELL NUMBER.—3N6E15ABB.

SITE ID (STATION NUMBER).—441337103225001.

OTHER IDENTIFIER.—MD-84A.

LOCATION.—Lat 44°13′37″, long 103°22′50″, in NW¼NW¼NW¼NE¼ sec. 15, T. 3 N, R. 6 E., Hydrologic Unit 10120111, 0.5 mi southeast of Piedmont. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 440 ft deep, with 409 ft of 5-in. steel casing; open hole from 409 to 440 ft.

INSTRUMENTATION.—Electronic data logger with submersible transducer (pressure transducer used from June 1990 to Feb. 11, 1992) -- 60-minute interval. Prior to June 1990, circular-chart pressure recorder.

DATUM.—Elevation of land-surface datum is 3,475.3 ft above sea level. Measuring point: Top of 3/4-in. nipple 1.50 ft above land-surface datum for pressure measurements; top of concrete pad at land-surface datum for water-level measurements.

REMARKS.—Records good. Unusual fluctuations in water level during August 1994 probably caused by drilling adjacent observation well (MD-94A; records not yet available).

PERIOD OF RECORD.—July 1984 to September 1994.

EXTREMES.—Highest daily water level, 28.1 ft above land-surface datum, July 17, 1984; lowest daily water level, 6.01 ft below land-surface datum, Apr. 12, 1993.

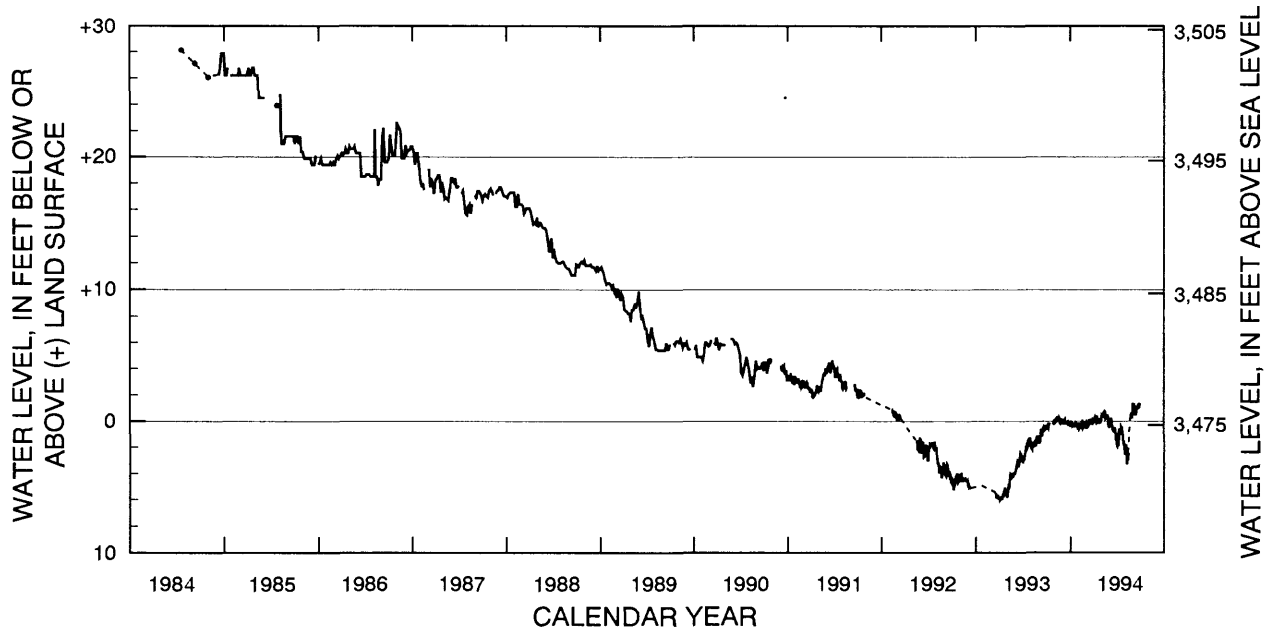

Figure 24. Hydrograph for observation well 3N6E15ABB (site number 17).

SITE NUMBER 17—Continued

WATER LEVEL, IN FEET BELOW OR ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.44	4.17	4.72	---	---	---	5.85	5.82	3.78	3.07	1.93	1.10
2	4.48	4.36	4.78	---	---	---	5.86	5.70	3.94	3.20	1.87	1.40
3	4.52	4.34	4.84	---	---	---	6.00	5.54	3.82	2.81	2.10	1.40
4	4.81	4.24	5.00	---	---	---	5.95	5.30	3.71	2.70	1.98	1.63
5	5.16	4.22	e4.96	---	---	---	5.82	5.31	3.55	2.79	2.12	1.65
6	5.16	4.20	e5.00	---	---	---	5.90	5.10	3.64	2.91	2.13	1.53
7	5.18	4.38	e5.02	---	---	---	5.91	4.82	3.43	2.91	1.80	1.29
8	4.98	4.49	e5.03	---	---	---	5.87	4.77	3.27	2.69	1.63	1.08
9	4.88	4.62	5.08	---	---	---	5.70	4.85	3.30	2.57	1.75	.95
10	4.88	4.51	5.08	---	---	---	5.80	4.88	3.25	2.38	1.81	.95
11	4.75	4.43	5.09	---	---	---	5.84	4.66	3.10	2.43	1.87	.58
12	4.72	4.36	---	---	---	---	6.01	4.39	3.18	2.20	2.00	.84
13	4.38	4.36	---	---	---	---	5.90	4.19	3.39	2.22	1.76	1.11
14	4.41	4.40	---	---	---	---	5.75	4.06	3.50	2.19	1.69	1.11
15	4.34	e4.34	---	---	---	---	5.66	4.15	3.35	1.94	1.61	.95
16	4.34	---	---	---	---	---	5.50	4.19	3.17	1.98	1.52	.91
17	4.24	---	---	---	---	---	5.52	4.21	3.24	2.11	1.45	.91
18	4.04	---	---	---	---	5.45	5.34	4.26	3.04	2.08	1.64	.78
19	4.05	e4.24	---	---	---	5.76	5.51	4.17	2.80	2.01	1.87	.62
20	3.97	4.33	---	---	---	5.76	5.52	4.07	2.71	1.81	1.86	.65
21	4.33	4.36	---	e4.95	---	5.82	5.50	3.96	2.69	1.57	1.57	.47
22	4.38	4.42	---	---	---	5.83	5.14	4.06	2.49	1.51	1.26	.52
23	4.31	4.48	---	---	---	5.67	5.05	4.21	2.51	1.46	1.26	.48
24	4.61	4.55	---	---	---	5.60	5.38	4.23	2.53	1.41	1.14	.31
25	4.60	4.54	---	---	---	5.68	5.53	4.13	2.56	1.46	1.39	.39
26	4.43	4.56	---	---	---	5.69	5.44	3.89	2.58	1.41	1.52	.59
27	4.43	4.53	---	---	---	5.69	5.50	3.96	2.79	1.28	1.63	.49
28	4.25	4.61	---	---	---	5.86	5.57	4.03	3.01	1.36	1.29	.58
29	4.01	4.60	---	---	---	5.85	5.57	3.93	2.87	1.28	1.62	.53
30	4.15	4.76	---	---	---	5.91	5.68	4.08	2.95	1.42	1.73	.29
31	4.21	---	---	---	---	5.91	---	3.99	---	1.89	1.49	---
LOW	5.18	4.76	5.09	4.95	---	5.91	6.01	5.82	3.94	3.20	2.13	1.65

WATER LEVEL, IN FEET BELOW OR ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.36	.13	+.09	.12	.26	.31	+.11	+.19	.42	1.96	2.53	+.77
2	.38	.13	+.03	.21	.17	.26	+.01	+.25	.45	1.87	2.07	+1.16
3	.36	+.17	+.01	.23	.24	.14	+.10	+.39	.16	1.51	1.97	+1.39
4	.43	.02	+.16	.20	.18	.10	+.02	+.37	+.17	1.87	2.27	+1.15
5	.35	.04	.14	+.04	.12	.25	+.06	+.47	+.03	1.82	2.07	+1.07
6	.33	+.07	.16	.33	.54	.48	+.18	+.51	+.17	1.81	1.79	+1.18
7	.40	+.09	+.04	.23	.52	.58	+.30	+.52	+.19	1.56	2.45	+1.35
8	.51	.00	+.17	.16	.38	.49	+.21	+.54	+.13	1.18	2.84	+1.26
9	.56	.00	+.02	.13	.35	.26	+.11	+.50	+.17	.83	3.15	+.98
10	.34	+.10	.01	.28	.11	.09	.02	+.60	+.18	.55	3.30	+.72
11	.27	+.22	+.04	.27	.28	.21	.06	+.53	+.06	.70	3.04	+.69
12	.21	+.36	+.08	.22	.44	.25	+.07	+.60	.28	.73	2.62	+.68
13	.18	+.14	.16	.16	.46	.15	+.43	+.65	.29	.80	2.68	+.45
14	e.11	+.09	.16	.21	.46	.07	+.14	+.53	.39	.74	2.72	+.53
15	---	+.10	.06	.24	.46	.10	+.12	+.55	.61	.92	2.43	+.65
16	---	+.08	.02	.28	.24	+.07	+.07	+.79	.65	1.02	---	+.66
17	---	+.08	+.02	.47	.15	+.12	+.11	+.55	.55	.74	---	+.82
18	---	+.14	.06	.38	+.10	+.10	.12	+.26	.69	.41	---	+1.07
19	---	+.11	.08	.31	.31	+.11	.17	+.30	.60	.42	---	+1.05
20	---	+.25	.08	.31	.50	.06	.01	+.39	.81	.55	---	+1.10
21	---	+.21	.11	.23	.47	.02	.04	+.33	.73	.48	---	+.90
22	---	+.01	.04	.16	.41	+.06	+.04	+.33	.81	.46	---	+.99
23	---	.15	.12	.20	.37	.08	.00	+.25	.73	.68	---	+1.18
24	---	.13	.06	.25	.26	.11	.08	+.27	.42	.88	---	+1.15
25	---	.03	.05	.24	.33	+.01	.09	+.27	.76	1.49	+.33	+1.07
26	e.26	+.14	.09	.22	.33	+.02	.11	+.35	.80	1.59	+.45	+1.06
27	.21	+.23	.27	.17	.26	.20	.11	+.52	1.47	1.56	+.40	+1.15
28	.14	.02	.25	.17	.34	.11	.08	+.28	1.50	1.51	+.41	+1.30
29	.18	.01	.28	.34	---	.24	.07	+.10	1.32	1.63	+.34	+1.31
30	.18	+.10	.10	.44	---	.09	+.04	.31	1.78	2.14	+.22	+1.38
31	+.02	---	.05	.41	---	+.10	---	.40	---	2.47	+.34	---
LOW	.56	.15	.28	.47	.54	.58	.17	.40	1.78	2.47	3.30	+.45

e Estimated

SITE NUMBER FROM LOCATION MAP.—18.

COUNTY.—Pennington.

LOCAL WELL NUMBER.—2N7E34BCCA.

SITE ID (STATION NUMBER).—440528103161001.

OTHER IDENTIFIERS.—PE-64A and Cement Plant.

LOCATION.—Lat 44°05′28″, long 103°16′10″, in SE¼SW¼SW¼NW¼ sec. 34, T. 2 N., R. 7 E., Hydrologic Unit 10120110, at Rapid City. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 400 ft deep with 228 ft of 3-in. steel casing, and 400 ft of 1.25-in. steel casing; perforated casing from 242 to 400 ft.

INSTRUMENTATION.—Electronic data logger with pressure transducer -- 60-minute interval. Prior to October 1991, circular-chart pressure recorder.

DATUM.—Elevation of land-surface datum is 3,320 ft above sea level. Measuring point: Base of gage, 2.5 ft above land-surface datum until Apr. 3, 1990, 2.2 ft above land-surface datum Apr. 3, 1990, to Sept. 16, 1991. Base of gage, 3.2 ft above land-surface datum from Sept. 16, 1991, to present.

REMARKS.—Records poor because of numerous problems with well, instrumentation, and amount of fluid used for antifreeze. Large errors are possible for numerous periods. Water levels may be affected by pumping of nearby wells, especially since 1989.

PERIOD OF RECORD.—June 1964 to September 1994.

EXTREMES.—Highest daily water level, 112.7 ft above land-surface datum, Dec. 15, 1984; lowest daily water level, 54.95 ft above land-surface datum, Sept. 17, 1992. Note: Extreme values published by Winter (1994) are in error.

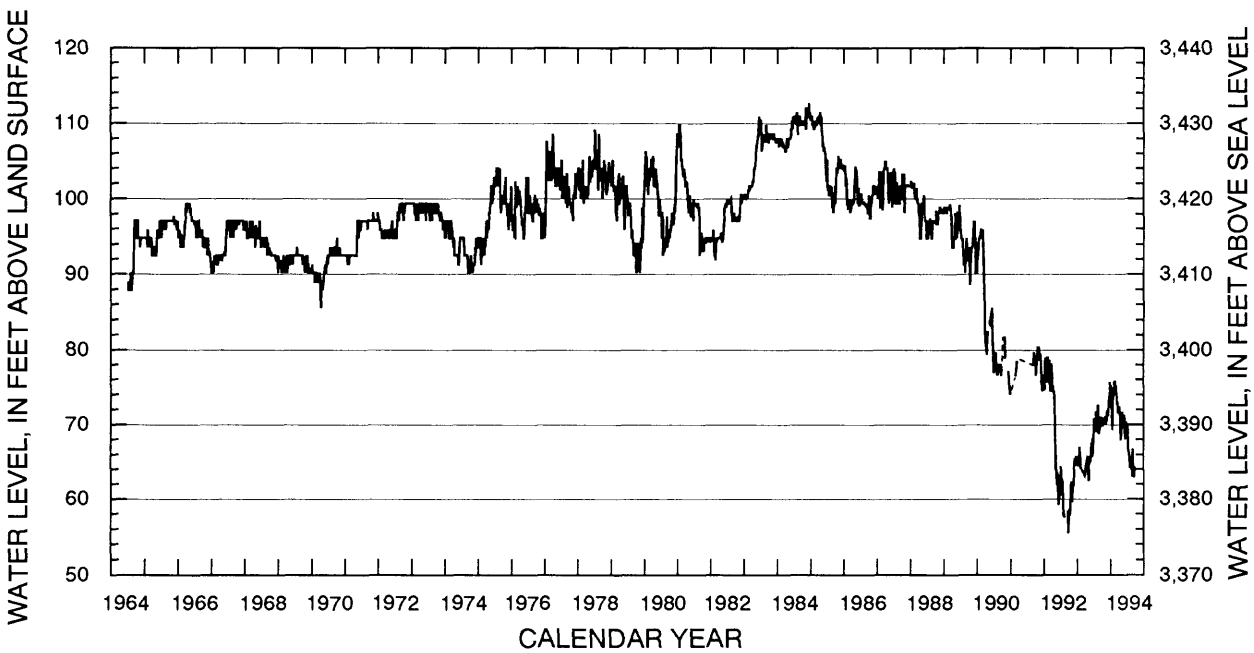

Figure 25. Hydrograph for observation well 2N7E34BCCA (site number 18).

SITE NUMBER 18—Continued

WATER LEVEL, IN FEET ABOVE LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MINIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	+56.21	+61.17	+64.29	+63.71	+68.37	---	---	+65.10	+67.52	+67.40	+72.36	+69.60
2	+56.26	+60.02	+63.53	+63.94	+68.56	---	---	+66.13	+66.99	+67.17	+70.75	+68.90
3	+56.72	+59.95	+64.06	+63.60	+66.94	---	---	+65.21	+67.80	+67.98	+70.63	+69.02
4	+57.76	+59.79	+69.02	---	+66.41	---	---	+62.91	+68.03	+69.64	+70.40	+69.64
5	+57.60	+59.61	+65.44	+64.45	+65.84	---	---	+62.49	+67.57	+70.86	+69.02	+69.64
6	+57.25	+60.41	+64.34	+64.80	+65.49	---	---	+64.10	+68.21	+69.76	+69.83	+70.22
7	+57.41	+60.41	+64.45	+64.40	+66.02	---	---	+64.91	+68.60	+69.41	+70.86	+71.10
8	+57.95	+61.64	+64.52	+63.94	+66.07	---	---	+64.98	+68.03	+69.36	+72.29	+69.99
9	+57.95	+61.22	+64.91	---	+65.72	---	---	+65.60	+66.25	+69.13	+71.79	+70.33
10	+58.68	+60.64	+64.80	+64.80	+64.10	---	---	+64.64	+66.18	+69.99	+70.98	+70.52
11	+59.44	+60.60	+64.68	+64.87	+64.10	---	---	+65.26	+66.30	+70.22	+71.03	+70.45
12	+58.45	+60.94	+64.64	+64.40	+63.94	---	---	+65.44	+66.87	+69.06	+71.10	+70.40
13	+59.10	+60.53	+64.10	+63.76	+64.17	---	---	+65.21	+67.06	+68.72	+71.10	+69.71
14	+58.80	+61.87	+65.56	+64.34	---	---	---	+64.22	+65.95	+69.60	+72.25	+69.71
15	+57.88	+61.91	+65.21	+64.64	---	---	---	+65.14	+65.72	+70.56	+72.64	+69.83
16	+57.25	+62.10	+65.14	+63.94	---	---	---	+66.71	+66.07	+70.29	+71.37	+69.94
17	+59.44	+61.98	+65.03	+63.87	---	---	---	+66.83	+66.30	+70.33	+70.56	+67.52
18	+59.61	+61.64	+65.03	+64.06	---	e+63.14	---	+65.84	+66.83	+71.26	+70.29	+69.99
19	+61.22	+61.87	+65.03	+64.34	---	+62.91	---	+65.14	+67.29	+71.14	+69.60	+70.17
20	+61.29	+61.80	+65.79	+64.45	---	e+63.18	---	+64.98	+68.26	+69.71	+69.64	+71.10
21	+61.91	+61.64	+66.30	+64.45	---	---	e+70.33	+64.98	+66.99	+70.06	+71.37	+70.33
22	+60.83	+61.64	+66.07	+65.79	---	---	+67.29	+65.90	+66.83	+70.22	+72.41	+70.06
23	+61.29	+63.41	+65.03	+66.25	---	---	+66.64	+67.10	+65.95	+70.40	+71.21	+69.76
24	+61.52	+63.64	+65.60	+66.25	---	---	+66.30	+65.84	+65.03	+70.75	+69.83	+70.33
25	+62.33	+63.76	+65.33	+66.99	---	---	+65.84	+65.10	+66.13	+71.83	+68.79	+70.80
26	+61.29	+64.10	+65.37	+68.03	---	---	+65.10	+65.21	+66.71	+71.90	+68.37	+70.98
27	+61.45	+64.34	+65.49	+68.03	---	---	+64.57	+64.17	+66.53	+72.71	+69.53	+70.91
28	+61.75	+63.71	+63.94	+67.17	---	---	+63.87	+64.98	+66.07	+72.06	+69.76	+70.52
29	+60.87	+63.18	---	+66.83	---	---	+63.64	+66.13	+66.99	+72.02	+70.86	+69.94
30	+61.41	+62.84	---	+67.22	---	---	+63.83	+66.99	+66.18	+71.90	+69.99	+70.63
31	+61.17	---	---	+68.03	---	---	---	+67.91	---	+72.29	+70.33	---
MIN	+56.21	+59.61	+63.53	+63.60	+63.94	+62.91	+63.64	+62.49	+65.03	+67.17	+68.37	+67.52

WATER LEVEL, IN FEET ABOVE LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MINIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	+71.51	+71.16	+75.48	+74.67	+76.59	+70.70	+69.90	+70.40	+66.60	+65.17	+63.94
2	+69.87	+71.56	+70.75	+75.48	+74.16	+76.52	+71.44	+70.47	+69.90	+67.36	+65.05	+64.70
3	+69.83	+71.67	+70.98	+75.59	+74.16	+75.89	+71.79	+70.70	+70.75	+68.10	+63.78	+65.40
4	+70.22	+70.98	+71.44	+75.09	+74.16	+75.59	+72.20	+70.59	+71.05	+68.97	+64.13	+66.02
5	+69.76	+71.16	+71.51	+74.74	+74.32	+74.74	+72.32	+70.70	+71.33	+68.79	+64.17	+66.71
6	+69.36	+71.33	+71.44	+74.09	+75.02	+74.97	+71.90	+71.21	+70.36	+68.97	+65.56	+65.44
7	+69.30	+71.79	+74.09	+74.28	+75.02	+74.39	+71.74	+71.33	+70.06	+69.66	+66.37	+64.47
8	+69.76	+71.05	+73.47	+74.32	+75.13	+74.28	+72.02	+71.97	+70.06	+69.71	+66.43	+63.90
9	+71.95	+70.24	+73.13	+74.56	+75.09	+74.51	+72.25	+72.13	+69.60	+69.83	+65.51	+64.13
10	+70.91	+70.13	+72.83	+73.75	+75.66	+73.98	+72.32	+71.05	+68.79	+69.83	+65.28	+63.71
11	+71.03	+69.83	+72.94	+73.75	+75.66	+73.24	+72.20	+69.71	+69.71	+67.98	+64.94	+63.83
12	+71.10	+70.13	+73.36	+74.21	+75.55	+72.89	+73.06	+69.66	+70.40	+67.36	+64.94	+63.94
13	---	+70.36	+73.29	+72.32	+75.36	+72.71	+72.36	+70.36	+68.44	+67.47	+65.44	+62.74
14	---	+70.70	+73.47	+71.16	+75.43	+72.55	+71.79	+71.21	+68.97	+67.17	+65.33	+63.09
15	---	+70.59	+73.47	+71.05	+75.48	+72.66	+71.33	+71.79	+68.05	+66.83	+64.94	+62.91
16	+71.63	+70.24	+73.59	+70.52	+75.89	+73.13	+71.28	+71.63	+69.02	+67.01	+63.83	+64.13
17	+71.56	+70.24	+73.47	+69.78	+75.71	+73.17	+70.82	+71.21	+68.40	+68.17	+64.06	+64.36
18	+71.44	+70.40	+73.59	+69.90	+75.78	+73.13	+70.36	+70.29	+69.36	+67.47	+63.60	+64.98
19	+71.10	+70.13	+73.70	+69.66	+75.59	+73.01	+69.36	+69.83	+70.52	+67.24	+64.06	+64.17
20	+70.98	+70.47	+73.98	+69.32	+75.89	+73.01	+70.13	+69.66	+69.83	+66.48	+64.98	+63.67
21	+70.52	+70.82	+73.98	+69.66	+75.55	+73.06	+69.32	+71.33	+68.33	+66.25	+66.20	+62.63
22	+69.71	+70.86	+73.98	+70.59	+75.43	+72.55	+69.43	+71.90	+69.13	+66.67	+65.44	+62.33
23	+70.86	+72.66	+75.09	+71.79	+75.48	+72.02	+69.02	+71.21	+69.13	+66.90	+63.94	+63.60
24	+71.28	+73.13	+75.20	+72.78	+75.43	+71.86	+68.17	+71.10	+69.20	+66.71	+63.32	+63.55
25	+70.70	+71.63	+75.71	+73.52	+75.43	+71.56	+67.93	+70.52	+70.01	+66.32	+63.02	+64.40
26	+70.40	+71.63	+76.17	+74.21	+75.36	+71.56	+68.17	+70.17	+70.40	+64.64	+63.02	+64.29
27	+71.05	+73.24	+75.78	+74.28	+75.89	+72.25	+69.09	+70.82	+68.17	+64.29	+63.48	+64.36
28	+70.75	+72.83	+75.13	+74.56	+76.52	+71.44	+69.90	+71.39	+67.87	+64.52	+64.13	+63.71
29	+71.28	+71.90	+74.74	+74.56	---	+70.75	+70.24	+71.51	+67.29	+64.17	+63.55	+63.02
30	+71.56	+71.28	+74.79	+74.44	---	+70.63	+69.94	+71.67	+66.94	+65.28	+62.33	+63.37
31	+71.74	---	+75.66	+74.62	---	+71.28	---	+70.24	---	+66.20	+62.56	---
MIN	+69.30	+69.83	+70.75	+69.32	+74.16	+70.63	+67.93	+69.66	+66.94	+64.17	+62.33	+62.33

e Estimated

SITE NUMBER FROM LOCATION MAP.—19.

COUNTY.—Pennington.

LOCAL WELL NUMBER.—2N7E32ABBD2.

SITE ID (STATION NUMBER).—440544103180002.

OTHER IDENTIFIERS.—PE-89C and City Quarry 2.

LOCATION.—Lat 44°05′44″, long 103°18′00″, in NW¼NW¼NE¼ sec. 32, T. 2 N., R. 7 E, Hydrologic Unit 10120110, at Rapid City. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Madison.

WELL CHARACTERISTICS.—Drilled observation well, 825 ft deep with 801 ft of 6 3/8-in. steel casing; open hole from 801 to 825 ft.

INSTRUMENTATION.—Electronic data logger with float-driven shaft encoder -- 60-minute interval. Prior to July 1992, digital water-level recorder.

DATUM.—Elevation of land-surface datum is 3,491.9 ft above sea level. Measuring point: Top of steel casing, 1.80 ft above land-surface datum.

REMARKS.—Records good. Water levels affected by pumping of nearby well.

PERIOD OF RECORD.—February 1990 to September 1994.

EXTREMES.—Highest daily water level, 28.22 ft below land-surface datum, June 6, 1994; lowest daily water level, 65.60 ft below land-surface datum, Sept. 26, 1992.

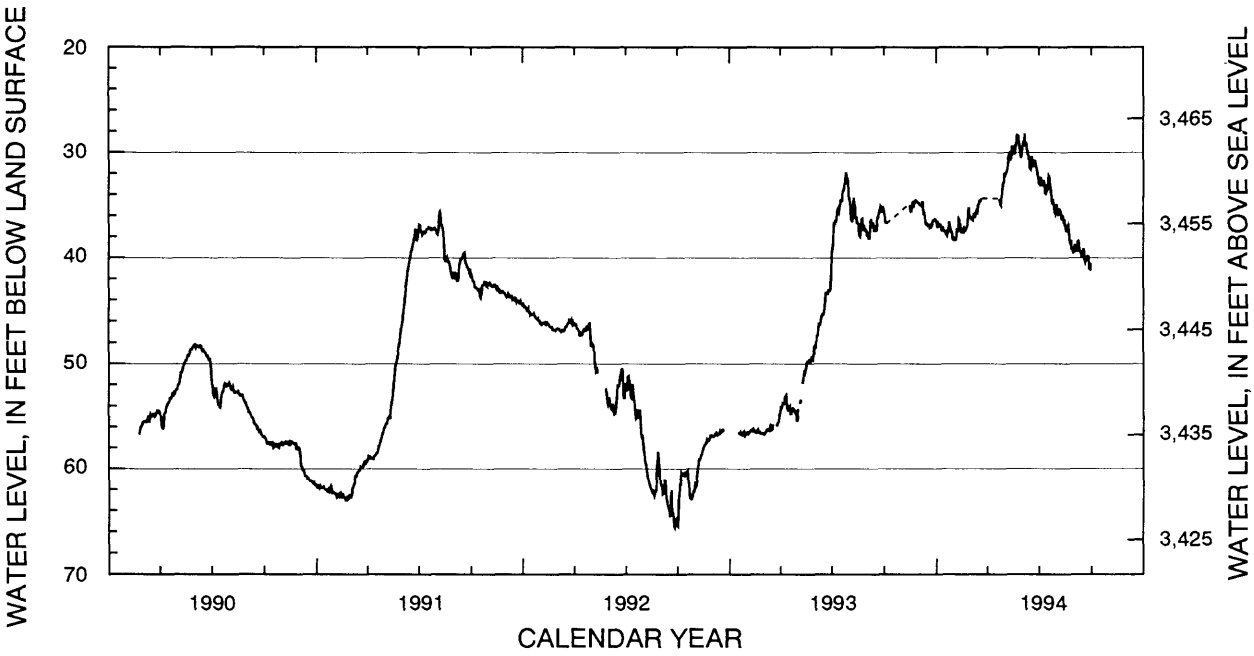

Figure 26. Hydrograph for observation well 2N7E32ABBD2 (site number 19).

SITE NUMBER 19—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65.38	61.25	56.86	---	56.46	56.59	54.57	55.16	48.48	39.82	34.30	37.86
2	65.47	61.72	56.86	---	56.46	56.70	54.14	54.32	48.48	39.05	34.75	37.87
3	62.97	61.64	56.89	---	56.62	56.71	54.16	e54.47	48.02	38.76	35.12	37.80
4	62.27	61.23	56.90	---	56.58	56.68	54.02	---	47.82	37.34	35.86	38.13
5	61.49	60.48	56.82	---	56.48	56.53	53.72	---	47.33	36.65	36.42	38.15
6	61.51	60.06	56.67	---	56.38	56.45	53.76	e53.78	47.34	36.82	36.52	37.64
7	60.77	59.68	56.65	---	56.33	56.28	53.76	e53.36	46.72	36.54	36.49	36.83
8	60.39	59.19	56.54	---	56.32	56.24	53.62	---	46.12	36.53	34.99	36.46
9	60.52	59.05	56.71	---	56.28	56.32	53.18	---	46.35	36.56	34.26	36.33
10	60.44	59.05	56.76	---	56.40	56.32	53.06	e51.88	46.24	36.06	34.88	37.00
11	60.49	58.88	56.63	---	56.39	56.27	52.94	e51.46	46.25	35.53	35.01	37.02
12	60.52	58.69	56.64	---	56.24	56.31	53.65	e51.10	45.70	35.41	36.06	36.57
13	60.68	58.58	56.67	---	56.33	56.07	54.13	e50.80	45.47	35.61	36.30	37.43
14	60.70	58.36	56.63	---	56.40	55.83	54.38	50.93	45.37	35.66	36.03	37.43
15	60.31	58.20	56.42	---	56.42	55.86	54.36	50.64	45.39	35.16	36.66	36.98
16	60.31	57.92	56.48	56.64	56.56	56.28	54.08	50.41	45.38	34.88	36.66	36.98
17	60.34	57.88	56.36	56.58	56.54	56.21	54.19	49.94	45.17	34.39	37.22	37.41
18	60.34	57.73	56.34	56.64	56.39	e55.71	54.10	49.76	44.74	34.57	37.60	37.39
19	e60.24	57.70	56.40	56.57	56.28	---	54.73	e49.66	44.19	34.57	37.97	36.50
20	e61.19	57.52	56.35	56.52	56.25	---	54.73	---	43.37	33.91	37.98	36.09
21	61.74	57.50	56.29	56.68	56.45	---	54.36	e49.50	43.41	33.63	37.37	36.26
22	62.36	57.22	56.24	56.66	56.54	---	54.25	49.85	43.39	33.58	36.67	35.74
23	62.77	57.34	---	56.79	56.55	---	54.18	49.86	43.29	33.15	36.33	35.56
24	62.77	57.34	---	56.76	56.52	e55.74	54.22	49.57	43.33	32.96	36.26	35.60
25	62.92	57.34	---	56.55	56.62	55.80	54.35	49.61	43.08	32.46	37.24	35.18
26	62.92	57.20	---	56.62	56.64	55.80	54.36	49.24	43.14	31.87	37.32	35.29
27	62.61	57.10	---	56.52	56.64	55.59	54.58	49.58	43.10	32.19	37.37	35.57
28	62.61	56.87	---	56.76	56.60	55.48	54.69	49.65	43.07	32.48	37.18	35.57
29	62.16	56.91	---	56.68	---	55.24	55.10	49.07	42.71	32.48	37.30	35.11
30	62.17	56.81	---	56.54	---	54.92	55.45	49.03	41.79	33.16	37.35	35.32
31	61.64	---	---	56.53	---	54.71	---	48.33	---	34.11	37.41	---
MAX	65.47	61.72	56.90	56.79	56.64	56.71	55.45	55.16	48.48	39.82	37.98	38.15

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35.50	---	34.76	36.53	38.24	36.11	---	31.92	30.02	33.01	34.92	39.43
2	35.87	---	34.86	37.00	38.31	36.11	---	32.21	29.49	33.04	35.32	38.68
3	36.12	e34.20	34.94	37.03	38.31	36.15	---	32.07	29.20	32.55	35.62	39.04
4	36.65	---	34.99	37.01	38.23	36.24	---	32.01	29.02	32.33	35.87	38.99
5	36.76	---	35.02	36.78	38.21	36.36	---	31.76	29.09	32.90	35.83	39.30
6	---	---	35.01	36.92	37.19	36.41	---	31.52	28.22	33.03	35.31	39.30
7	---	---	35.08	36.82	37.43	36.47	e33.38	31.30	29.22	32.97	35.48	38.46
8	---	---	34.59	36.87	37.53	36.21	---	30.72	29.40	32.87	35.53	38.42
9	---	---	35.43	36.99	37.12	35.80	---	30.29	29.04	32.57	36.09	38.63
10	---	e35.67	35.87	37.43	36.32	35.81	---	30.17	29.67	32.78	36.39	39.19
11	---	---	35.73	37.39	36.43	35.77	---	30.79	29.93	33.29	35.94	39.38
12	---	---	36.05	37.00	36.89	35.89	---	30.61	30.21	33.87	36.04	39.52
13	---	---	36.38	37.39	37.43	35.60	---	30.51	30.32	33.92	36.46	39.72
14	e34.17	---	36.82	37.46	37.57	35.69	---	30.48	31.08	33.73	36.72	39.89
15	---	34.99	36.80	37.46	37.61	35.71	---	29.40	31.51	33.38	36.64	39.61
16	---	35.28	36.70	37.45	37.22	35.04	---	29.56	31.61	33.43	37.20	39.41
17	---	35.48	36.95	37.57	37.44	34.96	---	29.70	31.08	32.69	37.44	39.08
18	---	35.41	36.95	37.37	37.25	34.80	---	29.60	30.44	32.24	37.46	39.48
19	---	35.47	36.78	37.70	37.39	34.46	e34.75	30.07	30.44	32.33	37.25	40.18
20	e34.22	34.77	36.99	37.82	37.29	34.70	---	30.08	31.13	32.90	37.05	40.39
21	---	34.72	36.80	37.48	37.36	34.47	---	29.59	31.36	33.21	36.94	40.23
22	---	34.88	37.17	37.19	37.28	e34.37	e34.43	29.07	31.10	33.68	37.53	40.19
23	---	35.02	37.01	37.08	37.27	---	34.58	28.47	31.08	34.36	38.23	39.81
24	---	34.77	36.97	36.56	36.95	---	34.89	28.37	30.68	34.80	38.49	40.04
25	---	34.73	36.66	37.27	36.88	---	35.02	28.41	31.33	34.80	38.63	39.88
26	---	34.41	36.48	37.27	36.52	---	34.33	28.46	31.31	34.70	38.56	39.90
27	---	34.61	36.46	37.62	35.64	---	33.89	28.82	31.52	34.97	39.17	40.55
28	e33.82	34.62	36.39	37.45	35.24	---	33.33	29.55	32.01	35.38	39.18	41.05
29	---	34.68	36.38	38.19	---	---	32.79	29.80	32.26	35.66	39.23	41.10
30	---	34.77	36.31	38.22	---	e33.75	33.00	30.37	32.75	35.80	39.59	40.52
31	---	---	36.35	38.09	---	---	---	30.52	---	35.47	39.43	---
MAX	36.76	35.67	37.17	38.22	38.31	36.47	35.02	32.21	32.75	35.80	39.59	41.10

e Estimated

SITE NUMBER FROM LOCATION MAP.—20.

COUNTY.—Pennington.

LOCAL WELL NUMBER.—2N7E32ABBD.

SITE ID (STATION NUMBER).—440544103180001.

OTHER IDENTIFIERS.—PE-89D and City Quarry 1.

LOCATION.—Lat 44°05′44″, long 103°18′00″, in NW¼NW¼NE¼ sec. 32, T. 2 N., R. 7 E., Hydrologic Unit 10120110, at Rapid City. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 175 ft deep with 135 ft of 6 3/8-in. steel casing; open hole from 135 to 175 ft.

INSTRUMENTATION.—Electronic data logger with float-driven shaft encoder -- 60-minute interval. Prior to July 1992, digital water-level recorder.

DATUM.—Elevation of land-surface datum is 3,492.49 ft above sea level. Measuring point: Top of steel casing, 1.45 ft above land-surface datum.

REMARKS.—Records good. Water levels affected by pumping of nearby wells.

PERIOD OF RECORD.—February 1990 to September 1994.

EXTREMES.—Highest daily water level, 33.88 ft below land-surface datum, June 6, 1994; lowest daily water level, 64.05 ft below land-surface datum, Oct. 2, 1992.

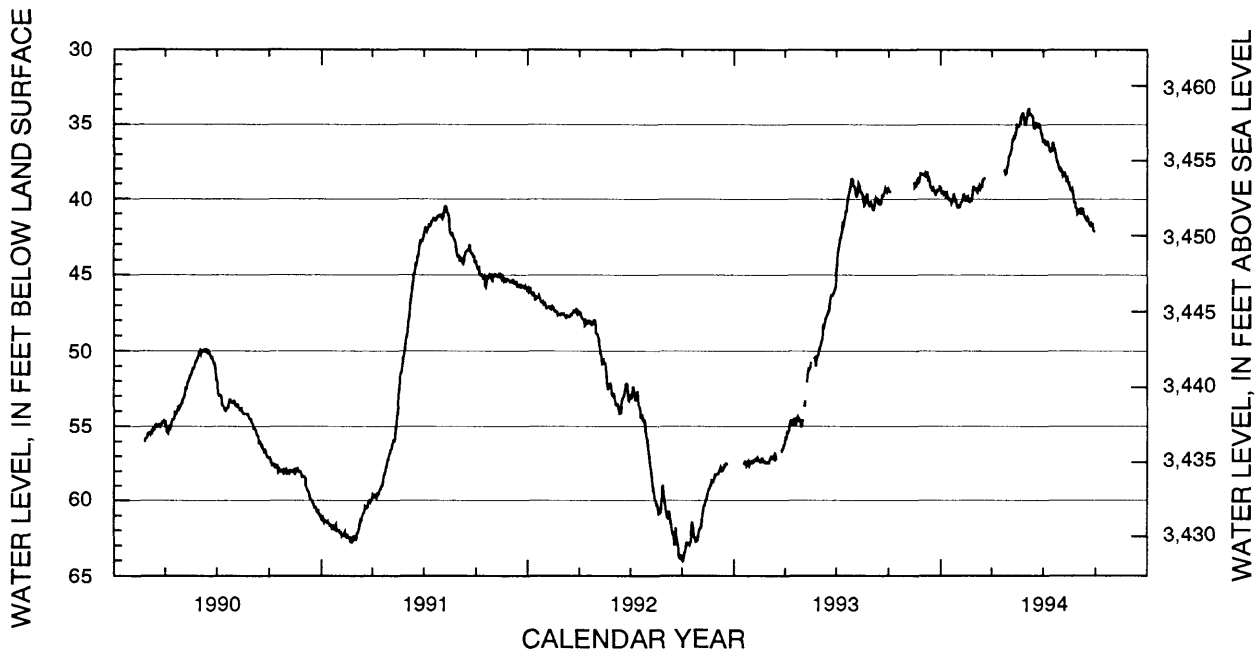

Figure 27. Hydrograph for observation well 2N7E32ABBD (site number 20).

SITE NUMBER 20—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	63.96	61.95	58.22	---	57.34	57.37	56.06	54.95	49.83	44.99	39.10	e40.42
2	64.05	61.82	58.22	---	57.33	57.44	55.76	54.52	49.83	44.51	39.24	e40.59
3	64.04	61.86	58.20	---	57.44	57.45	55.78	---	49.68	44.07	39.40	e40.58
4	63.74	61.79	58.20	---	57.42	57.44	55.66	---	49.58	43.58	39.57	e40.70
5	63.50	61.33	58.09	---	57.33	57.28	55.38	---	49.38	43.27	39.82	40.71
6	63.47	61.11	57.93	---	57.24	57.16	55.41	e53.73	49.29	43.10	39.82	e40.58
7	63.20	60.83	57.92	---	57.19	57.01	55.40	e53.28	49.00	42.88	39.74	e40.24
8	62.86	60.45	57.77	---	57.18	57.00	55.26	---	48.39	42.62	39.28	e39.99
9	62.81	60.34	57.89	---	57.15	57.13	54.84	---	48.44	42.59	38.97	e40.08
10	62.81	60.34	57.96	---	57.27	57.13	54.67	e52.11	48.29	42.30	39.04	e40.09
11	62.85	60.17	57.78	---	57.26	57.12	54.60	e51.74	48.15	42.19	39.20	e39.96
12	62.88	60.01	57.80	---	57.11	57.15	54.67	e51.31	47.85	41.76	e39.46	e40.02
13	62.97	59.91	57.88	---	57.20	56.96	54.83	e51.07	47.81	41.84	39.54	e40.29
14	63.00	59.76	57.80	---	57.27	56.79	54.88	51.24	47.74	41.79	39.52	e40.38
15	62.84	59.61	57.62	---	57.27	56.85	54.86	51.18	47.60	41.45	39.69	e40.14
16	62.75	59.37	57.68	---	57.39	57.18	54.59	51.06	47.44	41.27	e39.69	e40.21
17	62.30	59.34	57.58	57.45	57.39	57.13	54.62	50.78	47.49	41.07	40.01	e40.31
18	62.03	59.19	57.52	57.47	57.24	---	54.41	50.73	47.37	40.79	40.17	40.30
19	61.43	59.17	57.55	57.41	57.14	---	54.88	---	47.01	40.79	40.46	39.94
20	61.59	58.98	57.51	57.38	57.11	---	54.87	---	46.72	40.40	e40.42	e39.71
21	61.84	58.98	57.47	57.51	57.28	---	54.75	---	46.47	40.16	e40.23	e39.73
22	62.30	58.70	---	57.49	57.38	---	54.45	50.42	46.34	39.86	e39.85	e39.74
23	62.54	58.77	---	57.63	57.39	---	54.38	50.43	46.33	39.69	e39.77	e39.62
24	62.54	58.77	---	57.58	57.35	---	54.53	50.43	46.34	39.49	e39.67	e39.46
25	62.76	58.74	---	57.40	57.44	56.67	54.58	50.42	46.27	39.33	e40.13	e39.30
26	62.75	58.61	---	57.47	57.45	56.67	54.53	51.01	46.17	39.07	e40.21	e39.40
27	62.66	58.51	---	57.37	57.44	56.51	e54.57	50.51	46.11	38.75	e40.31	e39.36
28	62.66	58.29	---	57.59	57.39	56.51	54.70	50.55	46.06	38.80	e40.14	e39.48
29	62.42	58.32	---	57.52	---	56.42	54.74	50.35	45.83	38.71	e40.26	39.32
30	62.33	58.22	---	57.39	---	56.26	54.99	50.32	45.62	38.75	e40.34	e39.27
31	62.12	---	---	57.39	---	56.16	---	50.11	---	39.10	e40.27	---
MAX	64.05	61.95	58.22	57.63	57.45	57.45	56.06	54.95	49.83	44.99	40.46	40.71

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39.40	---	38.41	39.27	40.46	39.33	---	37.19	34.85	36.17	38.01	40.89
2	39.45	---	38.40	39.57	40.46	39.33	---	37.08	34.64	36.17	38.06	40.70
3	39.46	e38.05	38.41	39.63	40.54	39.28	---	36.97	34.51	36.08	38.29	40.66
4	39.58	---	38.31	39.61	40.51	39.27	---	36.97	34.18	35.97	38.44	40.85
5	---	---	38.52	39.42	40.45	39.38	---	36.74	34.25	36.30	38.39	40.96
6	---	---	38.51	39.62	40.21	39.49	---	36.61	33.88	36.34	38.16	40.95
7	---	---	38.35	39.52	40.20	39.57	e37.67	36.47	34.18	36.31	38.32	40.65
8	---	---	38.17	39.52	40.15	39.43	---	36.17	34.28	36.29	38.30	40.64
9	---	---	38.62	39.53	40.07	39.24	---	35.96	34.27	36.19	38.50	40.66
10	---	e38.97	38.82	39.85	39.76	39.11	---	35.86	34.32	36.22	38.66	40.91
11	---	---	38.64	39.80	39.73	39.27	---	35.95	34.36	36.47	38.61	41.06
12	---	---	38.78	39.68	39.89	39.33	---	35.92	34.47	36.77	38.59	41.19
13	---	---	39.06	39.88	39.92	39.12	---	35.63	34.47	36.84	38.86	41.27
14	e38.66	---	39.21	39.96	40.10	39.12	---	35.65	34.94	36.78	38.95	41.33
15	---	38.87	39.21	39.95	40.09	39.15	e37.75	35.41	35.23	36.75	38.84	41.45
16	---	39.20	39.27	39.97	39.91	38.79	---	35.04	35.28	36.77	39.18	41.45
17	---	39.16	39.44	40.12	39.84	38.70	---	35.08	35.22	36.60	39.28	41.26
18	---	39.06	39.43	39.99	39.80	38.71	---	35.15	34.97	36.24	39.41	41.31
19	---	39.07	39.31	40.18	40.07	38.58	e38.23	35.13	34.83	36.24	39.42	41.54
20	---	38.79	39.41	40.30	40.15	38.69	---	35.12	35.09	36.47	39.41	41.65
21	---	38.70	39.55	40.15	40.19	---	---	35.02	35.13	36.62	39.34	41.72
22	---	38.77	39.60	40.06	40.07	e38.38	38.02	34.82	35.13	36.82	39.53	41.70
23	---	38.90	39.77	39.91	40.05	---	38.08	34 44	35.12	37.12	39.91	41.62
24	---	38.83	39.58	39.61	39.97	---	38.24	34.43	34.89	37.34	40.04	41.79
25	---	38.64	39.56	39.95	40.03	---	38.31	34.27	35.21	37.44	40.22	41.79
26	---	38.29	39.40	39.94	39.82	---	38.26	34.27	35.21	37.57	40.22	41.71
27	---	38.29	39.44	40.12	39.34	---	38.26	34.18	35.37	37.66	40.57	41.93
28	e38.48	38.32	39.36	40.10	39.12	---	37.91	34.55	35.60	37.84	40.58	42.09
29	---	38.32	39.35	40.46	---	---	37.76	34.61	35.64	37.99	40.63	42.15
30	---	38.39	39.07	40.53	---	e38.02	37.55	34.98	35.99	38.10	40.98	42.09
31	---	---	39.26	40.43	---	---	---	35.06	---	38.12	40.94	---
MAX	39.58	39.20	39.77	40.53	40.54	39.57	38.31	37.19	35.99	38.12	40.98	42.15

e Estimated

SITE NUMBER FROM LOCATION MAP.—21.

COUNTY.—Pennington.

LOCAL WELL NUMBER.—2N7E17BAAD.

SITE ID (STATION NUMBER).—440818103180801.

OTHER IDENTIFIER.—PE-84B.

LOCATION.—Lat 44°08′18″, long 103°18′08″, in SE¼NE¼NE¼NW¼ sec. 17, T. 2 N., R. 7 E., Hydrologic Unit 10120111, at Blackhawk. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 560 ft deep with 510 ft of 5-in. steel casing; open hole from 510 to 560 ft.

INSTRUMENTATION.—Digital water-level recorder -- 60-minute interval.

DATUM.—Elevation of land-surface datum is 3,500 ft above sea level. Measuring point: Top of steel casing, 1.40 ft above land-surface datum.

REMARKS.—Records good. Water levels affected by pumping of nearby well. Previously unpublished records from July 17, 1984, through February 27, 1985, are presented with the following tabulation.

PERIOD OF RECORD.—July 1984 to September 1994.

EXTREMES.—Highest daily water level, 52.85 ft below land-surface datum, Apr. 5, 1985; lowest daily water level, 97.55 ft below land-surface datum, Oct. 3, 1992.

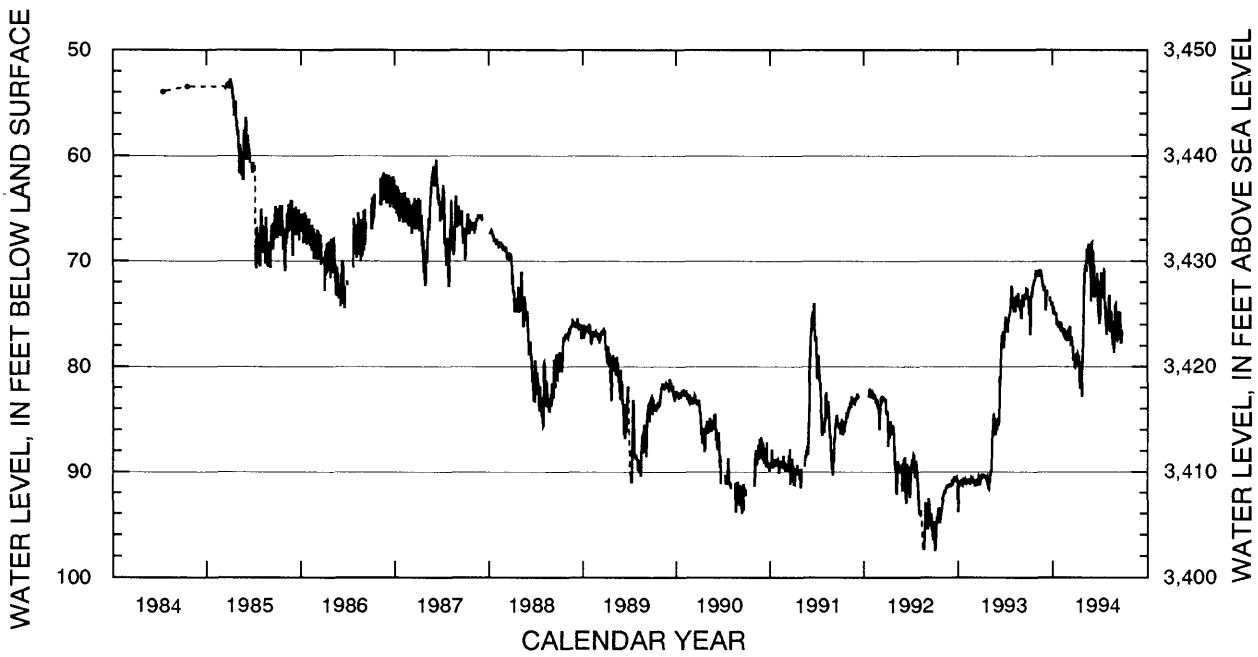

Figure 28. Hydrograph for observation well 2N7E17BAAD (site number 21).

SITE NUMBER 21—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
17	---	---	---	---	---	---	---	---	---	e54.00	---	---

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	53.20	57.20	57.35	60.78	67.04	69.81
2	---	---	---	---	---	---	52.90	58.08	56.99	60.80	66.08	69.99
3	---	---	---	---	---	---	53.05	57.62	56.77	60.89	65.15	69.32
4	---	---	---	---	---	---	52.86	57.70	56.41	---	67.90	70.03
5	---	---	---	---	---	---	52.85	57.64	57.54	---	68.15	68.22
6	---	---	---	---	---	---	53.18	59.00	58.91	---	68.46	70.68
7	---	---	---	---	---	---	53.35	59.31	60.44	---	66.71	70.17
8	---	---	---	---	---	---	53.28	61.54	60.21	---	68.17	69.79
9	---	---	---	---	---	---	53.30	61.73	60.23	---	69.26	67.15
10	---	---	---	---	---	---	53.33	60.80	59.32	68.53	67.36	66.68
11	---	---	---	---	---	---	53.68	59.62	58.19	69.89	66.92	---
12	---	---	---	---	---	---	53.50	59.05	58.12	70.24	68.02	68.72
13	---	---	---	---	---	---	54.19	58.98	59.06	70.75	66.83	67.06
14	---	---	---	---	---	---	54.32	60.01	59.14	69.23	68.01	66.54
15	---	---	---	---	---	53.49	54.64	59.95	59.86	67.91	68.81	67.93
16	---	---	---	---	---	53.74	54.38	61.72	59.01	66.87	68.55	66.46
17	53.50	---	---	---	---	53.61	55.37	61.96	59.39	67.71	69.36	68.87
18	---	---	---	---	---	53.43	56.29	60.89	60.76	67.67	70.29	68.94
19	---	---	---	---	---	53.54	55.64	61.17	---	67.46	70.10	67.81
20	---	---	---	---	---	53.45	54.90	61.64	---	67.75	67.03	66.99
21	---	---	---	---	---	53.19	54.98	61.63	---	67.92	65.92	66.35
22	---	---	---	---	---	53.26	55.18	61.02	---	68.53	68.45	65.64
23	---	---	---	---	---	53.41	54.88	62.29	---	69.43	66.94	68.02
24	---	---	---	---	---	53.43	55.17	62.29	---	68.69	69.52	66.72
25	---	---	---	---	---	53.24	55.26	61.83	---	68.20	69.92	65.43
26	---	---	---	---	---	53.16	54.87	59.77	61.32	70.23	70.45	64.88
27	---	---	---	---	53.60	53.05	56.58	58.50	60.70	70.57	69.27	65.26
28	---	---	---	---	---	53.20	56.60	57.61	61.67	70.35	70.59	67.71
29	---	---	---	---	---	53.43	56.86	58.05	---	70.50	68.27	65.67
30	---	---	---	---	---	53.39	57.22	57.62	---	67.02	70.43	66.34
31	---	---	---	---	---	53.41	---	57.78	---	65.20	70.37	---
MAX	53.50	---	---	---	53.60	53.74	57.22	62.29	61.67	70.75	70.59	70.68

e Estimated

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	96.65	92.89	91.33	93.90	90.88	90.96	90.63	90.79	85.92	76.32	74.14	74.64
2	96.95	92.75	91.31	91.14	90.88	90.99	90.21	90.93	85.40	76.32	73.96	74.57
3	97.55	92.52	91.14	91.50	91.03	91.09	90.59	91.10	85.04	75.79	73.80	75.35
4	97.02	92.35	91.48	91.50	90.96	91.09	90.59	90.83	84.90	75.27	74.52	75.35
5	96.65	92.13	91.22	91.22	90.81	91.00	90.42	90.52	85.56	76.04	74.76	75.01
6	95.58	92.03	91.15	91.21	90.72	91.17	90.36	90.32	85.55	76.04	74.78	73.51
7	95.43	92.03	91.14	90.95	90.92	91.40	90.36	90.01	85.50	75.98	73.41	73.17
8	94.47	92.15	90.85	90.89	90.85	91.15	90.23	89.89	84.90	75.94	73.67	73.90
9	94.40	92.08	90.85	91.00	90.67	91.07	90.34	89.99	84.25	76.32	74.78	74.01
10	95.03	91.83	90.80	91.08	90.85	91.07	90.38	89.58	83.35	76.04	74.78	73.94
11	94.90	91.82	90.69	90.95	90.85	91.09	90.38	88.96	82.14	76.67	73.85	74.39
12	94.49	91.85	90.76	90.93	90.79	91.09	90.36	87.94	81.21	76.67	73.79	73.97
13	94.05	91.69	91.06	90.94	90.85	90.94	90.47	86.90	81.26	75.70	73.56	73.76
14	93.49	91.59	91.01	90.94	90.95	90.91	90.47	86.67	81.05	75.58	73.30	73.19
15	94.19	91.66	90.63	90.71	91.03	90.97	90.50	85.69	80.79	75.67	73.56	73.59
16	94.23	91.54	90.63	91.21	91.12	91.29	90.50	85.06	79.38	75.77	73.45	73.39
17	93.94	91.49	90.47	91.43	91.27	91.29	90.70	84.70	78.56	75.33	74.22	73.42
18	93.74	91.47	90.73	91.23	90.87	90.94	90.58	84.62	77.98	75.25	74.19	73.28
19	93.48	91.45	90.78	91.26	90.68	90.64	90.69	84.70	77.06	75.12	74.29	73.18
20	93.99	91.25	90.75	91.08	90.59	90.68	90.63	85.27	77.66	75.11	74.10	73.17
21	94.52	91.38	90.71	90.81	90.65	90.82	90.63	85.09	77.55	74.88	73.12	72.53
22	94.97	91.36	90.50	90.86	90.63	90.77	90.57	85.51	77.17	74.42	73.05	72.76
23	94.84	91.48	90.89	90.92	90.68	90.49	90.50	84.94	76.84	74.43	73.44	72.90
24	94.10	91.48	90.88	90.92	90.69	90.55	90.97	85.44	76.68	74.02	74.33	72.90
25	94.14	91.27	90.68	91.01	90.80	90.82	91.30	86.47	76.79	73.46	74.33	72.72
26	93.92	91.36	90.64	90.82	90.80	90.82	90.88	86.47	78.24	73.22	74.09	72.74
27	93.62	91.25	90.96	90.79	90.72	90.94	91.34	86.21	78.12	72.39	74.04	72.64
28	93.55	91.15	90.85	91.05	90.94	91.11	91.34	86.19	77.80	73.09	74.43	73.58
29	93.29	91.43	90.79	91.04	---	91.03	91.58	85.68	76.98	73.64	74.39	73.38
30	93.08	91.15	90.73	91.01	---	90.86	91.63	85.47	76.83	74.27	74.16	73.59
31	92.81	---	92.51	91.21	---	90.66	---	85.92	---	74.15	74.64	---
MAX	97.55	92.89	92.51	93.90	91.27	91.40	91.63	91.10	85.92	76.67	74.78	75.35

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	73.69	71.45	72.43	74.15	75.96	77.41	79.93	76.40	71.47	75.89	75.91	74.94
2	74.29	71.18	72.93	74.70	75.86	76.89	79.64	75.12	69.66	75.89	75.44	74.32
3	75.00	71.03	72.76	74.62	75.88	76.69	79.48	73.65	68.31	75.22	75.44	74.20
4	75.00	71.39	73.53	74.50	75.93	76.57	78.89	72.50	68.29	75.18	75.44	74.12
5	74.39	71.39	74.59	74.30	76.07	76.50	78.74	71.70	71.10	75.34	74.66	74.54
6	75.62	71.13	74.61	74.75	76.70	76.77	78.99	70.74	71.13	74.98	76.31	74.54
7	76.50	71.44	73.94	74.75	76.70	76.69	78.96	70.80	69.56	72.01	76.41	75.77
8	77.02	71.44	73.17	74.78	76.59	76.57	78.68	70.73	69.14	71.11	76.41	76.45
9	74.16	71.13	72.95	75.03	76.54	76.41	78.72	70.97	69.01	72.15	73.53	76.45
10	73.68	71.13	72.95	75.03	76.36	76.31	78.93	70.97	69.74	72.90	73.40	76.98
11	73.31	70.90	72.78	75.00	76.51	76.22	79.14	70.97	71.83	73.34	73.21	77.48
12	73.12	70.90	73.01	74.94	76.80	76.97	79.05	70.97	73.37	73.43	73.69	77.43
13	72.87	70.89	73.32	75.00	76.75	77.98	78.94	70.18	73.37	73.43	75.17	76.75
14	73.31	71.41	73.32	75.00	77.09	77.95	79.33	68.90	72.52	72.02	76.67	76.73
15	73.31	71.41	---	75.00	77.14	77.38	79.94	68.99	71.72	71.85	76.67	75.34
16	72.80	71.19	---	75.50	77.04	77.20	81.10	69.50	71.72	71.33	75.14	74.76
17	72.51	71.20	---	75.97	76.83	77.56	82.13	69.90	71.86	72.32	74.83	75.88
18	72.41	71.14	---	75.96	76.40	77.55	81.95	69.95	71.86	72.32	74.83	77.15
19	72.16	71.22	---	75.72	77.08	77.98	81.61	69.89	73.19	71.20	75.37	77.15
20	72.14	71.27	---	75.85	77.33	78.04	81.55	68.85	73.18	70.69	76.22	76.28
21	72.14	71.80	---	75.84	77.43	78.11	82.12	68.40	73.07	71.48	77.28	75.55
22	71.88	71.89	73.38	75.97	77.43	78.21	82.00	68.71	72.38	72.69	77.43	74.89
23	71.79	72.08	73.78	76.21	77.23	79.35	82.28	68.94	71.15	73.73	77.86	75.61
24	71.88	72.34	73.87	76.22	77.16	79.37	82.93	69.14	71.49	74.44	77.86	76.64
25	71.80	72.52	73.71	76.18	77.14	79.33	82.65	69.48	72.15	74.44	77.89	77.74
26	71.76	72.29	73.87	76.00	77.39	79.16	80.48	69.69	73.82	73.85	77.91	77.74
27	71.35	72.30	74.02	75.84	77.49	79.03	80.02	70.57	74.11	75.38	77.90	77.03
28	70.89	72.74	73.98	75.84	77.49	79.06	79.15	71.33	75.01	75.95	78.62	76.56
29	70.94	72.74	74.06	75.98	---	80.08	78.56	72.25	75.25	76.09	78.68	77.11
30	70.96	72.62	74.04	76.29	---	80.16	76.99	73.74	75.15	76.85	77.27	76.99
31	71.46	---	73.93	76.24	---	80.08	---	73.74	---	76.99	76.51	---
MAX	77.02	72.74	74.61	76.29	77.49	80.16	82.93	76.40	75.25	76.99	78.68	77.74

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SITE NUMBER FROM LOCATION MAP.—22.

COUNTY.—Pennington.

LOCAL WELL NUMBER.—2N1E27ADAC.

SITE ID (STATION NUMBER).—440623103583701.

OTHER IDENTIFIERS.—PE-91A and Blind Park.

LOCATION.—Lat 44°06′23″, long 103°58′37″, in NE¼SE¼NE¼ sec. 27, T. 2 N., R. 1 E., Hydrologic Unit 10120107, about 13 mi west of Rochford. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Deadwood Formation.

WELL CHARACTERISTICS.—Drilled observation well, 450 ft deep with 420 ft of 5.5-in. steel casing; open hole from 420 to 450 ft.

INSTRUMENTATION.—Electronic data logger with pressure transducer.

DATUM.—Elevation of land-surface datum is 6,890 ft above sea level. Measuring point: Top of steel casing, 3.0 ft above land-surface datum.

REMARKS.—Records good.

PERIOD OF RECORD.—August 1992 to September 1994.

EXTREMES.—Highest daily water level, 351.90 ft below land-surface datum, Sept. 30, 1994; lowest daily water level, 359.35 ft below land-surface datum, Mar. 16, 1993.

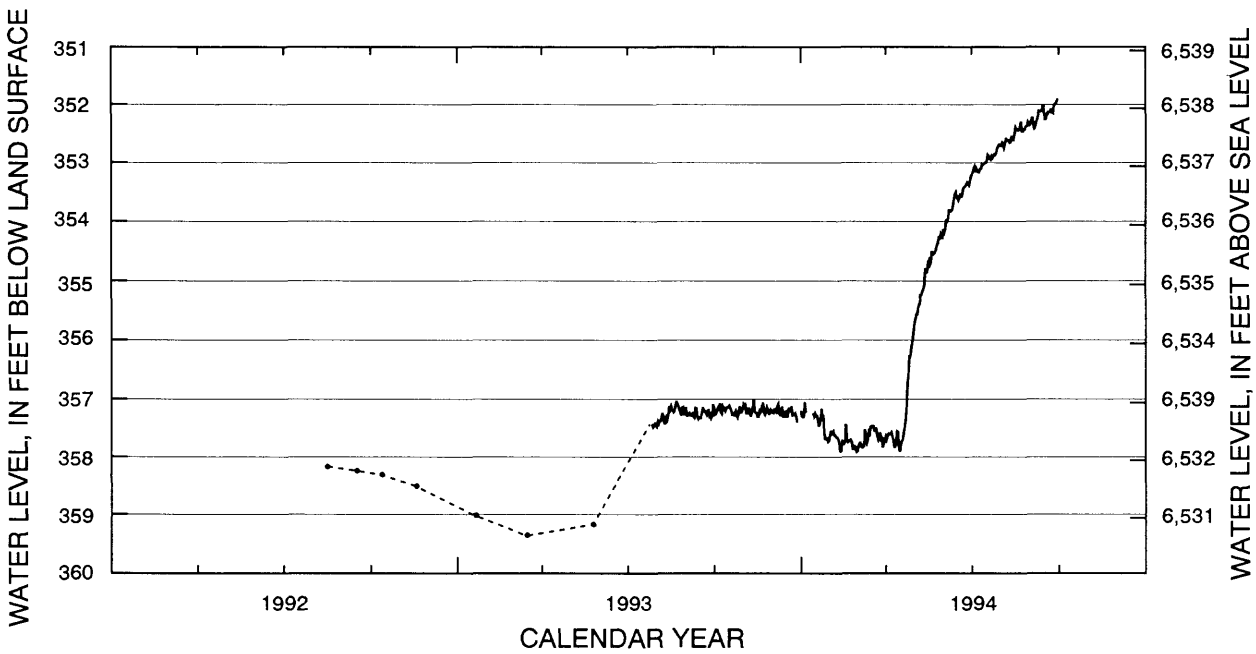

Figure 29. Hydrograph for observation well 2N1E27ADAC (site number 22).

SITE NUMBER 22—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
16	---	---	---	---	---	---	---	---	---	---	e358.16	e358.23

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	---	357.47	357.14
2	---	---	---	---	---	---	---	---	---	---	357.39	357.29
3	---	---	---	---	---	---	---	---	---	---	357.43	357.29
4	---	---	---	---	---	---	---	---	---	---	357.38	357.28
5	---	---	---	---	---	---	---	---	---	---	357.38	357.25
6	---	---	---	---	---	---	---	---	---	---	357.32	357.28
7	---	---	---	---	---	---	---	---	---	---	357.24	357.29
8	---	---	---	---	---	---	---	---	---	---	357.31	357.26
9	---	---	---	---	---	---	---	---	---	---	357.42	357.30
10	---	---	---	---	---	---	---	---	---	---	357.42	357.32
11	---	---	---	---	---	---	---	---	---	---	357.32	357.16
12	---	---	---	---	---	---	---	---	---	---	357.36	357.17
13	---	---	---	---	---	---	---	---	---	---	357.27	357.30
14	e358.30	---	---	---	---	---	---	---	---	---	357.13	357.35
15	---	---	---	---	---	---	---	---	---	---	357.18	357.32
16	---	---	---	---	---	e359.35	---	---	---	---	357.13	357.33
17	---	---	---	---	---	---	---	---	---	---	357.19	357.33
18	---	e358.50	---	---	---	---	---	---	---	---	357.21	357.25
19	---	---	---	---	---	---	---	---	---	---	357.23	357.15
20	---	---	---	e359.00	---	---	---	---	---	---	357.21	357.20
21	---	---	---	---	---	---	---	---	---	---	357.12	357.21
22	---	---	---	---	---	---	---	---	---	---	357.04	357.24
23	---	---	---	---	---	---	---	---	---	---	357.09	357.27
24	---	---	---	---	---	---	---	---	---	---	357.11	357.20
25	---	---	---	---	---	---	---	e359.16	---	---	357.18	357.19
26	---	---	---	---	---	---	---	---	---	---	357.23	357.30
27	---	---	---	---	---	---	---	---	---	357.43	357.29	357.27
28	---	---	---	---	---	---	---	---	---	357.49	357.15	357.33
29	---	---	---	---	---	---	---	---	---	357.46	357.14	357.30
30	---	---	---	---	---	---	---	---	---	357.42	357.28	357.09
31	---	---	---	---	---	---	---	---	---	357.44	357.24	---
MAX	358.30	358.50	---	359.00	---	359.35	---	359.16	---	357.49	357.47	357.35

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	357.17	357.09	357.21	357.22	357.63	357.92	357.65	355.73	354.14	353.23	352.71	352.30
2	357.27	357.13	357.23	357.30	357.54	357.91	357.71	355.65	354.19	353.17	352.66	352.27
3	357.26	357.08	357.24	357.31	357.60	357.83	357.64	355.56	354.15	353.11	352.69	352.21
4	357.21	357.25	357.16	357.31	357.60	357.80	357.60	355.56	353.99	353.08	352.75	352.34
5	357.15	357.25	357.22	357.05	357.57	357.74	357.61	355.45	354.00	353.17	352.68	352.41
6	357.17	357.20	357.23	357.24	357.63	357.82	357.60	355.40	353.95	353.11	352.57	352.39
7	357.08	357.14	357.13	---	357.63	357.84	357.58	355.37	353.81	353.16	352.61	352.30
8	357.23	357.25	357.09	---	357.67	357.84	357.66	355.24	353.81	353.17	352.61	352.26
9	357.26	357.31	357.25	---	357.67	357.81	357.72	355.24	353.83	353.17	352.61	352.18
10	357.13	357.23	357.28	---	357.71	357.53	357.83	355.18	353.81	353.10	352.66	352.11
11	357.15	357.13	357.27	---	357.79	357.72	357.83	355.14	353.76	353.10	352.65	352.12
12	357.15	357.02	357.13	---	357.90	357.77	357.76	355.07	353.62	353.03	352.54	352.12
13	357.21	357.21	357.31	---	357.90	357.71	357.56	354.79	353.54	353.04	352.61	352.10
14	357.17	357.24	357.31	357.24	357.73	357.57	357.57	354.86	353.51	353.03	352.61	352.04
15	357.14	357.24	357.23	357.30	357.75	357.60	357.84	354.85	353.58	353.00	352.52	352.00
16	357.14	357.31	357.22	357.25	357.77	357.49	357.91	354.68	353.62	353.00	352.40	352.25
17	357.12	357.31	357.31	357.29	357.73	357.47	357.81	354.65	353.65	352.96	352.44	352.25
18	357.15	357.21	357.31	357.29	357.44	357.47	357.73	354.72	353.60	352.87	352.43	352.19
19	357.19	357.23	357.17	357.38	357.70	357.47	357.71	354.67	353.53	352.90	352.45	352.16
20	357.27	357.20	357.17	357.47	357.75	357.55	357.58	354.50	353.60	352.94	352.44	352.13
21	357.27	357.12	357.19	357.42	357.73	357.55	357.49	354.56	353.54	352.95	352.38	352.13
22	357.28	357.07	357.13	357.32	357.72	357.50	357.35	354.55	353.44	352.89	352.29	352.13
23	357.23	357.24	357.28	357.17	357.71	357.65	357.09	354.53	353.43	352.92	352.46	352.07
24	357.21	357.27	357.27	357.27	357.74	357.71	356.76	354.49	353.40	352.89	352.46	352.14
25	357.29	357.22	357.27	357.29	357.86	357.65	356.57	354.42	353.38	352.86	352.43	352.15
26	357.32	357.14	357.25	357.57	357.86	357.58	356.27	354.38	353.34	352.87	352.43	352.02
27	357.26	357.19	357.31	357.69	357.80	357.71	356.27	354.28	353.35	352.83	352.37	351.99
28	357.13	357.26	357.39	357.69	357.86	357.69	356.11	354.29	353.39	352.76	352.37	351.99
29	357.23	357.25	357.39	357.68	---	357.84	356.01	354.22	353.35	352.72	352.31	351.95
30	357.23	357.18	---	357.74	---	357.78	355.89	354.28	353.23	352.69	352.36	351.90
31	357.18	---	357.22	357.72	---	357.71	---	354.28	---	352.70	352.36	---
MAX	357.32	357.31	357.39	357.74	357.90	357.92	357.91	355.73	354.19	353.23	352.75	352.41

e Estimated

SITE NUMBER FROM LOCATION MAP.—23.

COUNTY.—Pennington.

LOCAL WELL NUMBER.—1N7E29CAD.

SITE ID (STATION NUMBER).—440052103181201.

OTHER IDENTIFIERS.—PE-84A and Countryside.

LOCATION.—Lat 44°00′52″, long 103°18′12″, in SE¼NE¼SW¼ sec. 29, T. 1 N., R. 7 E., Hydrologic Unit 10120110, 3 mi southwest of Rapid City. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Deadwood.

WELL CHARACTERISTICS.—Drilled observation well, 940 ft deep with 895 ft of 5-in. steel casing; open hole from 895 to 940 ft.

INSTRUMENTATION.—Digital water-level recorder -- 60-minute interval.

DATUM.—Elevation of land-surface datum is 3,880 ft above sea level. Measuring point: Top of steel casing, 1.50 ft above land-surface datum.

REMARKS.—Available records fair. Water levels affected by pumping of nearby well since 1991. Previously unpublished records from July 17, 1984, through February 28, 1985, are presented with the following tabulation.

PERIOD OF RECORD.—July 1984 to September 1994.

EXTREMES.—Highest daily water level, 394.40 ft below land-surface datum, July 17, 1984; lowest daily water level, 430.60 ft below land-surface datum, Feb. 27, 1990.

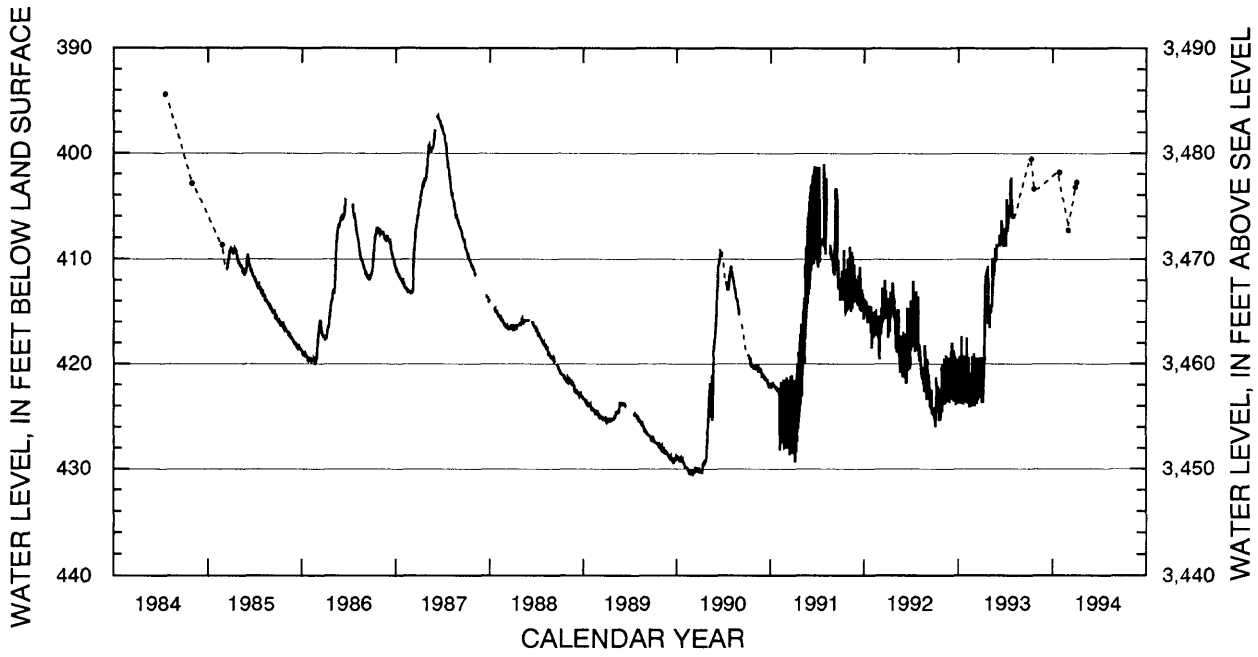

Figure 30. Hydrograph for observation well 1N7E29CAD (site number 23).

SITE NUMBER 23—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
17	---	---	---	---	---	---	---	---	---	394.40	---	---

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	409.11	410.44	410.56	412.08	413.38	414.79
2	---	---	---	---	---	---	409.16	410.46	410.15	412.06	413.30	414.69
3	---	---	---	---	---	---	409.16	410.40	409.87	411.99	413.45	414.75
4	---	---	---	---	---	---	409.26	410.51	409.71	412.12	413.47	414.80
5	---	---	---	---	---	---	409.26	410.67	409.62	412.15	413.54	414.72
6	---	---	---	---	---	---	409.40	410.71	409.88	412.17	413.60	414.93
7	---	---	---	---	---	---	409.45	410.81	409.99	412.26	413.61	415.09
8	---	---	---	---	---	---	409.40	410.67	410.23	412.38	413.66	415.12
9	---	---	---	---	---	---	409.13	410.71	410.31	412.49	413.83	415.05
10	---	---	---	---	---	---	409.14	410.57	410.48	412.46	413.78	415.14
11	---	---	---	---	---	---	409.18	410.79	410.69	412.48	413.73	---
12	---	---	---	---	---	---	409.40	410.91	410.72	412.34	413.85	---
13	---	---	---	---	---	---	409.38	410.94	410.61	412.46	414.05	---
14	---	---	---	---	---	---	409.21	410.94	410.83	412.67	414.04	---
15	---	---	---	---	---	411.03	409.37	411.09	410.86	412.61	413.89	---
16	---	---	---	---	---	411.03	409.35	411.17	411.10	412.63	414.03	415.06
17	---	---	---	---	---	410.96	409.16	411.12	411.23	412.60	414.20	415.21
18	---	---	---	---	---	410.90	409.19	410.98	411.30	412.82	414.19	415.24
19	---	---	---	---	---	410.80	409.11	411.08	411.21	412.90	414.18	415.73
20	---	---	---	---	---	410.69	409.28	411.21	411.07	412.79	414.19	415.75
21	---	---	---	---	---	410.40	409.31	411.28	411.42	412.88	414.17	415.65
22	---	---	---	---	---	410.16	409.53	411.35	411.34	412.84	414.36	415.70
23	---	---	---	---	---	410.16	409.65	411.34	411.48	412.82	414.42	415.73
24	---	---	---	---	---	410.10	409.78	411.31	411.38	412.98	414.51	415.66
25	---	---	---	---	---	409.75	409.86	411.31	411.62	413.15	414.41	415.81
26	---	---	---	---	---	409.51	410.07	411.44	411.73	413.09	414.53	415.67
27	---	---	---	---	---	409.32	410.09	411.42	411.77	413.19	414.62	415.92
28	---	---	---	---	408.50	409.28	410.11	411.37	411.81	413.30	414.55	415.95
29	---	---	---	---	---	409.29	410.31	411.44	411.83	413.33	414.64	415.92
30	---	---	---	---	---	409.16	410.47	411.35	411.95	413.29	414.61	415.90
31	402.96	---	---	---	---	409.13	---	411.18	---	413.40	414.75	---
MAX	402.96	---	---	---	408.50	411.03	410.47	411.44	411.95	413.40	414.75	415.95

SITE NUMBER 23—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	425.19	421.66	423.08	423.50	423.71	420.26	419.48	414.81	408.75	407.60	---	---
2	425.09	423.52	419.57	423.87	423.15	423.80	419.72	414.81	408.86	408.36	---	---
3	424.39	423.65	423.28	421.75	420.47	419.48	419.72	416.63	---	407.68	---	---
4	425.13	422.38	418.94	423.57	422.69	423.93	423.78	414.59	---	407.67	---	---
5	426.04	420.46	422.72	419.47	e417.58	419.08	420.43	414.71	---	407.08	---	---
6	424.60	423.59	418.82	423.27	422.98	423.20	422.34	414.84	---	408.87	---	---
7	421.36	419.61	423.36	419.36	423.85	424.15	421.23	414.84	---	406.15	---	---
8	422.80	423.14	418.04	423.69	421.05	422.63	423.78	415.23	---	404.44	---	---
9	424.03	423.58	422.99	419.94	423.53	423.36	421.82	414.53	e408.81	406.51	---	---
10	422.34	420.78	418.19	423.59	419.52	419.54	421.82	414.79	407.78	406.72	---	---
11	423.70	423.91	422.73	422.21	423.32	423.31	420.47	414.52	408.77	407.12	---	---
12	423.75	420.67	423.27	423.84	423.44	423.49	419.47	414.52	408.85	407.47	---	---
13	423.54	423.75	423.66	420.07	423.44	423.77	419.90	414.52	407.77	406.09	---	---
14	422.33	419.26	422.85	423.77	424.21	423.59	419.47	409.98	408.50	406.83	---	---
15	422.18	423.62	418.84	417.44	421.01	421.22	412.48	412.07	408.53	405.87	---	---
16	423.75	421.60	423.50	423.91	423.81	423.87	412.28	412.64	407.75	405.32	---	---
17	424.51	423.33	419.08	419.89	422.97	419.96	411.95	412.11	406.56	405.79	---	---
18	424.51	423.32	423.59	422.89	423.96	423.27	411.84	410.94	406.56	405.63	---	---
19	423.35	422.78	419.38	423.03	423.69	419.49	411.61	410.87	407.53	406.09	---	---
20	425.45	423.51	422.86	419.97	423.62	423.49	411.61	411.34	407.53	405.49	---	---
21	423.78	421.16	423.08	423.23	424.17	419.58	411.61	411.65	407.51	404.94	---	---
22	424.65	423.51	421.84	419.30	421.57	423.07	411.17	410.49	407.23	405.72	---	---
23	423.99	420.46	424.00	423.96	423.62	421.24	411.14	410.95	407.51	402.62	---	---
24	424.39	423.63	420.99	420.29	419.36	423.24	411.09	409.03	407.51	404.67	---	---
25	425.41	419.49	423.84	422.83	423.06	422.31	411.09	409.99	407.24	405.46	---	---
26	424.60	423.10	423.58	422.99	423.69	423.08	411.09	410.35	407.69	402.39	---	---
27	424.68	423.23	421.14	421.20	423.19	422.66	410.75	409.90	408.91	404.78	---	---
28	420.38	421.60	423.46	423.41	424.06	421.99	416.21	409.89	408.44	404.83	---	---
29	424.34	423.76	419.66	419.33	---	422.10	414.52	410.24	407.90	405.53	---	---
30	420.18	421.72	422.98	423.53	---	419.47	414.79	408.67	407.86	406.31	---	---
31	424.65	---	423.66	423.38	---	421.22	---	409.13	---	---	---	---
MAX	426.04	423.91	424.00	423.96	424.21	424.15	423.78	416.63	408.91	408.87	---	---

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	e407.31	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	e402.93	---	---	---	---	---
7	e400.73	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	e403.48	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	e401.89	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	e403.31	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MAX	403.48	---	---	401.89	---	407.31	402.93	---	---	---	---	---

e Estimated

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SITE NUMBER FROM LOCATION MAP.—24.

COUNTY.—Pennington.

LOCAL WELL NUMBER.—1N7E8ADDD2.

SITE ID (STATION NUMBER).—440338103173302.

OTHER IDENTIFIERS.—PE-89A and Canyon Lake 2.

LOCATION.—Lat 44°03′38″, long 103°17′33″, in SE¼SE¼SE¼NE¼ sec. 8, T. 1 N., R. 7 E., Hydrologic Unit 10120110, at Rapid City. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Madison.

WELL CHARACTERISTICS.—Drilled observation well, 700 ft deep with 630 ft of 6 3/8-in. steel casing; open hole from 630 to 700 ft.

INSTRUMENTATION.—Electronic data logger with pressure transducer and calibrated test gage.

DATUM.—Elevation of land-surface datum is 3,371.2 ft above sea level. Measuring point: Top of steel casing, 4.0 ft above land-surface datum.

REMARKS.—Records for 1993-94 poor because of problems with recording equipment. Other records good. Water levels affected by pumping of nearby wells.

PERIOD OF RECORD.—November 1989 to September 1994.

EXTREMES.—Highest daily water level, 53.72 ft above land-surface datum, Dec. 17, 1993; lowest daily water level, 35.84 ft above land-surface datum, Aug. 19, 1992.

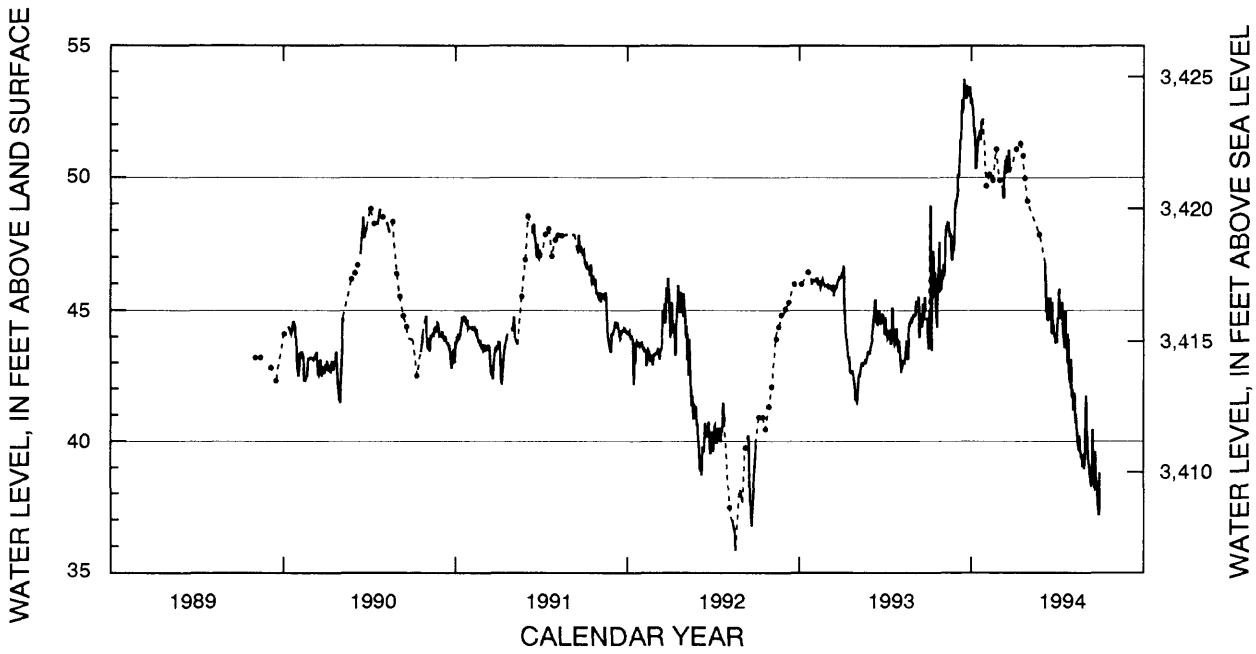

Figure 31. Hydrograph for observation well 1N7E8ADDD2 (site number 24).

SITE NUMBER 24—Continued

WATER LEVEL, IN FEET ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MINIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e+39.87	---	---	---	+46.13	+45.92	+46.33	+41.60	+43.57	+44.35	+43.86	+44.86
2	---	---	e+45.06	---	+46.10	+45.94	+46.29	+41.83	+43.59	+44.07	+43.54	+44.79
3	---	---	---	---	+46.08	+45.85	+46.33	+41.49	+43.68	+44.21	+43.22	e+44.79
4	---	e+42.07	---	---	+46.08	+45.83	+46.43	+41.47	+43.77	+44.74	+42.94	e+44.83
5	---	---	---	---	+46.13	+45.92	+46.68	+41.58	+44.03	+44.33	+42.62	+44.83
6	---	---	---	e+45.99	+46.17	+45.90	+46.59	+41.90	+44.14	+44.23	+42.76	+45.34
7	---	---	---	---	+46.20	+45.92	+45.55	+42.39	+44.30	+43.93	e+42.78	e+45.25
8	e+40.91	---	---	---	+46.20	+45.92	+45.02	+42.53	+44.67	+43.96	e+43.10	e+45.36
9	---	---	---	---	+46.20	+45.85	+44.72	+42.53	+44.83	+43.96	e+42.97	+45.27
10	---	---	e+45.29	---	+45.94	+45.83	+44.33	+42.50	+44.97	+44.19	e+43.08	e+45.20
11	---	---	---	---	+46.01	+45.76	+44.03	+42.69	+45.23	+44.21	e+43.01	e+45.53
12	---	e+43.91	---	---	+46.13	+45.76	+43.82	+42.83	+45.41	+44.00	+42.99	e+45.30
13	---	---	---	---	+46.06	+45.85	+43.57	+42.87	+45.13	+43.89	e+43.20	+44.21
14	e+40.91	---	---	---	+46.01	+45.87	+43.36	+43.01	+44.67	+43.68	e+43.36	+43.96
15	---	---	---	---	+45.94	+45.96	+43.22	+42.92	+44.51	+43.75	e+43.52	e+44.72
16	---	---	---	---	+45.85	+45.55	+43.17	+42.90	+44.49	+44.03	e+43.75	+44.88
17	---	---	---	---	+45.90	+45.69	+43.06	+43.01	+44.42	+44.23	e+43.70	+44.65
18	---	e+44.37	---	---	+46.08	+45.92	+43.08	+42.97	+44.65	+45.11	e+43.59	+44.58
19	---	---	---	---	+46.08	+45.80	+42.67	+42.99	+44.83	+44.72	e+43.22	+44.63
20	---	---	---	e+46.45	+46.15	+45.80	+42.60	+43.06	+45.02	+44.28	+43.13	+44.37
21	e+40.45	---	---	---	+46.06	+45.83	+42.60	+42.99	+44.70	+44.12	e+43.89	+45.27
22	---	---	e+45.99	---	+46.01	+45.85	+42.69	+42.94	+44.53	+43.68	+44.33	+45.00
23	---	---	---	---	+45.99	+45.99	+42.60	+43.08	+44.51	+43.70	e+44.40	+44.65
24	---	---	---	---	+45.96	+46.06	+42.71	+43.13	+44.58	+43.73	e+44.53	+44.86
25	---	e+44.83	---	---	+45.90	+46.13	+42.55	+43.22	+44.70	+44.12	e+44.58	+45.50
26	---	---	---	---	+45.92	+46.15	+42.46	+43.38	+44.67	+44.23	+44.56	+45.11
27	---	---	---	+46.20	+45.92	+46.26	+42.32	+43.45	+44.86	+44.33	+44.51	e+44.97
28	e+41.37	---	---	+45.96	+45.92	+46.26	+42.18	+43.36	+44.86	+44.12	e+44.70	---
29	---	---	---	+46.13	---	+46.20	+42.04	+43.43	+44.79	+43.77	+44.72	e+44.72
30	---	---	---	+46.13	---	+46.22	+41.56	+43.36	+44.72	+43.43	+44.67	+44.56
31	---	---	---	+46.10	---	+46.24	---	+43.36	---	+43.43	e+44.72	---
MIN	+39.87	+42.07	+45.06	+45.96	+45.85	+45.55	+41.56	+41.47	+43.57	+43.43	+42.62	+43.96

WATER LEVEL, IN FEET ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MINIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	+43.77	+46.47	+49.26	+52.84	---	---	---	---	---	+43.80	+42.07	+41.72
2	+43.52	+46.17	+49.36	+53.02	e+49.68	e+49.91	---	---	---	+44.14	+41.67	+41.37
3	+44.23	+46.75	+49.79	+52.75	---	---	---	---	---	+44.72	+41.97	+39.83
4	+44.83	+46.29	+50.12	+52.68	---	---	---	---	---	+44.65	+41.95	+40.22
5	---	+46.47	+50.05	+52.38	---	---	---	---	---	+44.72	+41.21	+39.76
6	+48.92	+46.93	+50.07	+52.22	---	---	---	---	+46.79	+45.71	+41.21	+39.30
7	+44.67	+47.72	+50.46	+51.71	---	---	e+51.06	---	+46.08	+45.80	+41.37	+39.14
8	+43.59	+47.97	+50.97	+51.87	---	+49.68	---	---	+46.10	---	+41.83	+38.84
9	+43.47	+48.20	+51.41	+51.25	e+50.14	+49.29	---	---	+45.02	---	+41.03	+38.67
10	+45.20	+48.09	+51.43	+51.11	---	+49.22	---	---	+45.04	---	+40.68	+38.67
11	+46.20	+48.23	+51.94	+50.32	---	+49.40	---	---	+44.65	+44.65	+41.03	+38.44
12	+47.26	+48.20	+52.95	+50.44	---	+50.26	---	---	+44.81	+45.02	+40.52	+38.26
13	+47.16	+48.32	+52.42	+50.67	---	+50.14	---	---	+44.60	+45.30	+40.40	+38.67
14	+46.31	+48.11	+52.54	+51.02	---	+50.67	---	---	+45.48	+44.37	+39.99	+39.02
15	+45.53	+48.02	+52.61	+51.29	---	+50.14	e+51.29	---	+45.00	+44.07	+39.83	+40.45
16	+46.45	+47.76	+53.37	+51.52	e+49.91	+50.19	---	---	+45.06	+43.68	+39.76	+39.30
17	+46.08	+47.81	+53.72	+51.59	---	+50.83	---	---	+45.41	+43.57	+39.64	+38.84
18	+45.41	+47.88	+52.98	+51.64	---	+50.26	---	---	+45.48	+43.98	+40.22	+38.56
19	+44.83	+47.33	+53.02	+51.80	---	+50.60	---	---	+45.06	+44.33	+39.64	+38.21
20	+44.72	+47.00	+53.09	+51.57	---	+50.83	e+50.83	---	+44.33	+45.00	+39.64	+38.26
21	+44.37	+46.89	+53.14	+51.41	---	+50.19	---	---	+44.10	+43.91	+39.41	+39.60
22	+45.92	+47.09	+52.98	+52.10	---	+51.06	---	---	+45.30	+43.63	+39.41	+38.67
23	+45.99	+47.23	+53.49	+52.05	e+51.06	+50.56	---	---	+44.33	+43.10	+39.30	+38.37
24	+47.09	+47.26	+53.09	+52.22	---	+50.19	---	e+47.83	+44.49	+42.94	+39.14	+38.10
25	+47.58	+47.49	+53.21	+51.99	---	---	e+49.99	---	+44.10	+44.10	+39.18	+37.64
26	+46.20	+48.11	+53.37	e+52.22	---	---	---	---	+44.03	+42.67	+39.25	+37.41
27	+45.69	+48.83	+53.37	---	---	---	---	---	+44.03	+42.46	+39.53	+37.41
28	+46.26	+49.03	+53.21	---	---	---	e+49.10	---	+43.75	+42.25	+38.95	+37.17
29	+45.87	+48.99	+53.44	---	---	---	---	---	+43.98	+42.30	+39.07	+37.29
30	+45.85	+49.08	+53.07	---	---	e+50.60	---	---	+43.80	+42.04	+39.41	+38.79
31	+46.43	---	+52.79	---	---	---	---	---	---	+43.15	+41.26	---
MIN	+43.47	+46.17	+49.26	+50.32	+49.68	+49.22	+49.10	+47.83	+43.75	+42.04	+38.95	+37.17

e Estimated

SITE NUMBER FROM LOCATION MAP.—25.

COUNTY.—Pennington.

LOCAL WELL NUMBER.—1N7E8ADDD.

SITE ID (STATION NUMBER).—440338103173301.

OTHER IDENTIFIERS.—PE-89B and Canyon Lake 1.

LOCATION.—Lat 44°05′44″, long 103°18′00″, in SE¼SE¼SE¼NE¼ sec. 8, T. 1 N., R. 7 E., Hydrologic Unit 10120110, at Rapid City. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 115 ft deep with 6 3/8-in. steel casing to 74 ft; open hole from 74 to 115 ft.

INSTRUMENTATION.—Digital water-level recorder -- 60-minute interval.

DATUM.—Elevation of land-surface datum is 3,371.2 ft above sea level. Measuring point: Top of steel casing, 1.30 ft above land-surface datum.

REMARKS.—Records good. Water levels may be affected by static level of Canyon Lake.

PERIOD OF RECORD.—January 1990 to September 1994.

EXTREMES.—Highest daily water level, 10.43 ft below land-surface datum, June 21, 1993; lowest daily water level, 11.22 ft below land-surface datum, Apr. 4-7, 1991.

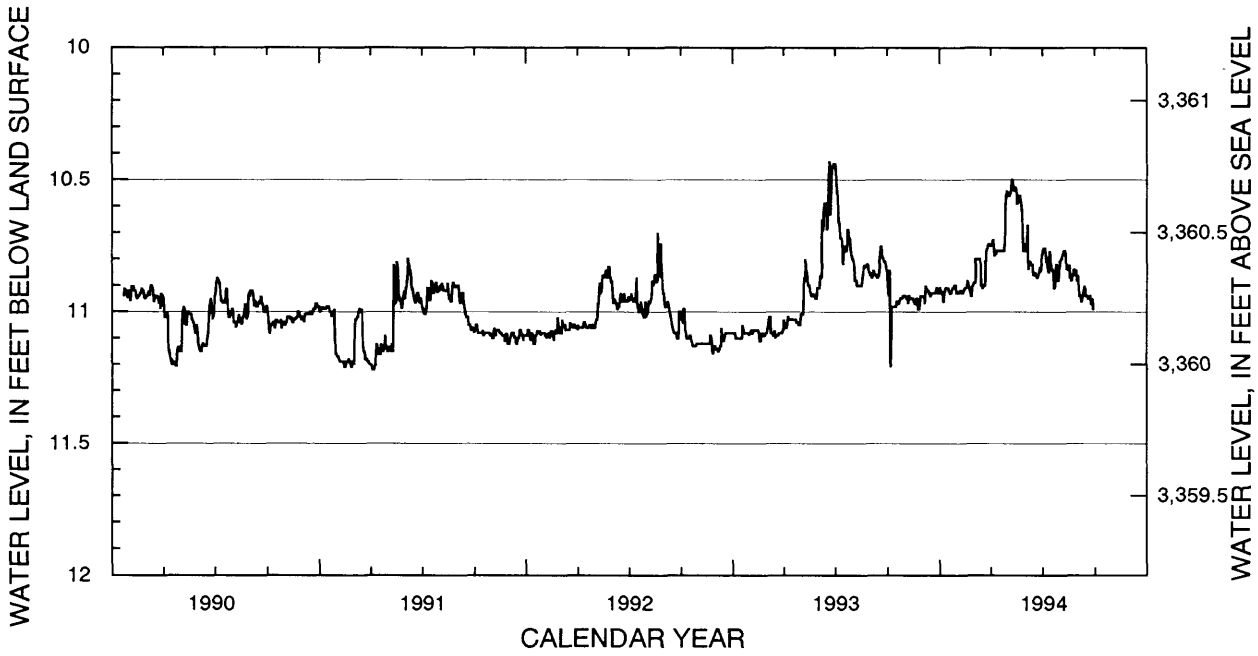

Figure 32. Hydrograph for observation well 1N7E8ADDD (site number 25).

SITE NUMBER 25—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.00	11.12	11.13	11.08	11.08	11.08	11.03	11.01	10.91	10.44	10.80	10.86
2	11.01	11.12	11.14	11.08	11.07	11.08	11.05	11.01	10.91	10.48	10.80	10.86
3	11.02	11.12	11.14	11.08	11.07	11.06	11.06	11.01	10.91	10.51	10.82	10.87
4	11.04	11.12	11.14	11.08	11.08	11.06	11.06	11.01	10.87	10.55	10.88	10.87
5	11.04	11.12	11.14	11.08	11.08	11.03	11.06	11.01	10.86	10.56	10.88	10.86
6	10.99	11.12	11.15	11.10	11.07	11.02	11.06	10.87	10.87	10.59	10.88	10.84
7	10.99	11.12	11.15	11.10	11.07	11.02	11.05	10.88	10.87	10.66	10.88	10.85
8	11.03	11.12	11.14	11.10	11.07	11.02	11.02	10.88	10.65	10.66	10.90	10.86
9	11.07	11.12	11.14	11.10	11.07	11.08	11.02	10.80	10.69	10.68	10.90	10.86
10	11.08	11.12	11.13	11.10	11.07	11.08	11.03	10.84	10.69	10.72	10.90	10.86
11	11.10	11.12	11.13	11.10	11.07	11.08	11.03	10.85	10.61	10.72	10.90	10.86
12	11.10	11.12	11.06	11.10	11.07	11.08	11.03	10.87	10.59	10.72	10.90	10.87
13	11.10	11.12	11.09	11.10	11.07	11.09	11.03	10.89	10.59	10.73	10.90	10.87
14	11.10	11.12	11.11	11.10	11.07	11.09	11.03	10.90	10.59	10.75	10.90	10.87
15	11.10	11.12	11.11	11.10	11.07	11.08	11.03	10.90	10.59	10.82	10.90	10.86
16	11.10	11.12	11.11	11.10	11.09	11.07	11.03	10.90	10.59	10.79	10.90	10.86
17	11.09	11.12	11.10	11.10	11.11	11.10	11.03	10.92	10.69	10.75	10.89	10.82
18	11.09	11.12	11.09	11.05	11.11	11.09	11.03	10.93	10.66	10.76	10.87	10.79
19	11.10	11.12	11.08	11.06	11.11	11.09	11.03	10.94	10.49	10.76	10.85	10.76
20	11.11	11.12	11.08	11.08	11.09	11.09	11.03	10.94	10.47	10.77	10.83	10.75
21	11.12	11.12	11.08	11.08	11.08	11.09	11.03	10.94	10.43	10.77	10.82	10.77
22	11.13	11.09	11.08	11.08	11.08	11.09	11.03	10.94	10.63	10.75	10.83	10.79
23	11.13	11.09	11.08	11.08	11.08	11.08	11.04	10.93	10.63	10.69	10.83	10.79
24	11.13	11.10	11.08	11.08	11.09	11.08	11.04	10.94	10.52	10.69	10.83	10.80
25	11.13	11.11	11.08	11.08	11.09	11.08	11.04	10.94	10.46	10.72	10.82	10.81
26	11.13	11.15	11.08	11.08	11.09	11.08	11.04	10.94	10.45	10.72	10.82	10.81
27	11.13	11.16	11.08	11.08	11.09	11.08	11.05	10.95	10.45	10.72	10.82	10.81
28	11.13	11.15	11.08	11.08	11.08	11.08	11.05	10.95	10.44	10.75	10.84	10.83
29	11.12	11.13	11.08	11.08	---	11.08	11.05	10.95	10.44	10.77	10.85	10.84
30	11.12	11.13	11.08	11.09	---	11.07	11.05	10.91	10.44	10.79	10.85	10.85
31	11.12	---	11.08	11.08	---	11.07	---	10.91	---	10.79	10.86	---
MAX	11.13	11.16	11.15	11.10	11.11	11.10	11.06	11.01	10.91	10.82	10.90	10.87

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.88	10.94	10.94	10.91	10.93	10.90	10.75	10.56	10.77	10.78	10.81	10.86
2	10.93	10.94	10.94	10.91	10.93	10.89	10.75	10.56	10.74	10.77	10.81	10.89
3	10.94	10.95	10.94	10.93	10.93	10.89	10.75	10.56	10.76	10.76	10.80	10.92
4	10.84	10.95	10.94	10.93	10.93	10.89	10.74	10.56	10.76	10.76	10.80	10.94
5	10.85	10.95	10.95	10.92	10.92	10.89	10.73	10.55	10.67	10.76	10.79	10.94
6	11.21	10.97	10.97	10.93	10.92	10.80	10.73	10.55	10.84	10.76	10.78	10.94
7	11.20	10.94	10.90	10.96	10.92	10.80	10.76	10.53	10.82	10.78	10.78	10.96
8	10.98	10.94	10.92	10.96	10.92	10.80	10.79	10.50	10.81	10.80	10.77	10.96
9	10.98	10.95	10.91	10.93	10.93	10.80	10.78	10.50	10.81	10.83	10.77	10.95
10	10.98	10.95	10.92	10.92	10.93	10.80	10.78	10.51	10.81	10.84	10.77	10.94
11	10.98	10.95	10.92	10.91	10.93	10.80	10.78	10.53	10.82	10.85	10.78	10.92
12	10.98	10.95	10.92	10.91	10.92	10.80	10.77	10.54	10.82	10.85	10.84	10.91
13	10.98	10.95	10.93	10.91	10.92	10.80	10.77	10.54	10.82	10.80	10.83	10.90
14	10.98	10.95	10.93	10.91	10.91	10.80	10.77	10.53	10.85	10.77	10.84	10.92
15	10.98	10.95	10.94	10.91	10.91	10.90	10.77	10.53	10.86	10.79	10.84	10.94
16	10.98	10.96	10.94	10.91	10.91	10.90	10.77	10.54	10.86	10.82	10.84	10.94
17	10.96	10.96	10.93	10.92	10.91	10.91	10.77	10.59	10.86	10.84	10.82	10.94
18	10.96	10.97	10.93	10.93	10.90	10.91	10.77	10.59	10.85	10.84	10.87	10.94
19	10.97	10.97	10.93	10.93	10.88	10.90	10.77	10.58	10.86	10.84	10.87	10.95
20	10.97	10.97	10.93	10.93	10.89	10.90	10.77	10.56	10.86	10.88	10.88	10.95
21	10.97	10.95	10.93	10.93	10.90	10.90	10.77	10.56	10.87	10.91	10.88	10.94
22	10.96	10.95	10.93	10.92	10.91	10.90	10.77	10.56	10.87	10.91	10.87	10.94
23	10.95	10.96	10.93	10.91	10.92	10.81	10.77	10.56	10.86	10.90	10.86	10.94
24	10.95	10.99	10.93	10.91	10.92	10.81	10.77	10.58	10.86	10.85	10.86	10.97
25	10.95	10.99	10.92	10.91	10.94	10.77	10.77	10.60	10.85	10.82	10.84	10.97
26	10.95	10.99	10.91	10.90	10.94	10.76	10.73	10.62	10.83	10.82	10.84	10.96
27	10.95	10.97	10.91	10.90	10.91	10.75	10.60	10.68	10.85	10.87	10.85	10.95
28	10.94	10.94	10.92	10.90	10.90	10.75	10.56	10.74	10.84	10.88	10.85	10.99
29	10.94	10.94	10.93	10.90	---	10.74	10.54	10.77	10.82	10.88	10.84	10.99
30	10.94	10.94	10.93	10.93	---	10.75	10.55	10.77	10.79	10.85	10.88	10.99
31	10.94	---	10.92	10.93	---	10.75	---	10.77	---	10.83	10.88	---
MAX	11.21	10.99	10.97	10.96	10.94	10.91	10.79	10.77	10.87	10.91	10.88	10.99

SITE NUMBER FROM LOCATION MAP.—26.

COUNTY.—Pennington.

LOCAL WELL NUMBER.—1N7E3CBAA2.

SITE ID (STATION NUMBER).—440430103160202.

OTHER IDENTIFIERS.—PE-65A and Sioux Park 2.

LOCATION.—Lat 44°04′30″, long 103°16′02″, in NE¼NE¼NW¼SW¼ sec. 3, T. 1 N., R. 7 E., Hydrologic Unit 10120110, at Rapid City. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Madison.

WELL CHARACTERISTICS.—Drilled observation well, 1,170 ft deep with 934 ft of 3-in. steel casing and 1,170 ft of 1.25-in. steel casing; perforated casing from 972 to 1,170 ft.

INSTRUMENTATION.—Electronic data logger with pressure transducer -- 60-minute interval. Circular-chart pressure recorder utilized as backup system. Prior to 1991, circular-chart pressure recorder only.

DATUM.—Elevation of land-surface datum is 3,300 ft above sea level. Measuring point: Top of recorder platform, 2.3 ft above land-surface datum.

REMARKS.—Records fair. Water levels may be affected by amount of fluid used for antifreeze. Water levels since 1989 affected by pumping of nearby wells. Effects prior to 1989 unknown.

PERIOD OF RECORD.—July 1965 to September 1994.

EXTREMES.—Highest daily water level, 149.95 ft above land-surface datum, numerous days between June 19 and Oct. 4, 1986, plus July 16, 1987; lowest daily water level, 80.46 ft above land-surface datum, Sept. 26, 1992. Note: Highest values published by Winter (1994) are in error.

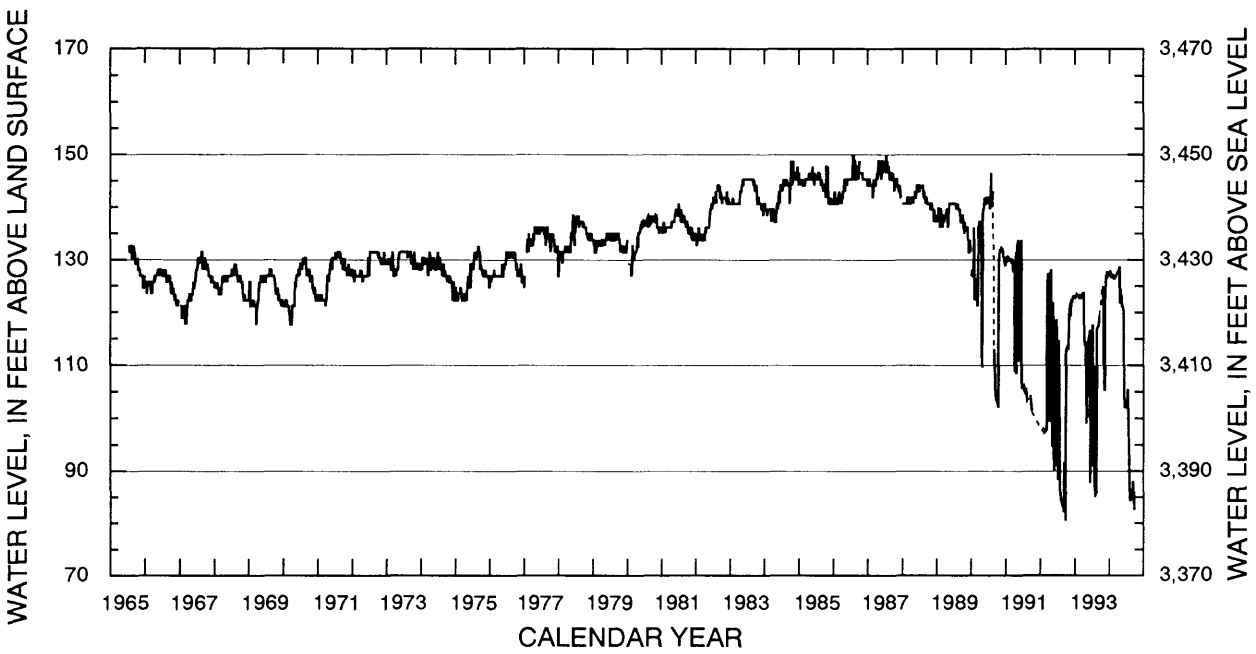

Figure 33. Hydrograph for observation well 1N7E3CBAA2 (site number 26).

SITE NUMBER 26—Continued

WATER LEVEL, IN FEET ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MINIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	+112.00	+113.96	+122.68	+122.84	+123.19	+122.73	+120.65	+109.88	+107.04	+91.23	+88.01	+116.91
2	+111.88	+113.84	+122.49	+123.42	+123.37	+122.84	+123.19	+94.70	+113.38	+90.66	+86.51	+116.73
3	+112.11	+118.11	+122.45	+123.07	+123.37	+123.14	+123.03	+88.42	+115.07	+90.61	+85.81	+116.68
4	+112.69	+119.45	+121.99	+122.73	+123.07	+122.49	+123.30	+97.23	+115.53	+101.11	+85.65	+116.80
5	+112.92	+119.84	+122.10	+122.79	+123.14	+122.73	+123.76	+99.08	+115.69	+99.03	+85.08	+117.19
6	+112.53	+120.30	+122.49	+122.84	+123.19	+122.96	+123.65	+113.45	+116.04	+97.65	+84.84	+118.11
7	+113.22	+120.49	+122.22	+122.91	+123.19	+122.91	+119.50	+113.96	+116.22	+92.85	+90.54	+118.07
8	+114.07	+121.18	+122.68	+123.14	+123.26	+122.73	+118.69	+114.14	+116.10	+104.15	+86.62	+118.18
9	+113.38	+121.18	+122.68	+122.91	+123.26	+122.91	+118.23	+97.46	+116.45	+105.84	+86.46	+117.72
10	+113.34	+120.95	+122.68	+123.03	+123.14	+122.79	+118.00	+107.22	+116.68	+117.65	+90.38	+117.30
11	+113.61	+121.11	+122.91	+123.14	+122.91	+122.79	+117.30	+113.96	+116.61	+112.46	+89.57	+117.60
12	+113.15	+121.34	+122.84	+123.19	+122.96	+122.56	+116.68	+114.42	+117.30	+95.04	+92.04	+118.00
13	e+113.45	+121.34	+122.79	+122.79	+123.19	+122.56	+115.76	+114.19	+97.35	+96.89	+93.54	+117.53
14	e+113.61	+121.80	+122.45	+122.84	+122.91	+122.56	+115.23	+114.49	+89.34	+91.53	+89.80	+117.42
15	+113.38	+121.76	+122.96	+123.07	+122.91	+123.03	+115.00	+114.42	+87.77	+105.65	+109.69	+118.11
16	+113.22	+121.87	+122.79	+123.30	+122.61	+122.49	+115.18	+114.37	+92.92	+117.19	+95.11	e+118.00
17	+113.57	+121.87	+122.79	+123.30	+122.45	+122.49	+114.72	+115.00	+96.19	+117.88	+91.00	e+118.00
18	+113.61	+122.03	+122.96	+123.03	+122.68	+122.61	+115.07	+115.34	+115.11	+119.45	+87.84	+117.95
19	+114.19	+122.03	+122.56	+123.30	+122.91	+122.91	+114.07	+114.84	+116.27	+95.46	+85.77	+119.03
20	+113.57	+119.33	+122.84	+123.37	+123.07	+122.68	+113.80	+113.57	+94.07	+91.00	+85.65	+119.26
21	+112.99	+122.15	+122.96	+123.53	+123.03	+122.73	+114.26	+94.88	+88.47	+89.27	+96.38	+119.50
22	+113.22	+122.26	+122.96	+123.49	+122.79	+122.56	+114.30	+103.12	+87.89	+88.47	+115.69	+119.50
23	+112.57	+122.38	+122.68	+123.42	+122.56	+122.73	+114.42	+113.73	+112.99	+88.35	+116.68	+119.38
24	+112.53	+122.22	+123.19	+122.91	+122.68	+122.91	+114.30	+114.72	+115.46	+88.19	+116.96	e+119.61
25	+112.87	+122.26	+122.96	+123.30	+122.79	+123.19	+114.37	+114.42	+116.22	+94.23	+116.91	---
26	+112.53	+121.99	+123.07	+123.49	+122.56	+123.14	+114.07	+115.07	+116.10	+91.81	+116.68	---
27	+112.76	+122.22	+123.07	+123.53	+122.56	+123.49	+113.80	+115.00	+116.57	+108.77	+116.68	---
28	+117.72	+122.38	+122.84	+123.30	+122.79	+123.37	+113.15	+114.65	+116.50	+95.04	+116.84	---
29	+114.60	+122.45	+122.73	+122.96	---	+123.26	+97.35	+114.88	+117.30	+92.46	+117.03	---
30	+114.07	+122.33	+122.73	+123.03	---	+120.37	+90.50	+100.69	+95.16	+88.88	+116.91	---
31	+114.07	---	+122.73	+123.14	---	+123.03	---	+108.65	---	+88.01	+116.84	---
MIN	+111.88	+113.84	+121.99	+122.73	+122.45	+120.37	+90.50	+88.42	+87.77	+88.01	+84.84	+116.68

WATER LEVEL, IN FEET ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MINIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	+96.77	+127.57	+127.41	+126.95	+126.99	+127.99	+126.30	+93.38	+101.96	+87.38	+106.53
2	---	+96.43	+127.45	+127.57	+127.06	+127.11	+128.10	+127.80	+105.08	+102.08	+86.51	+92.00
3	---	+107.15	+127.69	+127.69	+126.65	+127.11	+128.10	+127.22	+118.99	+104.15	+85.77	+99.84
4	---	+98.34	+127.64	+127.34	+126.60	+126.99	+127.99	+124.41	+120.42	+103.42	+85.88	+105.65
5	---	+114.19	+127.75	+127.69	+126.76	+127.11	+127.80	+124.46	+120.14	+102.61	+91.88	+86.57
6	e+109.6	+124.80	+127.41	+126.88	+127.06	+126.83	+127.99	+124.76	+121.30	+102.08	+90.54	+85.12
7	---	+125.68	+127.45	+126.60	+126.49	+126.53	+128.15	+125.84	+107.73	+102.19	+86.46	+84.43
8	---	+125.72	+127.69	+127.34	+126.49	+126.60	+128.33	+124.69	+103.99	+102.54	+85.70	+84.61
9	---	+103.88	+127.64	+126.99	+126.49	+126.72	+128.03	+123.42	+103.76	+102.26	+85.58	+84.84
10	---	+105.65	+127.22	+127.06	+127.11	+126.76	+127.92	+122.79	+103.58	+102.08	+84.73	+84.50
11	---	+109.64	+127.52	+127.11	+127.18	+126.88	+128.03	+121.87	+103.35	+102.08	+84.66	+85.12
12	---	+109.64	+128.03	+127.34	+126.53	+126.88	+128.03	+121.64	+103.00	+101.57	+86.04	+84.15
13	e+121.3	+126.30	+127.52	+127.29	+126.49	+126.88	+128.56	+121.80	+102.65	+101.45	+84.66	+83.69
14	---	+126.72	+127.11	+126.88	+126.95	+127.22	+128.38	+121.53	+102.38	+102.49	+84.04	+86.69
15	---	+105.19	+126.95	+126.99	+126.88	+126.83	+128.10	+123.19	+101.96	+102.08	+84.20	+88.01
16	---	+101.96	+127.41	+127.34	+127.11	+127.06	+128.26	+122.61	+101.92	+101.73	+84.96	+87.73
17	---	+124.57	+127.34	+126.65	+127.06	+127.52	+128.61	+121.92	+102.54	+101.73	+84.66	+86.34
18	---	+126.88	+127.22	+126.72	+127.52	+127.18	+128.61	+121.41	+104.50	+102.61	+86.04	+85.65
19	---	+123.37	+127.64	+126.83	+127.06	+127.80	+128.38	+119.38	+103.92	+102.31	+85.08	+84.73
20	e+125.0	+122.26	+127.22	+126.49	+126.88	+127.22	+128.68	+120.95	+102.77	+105.49	+86.51	+85.01
21	+120.26	+122.15	+127.06	+126.95	+126.42	+127.41	+120.26	+121.92	+102.42	+103.65	+85.19	+85.01
22	+122.22	+124.34	+126.88	+127.29	+126.30	+127.34	+122.84	+121.99	+102.19	+101.11	+84.08	+85.81
23	+121.80	+125.79	+127.11	+127.34	+126.53	+127.41	+122.79	+120.49	+103.00	+100.65	+83.69	+82.77
24	+125.72	+125.84	+127.45	+127.45	+126.76	+127.11	+121.87	+121.64	+102.84	+99.96	+84.78	+82.58
25	+124.41	+126.26	+127.52	+127.22	+126.19	+127.52	+121.64	+121.34	+102.72	+99.77	+84.78	+82.47
26	+122.45	+127.11	+127.69	+127.29	+126.53	+127.69	+122.03	+121.11	+102.65	+98.50	+84.54	+83.11
27	+121.99	+127.18	+127.11	+127.18	+127.18	+127.34	+123.03	+97.88	+102.65	+97.99	+84.27	+82.47
28	+104.80	+127.52	+126.99	+127.22	+127.11	+127.64	+122.73	+96.77	+102.38	+97.99	+84.31	+81.89
29	+99.38	+127.29	+127.11	+127.18	---	+127.57	+127.22	+108.61	+102.08	+94.46	+83.92	+81.50
30	+103.42	+127.41	+127.57	+126.60	---	+127.57	+127.80	+97.42	+102.15	+87.73	+83.74	+81.89
31	+100.00	---	+127.57	+126.95	---	+127.80	---	+95.69	---	+87.73	+84.31	---
MIN	+99.38	+96.43	+126.88	+126.49	+126.19	+126.53	+120.26	+95.69	+93.38	+87.73	+83.69	+81.50

e Estimated

SITE NUMBER FROM LOCATION MAP.—27.

COUNTY.—Pennington.

LOCAL WELL NUMBER.—1N7E3CBAA.

SITE ID (STATION NUMBER).—440430103160201.

OTHER IDENTIFIERS.—PE-64B and Sioux Park 1.

LOCATION.—Lat 44°04′30″, long 103°16′02″, in NE¼NE¼NW¼SW¼ sec. 3, T. 1 N., R. 7 E., Hydrologic Unit 10120110, at Rapid City. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 570 ft deep with 100 ft of 6-in. steel casing, 404 ft of 3-in. steel casing, and 570 ft of 1.25-in. steel casing; perforated casing from 413 to 570 ft.

INSTRUMENTATION.—Electronic data logger with pressure transducer -- 60-minute interval. Circular-chart pressure recorder prior to 1991.

DATUM.—Elevation of land-surface datum is 3,300 ft above sea level. Measuring point: Top of recorder platform, 2.7 ft above land-surface datum.

REMARKS.—Records poor because of numerous problems with well, instrumentation, and amount of fluid used for antifreeze. Large errors are possible for numerous periods. Water levels may be affected by pumping of nearby wells.

PERIOD OF RECORD.—July 1964 to September 1994.

EXTREMES.—Highest daily water level, 109.98 ft above land-surface datum, June 21, Sept. 16, 26, and Oct. 6, 1979; lowest daily water level, 53.45 ft above land-surface datum, Oct. 1, 1964 (revised). Note: Extreme values published by Winter (1994) were based on values for every fifth day. Accuracy of extreme low value is questionable.

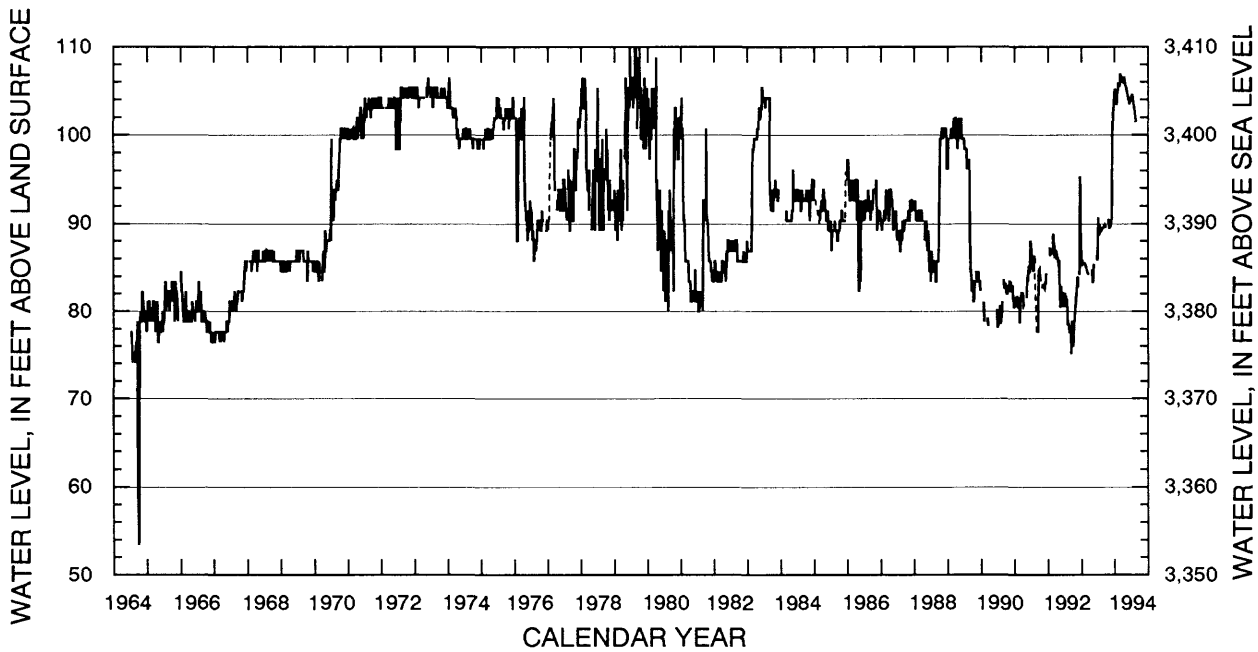

Figure 34. Hydrograph for observation well 1N7E3CBAA (site number 27).

WATER LEVEL, IN FEET ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MINIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	+76.59	---	+83.54	---	+85.94	---	---	+83.54	---	+94.98	---	---
2	+76.99	---	+82.61	---	+86.28	---	---	+83.93	---	+92.90	---	---
3	+76.32	---	e+82.17	---	+85.75	e+84.83	---	+83.91	---	+91.40	---	---
4	+75.56	---	---	---	+85.41	---	---	+83.40	---	+91.01	---	---
5	+76.04	---	---	e+85.18	e+85.61	---	---	+83.26	---	+90.71	---	---
6	+76.39	---	+83.26	e+86.44	---	---	---	+83.72	---	+90.32	---	---
7	+77.10	---	+83.15	---	---	---	e+84.83	+84.07	---	+88.87	---	---
8	+77.52	---	+83.54	e+86.21	---	---	---	+84.28	---	+88.59	---	---
9	+79.08	---	+84.14	+85.95	---	---	---	+84.28	e+87.14	+88.36	---	---
10	+78.76	---	+84.14	+85.87	---	e+84.37	---	+84.28	+86.33	+88.94	---	---
11	+79.06	---	+84.23	+85.59	---	---	---	+84.16	+86.33	+89.33	---	---
12	+79.50	---	+84.51	+85.64	---	---	---	+84.60	+86.47	+89.56	---	---
13	+78.99	---	+84.00	e+85.24	---	---	---	+84.83	+86.07	+89.21	---	---
14	+78.42	---	+84.00	---	---	---	e+84.83	+85.34	+86.47	e+89.67	---	+88.87
15	e+78.83	---	+87.44	---	---	---	---	+85.31	+86.28	+89.40	---	e+89.90
16	---	---	e+92.44	---	---	---	---	+85.31	+85.98	+89.28	---	+89.21
17	---	---	+92.77	---	---	---	---	+85.87	+85.59	+89.21	---	e+89.56
18	---	---	+93.80	---	---	e+84.37	---	+85.59	+85.75	+89.74	---	+89.44
19	---	e+84.83	+94.80	---	---	+84.30	e+84.83	+85.52	+85.94	+89.74	---	+89.67
20	---	e+83.98	+95.37	e+85.29	---	+84.18	---	+85.41	+86.40	+89.86	---	+89.86
21	---	---	+96.76	e+85.19	---	+83.95	---	+85.50	+86.91	e+90.37	---	+90.25
22	---	e+82.66	e+97.52	+84.71	---	---	e+82.98	+85.68	+86.56	+89.56	---	+89.79
23	---	+82.66	+92.28	e+85.18	---	---	+85.20	+85.89	+85.98	+89.44	---	+89.51
24	---	+82.68	+91.29	---	---	e+85.29	+85.08	e+86.21	+85.75	+89.21	---	e+89.90
25	---	+82.73	+89.21	---	---	---	+84.78	---	+85.82	+88.98	---	+89.51
26	---	+83.07	+88.94	+86.17	---	---	+84.76	e+86.44	+85.75	---	---	+89.28
27	---	---	+88.41	+86.21	---	---	+84.30	---	+86.51	---	---	+89.33
28	---	+82.80	+86.79	+85.71	---	---	+83.56	---	+86.79	e+89.67	---	+89.17
29	---	+82.61	e+86.44	+85.48	---	---	+83.47	---	+91.13	---	---	e+89.90
30	---	+82.43	---	+85.13	---	---	+83.35	---	e+95.44	---	---	+89.33
31	---	---	---	+85.87	---	---	---	---	---	---	---	---
MIN	+75.56	+82.43	+82.17	+84.71	+85.41	+83.95	+82.98	+83.26	+85.59	+88.36	---	+88.87

WATER LEVEL, IN FEET ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MINIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	+88.98	+90.60	+90.55	+104.97	+105.25	+106.47	---	---	---	---	---	---
2	+88.98	+90.14	+90.37	+105.25	+105.36	+106.58	---	---	---	---	---	---
3	+89.17	+90.44	+90.32	+105.43	+105.08	+106.75	---	e+105.52	---	---	---	---
4	---	+89.97	+90.48	+104.97	+105.08	+106.70	---	---	---	---	---	---
5	---	+89.44	+90.71	+105.25	+105.13	+106.93	---	---	---	---	---	---
6	---	+89.56	+90.44	+104.67	+105.36	+106.24	e+106.50	---	---	---	---	---
7	---	+90.14	+93.67	+104.55	+105.13	+106.01	---	---	---	---	---	---
8	---	+90.02	+96.59	+104.90	+105.13	---	---	---	e+103.52	---	---	---
9	---	+89.79	+99.09	+104.85	+105.02	e+106.75	---	---	---	---	---	---
10	---	+89.67	+100.12	+104.97	+105.94	---	---	---	---	---	---	---
11	---	+89.79	+101.09	+104.90	+106.01	---	---	---	---	e+104.67	---	---
12	---	+90.09	+102.66	+105.02	+105.66	---	---	---	---	---	---	---
13	---	+89.79	+102.36	+105.20	+105.66	---	---	---	---	---	---	---
14	---	+89.90	+102.25	+104.44	+106.05	---	e+106.50	---	---	---	---	---
15	---	+89.63	+102.59	+104.28	+105.71	---	---	---	---	---	---	---
16	---	+89.74	+103.05	+104.32	+106.17	e+106.28	---	---	---	---	---	---
17	---	+89.67	+103.17	+103.75	+106.17	---	---	---	---	---	---	---
18	---	+90.02	+103.17	+103.70	+106.52	---	---	---	---	---	---	---
19	---	+89.63	+103.47	+103.75	+106.24	---	---	---	---	---	---	---
20	---	+89.86	+103.63	+103.40	+105.94	---	e+106.05	---	---	---	---	---
21	+89.63	+89.90	+103.93	+103.59	+105.78	---	---	---	---	---	---	---
22	+89.63	+89.79	+103.63	+103.93	+105.78	---	---	---	---	---	---	---
23	+89.90	+89.63	+103.98	+104.28	+105.78	---	---	---	---	---	e+101.44	---
24	+90.25	+89.63	+104.51	+104.44	+106.17	---	---	---	---	---	---	---
25	+90.55	+90.09	+104.62	+104.55	+105.48	---	---	---	---	---	---	---
26	+90.14	+90.67	+104.90	+104.78	+105.82	---	---	---	---	---	---	---
27	+90.02	+91.17	+104.51	+104.90	+106.24	---	---	---	---	---	---	---
28	+90.32	+91.06	+104.51	+105.13	+106.28	---	e+105.59	---	---	---	---	---
29	+89.86	+90.71	+104.51	+105.13	---	---	---	---	---	---	---	---
30	+89.51	+90.60	+104.67	+104.74	---	e+106.05	---	---	---	---	---	---
31	+90.32	---	+105.20	+105.13	---	---	---	---	---	---	---	---
MIN	+88.98	+89.44	+90.32	+103.40	+105.02	+106.01	+105.59	+105.52	+103.52	+104.67	+101.44	---

e Estimated

SITE NUMBER FROM LOCATION MAP.—C1.

COUNTY.—Pennington.

LOCAL NUMBER.—1N6E13DDD.

SITE ID (STATION NUMBER).—440228103195701.

LOCATION.—Lat 44°02′23″, long 103°19′57″, in SE¼SE¼SE¼ sec. 13, T. 1 N., R. 6 E., Hydrologic Unit 10120110. Owner: private.

AQUIFER.—Madison.

SITE CHARACTERISTICS.—Pool of water in cave about 100 ft below cave entrance.

INSTRUMENTATION.—Electronic data logger with pressure transducer.

DATUM.—Elevation of land surface at cave entrance is about 3,550 ft above sea level. Measuring point: Staff gage with 0.0 being 21.71 ft below a brass cap reference point with elevation of about 3,477.53 ft above sea level.

REMARKS.—Current records good. Records prior to 1989 are questionable. Extreme fluctuations showing high water levels in 1988 could be caused by instrument error and may not reflect actual water level.

PERIOD OF RECORD.—January 1988 to September 1994.

EXTREMES.—Highest daily water level, 11.33 ft below reference point, Aug. 10, 1988; lowest daily water level, 22.96 ft below reference point, Mar. 22-23, 1989.

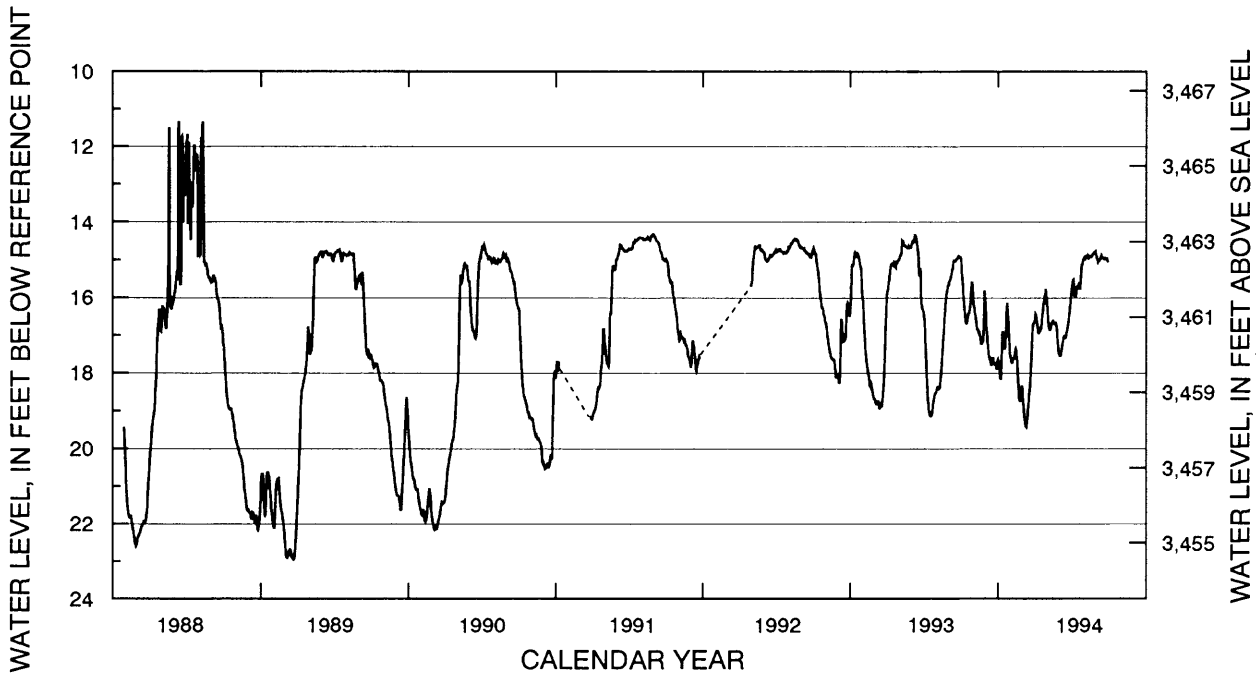

Figure 35. Hydrograph for cave site 1N6E13DDD (site number C1).

SITE NUMBER C1—Continued

WATER LEVEL, IN FEET BELOW REFERENCE POINT, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.72	16.65	18.11	16.37	16.05	18.68	16.04	14.98	14.59	16.40	18.50	15.66
2	14.68	16.68	18.13	16.09	16.21	18.68	15.85	14.95	14.54	16.48	18.47	15.57
3	14.72	16.78	18.15	15.75	16.44	18.71	15.81	14.92	14.55	16.55	18.42	15.56
4	14.78	16.84	18.24	15.36	16.68	18.77	15.77	14.89	14.54	16.73	18.36	15.55
5	14.82	16.96	18.24	15.13	16.94	18.79	15.66	14.86	14.53	17.03	18.36	15.49
6	14.82	17.06	18.16	15.13	17.14	18.82	15.57	14.86	14.48	17.32	18.42	15.45
7	14.82	17.13	17.92	15.17	17.35	18.82	15.52	14.80	14.47	17.58	18.42	15.39
8	14.88	17.21	17.38	15.12	17.45	18.78	15.42	14.52	14.46	17.84	18.41	15.34
9	15.02	17.28	16.85	15.05	17.60	18.74	15.29	14.53	14.31	18.11	18.40	15.31
10	15.08	17.35	16.55	14.95	17.70	18.74	15.21	14.47	14.36	18.34	18.38	15.24
11	15.16	17.40	16.64	14.83	17.77	18.72	15.16	14.52	14.36	18.57	18.31	15.22
12	15.19	17.47	16.83	14.80	17.88	18.78	15.11	14.56	14.40	18.74	18.17	15.09
13	15.28	17.51	16.92	14.81	17.88	18.87	15.10	14.59	14.48	18.85	18.02	15.01
14	15.36	17.57	17.10	14.88	17.98	18.92	15.12	14.59	14.56	18.97	17.88	15.01
15	15.51	17.59	17.16	14.90	18.05	18.92	15.10	14.61	14.63	19.02	17.70	15.01
16	15.62	17.62	17.16	14.87	18.16	18.84	15.10	14.63	14.68	19.07	17.55	15.02
17	15.78	17.62	17.05	14.80	18.28	18.83	15.11	14.63	14.77	19.12	17.38	15.03
18	15.87	17.63	17.12	14.83	18.34	18.85	15.08	14.66	14.94	19.14	17.19	15.02
19	15.98	17.63	17.12	14.85	18.36	18.90	15.11	14.66	15.19	19.14	17.03	14.98
20	16.04	17.64	17.08	14.85	18.31	18.86	15.16	14.67	15.39	19.14	16.85	14.97
21	16.12	17.66	17.02	14.90	18.25	18.73	15.18	14.67	15.39	19.11	16.70	14.97
22	16.23	17.66	16.71	14.92	18.27	18.64	e15.14	14.68	15.30	19.06	16.52	14.96
23	16.26	17.74	16.34	15.00	18.37	18.53	e15.16	14.68	15.20	18.97	16.31	14.95
24	16.26	17.83	16.17	15.07	18.44	18.38	15.03	14.65	15.61	18.90	16.17	14.92
25	16.29	17.91	16.15	15.13	18.52	18.17	15.06	14.67	15.95	18.78	16.06	14.90
26	16.30	18.11	16.19	15.17	18.58	17.95	15.08	14.67	16.14	18.69	15.94	14.91
27	16.41	18.13	16.26	15.19	18.62	17.64	15.06	14.66	16.25	18.66	15.88	14.91
28	16.46	18.06	16.26	15.38	18.68	17.28	15.03	14.66	16.30	18.60	15.81	14.91
29	16.50	18.07	16.31	15.61	---	16.93	15.01	14.67	16.31	18.57	15.72	14.93
30	16.56	18.08	16.47	15.87	---	16.56	15.01	14.67	16.34	18.55	15.67	14.93
31	16.64	---	16.47	16.01	---	16.25	---	14.66	---	18.52	15.67	---
MAX	16.64	18.13	18.24	16.37	18.68	18.92	16.04	14.98	16.34	19.14	18.50	15.66

WATER LEVEL, IN FEET BELOW REFERENCE POINT, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.94	15.94	16.17	17.65	17.59	18.32	16.64	16.02	17.51	15.88	14.96	14.89
2	15.00	16.15	16.43	17.73	17.61	18.39	16.61	16.12	17.55	15.77	14.93	14.95
3	15.14	16.24	16.66	17.81	17.70	18.53	16.55	16.24	17.55	15.65	14.91	14.98
4	15.34	16.26	16.83	17.87	17.73	18.68	16.44	16.41	17.55	15.58	14.94	15.03
5	15.51	16.39	16.94	17.94	17.73	18.86	16.47	16.58	17.53	15.54	14.90	15.05
6	15.65	16.44	17.17	18.12	17.68	19.02	16.50	16.73	17.49	15.52	14.89	15.03
7	15.83	16.48	17.27	18.15	17.65	19.16	16.57	16.79	17.41	15.61	14.89	15.02
8	15.98	16.58	17.38	18.15	17.63	19.25	16.71	16.84	17.33	15.80	14.90	15.01
9	16.15	16.70	17.49	17.94	17.62	19.31	16.81	16.84	17.25	15.96	14.88	15.00
10	16.26	16.80	17.56	17.56	17.60	19.35	16.90	16.84	17.18	15.96	14.91	14.98
11	16.38	16.84	17.63	17.23	17.56	19.42	16.93	16.80	17.13	16.00	14.89	14.95
12	16.51	16.86	17.63	16.95	17.46	19.43	16.93	16.78	17.08	15.95	14.91	14.91
13	16.61	16.86	17.62	16.89	17.40	19.39	16.89	16.68	17.04	15.88	14.94	14.92
14	16.67	16.92	17.73	17.12	17.37	19.28	16.85	16.65	17.00	15.79	14.93	14.88
15	16.68	16.95	17.78	17.26	17.42	19.17	16.87	16.65	17.05	15.70	14.91	14.91
16	16.68	16.93	17.78	17.35	17.56	19.02	16.87	16.63	17.06	15.70	14.88	14.94
17	16.66	16.99	17.64	17.35	17.64	18.85	16.84	16.59	17.06	15.69	14.89	14.94
18	16.56	17.03	17.59	17.36	17.79	18.74	16.74	16.67	17.02	15.67	14.90	14.95
19	16.45	17.13	17.65	17.25	18.03	18.59	16.67	16.68	16.94	15.64	14.90	14.96
20	16.41	17.22	17.64	17.10	18.25	18.49	16.54	16.65	16.90	15.65	14.91	14.95
21	16.40	17.23	17.72	16.80	18.46	18.37	16.43	16.65	16.85	15.73	14.90	14.96
22	16.40	17.21	17.72	16.51	18.67	18.24	16.33	16.65	16.78	15.75	14.87	14.95
23	16.36	17.18	17.75	16.24	18.71	18.00	16.20	16.65	16.71	15.75	14.85	14.97
24	16.24	17.19	17.78	16.13	18.72	17.75	16.11	16.66	16.62	15.61	14.84	14.98
25	16.08	17.18	17.78	16.30	18.75	17.47	16.03	16.72	16.55	15.40	14.81	14.98
26	15.88	17.06	17.72	16.49	18.72	17.16	15.98	16.79	16.47	15.23	14.81	14.95
27	15.79	16.71	17.78	16.72	18.59	16.93	15.98	16.88	16.32	15.11	14.80	14.95
28	15.68	16.23	17.88	16.92	18.40	16.79	15.83	17.07	16.24	15.10	14.78	14.99
29	15.57	15.80	17.88	17.13	---	16.69	15.77	17.23	16.14	15.10	14.77	15.02
30	15.68	15.94	17.83	17.38	---	16.68	15.87	17.41	15.97	15.01	14.84	15.07
31	15.80	---	17.67	17.52	---	16.66	---	17.49	---	14.96	14.84	---
MAX	16.68	17.23	17.88	18.15	18.75	19.43	16.93	17.49	17.55	16.00	14.96	15.07

e Estimated

SITE NUMBER FROM LOCATION MAP.—28.

COUNTY.—Pennington.

LOCAL WELL NUMBER.—1S7E3CDBD.

SITE ID (STATION NUMBER).—435916103161801.

OTHER IDENTIFIERS.—PE-86A and Reptile Gardens.

LOCATION.—Lat 43°59′16″, long 103°16′18″, in SE¼NW¼SE¼SW¼ sec. 3, T. 1 S., R. 7 E., Hydrologic Unit 10120111, 5 mi south of Rapid City. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Madison.

WELL CHARACTERISTICS.—Drilled observation well, 1,220 ft deep with 1,194 ft of 5-in. steel casing; open hole 1,194 to 1,220 ft.

INSTRUMENTATION.—Digital water-level recorder -- 60-minute interval.

DATUM.—Elevation of land-surface datum is 3,510 ft above sea level. Measuring point: Top of steel casing, 0.50 ft above land-surface datum.

REMARKS.—Records good.

PERIOD OF RECORD.—August 1986 to September 1994.

EXTREMES.—Highest daily water level, 8.58 ft above land-surface datum, June 25, 1994; lowest daily water level, 62.92 ft below land-surface datum, Feb. 27, 1990.

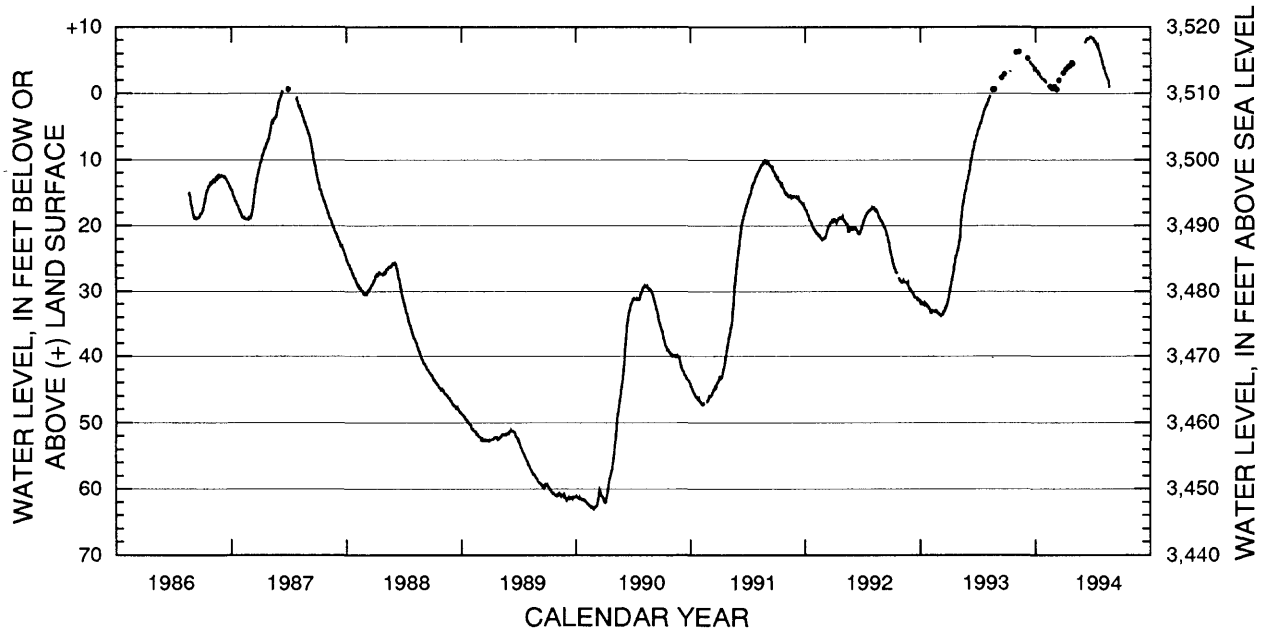

Figure 36. Hydrograph for observation well 1S7E3CDBD (site number 28).

SITE NUMBER 28—Continued

WATER LEVEL, IN FEET BELOW OR ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24.44	28.54	29.75	31.61	32.84	33.41	30.74	23.31	12.81	6.04	1.70	---
2	24.60	28.53	29.75	31.54	33.12	33.51	30.34	23.11	12.55	5.84	1.52	---
3	24.77	28.63	29.95	31.66	33.30	33.63	30.15	22.78	12.39	5.58	1.49	---
4	25.08	28.62	30.07	31.70	33.27	33.66	29.93	22.45	12.24	5.43	1.35	---
5	25.43	28.54	30.05	31.79	33.18	33.67	29.56	22.29	11.94	5.40	1.19	---
6	25.61	28.52	30.16	31.78	33.10	33.69	29.34	22.08	11.69	5.35	1.16	---
7	25.79	28.49	30.18	31.77	33.03	33.67	29.22	21.39	11.42	5.29	.84	---
8	25.79	28.36	30.20	31.97	33.03	33.67	29.00	20.72	10.90	5.10	.61	---
9	26.10	28.48	30.45	32.02	33.00	33.67	28.66	20.13	10.79	4.92	.45	---
10	26.28	28.51	30.52	32.01	33.09	33.67	28.35	19.63	10.52	4.72	.39	---
11	26.45	28.52	30.61	31.91	33.09	33.59	28.12	18.97	10.11	4.64	.23	---
12	26.46	28.56	30.79	32.00	33.00	33.57	27.87	18.37	9.78	4.48	---	---
13	26.63	28.56	30.91	32.01	33.01	33.41	27.55	17.85	9.72	4.43	---	---
14	26.69	28.55	30.91	31.97	33.04	33.20	27.39	17.22	9.54	4.41	---	---
15	26.93	28.54	30.91	31.83	33.04	32.96	27.13	17.06	9.22	4.10	---	---
16	26.93	28.57	30.97	31.94	33.13	33.18	26.78	16.88	8.78	3.88	---	---
17	27.08	28.59	30.94	31.91	33.13	33.16	26.49	16.47	8.70	3.75	---	---
18	27.09	28.69	30.93	31.98	33.04	32.84	26.07	16.24	8.54	3.57	---	+2.40
19	27.16	28.69	30.98	31.96	32.93	32.91	25.76	15.91	8.31	3.47	---	---
20	27.21	28.75	30.94	31.95	32.89	32.91	25.73	15.66	8.01	3.25	+.50	---
21	---	28.78	30.94	32.12	33.02	32.65	25.56	15.30	7.79	3.02	---	---
22	---	28.67	30.99	32.12	33.15	32.64	25.01	15.12	7.45	2.89	---	---
23	---	28.97	31.27	32.35	33.19	32.45	24.63	14.85	7.26	2.72	---	---
24	27.79	29.20	31.19	32.35	33.19	32.28	24.45	14.70	7.20	2.56	---	---
25	27.96	29.37	31.19	32.32	33.32	32.13	24.44	14.51	7.18	2.42	---	+2.85
26	28.01	29.50	31.17	32.41	33.36	32.12	24.23	14.17	6.97	2.31	---	---
27	28.26	29.51	31.34	32.43	33.36	31.88	23.95	13.86	6.71	2.08	+.50	---
28	28.31	29.69	31.37	32.64	33.39	31.64	23.86	13.73	6.54	2.04	---	---
29	28.31	29.69	31.47	32.64	---	31.43	23.70	13.51	6.27	1.95	---	---
30	28.30	29.62	31.68	32.67	---	31.23	23.42	13.28	6.27	1.73	---	---
31	28.50	---	31.72	32.77	---	30.97	---	13.15	---	1.72	---	---
LOW	28.50	29.69	31.72	32.77	33.39	33.69	30.74	23.31	12.81	6.04	1.70	+2.40

WATER LEVEL, IN FEET BELOW OR ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	+3.92	+1.94	---	---	---	---	+8.35	+4.57	---
2	---	---	---	+3.74	+1.91	e+.90	---	---	---	+8.33	+4.36	---
3	---	e+6.19	---	+3.55	+1.80	---	---	---	---	+8.33	+4.18	---
4	e+3.11	---	---	+3.48	+1.73	---	---	---	---	+8.28	+3.92	---
5	---	---	---	+3.60	+1.73	---	---	---	---	+8.05	+3.92	---
6	---	---	---	+3.18	+1.73	---	e+3.55	---	+7.87	+7.91	+3.90	---
7	e+3.19	---	---	+3.28	---	---	---	---	+7.82	+7.75	+3.65	---
8	---	---	e+5.24	+3.35	---	---	---	---	+7.77	+7.75	+3.48	---
9	---	---	---	+3.37	---	e+.58	---	---	+7.82	+7.82	+3.28	---
10	---	---	---	+3.11	e+1.34	---	---	---	+7.91	+7.77	+3.11	---
11	---	---	---	+3.14	---	---	---	---	+7.96	+7.66	+3.05	---
12	e+3.22	e+6.29	---	+3.09	---	---	---	---	+8.17	+7.45	+3.00	---
13	e+3.45	---	---	+3.00	---	---	---	---	+8.28	+7.29	+2.72	---
14	---	---	e+4.80	+2.79	---	---	---	---	+8.37	+7.20	+2.54	---
15	---	---	+4.71	+2.79	---	---	e+3.99	---	+8.17	+7.04	+2.45	---
16	---	---	+4.71	+2.68	e+.99	e+1.84	---	---	+8.17	+7.04	+2.42	---
17	---	---	+4.50	+2.49	---	---	---	---	+8.17	+7.04	+2.31	---
18	---	e+6.07	+4.45	+2.54	---	---	---	---	+8.17	+7.15	+2.24	---
19	---	---	+4.48	+2.49	---	---	---	---	+8.33	+6.87	+1.98	---
20	---	---	+4.43	+2.35	---	---	e+4.12	---	+8.35	+6.69	+1.89	---
21	---	---	+4.34	+2.42	---	---	---	---	+8.33	+6.53	+1.80	---
22	---	---	+4.24	---	---	---	---	---	+8.42	+6.44	+1.13	---
23	---	---	+4.08	---	e+.68	---	---	---	+8.44	+6.25	+.90	---
24	---	---	+4.24	---	---	---	---	---	+8.56	+6.11	---	---
25	---	---	+4.24	e+2.28	---	---	e+4.50	---	+8.58	+5.93	---	---
26	---	---	+4.08	+2.24	---	---	---	---	+8.51	+5.74	---	---
27	---	---	+3.85	+2.15	---	---	---	---	+8.47	+5.54	---	---
28	---	---	+3.88	+2.12	---	---	e+4.32	---	+8.40	+5.40	---	---
29	---	e+5.40	+3.76	+1.91	---	---	---	---	+8.35	+5.28	---	---
30	---	---	+3.90	+1.85	---	e+2.98	---	---	+8.47	+5.14	---	---
31	---	---	+3.92	+1.87	---	---	---	---	---	+4.75	---	---
LOW	+3.11	+5.40	+3.76	+1.85	+.68	+.58	+3.55	---	+7.77	+4.75	+.90	---

e Estimated

SITE NUMBER FROM LOCATION MAP.—29.

COUNTY.—Custer.

LOCAL WELL NUMBER.—2S7E34ABBA.

SITE ID (STATION NUMBER).—435018103155801.

OTHER IDENTIFIER.—CU-83A.

LOCATION.—Lat 43°50′18″, long 103°15′58″, in NE¼NW¼NW¼NE¼ sec. 34, T. 2 S., R. 7 E., Hydrologic Unit 10120109, 4 mi west of Hermosa. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 510 ft deep with 464 ft of 5-in. diameter steel casing; open hole from 464 to 510 ft.

INSTRUMENTATION.—Electronic data logger with pressure transducer -- 60-minute interval (24-hour interval prior to Nov. 21, 1992). Prior to June 20, 1990, circular-chart pressure recorder.

DATUM.—Elevation of land-surface datum is 3,476.56 ft above sea level. Measuring point: Top of casing, 2.9 ft above land-surface datum (formerly reported as 3,476.21 ft elevation and 2.15 ft measuring point).

REMARKS.—Current records good. Records prior to June 1990 fair. Records since October 1990 are republished because of the change in datum when recording equipment was changed.

PERIOD OF RECORD.—October 1983 to September 1994.

EXTREMES.—Highest daily water level, 92.0 ft above land-surface datum, May 20, 1987; lowest daily water level, 58.0 ft above land-surface datum, Dec. 15, 1989, Feb. 25, 1990.

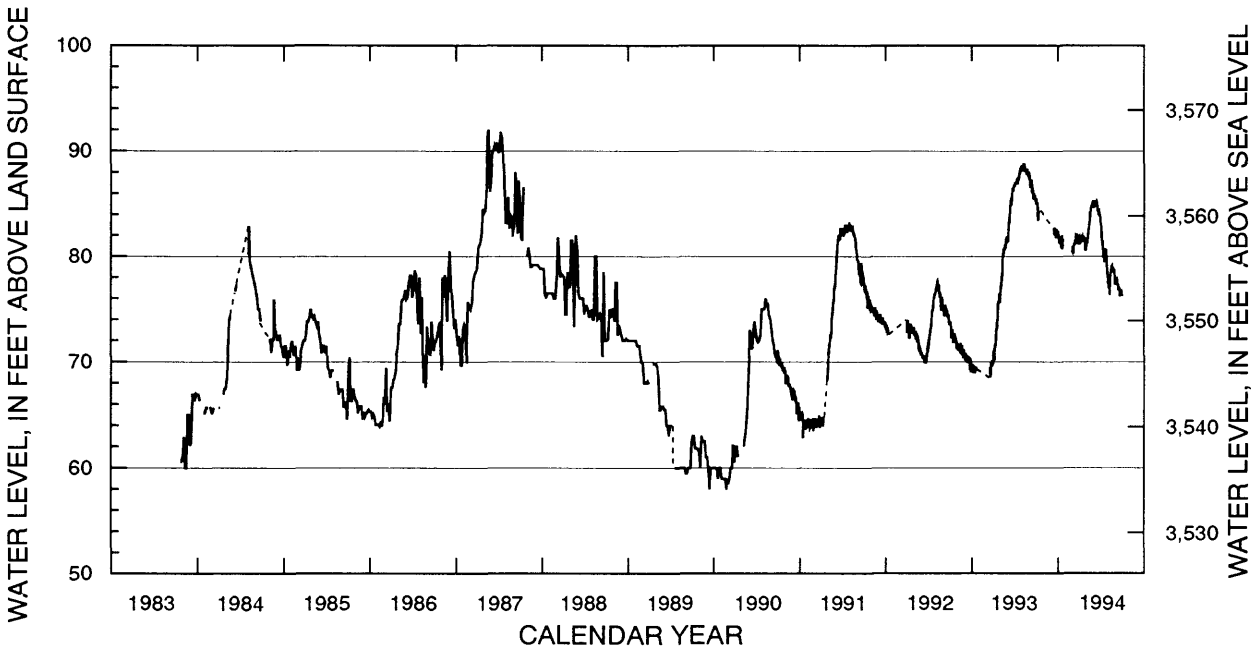

Figure 37. Hydrograph for observation well 2S7E34ABBA (site number 29).

SITE NUMBER 29—Continued

WATER LEVEL, IN FEET ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
INSTANTANEOUS VALUE AT 1200 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	+73.96	+76.05	+74.05
2	---	---	---	---	---	---	---	---	---	+73.96	+75.78	+74.09
3	---	---	---	---	---	---	---	---	---	+73.68	+75.82	+74.05
4	---	---	---	---	---	---	---	---	---	+73.33	+75.66	+73.47
5	---	---	---	---	---	---	---	---	---	+73.10	+75.59	+73.70
6	---	---	---	---	---	---	---	---	---	+73.15	+75.82	+73.40
7	---	---	---	---	---	---	---	---	---	+73.15	+76.24	+73.36
8	---	---	---	---	---	---	---	---	---	+72.76	+76.17	+73.40
9	---	---	---	---	---	---	---	---	---	+72.64	+76.05	+73.24
10	---	---	---	---	---	---	---	---	---	+72.57	+75.94	+72.83
11	---	---	---	---	---	---	---	---	---	+72.92	+75.71	+73.13
12	---	---	---	---	---	---	---	---	---	+72.99	+75.71	+73.01
13	---	---	---	---	---	---	---	---	---	+73.03	+76.01	+72.78
14	---	---	---	---	---	---	---	---	---	+73.15	+75.78	+72.25
15	---	---	---	---	---	---	---	---	---	+73.03	+75.89	+72.36
16	---	---	---	---	---	---	---	---	---	+73.22	+75.94	+72.09
17	---	---	---	---	---	---	---	---	---	+73.22	+75.94	+72.09
18	---	---	---	---	---	---	---	---	---	+73.45	+75.66	+71.90
19	---	---	---	---	---	---	---	---	---	+73.26	+75.48	+71.67
20	---	---	---	---	---	---	---	---	+74.30	+73.15	+75.25	+71.79
21	---	---	---	---	---	---	---	---	+73.84	+73.15	+75.43	+71.74
22	---	---	---	---	---	---	---	---	+74.37	+73.91	+75.48	+71.39
23	---	---	---	---	---	---	---	---	+74.42	+74.32	+75.36	+71.63
24	---	---	---	---	---	---	---	---	+74.65	+74.90	+75.36	+71.86
25	---	---	---	---	---	---	---	---	+74.37	+75.20	+75.20	+71.74
26	---	---	---	---	---	---	---	---	+74.30	+75.36	+74.90	+71.44
27	---	---	---	---	---	---	---	---	+74.53	+75.36	+74.86	+71.05
28	---	---	---	---	---	---	---	---	+74.30	+75.25	+74.62	+71.12
29	---	---	---	---	---	---	---	---	+74.19	+75.55	+74.51	+70.84
30	---	---	---	---	---	---	---	---	+74.07	+75.59	+74.56	+71.19
31	---	---	---	---	---	---	---	---	---	+75.89	+74.21	---
MIN	---	---	---	---	---	---	---	---	+73.84	+72.57	+74.21	+70.84

WATER LEVEL, IN FEET ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
INSTANTANEOUS VALUE AT 1200 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	+71.00	+69.09	+66.39	+64.50	+64.43	+63.57	+64.73	+69.34	+77.19	+82.26	+82.95	+80.32
2	+71.00	+67.93	+66.92	+65.12	+64.43	+63.57	+64.73	+69.34	+77.19	+82.26	+82.95	+80.28
3	+70.77	+68.14	+66.60	+64.70	+64.45	+64.50	+64.50	+70.03	+78.11	+82.26	+82.72	+79.77
4	+70.77	+68.60	+67.36	+65.10	+64.24	+64.50	+64.50	+70.26	+78.34	+82.72	+82.49	+79.75
5	+70.77	+68.35	+66.87	+64.96	+64.50	+64.27	+64.73	+70.50	+78.34	+82.49	+82.95	+79.70
6	+69.85	+67.89	+66.80	+64.61	+63.83	+64.04	+64.73	+70.96	+78.57	+82.49	+82.95	+79.65
7	+69.62	+68.33	+67.01	+65.19	+64.31	+64.04	+64.50	+70.73	+79.26	+82.03	+82.49	+79.61
8	+69.85	+68.07	+67.29	+64.52	+64.57	+64.27	+64.04	+71.19	+79.95	+82.03	+82.49	+79.56
9	+70.08	+68.07	+67.22	+64.73	+63.90	+64.50	+64.50	+71.65	+80.18	+82.03	+82.72	+78.82
10	+70.31	+68.28	+67.31	+65.07	+64.38	+64.73	+64.50	+71.65	+80.65	+82.26	+82.72	+78.32
11	+69.62	+68.28	+67.08	+65.12	+64.40	+64.73	+64.04	+71.42	+81.11	+82.26	+82.72	+78.73
12	+69.85	+68.26	+66.67	+65.05	+64.66	+64.04	+64.04	+71.88	+81.11	+82.49	+82.72	+78.45
13	+69.62	+68.49	+66.37	+65.10	+64.22	+64.27	+64.73	+72.11	+81.57	+82.49	+82.49	+78.64
14	+69.62	+68.46	+66.30	+64.98	+63.78	+64.27	+64.73	+72.57	+81.57	+82.95	+82.95	+78.59
15	+69.62	+67.75	+66.76	+62.81	+63.80	+63.80	---	+72.34	+81.57	+82.95	+82.72	+78.09
16	+69.85	+67.75	+66.50	+64.29	+64.52	+64.27	---	+72.34	+82.03	+82.95	+82.49	+78.27
17	+69.39	+67.73	+66.64	+64.08	+64.08	+64.04	---	+72.57	+81.80	+82.95	+82.26	+77.53
18	+69.85	+67.96	+66.30	+64.57	+63.87	+64.04	---	+72.80	+81.80	+82.95	+82.26	+77.49
19	+69.85	+67.70	+65.07	+64.13	+64.59	+64.50	---	+73.26	+82.03	+82.95	+82.26	+77.44
20	+69.16	+67.93	+65.12	+63.69	+64.50	+64.50	---	+74.19	+82.03	+82.95	+82.26	+77.85
21	+69.39	+67.68	+65.21	+64.40	+64.50	+64.04	---	+74.65	+81.80	+82.72	+81.98	+79.42
22	+69.39	+67.45	+65.90	+64.43	+64.04	+64.04	---	+74.42	+81.57	+82.49	+81.94	+78.45
23	+69.16	+67.43	+65.77	+63.99	+64.27	+64.50	---	+75.11	+82.03	+82.26	+81.89	+78.41
24	+69.16	+67.63	+66.04	+63.78	+64.04	+64.50	---	+75.11	+82.03	+82.49	+82.08	+78.59
25	+69.39	+67.40	+65.74	+64.27	+64.04	+64.73	---	+75.57	+82.72	---	+81.80	+78.55
26	+69.39	+67.15	+65.83	+64.52	+64.27	+64.96	---	+75.80	+82.26	---	+81.75	+78.50
27	+68.93	+66.92	+66.18	+64.54	+64.04	+64.50	---	+75.57	+82.26	---	+81.48	+78.22
28	+69.39	+66.90	+64.61	+63.64	+64.73	+64.50	+68.19	+76.03	+82.26	+83.18	+81.43	+78.18
29	+69.39	+66.67	+64.43	+64.13	---	+63.80	+68.65	+76.72	+82.26	+83.18	+80.92	+78.13
30	+68.93	+66.99	+65.51	+64.38	---	+64.50	+68.65	+76.95	+82.26	+83.18	+80.65	+77.62
31	+69.11	---	+65.77	+64.40	---	+64.50	---	+76.95	---	+83.18	+80.60	---
MIN	+68.93	+66.67	+64.43	+62.81	+63.78	+63.57	+64.04	+69.34	+77.19	+82.03	+80.60	+77.44

SITE NUMBER 29—Continued

WATER LEVEL, IN FEET ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
INSTANTANEOUS VALUE AT 1200 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	+77.30	+74.88	+74.42	+73.26	---	---	+72.67	+72.80	+70.80	+71.33	+76.93	+75.11
2	+77.55	+74.65	+74.42	+73.72	---	---	+73.52	+72.55	+70.73	+71.30	+76.77	+74.88
3	+77.28	+75.11	+73.72	+73.26	---	---	+73.96	+72.55	+70.89	+71.76	+76.84	+75.11
4	+76.77	+75.34	+73.96	+73.03	---	---	+73.72	+72.53	+70.82	+71.74	+77.14	+75.11
5	+76.72	---	+74.42	+73.26	---	---	+73.47	+72.50	+70.31	+71.95	+77.21	+74.65
6	+76.91	---	+74.42	+73.49	---	---	+73.22	+72.48	+70.47	+72.41	+77.28	+74.42
7	+77.32	---	+73.96	+72.84	---	---	+73.22	+72.71	+70.40	+72.39	+77.58	+74.42
8	+77.05	+75.11	+74.19	+72.80	---	---	+73.19	+72.69	+70.56	+72.69	+77.65	+74.88
9	+76.77	+74.88	+74.19	+72.80	---	---	+73.40	+72.66	+70.52	+72.53	+77.49	+74.88
10	+76.72	+74.88	+74.19	+73.03	---	---	+73.15	+72.18	+70.47	+73.06	+77.32	+74.88
11	+76.72	+74.88	+74.42	+73.26	---	---	+72.23	+72.18	+70.47	+73.13	+77.39	+75.34
12	+76.95	+74.88	+74.42	+72.57	---	---	+72.20	+72.16	+70.45	+73.19	+77.23	+75.34
13	+76.26	+75.11	+73.72	+72.57	---	---	+73.10	+72.13	+70.45	+73.49	+77.30	+74.88
14	+76.03	+74.42	+73.72	---	---	---	+73.08	+72.59	+69.96	+74.02	+77.14	+74.88
15	+76.49	+74.42	+73.96	---	---	---	+73.31	+72.55	+69.94	+74.09	+77.21	+75.11
16	+76.72	+74.42	+73.72	---	---	---	+73.29	+71.81	+70.17	+74.42	+76.12	+74.65
17	+76.03	+75.11	+73.72	---	---	---	+73.49	+71.97	+70.38	+74.72	+76.22	+74.88
18	+75.11	+75.11	+73.72	---	---	---	+73.49	+72.36	+70.36	+75.02	+76.49	+74.42
19	+75.80	+74.88	+73.72	---	---	---	+73.01	+72.29	+70.36	+74.86	+76.49	+74.88
20	+76.03	+74.88	+73.49	---	---	---	+72.99	+72.02	+69.87	+74.92	+76.26	+74.65
21	+76.26	+74.65	+74.19	---	---	---	+73.19	+71.95	+70.31	+75.46	+75.80	+74.19
22	+76.03	+74.19	+73.96	---	---	---	+72.96	+71.19	+70.31	+75.29	+75.80	+74.42
23	+75.57	+74.42	+73.72	---	---	---	+73.17	+71.35	+70.52	+75.82	+75.11	+74.42
24	+75.57	+73.96	+73.72	---	---	---	+72.69	+71.53	+70.73	+76.12	+74.88	+74.42
25	+75.80	+74.88	+73.72	---	---	---	+72.89	+71.00	+70.73	+75.96	+75.34	+74.19
26	+75.80	+74.42	+73.72	---	---	---	+72.89	+70.93	+70.70	+76.26	+75.80	+73.72
27	+75.80	+74.42	+73.49	---	---	---	+73.10	+71.09	+71.37	+76.33	+76.03	+73.72
28	+74.88	+74.19	+73.72	---	---	---	+73.08	+71.28	+71.37	+76.40	+76.03	+73.49
29	+75.11	+74.42	+73.72	---	---	---	+73.06	+71.21	+70.89	+76.47	+75.57	+73.72
30	+74.88	+74.19	+73.72	---	---	---	+73.29	+71.14	+71.81	+76.54	+75.34	+73.72
31	+75.57	---	+73.26	---	---	---	---	+70.61	---	+76.84	+75.34	---
MIN	+74.88	+73.96	+73.26	+67.20	---	---	+72.20	+70.61	+69.87	+71.30	+74.88	+73.49

WATER LEVEL, IN FEET ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
INSTANTANEOUS VALUE AT 1200 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	+73.72	+71.72	+70.61	+69.46	---	---	+69.92	+76.47	+81.68	+86.76	+88.35	+87.98
2	+73.72	+71.49	+70.38	+69.69	---	---	+70.61	+76.91	+81.45	+86.76	+88.35	+87.29
3	+73.49	+71.26	+70.15	+69.69	---	---	+70.61	+77.14	+81.45	+86.99	+88.12	+87.73
4	+73.49	+71.03	+70.61	+69.69	---	---	+70.84	+77.35	+81.91	+86.99	+88.56	+87.50
5	+73.03	+71.49	+70.61	+69.00	---	---	+71.07	+76.89	+82.61	+86.99	+88.56	+86.57
6	+72.34	+71.26	+70.61	+69.69	---	---	+70.15	+77.55	+82.61	+86.99	+88.56	+87.04
7	+72.34	+71.49	+70.84	+69.46	---	---	+70.38	+78.02	+83.30	+86.99	+88.79	+86.81
8	+73.03	+71.51	+70.61	+69.00	---	---	+71.30	+77.99	+83.07	+86.99	+88.79	+87.24
9	+72.57	+71.51	+70.61	+69.00	---	---	+71.53	+78.45	+83.53	+87.22	+88.77	+86.78
10	+72.57	+71.28	+70.61	+69.00	---	---	+71.53	+78.89	+83.99	+86.99	+88.77	+86.78
11	+72.80	+71.51	+70.38	+69.23	---	---	+71.30	+79.33	+84.45	+86.99	+88.77	+87.24
12	+72.57	+71.28	+69.92	+69.00	---	---	+71.53	+79.79	+84.91	+87.45	+88.07	+87.24
13	+73.03	+70.82	+70.15	+69.00	---	---	+71.76	+80.23	+84.91	+86.99	+88.31	+86.07
14	+71.88	+71.28	+70.61	+69.23	---	---	+72.46	+80.23	+84.91	+86.99	+88.28	+86.30
15	+71.88	+71.76	+70.38	+69.46	---	---	+72.92	+79.98	+85.38	+87.45	+88.28	+86.53
16	+72.11	+71.53	+70.15	+69.46	---	---	+73.15	+80.67	+85.61	+87.45	+88.28	+86.07
17	+72.11	+71.30	+70.15	+69.23	---	---	+73.61	+80.65	+84.91	+87.22	+88.28	+85.58
18	+72.36	+70.84	+69.92	+69.23	---	+69.46	+73.84	+80.65	+85.14	+87.45	+88.05	+85.58
19	+72.36	+70.84	+70.15	+69.23	---	+69.00	+73.15	+80.62	+85.84	+87.45	+88.26	+85.58
20	+72.59	+70.84	+70.38	+69.46	---	+69.00	+73.84	+80.83	+86.07	+87.68	+87.80	+86.02
21	+72.59	+70.84	+70.38	---	---	+68.53	+74.76	+81.06	+86.30	+87.91	+88.26	+86.02
22	+72.36	+71.53	+70.15	---	---	+69.46	+75.43	+81.04	+86.53	+88.14	+88.26	+85.56
23	+72.13	+70.61	+69.23	---	---	+69.69	+75.64	+81.04	+86.30	+88.14	+88.26	+85.54
24	+72.36	+70.38	+70.38	---	---	+69.92	+75.64	+81.02	+86.30	+87.91	+88.24	+85.77
25	+71.93	+70.84	+69.92	---	---	+69.92	+75.62	+81.25	+86.30	+88.37	+88.01	+85.77
26	+71.93	+70.84	+70.15	---	---	+69.92	+76.08	+81.68	+86.53	+88.37	+87.77	+85.51
27	+71.93	+71.07	+70.15	---	---	+70.15	+76.05	+81.68	+86.76	+88.14	+87.77	+85.51
28	+71.46	+71.07	+69.00	---	---	+69.69	+76.05	+81.22	+86.76	+88.37	+88.01	+85.26
29	+71.23	+70.61	+69.46	---	---	+69.69	+76.26	+81.91	+86.76	+88.61	+87.98	+85.49
30	+71.93	+71.07	+69.00	---	---	+69.92	+75.57	+81.45	+86.76	+88.58	+87.52	+85.49
31	+71.23	---	+69.23	---	---	+69.92	---	+81.91	---	+88.58	+87.75	---
MIN	+71.23	+70.38	+69.00	+69.00	---	+68.53	+69.92	+76.47	+81.45	+86.76	+87.52	+85.26

SITE NUMBER 29—Continued

WATER LEVEL, IN FEET ABOVE (+) LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INSTANTANEOUS VALUE AT 1200 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	+84.96	---	---	+82.15	---	+80.48	+81.80	+81.41	+85.10	+83.02	+77.72	+77.42
2	+85.08	---	---	+81.94	---	+80.44	+81.45	+81.41	+84.64	+83.02	+77.76	+77.53
3	+85.19	---	---	+82.17	---	+80.81	+81.94	+81.41	+85.03	+82.56	+77.65	+77.88
4	+84.94	---	---	+81.66	---	+80.92	+81.13	+81.68	+85.14	+81.80	+77.02	+77.88
5	+85.17	---	---	+81.91	---	+80.92	+81.57	+81.22	+85.10	+81.57	+77.30	+77.58
6	+85.10	---	---	+81.34	---	+80.60	+81.52	+81.45	+85.10	+81.11	+77.25	+77.67
7	+83.88	---	---	+81.45	---	+80.25	+81.96	+82.10	+85.21	+81.11	+76.95	+77.72
8	+83.46	---	---	+81.22	---	+80.92	+81.55	+82.15	+84.75	+81.41	+76.33	+77.67
9	+83.88	---	---	+81.52	---	+81.15	+81.64	+82.45	+84.87	+81.41	+77.02	+77.72
10	+84.36	---	---	+81.64	---	+81.18	+81.36	+82.72	+84.98	+81.41	+77.30	+77.49
11	+84.43	---	---	+81.71	---	+81.25	+81.50	+82.72	+85.10	+80.72	+77.88	+77.39
12	+84.41	---	---	+81.55	---	+81.11	+81.85	+83.07	+85.26	+80.02	+78.41	+77.28
13	---	---	---	+81.20	---	+81.45	+81.89	+83.07	+85.33	+80.02	+78.45	+77.28
14	---	---	+82.68	+80.92	---	+81.48	+81.43	+83.25	+85.26	+80.42	+78.75	+77.28
15	---	---	+82.24	+81.04	---	+81.48	+81.57	+83.53	+84.98	+79.84	+79.03	+76.77
16	---	---	+82.12	+80.83	---	+81.87	+81.68	+84.06	+84.75	+79.56	+79.15	+76.91
17	---	---	+82.12	+80.83	---	+81.80	+81.85	+84.22	+84.64	+79.45	+78.98	+76.84
18	---	---	+82.75	+82.03	---	+81.78	+81.73	+84.18	+84.29	+79.72	+79.03	+77.02
19	---	---	+82.38	+80.74	---	+82.19	+81.48	+84.52	+84.52	+80.02	+78.80	+76.95
20	---	---	+82.65	+81.36	---	+81.71	+81.64	+84.64	+83.99	+80.25	+78.80	+76.79
21	---	---	+82.19	+81.59	---	+82.05	+81.50	+84.64	+84.18	+80.48	+78.92	+76.17
22	---	---	+82.51	+81.66	---	+82.03	+81.61	+84.75	+84.06	+80.72	+78.98	+76.63
23	---	---	+81.75	+81.68	---	+81.22	+81.71	+84.80	+84.18	+80.48	+78.75	+76.75
24	---	---	+82.33	---	---	+81.36	+81.66	+84.80	+84.22	+80.53	+78.64	+76.63
25	---	---	+82.63	---	---	+81.82	+80.76	+84.98	+83.99	+80.02	+78.64	+76.70
26	---	---	+82.47	---	---	+81.57	+80.53	+84.98	+83.88	+79.49	+78.48	+76.77
27	---	---	+81.78	---	---	+81.34	+80.83	+85.21	+83.83	+78.98	+78.43	+76.54
28	---	---	+82.31	---	---	+81.61	+80.53	+85.10	+83.65	+78.64	+78.36	+76.61
29	---	---	+81.98	---	---	+81.15	+80.76	+85.38	+83.25	+78.34	+78.43	+76.42
30	---	---	+82.38	---	---	+81.82	+81.18	+85.21	+83.18	+78.11	+78.02	+76.19
31	---	---	+82.10	---	---	+81.75	---	+85.10	---	+77.42	+77.42	---
MIN	+83.46	---	+81.75	+80.74	---	+80.25	+80.53	+81.22	+83.18	+77.42	+76.33	+76.17

SITE NUMBER FROM LOCATION MAP.—30.

COUNTY.—Custer.

LOCAL WELL NUMBER.—2S7E36CBCB.

SITE ID (STATION NUMBER).—434946103140501.

OTHER IDENTIFIER.—CU-83B.

LOCATION.—Lat 43°49′46″, long 103°14′16″, in NW¼SW¼NW¼SW¼ sec. 36, T. 2 S., R. 7 E., Hydrologic Unit 10120109, 2 mi west of Hermosa. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Lakota.

WELL CHARACTERISTICS.—Drilled observation well, 80 ft deep with 42 ft of 5-in. steel casing; open hole from 42 to 80 ft.

INSTRUMENTATION.—Digital water-level recorder — 60-minute interval.

DATUM.—Elevation of land-surface datum is 3,367.18 ft above sea level. Measuring point: Top of steel casing, 1.25 ft above land-surface datum.

REMARKS.—Records good.

PERIOD OF RECORD.—October 1983 to September 1994.

EXTREMES.—Highest daily water level, 15.84 ft below land-surface datum, June 7, 1991; lowest daily water level, 18.40 ft below land-surface datum, Sept. 21, 1984.

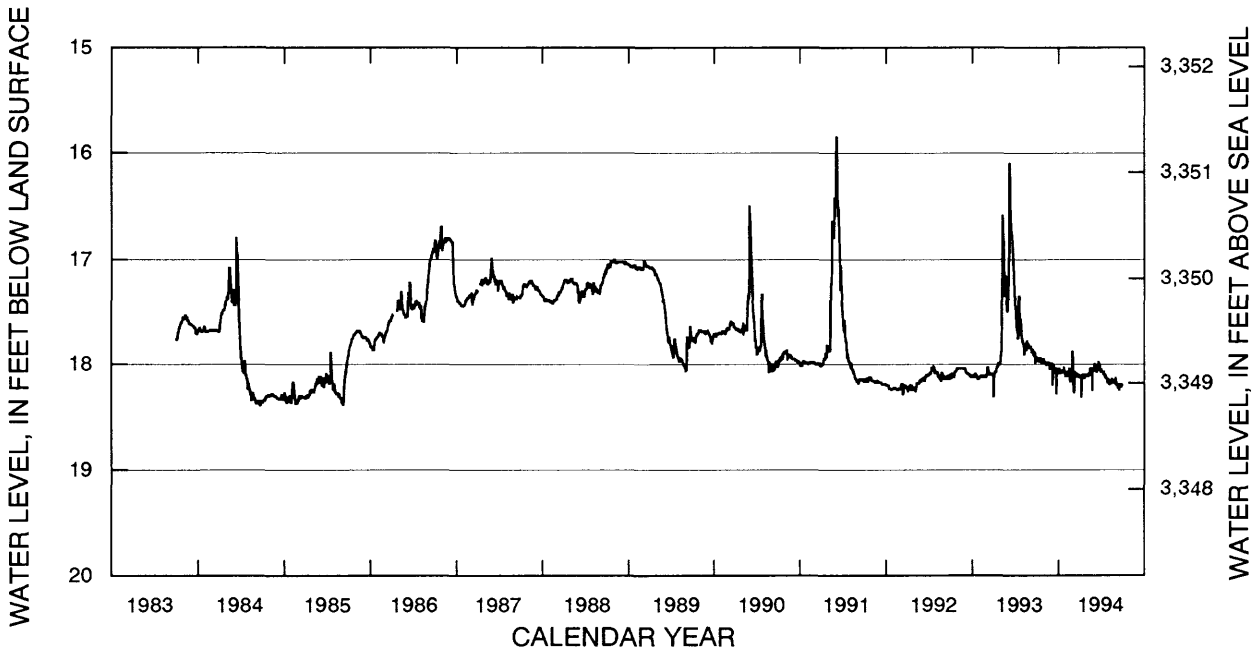

Figure 38. Hydrograph for observation well 2S7E36CBCB (site number 30).

SITE NUMBER 30—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18.10	18.04	18.04	18.11	18.13	18.12	18.09	17.95	17.47	17.37	17.75	17.84
2	18.12	18.03	18.04	18.11	18.12	18.12	18.31	17.94	17.44	17.43	17.79	17.85
3	18.10	18.04	18.04	18.11	18.12	18.10	18.17	17.91	17.41	17.44	17.77	17.84
4	18.13	18.04	18.07	18.11	18.12	18.10	18.12	17.90	17.33	17.46	17.78	17.84
5	18.13	18.04	18.07	18.11	18.12	18.07	18.10	17.88	17.05	17.51	17.81	17.83
6	18.13	18.04	18.07	18.11	18.12	18.06	18.10	17.85	16.98	17.51	17.81	17.83
7	18.09	18.04	18.07	18.11	18.11	18.03	18.10	17.21	16.97	17.54	17.81	17.83
8	18.09	18.04	18.07	18.12	18.11	18.02	18.07	17.00	16.27	17.57	17.81	17.85
9	18.11	18.04	18.08	18.12	18.11	18.04	18.06	16.66	16.09	17.60	17.83	17.85
10	18.12	18.04	18.08	18.10	18.11	18.05	18.07	16.58	16.19	17.65	17.91	17.86
11	18.10	18.04	18.08	18.10	18.11	18.06	18.07	16.66	16.32	17.67	17.84	17.89
12	18.11	18.04	18.09	18.10	18.11	18.08	18.07	16.73	16.54	17.69	17.85	17.86
13	18.09	18.04	18.09	18.10	18.11	18.08	18.07	16.80	16.53	17.69	17.84	17.87
14	18.11	18.04	18.09	18.10	18.11	18.07	18.04	16.88	16.64	17.76	17.82	17.88
15	18.11	18.04	18.09	18.08	18.11	18.08	18.04	16.97	16.70	17.75	17.83	17.86
16	18.09	18.04	18.09	18.10	18.12	18.10	18.03	17.16	16.79	17.75	17.84	17.86
17	18.12	18.04	18.09	18.10	18.12	18.10	18.02	17.11	16.79	17.64	17.86	17.90
18	18.12	18.04	18.09	18.11	18.11	18.10	18.01	17.16	16.77	17.38	17.84	17.91
19	18.11	18.04	18.10	18.11	18.10	18.10	18.02	17.22	16.76	17.34	17.87	17.87
20	18.09	18.04	18.10	18.11	18.11	18.10	18.02	17.27	16.80	17.39	17.80	17.88
21	18.06	18.04	18.10	18.13	18.12	18.09	18.01	17.35	16.86	17.43	17.78	17.93
22	18.08	18.04	18.10	18.13	18.12	18.09	17.99	17.34	16.92	17.48	17.78	17.92
23	18.07	18.04	18.12	18.13	18.12	18.09	17.99	17.15	16.99	17.56	17.82	17.90
24	18.06	18.04	18.11	18.14	18.12	18.09	18.00	17.21	17.05	17.56	17.80	17.88
25	18.07	18.04	18.11	18.14	18.12	18.09	18.00	17.26	17.10	17.56	17.80	17.90
26	18.06	18.04	18.11	18.14	18.12	18.09	18.00	17.34	17.17	17.58	17.81	17.99
27	18.06	18.04	18.12	18.14	18.12	18.09	18.00	17.37	17.23	17.60	17.82	17.92
28	18.05	18.04	18.12	18.14	18.12	18.10	18.00	17.41	17.27	17.61	17.81	17.93
29	18.05	18.04	18.12	18.14	---	18.10	18.00	17.47	17.34	17.64	17.82	17.93
30	18.04	18.04	18.11	18.14	---	18.08	18.00	17.47	17.37	17.72	17.84	17.96
31	18.04	---	18.11	18.13	---	18.09	---	17.50	---	17.73	17.84	---
MAX	18.13	18.04	18.12	18.14	18.13	18.12	18.31	17.95	17.47	17.76	17.91	17.99

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17.95	17.98	18.02	18.06	18.10	18.07	18.11	18.10	18.06	18.08	18.14	18.12
2	17.96	17.96	17.99	18.06	18.11	17.87	18.13	18.11	18.03	18.04	18.14	18.14
3	17.96	17.98	17.99	18.08	18.09	17.91	18.10	18.12	18.00	18.06	18.15	18.14
4	17.97	17.99	18.00	18.08	18.07	17.97	18.11	18.09	18.00	18.08	18.18	18.15
5	17.94	17.97	18.03	18.03	18.10	18.20	18.11	18.11	18.00	18.07	18.18	18.19
6	17.96	17.99	18.02	18.08	18.09	18.22	18.11	18.09	18.04	18.07	18.18	18.19
7	17.95	17.99	18.20	18.08	18.12	18.25	18.13	18.12	18.04	---	18.20	18.21
8	17.96	17.99	18.00	18.06	18.06	18.27	18.11	18.08	18.02	---	18.16	18.18
9	17.93	17.99	18.00	18.07	18.07	18.24	18.31	18.09	18.06	---	18.17	18.19
10	17.95	17.98	18.02	18.08	18.09	18.07	18.12	18.11	18.04	---	18.18	18.18
11	17.96	18.01	18.00	18.07	18.08	18.06	18.11	18.10	18.01	---	18.15	18.19
12	17.95	17.97	18.02	18.07	18.11	18.08	18.10	18.11	18.04	18.11	18.17	18.23
13	17.98	17.99	18.02	18.09	18.10	18.07	18.10	18.08	18.08	18.08	18.18	18.20
14	17.95	17.99	18.02	18.06	18.09	18.09	18.10	18.06	18.06	18.06	18.19	18.18
15	17.96	17.99	18.04	18.06	18.07	18.12	18.12	18.04	18.05	18.08	18.17	18.19
16	17.97	17.99	18.06	18.07	18.03	18.09	18.12	18.04	18.03	18.09	18.16	18.19
17	17.93	17.99	18.04	18.06	18.05	18.11	18.11	18.07	18.05	18.10	18.13	18.25
18	17.96	17.99	18.08	18.05	18.06	18.11	18.11	18.06	18.02	18.12	18.16	18.20
19	17.96	17.99	18.03	18.07	18.14	18.09	18.12	18.04	18.00	18.10	18.17	18.21
20	17.96	17.97	18.05	18.08	18.17	18.11	18.12	18.09	17.97	18.09	18.15	18.21
21	17.95	18.00	18.06	18.07	18.06	18.08	18.14	18.08	17.98	18.13	18.16	18.20
22	17.97	18.00	18.03	18.08	18.07	18.10	18.11	18.06	17.99	18.14	18.16	18.19
23	17.99	18.00	18.06	18.07	18.08	18.12	18.10	18.07	18.04	18.12	18.18	18.20
24	17.96	17.99	18.28	18.02	18.09	18.11	18.10	18.06	17.98	18.12	18.17	18.22
25	17.98	18.05	18.03	18.04	18.09	18.10	---	18.25	18.05	18.14	18.17	18.19
26	17.99	17.99	18.07	18.07	18.04	18.09	18.10	18.04	18.00	18.13	18.16	18.19
27	17.96	17.99	18.09	18.08	18.10	18.12	18.11	18.04	18.06	18.14	18.17	18.21
28	17.98	18.00	18.04	18.08	18.07	18.09	18.12	18.05	18.05	18.15	18.17	18.21
29	17.99	17.99	18.07	18.10	---	18.11	18.10	18.04	18.06	18.18	18.19	18.20
30	17.98	17.99	18.05	18.12	---	18.12	18.09	18.07	18.05	18.17	18.17	18.19
31	17.94	---	18.04	18.06	---	18.12	---	18.04	---	18.15	18.16	---
MAX	17.99	18.05	18.28	18.12	18.17	18.27	18.31	18.25	18.08	18.18	18.20	18.25

SITE NUMBER FROM LOCATION MAP.—31.

COUNTY.—Custer.

LOCAL WELL NUMBER.—3S1E18DDDB.

SITE ID (STATION NUMBER).—434700104021401.

OTHER IDENTIFIER.—CU-93C and Boles Canyon 1.

LOCATION.—Lat 43°47′00″, long 104°02′14″, in NE¼NE¼NE¼ sec. 18, T. 3 S., R. 1 E., Hydrologic Unit 10120107, about 10 mi west of Jewel Cave. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Madison.

WELL CHARACTERISTICS.—Drilled observation well, 1,054 ft deep with 900 ft of 5-in. steel casing; open hole from 900 to 1,054 ft.

INSTRUMENTATION.—Intermittent taped measurements.

DATUM.—Elevation of land-surface datum is 4,660 ft above sea level. Measuring point: Top of steel casing, 2.60 ft above land-surface datum.

REMARKS.—

PERIOD OF RECORD.—September 1993 to September 1994.

EXTREMES.—Highest daily water level, 909.8 ft below land-surface datum, Mar. 22, 1994; lowest daily water level, 912.4 ft below land-surface datum, Sept. 9, 1993.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL
SEP 09, 1993	912.4	MAR 22, 1994	909.8

HIGHEST	909.8	MAR 22, 1994
LOWEST	912.4	SEP 09, 1993

SITE NUMBER FROM LOCATION MAP.—32.

COUNTY.—Custer.

LOCAL WELL NUMBER.—3S1E18DDDB2.

SITE ID (STATION NUMBER).—434700104021402.

OTHER IDENTIFIER.—CU-93D and Boles Canyon 2.

LOCATION.—Lat 43°47′00″, long 104°02′14″, in NE¼NE¼NE¼ sec. 18, T. 3 S., R. 1 E., Hydrologic Unit 10120107, about 10 mi west of Jewel Cave. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 450 ft deep with 365 ft of 5-in. steel casing; 3-in. PVC screen from 320 to 415 ft; open hole completion prior to May 23, 1994.

INSTRUMENTATION.—Intermittent taped measurements.

DATUM.—Elevation of land-surface datum is 4,660 ft above sea level. Measuring point: Top of steel casing, 2.20 ft above land-surface datum.

REMARKS.—

PERIOD OF RECORD.—September 1993 to September 1994.

EXTREMES.—Highest daily water level, 357.6 ft below land-surface datum, May 23, 1994; lowest daily water level, 369.8 ft below land-surface datum, Sept. 16, 1993.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL
SEP 16, 1993	369.80	MAY 23, 1994	357.6

HIGHEST	357.6	MAY 23, 1994	
LOWEST	369.80	SEP 16, 1993	

SITE NUMBER FROM LOCATION MAP.—33.

COUNTY.—Custer.

LOCAL WELL NUMBER.—3S4E24BCDD.

SITE ID (STATION NUMBER).—434634103351801.

OTHER IDENTIFIER.—CU-86A and Custer Test.

LOCATION.—Lat 43°46′30″, long 103°35′22″, in SE¼SE¼SW¼NW¼ sec. 24, T. 3 S., R. 4 E., Hydrologic Unit 10120109, at Custer. Owner: City of Custer.

AQUIFER.—Precambrian.

WELL CHARACTERISTICS.—Drilled observation well, 160 ft deep with 18 ft of 6-in. PVC casing; open hole from 18 to 160 ft.

INSTRUMENTATION.—Digital water-level recorder -- 60-minute interval.

DATUM.—Elevation of land-surface datum is 5,380.5 ft above sea level. Measuring point: Top of PVC casing, 1.00 ft above land-surface datum.

REMARKS.—Records good. Drawdown during February 1987 from aquifer test.

PERIOD OF RECORD.—November 1986 to September 1994.

EXTREMES.—Highest daily water level, 40.34 ft below land-surface datum, Aug. 19, 1991; lowest daily water level, 69.27 ft below land-surface datum, Mar. 9, 1990.

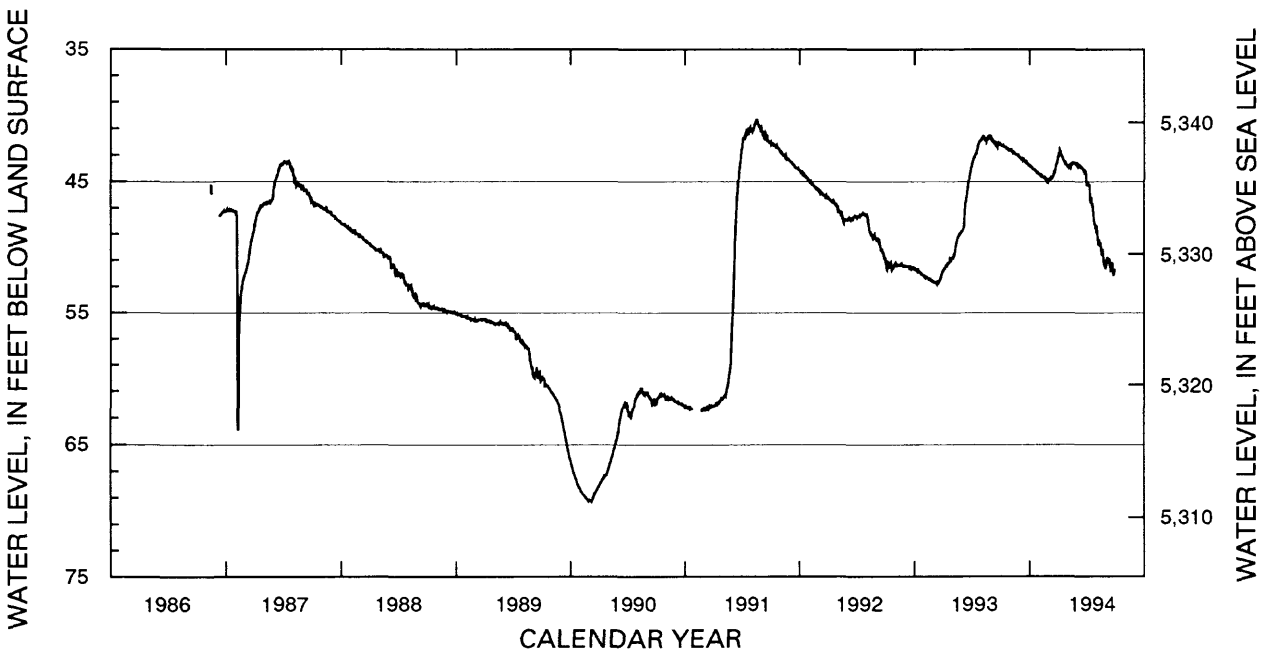

Figure 39. Hydrograph for observation well 3S4E24BCDD (site number 33).

SITE NUMBER 33—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51.03	51.31	51.41	51.64	52.18	52.57	51.84	50.87	48.74	43.88	41.82	41.74
2	51.20	51.26	51.41	51.60	52.20	52.61	51.74	50.83	48.75	43.73	41.75	41.83
3	51.33	51.34	51.45	51.67	52.28	52.66	51.74	50.80	48.71	43.57	41.73	41.92
4	51.49	51.35	51.48	51.68	52.28	52.68	51.70	50.75	48.68	43.46	41.69	41.90
5	51.66	51.34	51.47	51.72	52.29	52.68	51.62	50.78	48.62	43.41	41.65	41.94
6	51.69	51.35	51.44	51.72	52.27	52.68	51.61	50.72	48.56	43.40	41.62	41.96
7	51.40	51.33	51.44	51.73	52.29	52.69	51.63	50.66	48.46	43.27	41.53	41.97
8	51.26	51.31	51.44	51.77	52.29	52.69	51.59	50.49	48.05	43.19	41.53	41.91
9	51.15	51.36	51.47	51.78	52.28	52.70	51.50	50.36	47.65	43.17	41.62	41.97
10	51.19	51.40	51.47	51.79	52.31	52.71	51.47	50.23	47.32	43.10	41.62	41.98
11	51.12	51.40	51.46	51.73	52.31	52.72	51.41	50.06	47.02	43.10	41.72	41.98
12	51.30	51.40	51.46	51.76	52.36	52.79	51.40	49.89	46.77	42.99	41.75	42.01
13	51.51	51.41	51.47	51.79	52.35	52.65	51.35	49.76	46.61	42.95	41.86	42.14
14	51.52	51.40	51.49	51.77	52.36	52.59	51.33	49.65	46.50	42.93	41.86	42.06
15	51.36	51.41	51.40	51.83	52.40	52.58	51.36	49.52	46.31	42.84	41.92	42.01
16	51.33	51.37	51.50	51.85	52.44	52.71	51.26	49.45	46.17	42.85	41.89	42.06
17	51.25	51.37	51.42	51.85	52.45	52.67	51.24	49.37	46.03	42.76	41.97	41.99
18	51.23	51.36	51.45	51.91	52.42	52.62	51.16	49.31	45.87	42.63	41.88	42.21
19	51.37	51.34	51.52	51.91	52.39	52.66	51.20	49.25	45.68	42.57	41.82	42.36
20	51.53	51.38	51.50	51.92	52.37	52.64	51.21	49.18	45.46	42.46	41.82	42.37
21	51.70	51.37	51.52	51.96	52.45	52.56	51.17	49.16	45.28	42.36	41.71	42.17
22	51.66	51.34	51.54	51.96	52.51	52.54	51.14	49.03	45.03	42.25	41.58	42.17
23	51.67	51.41	51.64	52.05	52.51	52.46	50.94	49.00	44.87	42.18	41.57	42.18
24	51.61	51.45	51.60	52.05	52.51	52.39	50.98	48.99	44.71	42.10	41.54	42.11
25	51.57	51.45	51.61	52.04	52.53	52.37	51.02	48.95	44.59	42.06	41.55	42.10
26	51.54	51.47	51.60	52.06	52.60	52.25	50.95	48.87	44.43	42.03	41.64	42.16
27	51.45	51.48	51.60	52.08	52.61	52.11	50.94	48.92	44.27	41.94	41.60	42.16
28	51.45	51.39	51.61	52.12	52.58	52.04	50.98	48.85	44.16	41.95	41.51	42.21
29	51.38	51.41	51.57	52.13	---	52.03	50.90	48.81	43.98	41.91	41.52	42.21
30	51.31	51.42	51.66	52.15	---	51.91	50.86	48.81	43.94	41.86	41.56	42.16
31	51.30	---	51.66	52.21	---	51.87	---	48.83	---	41.83	41.53	---
MAX	51.70	51.48	51.66	52.21	52.61	52.79	51.84	50.87	48.75	43.88	41.97	42.37

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42.21	42.65	43.13	43.77	44.43	44.95	43.17	43.80	43.78	44.93	48.52	51.31
2	42.25	42.65	43.17	43.82	44.48	44.99	43.09	43.82	43.86	45.12	48.69	51.10
3	42.25	42.61	43.20	43.83	44.45	44.91	42.99	43.85	43.79	45.29	48.63	51.01
4	42.26	42.67	43.14	43.85	44.47	44.87	42.87	43.89	43.74	45.13	48.94	50.87
5	42.24	42.68	43.25	43.76	44.48	44.83	42.81	43.82	43.77	45.13	49.07	50.87
6	42.24	42.67	43.21	43.89	44.55	44.83	42.75	43.83	43.74	45.19	49.30	50.80
7	42.23	42.68	43.20	43.90	44.51	44.87	42.61	43.83	43.72	45.15	49.55	50.80
8	42.28	42.75	43.23	43.93	44.56	44.79	42.66	43.81	43.78	45.25	49.68	51.04
9	42.31	42.81	43.28	43.94	44.58	44.81	42.77	43.82	43.87	45.16	49.86	51.22
10	42.27	42.78	43.35	44.02	44.57	44.74	42.90	43.81	43.82	45.22	49.50	51.01
11	42.30	42.75	43.31	44.06	44.63	44.78	42.95	43.91	43.88	45.25	49.50	50.92
12	42.33	42.74	43.29	44.06	44.68	44.79	42.96	43.82	43.87	45.77	49.78	50.85
13	42.34	42.83	43.40	44.04	44.68	44.75	43.01	43.75	43.88	46.17	49.88	51.20
14	42.37	42.87	43.41	44.07	44.69	44.64	43.07	43.75	43.90	46.46	49.60	51.49
15	42.37	42.87	43.40	44.08	44.70	44.63	43.17	43.71	43.91	46.63	49.78	51.70
16	42.38	42.93	43.40	44.08	44.71	44.59	43.24	43.60	43.98	46.34	50.05	51.86
17	42.39	42.93	43.45	44.12	44.70	44.45	43.25	43.58	43.97	46.17	50.31	51.57
18	42.41	42.92	43.47	44.12	44.59	44.45	43.34	43.61	43.98	46.53	50.52	51.39
19	42.42	42.94	43.45	44.19	44.71	44.35	43.38	43.61	44.04	46.80	50.65	51.33
20	42.48	42.93	43.45	44.24	44.79	44.39	43.43	43.57	44.09	46.62	50.34	51.24
21	42.49	42.92	43.56	44.25	44.79	44.34	43.48	43.59	44.15	46.91	50.11	51.26
22	42.53	42.93	43.50	44.27	44.82	44.22	43.54	43.63	44.11	47.19	50.42	51.14
23	42.49	43.01	43.59	44.25	44.82	44.07	43.49	43.62	44.11	47.48	50.70	51.48
24	42.48	43.05	43.62	44.27	44.80	44.06	43.52	43.63	44.23	47.78	50.90	51.85
25	42.56	43.04	43.61	44.27	44.93	43.91	43.53	43.66	44.17	47.95	51.14	52.06
26	42.59	43.01	43.66	44.26	44.87	43.74	43.67	43.60	44.17	48.07	51.22	52.15
27	42.56	43.06	43.73	44.37	44.86	43.66	43.73	43.57	44.29	48.12	51.42	51.93
28	42.56	43.12	43.76	44.37	44.91	43.57	43.75	43.59	44.40	48.31	51.50	51.74
29	42.60	43.12	43.76	44.40	---	43.58	43.81	43.61	44.60	48.54	51.34	51.65
30	42.60	43.10	43.76	44.43	---	43.42	43.85	43.71	44.84	48.60	51.58	51.91
31	42.58	---	43.75	44.43	---	43.32	---	43.77	---	48.26	51.66	---
MAX	42.60	43.12	43.76	44.43	44.93	44.99	43.85	43.91	44.84	48.60	51.66	52.15

SITE NUMBER FROM LOCATION MAP.—34.

COUNTY.—Custer.

LOCAL WELL NUMBER.—3S8E19BBBB.

SITE ID (STATION NUMBER).—434652103130501.

OTHER IDENTIFIER.—CU-83C.

LOCATION.—Lat 43°46′52″, long 103°13′05″, in NW¼NW¼NW¼NW¼ sec. 19, T. 3 S., R. 8 E., Hydrologic Unit 10120109, 4 mi south of Hermosa. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Lakota.

WELL CHARACTERISTICS.—Drilled observation well, 760 ft deep with 676 ft of 5-in. steel casing; open hole from 676 to 760 ft.

INSTRUMENTATION.—Digital water-level recorder -- 60-minute interval.

DATUM.—Elevation of land-surface datum is 3,505.15 ft above sea level. Measuring point: Top of steel casing, 2.00 ft above land-surface datum.

REMARKS.—Records good.

PERIOD OF RECORD.—September 1983 to September 1994.

EXTREMES.—Highest daily water level, 175.89 ft below land-surface datum, Nov. 20, 1983; lowest daily water level, 180.07 ft below land-surface datum, Aug. 4, 1994.

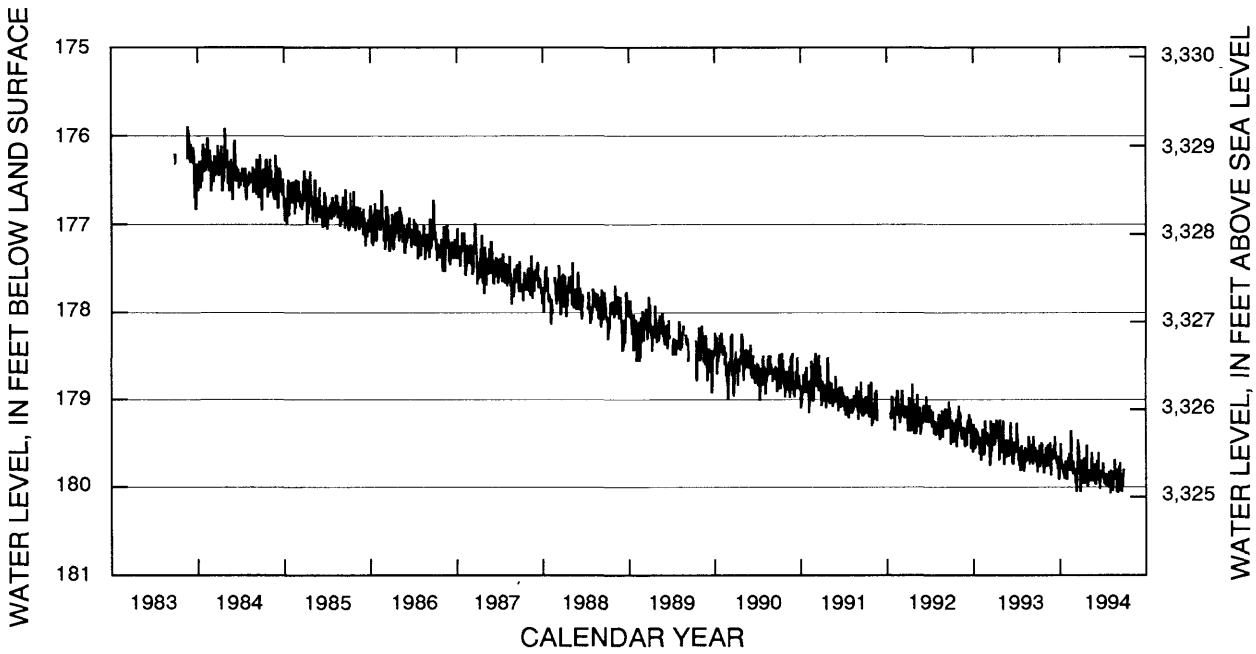

Figure 40. Hydrograph for observation well 3S8E19BBBB (site number 34).

SITE NUMBER 34—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	179.39	179.17	179.37	179.53	179.60	179.38	179.51	179.59	179.47	179.51	179.80	179.51
2	179.30	179.07	179.37	179.28	179.51	179.37	179.41	179.57	179.51	179.51	179.73	179.67
3	179.26	179.29	179.42	179.36	179.68	179.48	179.50	179.45	179.53	179.31	179.82	179.68
4	179.23	179.34	179.51	179.36	179.68	179.52	179.50	179.33	179.55	179.27	179.79	179.64
5	179.45	179.32	179.51	179.47	179.63	179.52	179.33	179.46	179.45	179.37	179.74	179.68
6	179.46	179.34	179.32	179.48	179.56	179.49	179.29	179.38	179.47	179.45	179.72	179.70
7	179.49	179.34	179.32	179.39	179.47	179.46	179.37	179.24	179.30	179.44	179.58	179.71
8	179.42	179.15	179.26	179.48	179.46	179.46	179.37	179.32	179.26	179.48	179.54	179.70
9	179.32	179.23	179.26	179.55	179.33	179.53	179.23	179.59	179.42	179.52	179.62	179.69
10	179.34	179.35	179.27	179.55	179.46	179.59	179.30	179.73	179.45	179.60	179.64	179.74
11	179.40	179.36	179.23	179.32	179.46	179.64	179.34	179.73	179.43	179.69	179.59	179.50
12	179.41	179.42	179.29	179.42	179.37	179.75	179.41	179.69	179.48	179.63	179.71	179.42
13	179.26	179.45	179.37	179.48	179.41	179.64	179.40	179.68	179.61	179.68	179.65	179.56
14	179.27	179.42	179.37	179.48	179.45	179.46	179.43	179.56	179.72	179.75	179.58	179.60
15	179.45	179.41	179.17	179.34	179.51	179.24	179.43	179.59	179.66	179.63	179.62	179.56
16	179.46	179.31	179.26	179.43	179.62	179.64	179.42	179.61	179.57	179.57	179.58	179.66
17	179.44	179.34	179.26	179.43	179.62	179.64	179.44	179.58	179.73	179.69	179.59	179.68
18	179.45	179.39	179.21	179.45	179.56	179.40	179.33	179.65	179.74	179.68	179.64	179.67
19	179.27	179.39	179.30	179.45	179.37	179.58	179.53	179.65	179.69	179.81	179.66	179.55
20	179.28	179.36	179.30	179.36	179.24	179.58	179.68	179.59	179.66	179.71	179.66	179.55
21	179.22	179.36	179.22	179.42	179.25	179.53	179.69	179.51	179.61	179.59	179.57	179.57
22	179.45	179.31	179.28	179.42	179.35	179.53	179.45	179.45	179.49	179.56	179.42	179.65
23	179.53	179.34	179.56	179.51	179.40	179.42	179.23	179.52	179.48	179.54	179.49	179.71
24	179.53	179.45	179.50	179.52	179.39	179.39	179.43	179.64	179.58	179.52	179.46	179.64
25	179.43	179.49	179.48	179.46	179.41	179.41	179.56	179.65	179.61	179.57	179.55	179.60
26	179.44	179.52	179.43	179.48	179.43	179.41	179.51	179.58	179.60	179.59	179.63	179.75
27	179.37	179.54	179.42	179.42	179.44	179.27	179.51	179.55	179.55	179.58	179.74	179.69
28	179.39	179.37	179.46	179.61	179.39	179.33	179.59	179.59	179.53	179.70	179.60	179.83
29	179.28	179.40	179.40	179.61	---	179.35	179.59	179.55	179.48	179.68	179.58	179.82
30	179.17	179.40	179.55	179.57	---	179.43	179.54	179.65	179.56	179.65	179.71	179.58
31	179.12	---	179.60	179.61	---	179.51	---	179.63	---	179.73	179.69	---
MAX	179.53	179.54	179.60	179.61	179.68	179.75	179.69	179.73	179.74	179.81	179.82	179.83

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	179.67	179.68	179.57	179.68	179.78	179.81	179.85	179.84	179.88	179.82	179.93	180.02
2	179.69	179.70	179.64	179.74	179.70	179.83	179.93	179.81	179.96	179.82	179.89	179.99
3	179.70	179.54	179.68	179.71	179.73	179.80	179.90	179.80	179.96	179.77	179.89	179.90
4	179.64	179.65	179.56	179.74	179.72	179.78	179.81	179.85	179.81	179.72	180.07	179.93
5	179.60	179.69	179.61	179.50	179.66	179.79	179.81	179.86	179.83	179.85	179.99	180.05
6	179.54	179.69	179.65	179.75	179.79	179.86	179.78	179.89	179.75	179.83	179.80	180.05
7	179.52	179.56	179.53	179.75	179.79	179.94	179.70	179.89	179.69	179.91	179.92	179.94
8	179.72	179.64	179.51	179.69	179.70	179.94	179.68	179.85	179.84	179.95	179.94	179.89
9	179.77	179.75	179.61	179.69	179.70	179.91	179.76	179.89	179.90	179.96	179.87	179.82
10	179.64	179.75	179.65	179.78	179.61	179.84	179.91	179.84	179.91	179.88	179.98	179.76
11	179.58	179.61	179.65	179.79	179.66	179.96	179.96	179.93	179.87	179.93	179.98	179.77
12	179.58	179.51	179.42	179.76	179.79	180.05	179.87	179.87	179.74	179.87	179.87	179.78
13	179.58	179.55	179.62	179.74	179.80	179.98	179.66	179.67	179.68	179.95	179.97	179.81
14	179.55	179.59	179.62	179.82	179.78	179.82	179.68	179.77	179.60	179.93	180.04	179.72
15	179.49	179.61	179.59	179.83	179.81	179.85	179.81	179.78	179.76	179.91	179.95	179.87
16	179.51	179.69	179.62	179.74	179.76	179.73	179.91	179.63	179.84	179.98	179.82	179.99
17	179.50	179.71	179.69	179.85	179.72	179.54	179.84	179.60	179.93	179.97	179.87	180.04
18	179.53	179.62	179.73	179.85	179.35	179.57	179.93	179.77	179.96	179.84	179.83	179.97
19	179.57	179.69	179.65	179.82	179.58	179.46	179.96	179.77	179.87	179.86	179.90	179.94
20	179.72	179.62	179.65	179.90	179.78	179.61	179.89	179.74	180.02	179.94	179.91	179.95
21	179.71	179.49	179.71	179.89	179.79	179.61	179.92	179.80	179.96	179.97	179.83	180.04
22	179.69	179.58	179.71	179.83	179.79	179.53	179.87	179.87	179.90	179.92	179.68	180.04
23	179.65	179.78	179.79	179.79	179.79	179.72	179.66	179.87	179.88	179.98	179.82	179.90
24	179.64	179.85	179.77	179.69	179.70	179.81	179.58	179.93	179.84	179.96	179.83	179.96
25	179.77	179.85	179.77	179.72	179.85	179.80	179.52	179.88	179.83	179.96	179.84	180.00
26	179.84	179.72	179.76	179.72	179.84	179.68	179.76	179.89	179.82	179.99	179.89	179.90
27	179.83	179.59	179.86	179.75	179.69	179.83	179.90	179.78	179.82	179.99	179.85	179.85
28	179.66	179.66	179.89	179.75	179.78	179.82	179.91	179.77	179.88	179.92	179.89	179.84
29	179.77	179.66	179.91	179.82	---	180.05	180.00	179.73	179.88	179.87	179.79	179.79
30	179.78	179.56	179.83	179.90	---	180.00	179.94	179.86	179.80	179.82	179.96	179.81
31	179.62	---	179.64	179.90	---	179.89	---	179.96	---	179.84	180.05	---
MAX	179.84	179.85	179.91	179.90	179.85	180.05	180.00	179.96	180.02	179.99	180.07	180.05

SITE NUMBER FROM LOCATION MAP.—35.

COUNTY.—Custer.

LOCAL WELL NUMBER.—4S6E1DAAA.

SITE ID (STATION NUMBER).—434350103201901.

OTHER IDENTIFIER.—CU-93A and Custer State Park Airport 1.

LOCATION.—Lat 43°43'50", long 103°20'19", in NE¼NE¼SE¼ sec. 1, T. 4 S., R. 6 E., Hydrologic Unit 10120109, 0.6 mi east of Custer State Park airport. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Madison.

WELL CHARACTERISTICS.—Drilled observation well, 680 ft deep with 632 ft of 5-in. steel casing; open hole from 632 to 680 ft.

INSTRUMENTATION.—Electronic data logger with pressure transducer.

DATUM.—Elevation of land-surface datum is 3,860 ft above sea level. Measuring point: Top of steel casing, 1.65 ft above land-surface datum.

REMARKS.—Records good.

PERIOD OF RECORD.—August 1993 to September 1994.

EXTREMES.—Highest daily water level, 177.55 ft below land-surface datum, Aug. 6, 1993; lowest daily water level, 188.20 ft below land-surface datum, Aug. 23, 1994.

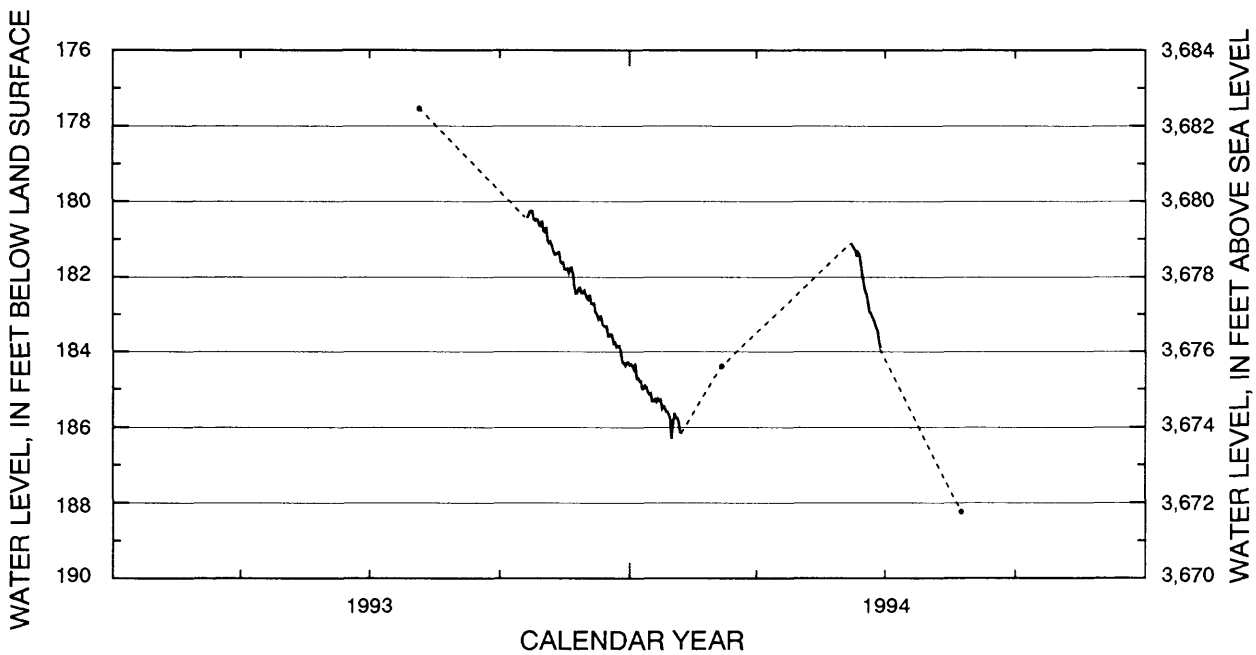

Figure 41. Hydrograph for observation well 4S6E1DAAA (site number 35).

SITE NUMBER 35—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
6	---	---	---	---	---	---	---	---	---	---	e177.55	---

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	180.79	182.46	184.36	185.89	---	---	---	---	---	---	---
2	---	180.81	182.56	184.34	185.63	---	---	---	---	---	---	---
3	---	180.67	182.60	184.40	185.75	---	---	---	---	---	---	---
4	---	181.04	182.47	184.48	185.75	---	---	---	---	---	---	---
5	---	181.10	182.71	184.31	185.84	---	---	---	---	---	---	---
6	---	181.06	182.72	184.72	186.12	---	---	---	---	---	---	---
7	---	181.17	182.70	184.70	186.12	e184.40	---	---	e181.10	---	---	---
8	---	181.30	182.95	184.78	---	---	---	---	181.16	---	---	---
9	---	181.41	182.98	184.78	---	---	---	---	181.24	---	---	---
10	---	181.40	183.12	184.98	---	---	---	---	181.29	---	---	---
11	---	181.36	183.08	184.98	---	---	---	---	181.46	---	---	---
12	---	181.35	183.05	184.91	---	---	---	---	181.35	---	---	---
13	---	181.58	183.25	184.95	---	---	---	---	181.41	---	---	---
14	---	181.64	183.31	185.08	---	---	---	---	181.66	---	---	---
15	---	181.63	183.33	185.14	---	---	---	---	181.94	---	---	---
16	---	181.79	183.32	185.11	---	---	---	---	182.17	---	---	---
17	---	181.80	183.58	185.32	---	---	---	---	182.36	---	---	---
18	---	181.78	183.58	185.32	---	---	---	---	182.46	---	---	---
19	---	181.89	183.53	185.27	---	---	---	---	182.65	---	---	---
20	e180.40	181.76	183.56	185.33	---	---	---	---	182.93	---	---	---
21	180.40	181.75	183.77	185.25	---	---	---	---	182.95	---	---	---
22	180.28	181.93	183.75	185.30	---	---	---	---	183.05	---	---	---
23	180.25	182.25	183.88	185.28	---	---	---	---	183.12	---	e188.20	---
24	180.25	182.44	183.84	185.50	---	---	---	---	183.23	---	---	---
25	180.46	182.42	183.84	185.44	---	---	---	---	183.36	---	---	---
26	180.50	182.31	184.09	185.45	---	---	---	---	183.45	---	---	---
27	180.47	182.29	184.30	185.58	---	---	---	---	183.73	---	---	---
28	180.48	182.43	184.31	185.58	---	---	---	---	e183.90	---	---	---
29	180.63	182.42	184.37	185.66	---	---	---	---	---	---	---	---
30	180.64	182.36	184.30	185.78	---	---	---	---	---	---	---	---
31	180.51	---	184.28	186.29	---	---	---	---	---	---	---	---
MAX	180.64	182.44	184.37	186.29	186.12	184.40	---	---	183.90	---	188.20	---

e Estimated

SITE NUMBER FROM LOCATION MAP.—36.

COUNTY.—Custer.

LOCAL WELL NUMBER.—4S6E1DAAA2.

SITE ID (STATION NUMBER).—434350103201902.

OTHER IDENTIFIERS.—CU-93B and Custer State Park Airport 2.

LOCATION.—Lat 43°43′50″, long 103°20′19″, in NE¼NE¼SE¼ sec. 1, T. 4 S., R. 6 E., Hydrologic Unit 10120109, 0.6 mi east of Custer State Park airport. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 270 ft deep with 210 ft of 5-in. steel casing; open hole from 210 to 270 ft.

INSTRUMENTATION.—Electronic data logger with pressure transducer.

DATUM.—Elevation of land-surface datum is 3,860 ft above sea level. Measuring point: Top of steel casing, 2.2 ft above land-surface datum.

REMARKS.—Records good.

PERIOD OF RECORD.—August 1993 to September 1994.

EXTREMES.—Highest daily water level, 182.61 ft below land-surface datum, Oct. 20, 1993; lowest daily water level, 189.30 ft below land-surface datum, Sept. 30, 1994.

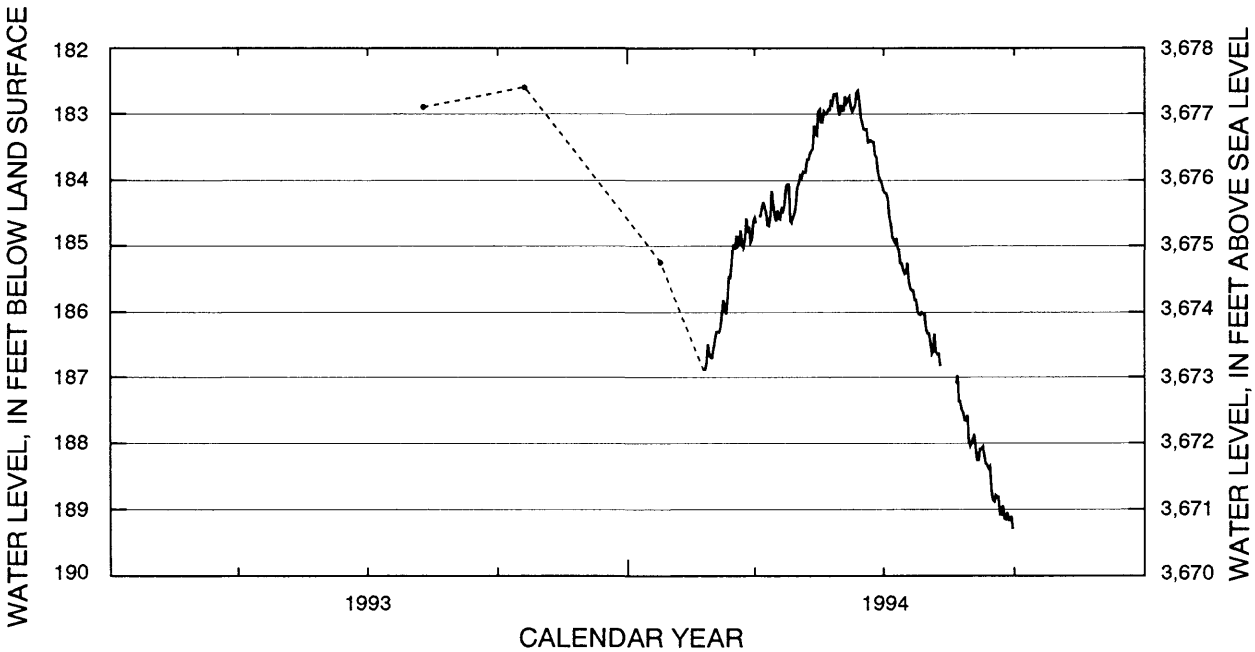

Figure 42. Hydrograph for observation well 4S6E1DAAA2 (site number 36).

SITE NUMBER 36—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
9	---	---	---	---	---	---	---	---	---	---	182.90	---

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	186.70	184.57	184.11	182.86	184.16	186.32	188.00
2	---	---	---	---	---	186.70	184.65	184.05	182.95	184.19	186.32	187.94
3	---	---	---	---	---	186.56	---	183.94	182.95	184.20	186.45	187.87
4	---	---	---	---	---	186.43	184.54	183.97	182.73	184.30	186.64	188.08
5	---	---	---	---	---	186.30	184.54	183.87	182.83	184.56	186.60	188.26
6	---	---	---	---	---	186.30	184.42	183.88	182.77	184.66	186.33	188.26
7	---	---	---	---	---	186.31	184.32	183.88	182.74	184.85	186.61	188.09
8	---	---	---	---	---	186.23	184.41	183.69	182.91	184.91	186.65	188.09
9	---	---	---	---	---	186.01	184.48	183.69	182.96	184.95	186.64	188.06
10	---	---	---	---	---	185.81	184.68	183.60	182.92	184.88	186.83	188.19
11	---	---	---	---	---	185.94	184.69	183.56	182.87	185.04	---	188.30
12	---	---	---	---	---	186.03	184.54	183.52	182.68	185.06	---	188.33
13	---	---	---	---	---	185.82	184.16	183.17	182.65	185.26	---	188.38
14	---	---	---	---	---	185.47	184.36	183.30	182.79	185.26	---	188.35
15	---	---	---	---	---	185.48	184.54	183.32	183.05	185.36	---	188.71
16	---	---	---	---	---	185.24	184.62	182.96	183.13	185.42	---	188.86
17	---	---	---	---	---	184.97	184.45	182.93	183.23	185.40	---	188.88
18	---	---	---	---	---	185.05	184.58	183.12	183.24	185.25	---	188.79
19	---	---	---	---	---	184.84	184.59	183.12	183.23	185.53	---	188.81
20	e182.61	---	---	---	---	185.00	184.43	182.96	183.43	185.64	---	188.81
21	---	---	---	---	---	184.96	184.47	183.00	183.42	185.67	187.09	189.08
22	---	---	---	---	---	184.76	184.36	183.00	183.40	185.67	186.97	189.08
23	---	---	---	---	---	184.98	184.10	182.93	183.42	185.81	187.37	188.94
24	---	---	---	e185.26	---	185.03	184.06	182.94	183.43	185.81	187.37	189.14
25	---	---	---	---	186.90	184.90	184.06	182.82	183.62	185.99	187.49	189.15
26	---	---	---	---	186.79	184.58	184.61	182.85	183.66	186.03	187.53	189.04
27	---	---	---	---	186.49	184.76	184.64	182.70	183.87	186.04	187.65	189.16
28	---	---	---	---	186.65	184.73	184.56	182.70	183.97	186.00	187.66	189.16
29	---	---	---	---	---	184.94	184.51	182.69	184.01	186.02	187.57	189.11
30	---	---	---	---	---	184.89	184.38	182.92	184.07	186.02	187.98	189.30
31	---	---	---	---	---	184.63	---	183.02	---	186.25	188.05	---
MAX	182.61	---	---	185.26	186.90	186.70	184.69	184.11	184.07	186.25	188.05	189.30

e Estimated

SITE NUMBER FROM LOCATION MAP.—C2.

COUNTY.—Custer.

LOCAL NUMBER.—6S5E12DBAB.

SITE ID (STATION NUMBER).—433302103281501.

OTHER IDENTIFIER.—Windy City Lake.

LOCATION.—Lat 43°32′57″, long 103°28′27″, in NW¼NE¼NW¼SE¼ sec. 12, T. 6 S., R. 5 E., Hydrologic Unit 10120109, at Wind Cave National Park near Hot Springs. Owner: National Park Service.

AQUIFER.—Madison.

SITE CHARACTERISTICS.—Pool of water, approximately 550 ft below land surface in Wind Cave, called Windy City Lake.

INSTRUMENTATION.—Electronic data logger with pressure transducer.

DATUM.—Elevation of land surface is about 4,094 ft above sea level at visitor center. Measuring point: Staff gage with 0.0 being 12.84 ft below a brass cap reference point with elevation of about 3,640 ft (revised) above sea level.

REMARKS.—Records good. Previously unpublished records from July 9 through Sept. 30, 1992, are presented with the following tabulation.

PERIOD OF RECORD.—January 1988 to September 1994.

EXTREMES.—Highest daily water level, 10.76 ft below reference point, June 13, 1994; lowest daily water level, 15.24 ft below reference point, Mar. 14, 1989.

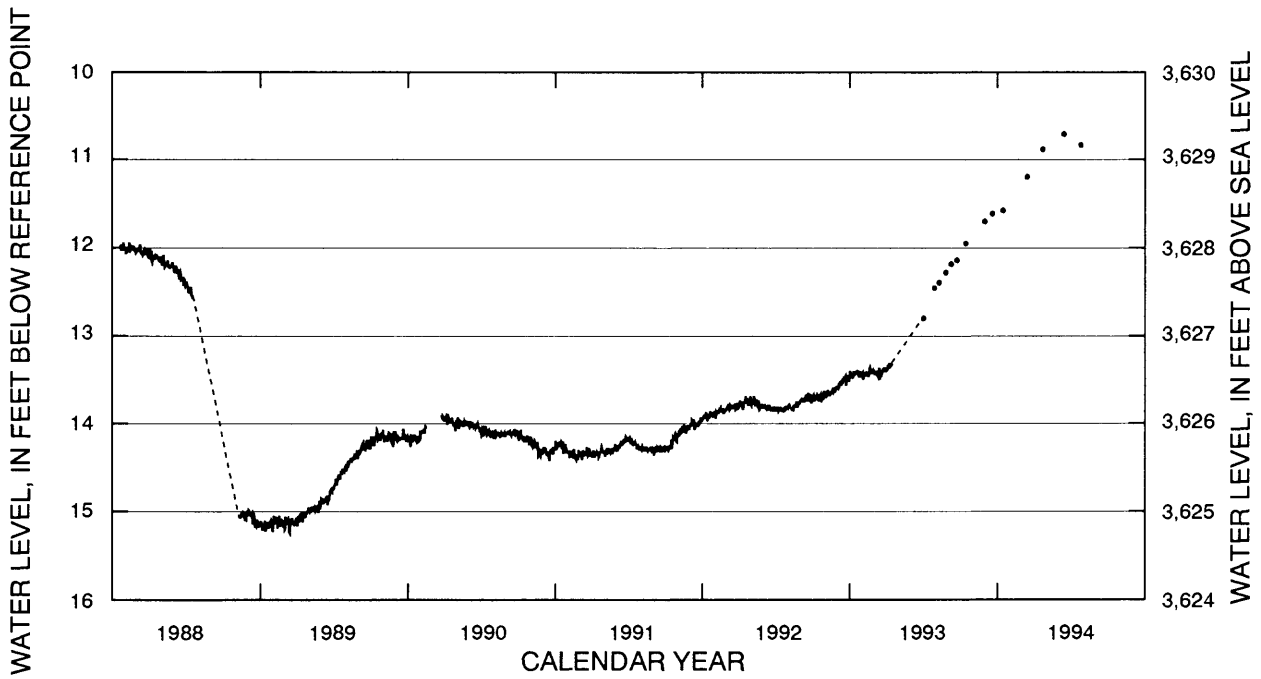

Figure 43. Hydrograph for cave site 6S5E12DBAB (site number C2).

WATER LEVEL, IN FEET BELOW REFERENCE POINT, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.25	14.15	14.05	13.97	13.87	13.83	13.82	13.79	13.82	13.83	13.81	13.73
2	14.26	14.14	14.02	13.93	13.90	13.83	13.78	13.80	13.80	13.85	13.82	13.74
3	14.27	14.13	14.02	13.95	13.93	13.82	13.75	13.77	13.80	13.85	13.81	13.74
4	14.29	14.10	14.02	13.92	13.93	13.81	13.75	13.77	13.81	13.84	13.80	13.72
5	14.29	14.09	14.01	13.92	13.87	13.80	13.77	13.76	13.80	13.84	13.81	13.73
6	14.29	14.11	13.96	13.91	13.88	13.81	13.78	13.76	13.81	13.81	13.79	13.73
7	14.25	14.12	13.97	13.91	13.87	13.81	13.80	13.74	13.82	13.84	---	13.75
8	14.29	14.11	14.01	13.93	13.87	13.82	13.77	13.74	13.83	13.86	---	13.75
9	14.30	14.11	14.03	13.93	13.85	13.84	13.76	13.69	13.81	13.85	13.82	13.74
10	14.29	14.11	14.00	13.93	13.88	13.83	13.76	13.72	13.82	13.85	13.85	13.76
11	14.27	14.09	14.00	13.87	13.89	13.80	13.83	13.74	13.83	13.83	13.82	13.72
12	14.25	14.05	13.95	13.91	13.86	13.81	13.83	13.79	13.82	13.83	13.83	13.71
13	14.27	14.03	14.06	13.91	13.83	13.82	13.76	13.78	13.79	13.82	13.82	13.70
14	14.27	14.07	14.06	13.96	13.83	13.82	13.76	13.74	13.81	13.82	13.83	13.72
15	14.23	14.10	14.03	13.96	13.83	13.82	13.76	13.74	13.80	13.84	13.80	13.68
16	14.18	14.07	14.03	13.92	13.82	13.80	13.76	13.79	13.79	13.84	13.80	13.71
17	14.27	14.01	14.03	13.93	13.84	13.80	13.74	13.80	13.84	13.85	13.81	13.73
18	14.29	14.04	14.01	13.92	13.86	13.82	13.69	13.77	13.85	13.84	13.81	13.75
19	14.24	14.09	13.99	13.90	13.86	13.82	13.75	13.75	13.85	13.86	13.79	13.68
20	14.22	14.06	14.04	13.91	13.85	13.81	13.75	13.75	13.84	13.86	13.79	13.65
21	14.16	14.03	14.01	13.86	13.85	13.81	13.72	13.79	13.84	13.84	13.80	13.74
22	14.17	14.10	13.99	13.88	13.84	13.80	13.72	13.85	13.84	13.83	13.75	13.74
23	14.17	14.10	14.00	13.88	13.88	13.77	13.78	13.84	13.83	13.83	13.79	13.69
24	14.16	14.05	13.98	13.88	13.88	13.83	13.79	13.80	13.84	13.81	13.81	13.66
25	14.14	14.04	13.98	13.92	13.87	13.82	13.79	13.81	13.85	13.85	13.81	13.70
26	14.12	14.03	14.00	13.90	13.86	13.79	13.77	13.80	13.84	13.84	13.79	13.73
27	14.11	14.03	13.99	13.91	13.86	13.78	13.75	13.79	13.83	13.81	13.78	13.76
28	14.12	14.04	13.94	13.88	13.85	13.82	13.75	13.79	13.85	13.81	13.75	13.76
29	14.20	14.04	13.94	13.91	13.85	13.84	13.75	13.79	13.85	13.81	13.77	13.71
30	14.21	14.07	13.96	13.89	---	13.82	13.69	13.80	13.81	13.82	13.78	13.72
31	14.13	---	13.97	13.87	---	13.82	---	13.82	---	13.82	13.75	---
MAX	14.30	14.15	14.06	13.97	13.93	13.84	13.83	13.85	13.85	13.86	13.85	13.76

WATER LEVEL, IN FEET BELOW REFERENCE POINT, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.70	13.67	13.60	13.47	13.44	13.39	13.40	---	---	---	---	---
2	13.69	13.64	13.60	13.40	13.43	13.40	13.36	---	---	e12.77	---	---
3	13.68	13.70	13.60	13.45	13.49	13.43	13.40	---	---	---	---	---
4	13.70	13.70	13.61	13.45	13.49	13.45	13.39	---	---	---	---	---
5	13.74	13.67	13.59	13.47	13.45	13.42	13.33	---	---	---	---	---
6	13.74	13.67	13.55	13.45	13.44	13.41	13.35	---	---	---	---	---
7	13.73	13.66	13.55	13.43	13.43	13.41	13.36	---	---	---	---	---
8	13.71	13.62	13.52	13.45	13.43	13.41	13.36	---	---	---	---	e12.22
9	13.70	13.65	13.53	13.49	13.42	13.44	13.31	---	---	---	e12.37	---
10	13.71	13.68	13.57	13.47	13.45	13.45	13.33	---	---	---	---	---
11	13.71	13.68	13.51	13.40	13.45	13.46	13.33	---	---	---	---	---
12	13.71	13.68	13.52	13.45	13.41	13.47	13.34	---	---	---	---	---
13	13.68	13.68	13.55	13.45	13.43	13.44	13.33	---	---	---	---	---
14	13.69	13.67	13.54	13.43	13.43	13.39	13.33	---	---	---	---	---
15	13.74	13.66	13.49	13.40	13.44	13.36	13.33	---	---	---	---	---
16	13.74	13.64	13.51	13.43	13.46	13.50	13.32	---	---	---	---	---
17	13.72	13.64	13.49	13.43	13.46	13.49	13.32	---	---	---	---	---
18	13.72	13.65	13.47	13.43	13.43	13.39	---	---	---	---	---	---
19	13.68	13.65	13.49	13.42	13.38	13.46	---	---	---	---	---	---
20	13.68	13.63	13.49	13.39	13.36	13.46	---	---	---	---	---	---
21	13.67	13.64	13.47	13.43	13.39	13.43	---	---	---	---	---	---
22	13.74	13.59	13.46	13.43	13.42	13.43	---	---	---	---	---	e12.17
23	13.76	13.63	13.57	13.46	13.42	13.40	---	---	---	---	---	---
24	13.73	13.64	13.51	13.46	13.41	13.39	---	---	---	---	---	---
25	13.71	13.64	13.50	13.41	13.42	13.40	---	---	---	---	e12.22	---
26	13.71	13.63	13.48	13.43	13.42	13.40	---	---	---	---	---	---
27	13.69	13.63	13.49	13.40	13.42	13.36	---	---	---	---	---	---
28	13.70	13.58	13.49	13.47	13.40	13.38	---	---	---	e12.50	---	---
29	13.66	13.60	13.45	13.46	---	13.38	---	---	---	---	---	---
30	13.63	13.59	13.51	13.44	---	13.39	---	---	---	---	---	---
31	13.67	---	13.52	13.44	---	13.40	---	---	---	---	---	---
MAX	13.76	13.70	13.61	13.49	13.49	13.50	13.40	---	---	12.77	12.37	12.22

WATER LEVEL, IN FEET BELOW REFERENCE POINT, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
13	---	---	---	---	---	---	---	---	e10.76	---	---	---
14	12.00	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	e11.62	---	e11.24	---	---	---	---	---	---
20	---	---	---	---	---	---	e10.92	---	---	---	---	---
21	---	---	e11.65	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	e10.88	---	---
30	---	e11.74	---	---	---	---	---	---	---	---	---	---

e Estimated

SITE NUMBER FROM LOCATION MAP.—37.

COUNTY.—Custer.

LOCAL WELL NUMBER.—6S6E21BBBB.

SITE ID (STATION NUMBER).—433115103251401.

OTHER IDENTIFIERS.—CU-91A and 7-11 Ranch 1.

LOCATION.—Lat 43°31'15", long 103°25'14", in NW¼NW¼NW¼NW¼ sec. 21, T. 6 S., R. 6 E., Hydrologic Unit 10120109, 6 mi northeast of Hot Springs. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Madison.

WELL CHARACTERISTICS.—Drilled observation well, 1,165 ft deep with 1,135 ft of 5-in. steel casing, open hole from 1,135 to 1,165 ft.

INSTRUMENTATION.—Electronic data logger with submersible pressure transducer -- 60-minute interval. Instrumentation replaced on June 16, 1992, because of data problems.

DATUM.—Elevation of land-surface datum is 3,640 ft above sea level. Measuring point: Top of steel casing, 1.7 ft above land-surface datum.

REMARKS.—Current records good. Records prior to June 17, 1992, poor because of large, unexplained fluctuations in water level that may be a result of instrumentation problems.

PERIOD OF RECORD.—February 1992 to September 1994.

EXTREMES.—Highest daily water level, 5.74 ft below land-surface datum, May 16, 1994; lowest daily water level, 9.28 ft below land-surface datum, Feb. 16, 1992.

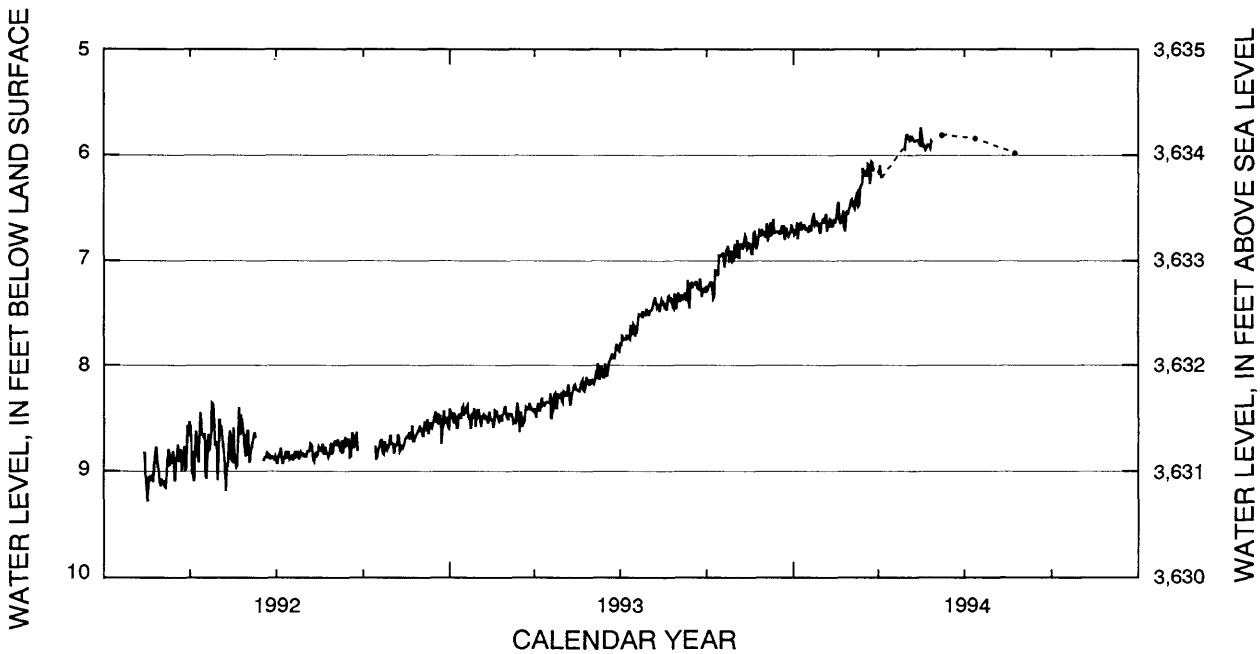

Figure 44. Hydrograph for observation well 6S6E21BBBB (site number 37).

SITE NUMBER 37—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	8.74	8.63	8.42	8.42	8.39	8.41	8.36	8.14	7.78	7.51	7.30
2	---	8.74	8.59	8.44	8.51	8.46	8.45	8.25	8.17	7.81	7.47	7.38
3	---	8.83	8.67	8.51	8.58	8.51	8.50	8.26	8.18	7.70	7.47	7.38
4	---	8.77	8.67	8.45	8.50	8.51	8.41	8.26	8.15	7.75	7.46	7.32
5	---	8.75	8.53	8.55	8.48	8.46	8.36	8.30	8.08	7.75	7.41	7.37
6	---	8.75	8.62	8.45	8.47	8.46	8.41	8.24	8.10	7.75	7.38	7.37
7	---	8.66	8.54	8.49	8.50	8.47	8.44	8.18	7.98	7.75	7.34	7.33
8	---	8.68	8.51	8.59	8.48	8.47	8.38	8.27	8.11	7.70	7.39	7.30
9	---	8.81	8.65	8.59	8.49	8.55	8.31	8.38	8.14	7.73	7.44	7.35
10	---	8.79	8.61	8.49	8.55	8.54	8.38	8.34	8.08	7.74	7.42	7.38
11	---	8.77	8.54	8.46	8.52	8.53	8.37	8.27	8.01	7.75	7.43	7.18
12	---	8.78	8.59	8.50	8.44	8.56	8.38	8.23	8.07	7.61	7.48	7.38
13	---	8.76	8.60	8.50	8.49	8.42	8.36	8.19	8.12	7.70	7.39	7.45
14	e8.76	8.73	8.54	8.41	8.52	8.36	8.35	8.18	8.12	7.69	7.37	7.22
15	8.89	8.69	8.51	8.39	8.53	8.42	8.35	8.23	7.98	7.60	7.40	7.21
16	8.86	8.68	8.54	8.48	8.59	8.63	8.36	8.23	8.06	7.62	7.39	7.26
17	8.80	8.67	8.44	8.41	8.53	8.51	8.35	8.24	8.11	7.72	7.43	7.22
18	8.78	8.68	8.54	8.46	8.43	8.44	8.27	8.25	8.05	7.66	7.42	7.22
19	8.73	8.63	8.55	8.40	8.44	8.58	8.51	8.25	7.97	7.67	7.46	7.20
20	8.71	8.70	8.46	8.38	8.44	8.52	8.47	8.18	7.95	7.57	7.46	7.20
21	8.71	8.67	8.50	8.50	8.51	8.53	8.43	8.16	7.92	7.51	7.34	7.26
22	8.83	8.57	8.49	8.49	8.53	8.48	8.28	8.14	7.89	7.52	7.33	7.26
23	8.84	8.72	8.74	8.60	8.51	8.40	8.27	8.24	7.93	7.52	7.38	7.28
24	8.72	8.72	8.61	8.51	8.47	8.41	8.41	8.25	7.93	7.50	7.34	7.17
25	8.81	8.68	8.58	8.45	8.53	8.42	8.41	8.22	7.93	7.54	7.40	7.25
26	8.75	8.67	8.43	8.48	8.48	8.40	8.27	8.11	7.84	7.49	7.43	7.34
27	8.79	8.65	8.54	8.41	8.46	8.36	8.31	8.15	7.79	7.50	7.45	7.26
28	8.77	8.62	8.54	8.58	8.42	8.42	8.30	8.17	7.84	7.51	7.31	7.30
29	8.71	8.62	8.49	8.50	---	8.41	8.28	8.13	7.86	7.45	7.42	7.26
30	8.66	8.57	8.59	8.45	---	8.43	8.34	8.19	7.87	7.49	7.46	7.25
31	8.74	---	8.60	8.47	---	8.44	---	8.15	---	7.51	7.35	---
MAX	8.89	8.83	8.74	8.60	8.59	8.63	8.51	8.38	8.18	7.81	7.51	7.45

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.29	6.96	6.74	6.70	6.63	6.52	6.14	5.81	5.88	---	---	---
2	7.28	6.95	6.77	6.75	6.59	6.49	6.18	5.81	---	---	---	---
3	7.23	6.80	6.77	6.73	6.64	6.43	6.09	5.84	---	---	---	---
4	7.22	6.97	6.64	6.73	6.58	6.42	6.22	5.86	---	---	---	---
5	7.20	6.97	6.82	6.63	6.55	6.46	---	5.83	---	---	---	---
6	7.20	6.84	6.76	6.79	6.72	6.48	---	5.85	---	---	---	---
7	7.27	6.84	6.70	6.66	6.63	6.50	---	5.83	e5.82	---	---	---
8	7.36	6.86	6.63	6.66	6.68	6.41	---	5.85	---	---	---	---
9	7.34	6.89	6.75	6.63	6.60	6.37	---	5.87	---	---	---	---
10	7.08	6.81	6.74	6.71	6.61	6.35	---	5.87	---	---	---	---
11	7.11	6.76	6.60	6.68	6.67	6.48	---	5.86	---	---	---	---
12	7.12	6.78	6.73	6.66	6.67	6.47	---	5.86	---	e5.85	---	---
13	7.14	6.89	6.73	6.66	6.62	6.30	---	5.86	---	---	---	---
14	6.95	6.88	6.72	6.70	6.63	6.28	---	5.89	---	---	---	---
15	6.95	6.82	6.72	6.69	6.63	6.27	---	5.90	---	---	---	---
16	6.95	6.86	6.72	6.69	6.57	6.12	---	5.74	---	---	---	---
17	6.94	6.85	6.74	6.73	6.48	6.19	---	5.80	---	---	---	---
18	6.93	6.93	6.74	6.66	6.44	6.19	---	5.91	---	---	---	---
19	6.97	6.93	6.70	6.69	6.60	6.14	---	5.90	---	---	---	---
20	7.06	6.74	6.66	6.72	6.65	6.20	---	5.93	---	---	---	---
21	6.96	6.72	6.74	6.61	6.60	6.08	---	5.95	---	---	---	---
22	6.91	6.79	6.66	6.58	6.59	6.09	---	5.93	---	---	---	---
23	6.89	6.89	6.80	6.54	6.52	6.27	---	5.90	---	---	e5.98	---
24	6.86	6.85	6.74	6.66	6.68	6.20	---	5.90	---	---	---	---
25	7.00	6.78	6.68	6.64	6.72	6.06	---	5.91	---	---	---	---
26	6.99	6.72	6.75	6.61	6.57	6.07	---	5.93	---	---	---	---
27	6.90	6.73	6.77	6.67	6.52	6.15	---	5.87	---	---	---	---
28	7.01	6.77	6.74	6.63	6.56	6.12	5.93	5.88	---	---	---	---
29	7.00	6.71	6.73	6.72	---	---	5.94	---	---	---	---	---
30	6.95	6.72	6.65	6.74	---	6.19	5.84	---	---	---	---	---
31	6.84	---	6.70	6.64	---	---	---	---	---	---	---	---
MAX	7.36	6.97	6.82	6.79	6.72	6.52	6.22	5.95	5.88	5.85	5.98	---

e Estimated

SITE NUMBER FROM LOCATION MAP.—38.

COUNTY.—Custer.

LOCAL WELL NUMBER.—6S6E21BBBB2.

SITE ID (STATION NUMBER).—433115103251402.

OTHER IDENTIFIERS.—CU-91B and 7-11 Ranch 2.

LOCATION.—Lat 43°31'15", long 103°25'14", in NW¼NW¼NW¼NW¼ sec. 21, T. 6 S., R. 6 E., Hydrologic Unit 10120109, 6 mi northeast of Hot Springs. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Minnelusa.

WELL CHARACTERISTICS.—Drilled observation well, 480 ft deep with 443 ft of 5-in. steel casing; open hole from 443 to 480 ft.

INSTRUMENTATION.—Electronic data logger with pressure transducer -- 60-minute interval. Digital water-level recorder with 60-minute interval prior to June 8, 1992.

DATUM.—Elevation of land-surface datum is 3,640 ft above sea level. Measuring point: Top of steel casing, 1.70 ft above land-surface datum.

REMARKS.—Records good.

PERIOD OF RECORD.—February 1992 to September 1994.

EXTREMES.—Highest daily water level, 159.16 ft below land-surface datum, Mar. 19, 1994; lowest daily water level, 160.81 ft below land-surface datum, Jan. 31, 1993.

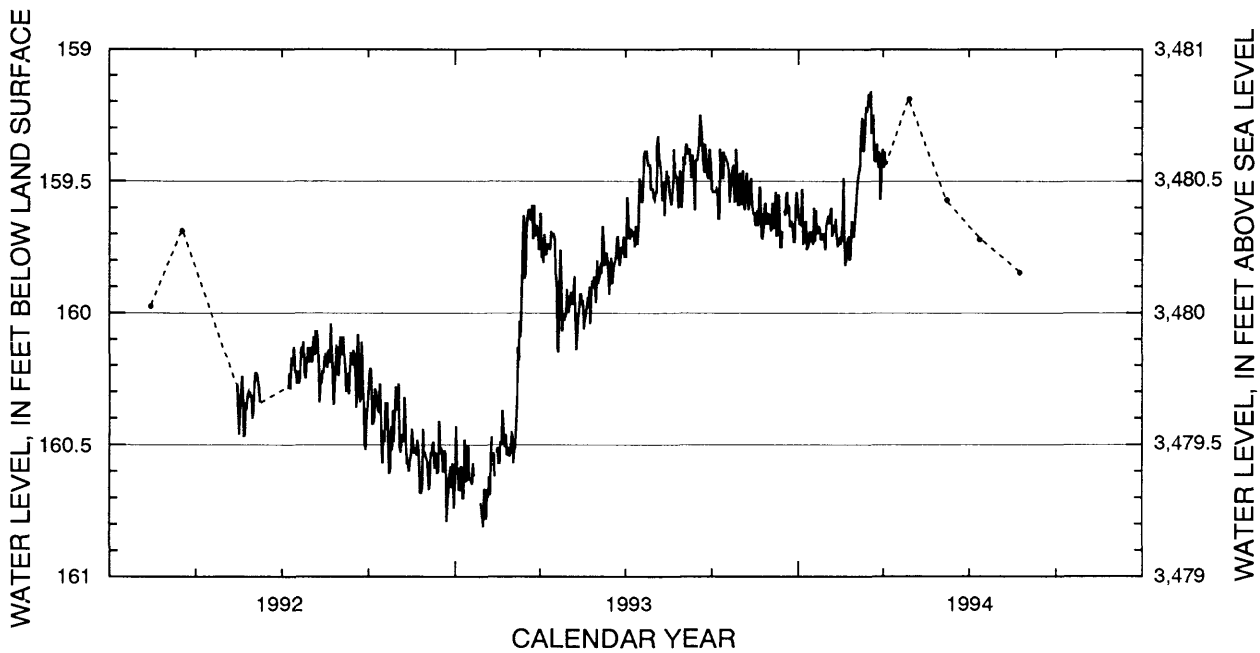

Figure 45. Hydrograph for observation well 6S6E21BBBB2 (site number 38).

SITE NUMBER 38—Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	160.30	160.37	160.55	160.63	e160.67	e160.51	e159.73	159.98	159.80	159.77	159.57	159.41
2	160.23	160.27	160.56	160.43	e160.67	e160.45	e159.62	160.00	159.89	159.79	159.55	159.44
3	160.21	160.51	160.60	160.59	e160.78	e160.47	e159.79	159.97	159.87	159.56	159.54	159.40
4	160.23	160.53	160.67	160.59	e160.67	e160.57	e159.78	159.92	159.86	159.62	159.36	159.36
5	160.42	160.46	160.66	160.67	e160.70	e160.52	e159.81	159.95	159.81	159.71	159.33	159.37
6	160.42	160.48	160.53	160.67	e160.62	e160.51	159.70	159.97	159.85	159.72	159.41	159.40
7	160.41	160.49	160.54	160.58	e160.69	e160.43	159.76	159.91	159.67	159.68	159.44	159.39
8	160.29	160.32	160.50	160.59	e160.53	e160.33	159.78	159.86	159.72	159.69	159.47	159.38
9	160.30	160.38	160.49	160.70	e160.47	e160.13	159.74	160.03	159.82	159.71	159.57	159.49
10	160.33	160.51	160.59	160.70	---	e160.18	159.74	160.14	159.80	159.69	159.57	159.45
11	160.37	160.57	160.53	160.48	e160.53	e160.03	159.75	160.10	159.77	159.75	159.50	159.40
12	160.38	160.57	160.54	160.59	e160.62	e160.09	159.76	160.03	159.79	159.67	159.63	159.49
13	160.27	160.60	160.61	160.64	---	159.91	159.69	159.99	159.86	159.68	159.52	159.61
14	160.35	160.56	160.60	160.58	e160.53	e159.72	159.71	159.93	159.93	159.74	159.46	159.43
15	160.49	160.54	160.41	160.50	e160.51	159.63	159.70	159.93	159.83	159.68	159.51	159.42
16	160.57	160.44	160.53	160.63	e160.57	e159.87	159.70	159.97	159.79	159.49	159.48	159.42
17	160.45	160.48	160.51	160.63	e160.57	e159.85	159.72	159.95	159.89	159.57	159.54	159.38
18	160.49	160.53	160.52	160.64	e160.49	e159.69	159.85	160.06	159.86	159.54	159.57	159.36
19	160.34	160.53	160.60	160.65	e160.50	e159.63	e159.89	160.03	159.82	159.58	159.59	159.25
20	160.37	160.51	160.60	160.57	e160.37	e159.61	e160.13	160.01	159.81	159.49	159.56	159.29
21	160.34	160.54	160.52	160.62	e160.43	e159.61	160.15	159.98	159.79	159.41	159.50	159.35
22	160.53	160.48	160.54	---	e160.48	e159.64	159.92	159.94	159.72	159.39	159.38	159.43
23	160.61	160.51	160.79	---	e160.51	e159.65	159.76	159.96	159.71	159.39	159.49	159.47
24	160.59	160.60	160.71	---	e160.46	e159.59	159.86	159.90	159.78	159.39	159.48	159.36
25	160.43	160.68	160.68	e160.78	e160.54	e159.72	160.07	160.04	159.82	159.44	159.49	159.39
26	160.52	160.68	160.61	---	e160.51	e159.59	160.00	159.92	159.79	159.44	159.57	159.48
27	160.37	160.67	160.58	---	e160.54	e159.71	160.03	159.88	159.75	159.44	159.60	159.49
28	160.49	160.44	160.66	e160.72	e160.54	e159.67	160.02	159.88	159.76	159.53	159.46	159.49
29	160.39	160.54	160.57	e160.74	---	e159.67	160.01	159.86	159.71	159.53	159.52	159.38
30	160.28	160.53	160.68	e160.78	---	e159.69	159.91	159.92	159.79	159.53	159.60	159.42
31	160.30	---	160.74	e160.81	---	e159.76	---	159.96	---	159.56	159.54	---
MAX	160.61	160.68	160.79	160.81	160.78	160.57	160.15	160.14	159.93	159.79	159.63	159.61

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	159.53	159.57	159.63	159.62	159.65	159.71	159.38	---	---	---	---	---
2	159.54	159.59	159.66	159.66	159.63	159.67	159.45	---	---	---	---	---
3	159.54	159.46	159.69	159.66	159.66	159.61	159.39	---	---	---	---	---
4	159.54	159.58	159.58	159.67	159.63	159.55	159.44	---	---	---	---	---
5	159.54	159.61	159.66	159.53	159.60	159.50	---	---	---	---	---	---
6	159.53	159.53	159.68	159.74	159.71	159.47	---	---	---	---	---	---
7	159.54	159.47	159.59	159.70	159.69	159.46	---	---	e159.57	---	---	---
8	159.64	159.55	159.54	159.67	159.69	159.43	---	---	---	---	---	---
9	159.64	159.61	159.71	159.65	159.68	159.33	---	---	---	---	---	---
10	159.38	159.57	159.70	159.76	159.64	159.26	---	---	---	---	---	---
11	159.44	159.51	159.55	159.75	159.71	159.36	---	---	---	---	---	---
12	159.49	159.49	159.61	159.74	159.75	159.39	---	---	---	e159.72	---	---
13	159.49	159.59	159.75	159.69	159.73	159.33	---	---	---	---	---	---
14	159.39	159.62	159.75	159.72	159.72	159.22	---	---	---	---	---	---
15	159.41	159.62	159.69	159.73	159.74	159.24	---	---	---	---	---	---
16	159.41	159.66	---	159.69	159.71	159.21	---	---	---	---	---	---
17	159.42	159.67	159.61	159.74	159.66	159.17	---	---	---	---	---	---
18	159.44	159.61	159.63	159.60	159.49	159.21	---	---	---	---	---	---
19	159.46	159.67	159.56	159.73	159.73	159.16	---	---	---	---	---	---
20	159.58	159.58	159.54	159.61	159.82	159.32	---	---	---	---	---	---
21	159.53	159.52	159.62	159.70	159.80	159.29	---	---	---	---	---	---
22	159.50	159.59	159.59	159.69	159.75	159.25	---	---	---	---	---	---
23	159.45	159.71	159.67	159.67	159.72	159.42	---	---	---	---	e159.85	---
24	159.44	159.72	159.67	159.68	159.71	159.43	---	---	---	---	---	---
25	159.58	159.69	159.66	159.72	159.80	159.40	---	---	---	---	---	---
26	159.57	159.60	159.68	159.72	159.77	159.36	---	---	---	---	---	---
27	159.38	159.58	159.73	159.70	159.65	159.45	---	---	---	---	---	---
28	159.53	159.66	159.73	159.70	159.71	159.39	e159.19	---	---	---	---	---
29	159.59	159.66	159.59	159.72	---	159.57	---	---	---	---	---	---
30	159.59	159.62	159.54	159.76	---	159.47	---	---	---	---	---	---
31	159.47	---	159.58	159.67	---	159.40	---	---	---	---	---	---
MAX	159.64	159.72	159.75	159.76	159.82	159.71	159.45	---	159.57	159.72	159.85	---

e Estimated

SITE NUMBER FROM LOCATION MAP.—39.

COUNTY.—Fall River.

LOCAL WELL NUMBER.—7S4E19BCCB.

SITE ID (STATION NUMBER).—432548103414801.

OTHER IDENTIFIERS.—FR-92A.

LOCATION.—Lat 43°25′48″, long 103°41′48″, in SW¼SW¼NW¼ sec. 19, T. 7 S., R. 4 E., Hydrologic Unit 10120106, about 10 mi west of Hot Springs. Owner: South Dakota Department of Environment and Natural Resources.

AQUIFER.—Madison.

WELL CHARACTERISTICS.—Drilled observation well, 1,540 ft deep with 1,339 ft of 5-in. steel casing; 4.5-in. steel casing from 1,309 to 1,540 ft; bottom 14 ft slotted with ¼ by 1¼-in. vertical slots.

INSTRUMENTATION.—Electronic data logger with pressure transducer. Prior to Jan. 27, 1994, intermittent taped measurements.

DATUM.—Elevation of land-surface datum is 4,173.45 ft above sea level. Measuring point: Top of steel casing, 2.1 ft above land-surface datum.

REMARKS.—Available records fair.

PERIOD OF RECORD.—September 1992 to September 1994.

EXTREMES.—Highest daily water level, 535.61 ft below land-surface datum, June 14, 1994; lowest daily water level, 538.60 ft below land-surface datum, Sept. 16, 1992.

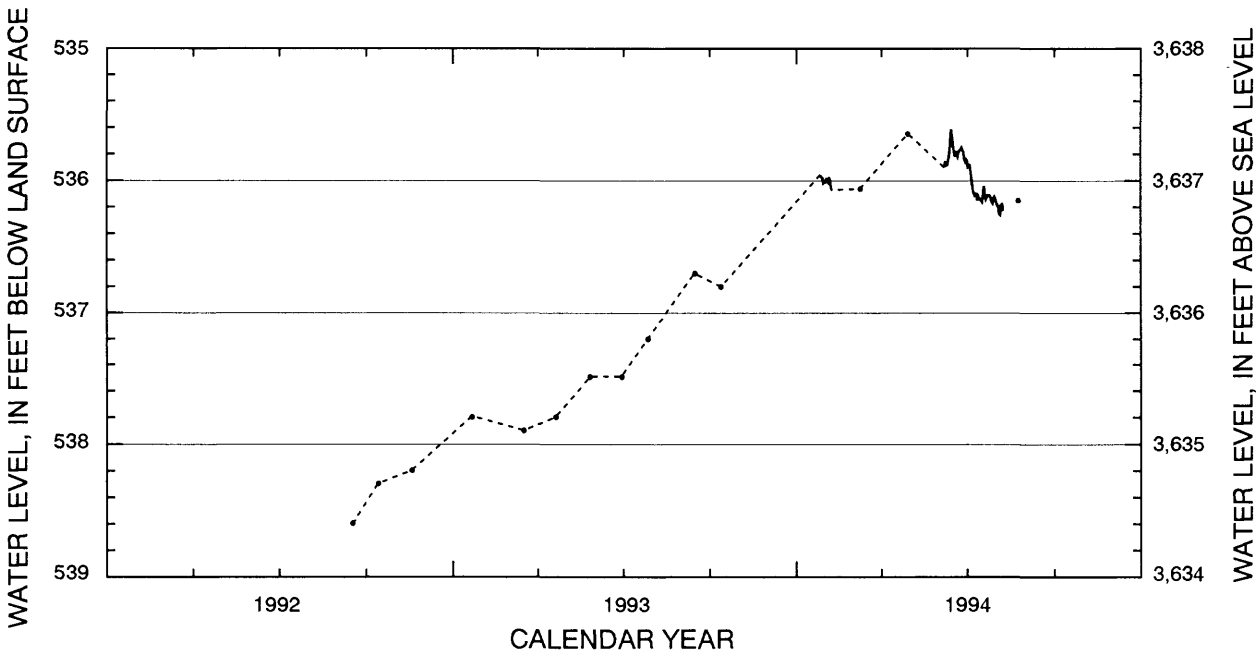

Figure 46. Hydrograph for observation well 7S4E19BCCB (site number 39).

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
16	---	---	---	---	---	---	---	---	---	---	---	538.60

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	e538.30	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	e536.70
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	e537.90	---	---	---	---	---	---
18	---	e538.20	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	e537.80	---	---	---	---	---
21	---	---	---	e537.80	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	e537.50	---	---	---	---
27	---	---	---	---	---	---	---	---	---	e537.20	---	---
28	---	---	---	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	e537.50	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MAX	538.30	538.20	---	537.80	---	537.90	537.80	537.50	537.50	537.20	---	536.70

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	536.01	---	---	---	---	535.85	536.16	---
2	---	---	---	---	535.99	---	---	---	---	535.89	536.19	---
3	---	---	---	---	536.00	---	---	---	---	535.88	536.19	---
4	---	---	---	---	536.01	---	---	---	---	535.88	536.25	---
5	---	---	---	---	535.97	---	---	---	---	535.94	536.26	---
6	---	---	---	---	536.00	---	---	---	---	535.99	536.19	---
7	---	---	---	---	536.06	---	---	---	e535.90	536.06	536.17	---
8	---	---	---	---	---	---	---	---	535.85	536.09	536.23	---
9	---	---	---	---	---	e536.07	---	---	535.88	536.11	---	---
10	---	---	---	---	---	---	---	---	535.88	536.10	---	---
11	---	---	---	---	---	---	---	---	535.85	536.10	---	---
12	---	---	---	---	---	---	---	---	535.80	536.15	---	---
13	e536.80	---	---	---	---	---	---	---	535.71	536.12	---	---
14	---	---	---	---	---	---	---	---	535.61	536.14	---	---
15	---	---	---	---	---	---	---	---	535.66	536.14	---	---
16	---	---	---	---	---	---	---	---	535.74	536.15	---	---
17	---	---	---	---	---	---	---	---	535.78	536.16	---	---
18	---	---	---	---	---	---	---	---	535.82	536.11	---	---
19	---	---	---	---	---	---	---	---	535.78	536.04	---	---
20	---	---	---	---	---	---	---	---	535.80	536.10	---	---
21	---	---	---	---	---	---	---	---	535.82	536.14	---	---
22	---	---	---	---	---	---	---	---	535.78	536.12	---	---
23	---	---	---	---	---	---	---	---	535.77	536.11	e536.15	---
24	---	---	---	---	---	---	---	---	535.76	536.11	---	---
25	---	---	---	---	---	---	---	---	535.75	536.11	---	---
26	---	---	---	---	---	---	---	---	535.77	536.13	---	---
27	---	---	---	535.96	---	---	---	---	535.78	536.16	---	---
28	---	---	---	535.97	---	---	e535.65	---	535.84	536.17	---	---
29	---	---	---	535.98	---	---	---	---	535.86	536.13	---	---
30	---	---	---	536.02	---	---	---	---	535.84	536.12	---	---
31	---	---	---	536.01	---	---	---	---	---	536.14	---	---
MAX	536.80	---	---	536.02	536.06	536.07	535.65	---	535.90	536.17	536.26	---

e Estimated

Miscellaneous Wells

This section presents water-level data for a network of 20 miscellaneous wells at which annual measurements of water level were collected during water years 1993-94. These wells are part of a State-wide network of wells completed in bedrock aquifers, that was operated through 1989, in cooperation with DENR. Previous records for these wells have been published by Bradford (1981) and/or Winter (1994). Annual measurements at selected wells were resumed during 1993 as part of the Black Hills Hydrology Study. Many of the wells in this network are used as production wells; thus, water levels may be influenced by effects of pumping.

Locations of the miscellaneous wells are presented in figure 47. Site information and measured water levels during water years 1993-94 are presented in table 2. Brief descriptions and hydrographs for the entire period of record that is available for each site are presented in figures 48-67. Most of these wells generally have been measured annually, with the exception of the period from 1990 through 1992. Periods of record without an annual measurement generally are shown as dashed in the hydrographs.

Table 2. Site information and measured water levels for miscellaneous wells

USGS local number	Station identification number	Latitude (degrees)	Longitude (degrees)	Aquifer	Measured water level	
		(degrees, minutes, seconds)			Date	Water level (feet above (+) or below land-surface datum)
			Lawrence County			
7N1E26ACD	443215103573001	443215	1035730	Minnelusa	03-26-1993	33.49
					03-17-1994	30.21
6N2E23BBBA	442820103503501	442825	1035050	Minnelusa	03-26-1993	86.99
					03-17-1994	92.72
6N2E10BCBB	443008103514701	443008	1035147	Spearfish	04-09-1993	56.08
					09-19-1994	51.73
6N2E 4BDD	443044103525801	443044	1035258	Minnekahta	03-26-1993	39.31
					03-17-1994	38.10
			Meade County			
6N5E19AAAC	442804103330401	442804	1033304	Fall River	04-09-1993	6.14
					04-01-1994	6.50
3N6E23DCB3	441155103222501	441155	1032225	Spearfish	04-09-1993	132.06
					04-01-1994	131.95
			Pennington County			
2N8E28BCB	440622103101101	440622	1031011	Lakota	03-25-1993	127.73
					03-17-1994	136.14
1N7E14CBBD	440243103150001	440243	1031500	Sundance	03-25-1993	149.50
					03-17-1994	140.26
			Custer County			
3S7E23DDAC	434611103142501	434611	1031425	Lakota	04-29-1993	355.00
					04-08-1994	354.20
3S7E35DBB	434443103145601	434443	1031456	Lakota	04-14-1993	201.59
					04-07-1994	195.56
3S8E17BACB	434737103113301	434737	1031133	Greenhorn	04-15-1993	109.93
					04-07-1994	96.80
4S7E28DBBC	434016103171001	434016	1031710	Fall River	04-29-1993	93.50
					04-08-1994	92.38
5S6E12DAAD	433740103202801	433740	1032028	Lakota	04-15-1993	60.70
					03-31-1994	59.38
6S6E15ABDD	433150103230501	433150	1032305	Madison	04-29-1993	+71.52
					04-08-1994	+83.05
			Fall River County			
7S2E 3DAAB	432813103512701	432813	1035127	Sundance	04-20-1993	149.67
					09-29-1994	144.23
7S5E12CDBB	432704103282801	432704	1032828	Spearfish	04-20-1993	173.10
					09-20-1994	175.20
7S6E 1AAAD	432834103203301	432834	1032033	Fall River	04-20-1993	364.80
					04-08-1994	357.10
8S2E20DACC	432015103535801	432015	1035358	Lakota	04-20-1993	45.10
					09-29-1994	42.80
8S2E36ADBB	431855103491301	431855	1034913	Lakota	04-20-1993	67.13
8S2E36ADBC	431849103491301	431849	1034913	Fall River	04-20-1993	18.68

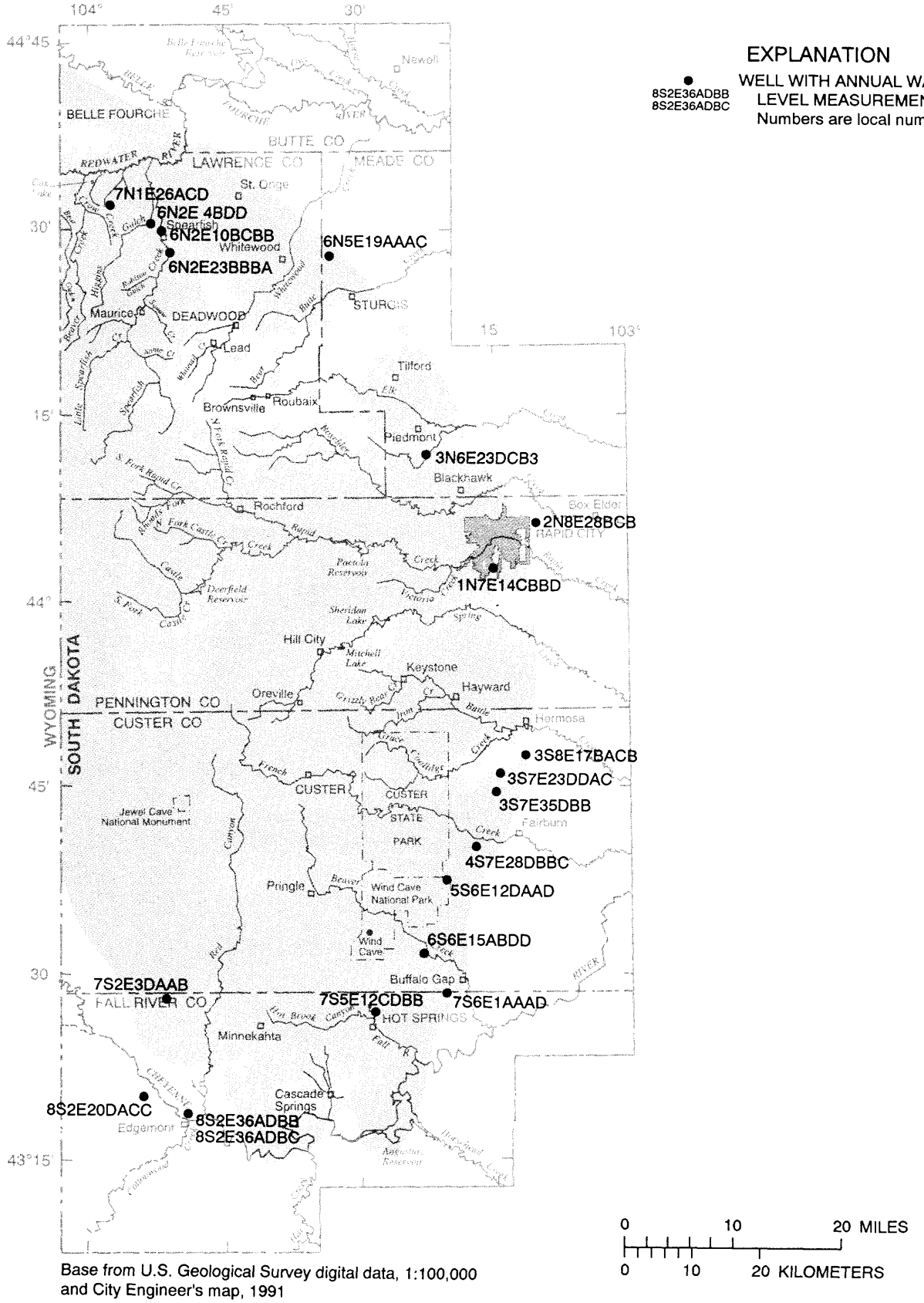

Figure 47. Location of miscellaneous wells for which annual water-level measurements are presented.

LOCAL WELL NUMBER.—7N1E26ACD.

SITE ID.—443215103573001.

COUNTY.—Lawrence.

WELL CHARACTERISTICS.—Artesian stock well in the Minnelusa Formation. Diameter, 4 in; depth, 270 ft; opening, open end; mp, top of casing, 1.00 ft above lsd; lsd, about 3,524 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 19.49 ft, May 24, 1978; lowest, 34.52 ft, May 5, 1981.

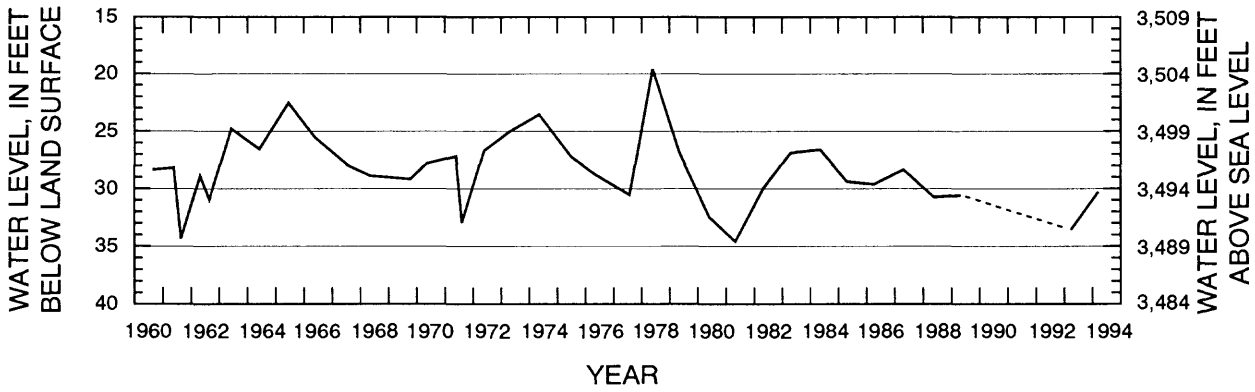

Figure 48. Hydrograph for well 7N1E26ACD.

LOCAL WELL NUMBER.—6N2E23BBBA.

SITE ID.—442820103503501.

COUNTY.—Lawrence.

WELL CHARACTERISTICS.—Unused artesian well in the Minnelusa Formation. Diameter, 8 in; depth, 415 ft (measured 264 ft, Sept. 25, 1956); opening, unknown; mp, hole in top of cap, 1.50 ft above lsd; lsd, about 3,740 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 36.07 ft, May 16, 1971; lowest, 92.72 ft, Mar. 17, 1994.

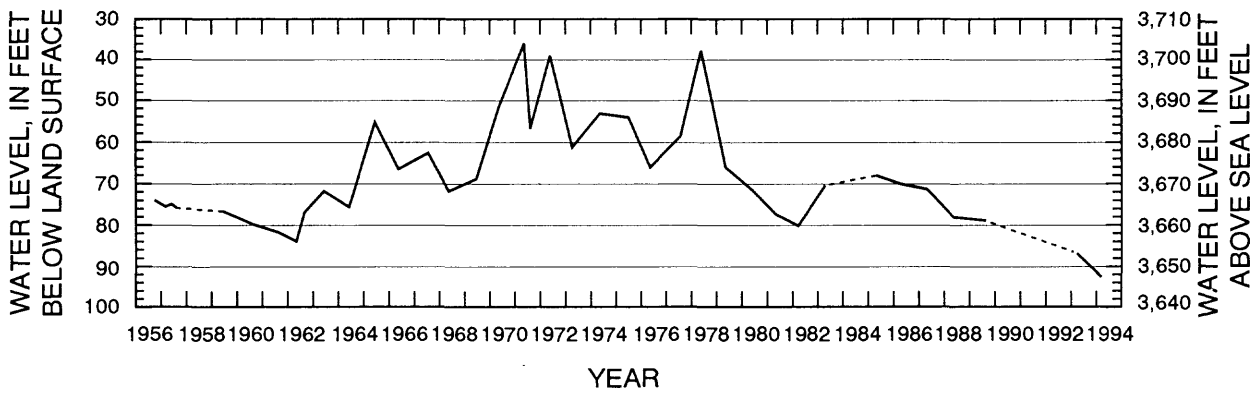

Figure 49. Hydrograph for well 6N2E23BBBA.

LOCAL WELL NUMBER.—6N2E10BCBB.

SITE ID.—443008103514701.

COUNTY.—Lawrence.

WELL CHARACTERISTICS.—Artesian domestic well in the Spearfish Formation. Diameter, 6.0 in; depth, 75 ft; opening, unknown; mp, 5.5 ft above lsd; lsd, about 3,590 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 46.08 ft, July 11, 1989; lowest, 57.42 ft, May 13, 1982.

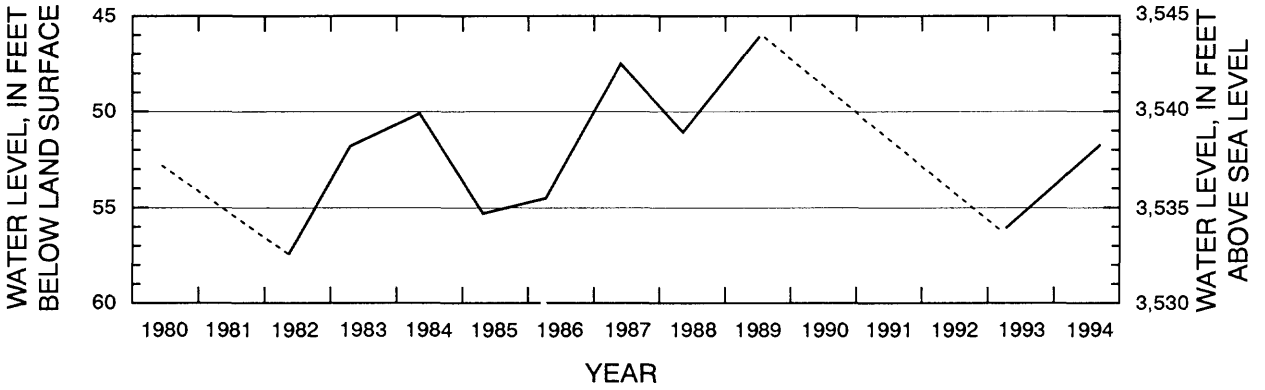

Figure 50. Hydrograph for well 6N2E10BCBB.

LOCAL WELL NUMBER.—6N2E4BDD.

SITE ID.—443044103525801.

COUNTY.—Lawrence.

WELL CHARACTERISTICS.—Artesian stock well in the Minnekahta Limestone. Diameter, 6.0 in; depth, 70 ft; opening, perforated 55-70 ft; mp, top of casing, 0.50 ft above lsd; lsd, about 3,540 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 31.91 ft, June 4, 1980; lowest, 39.84 ft, May 11, 1982.

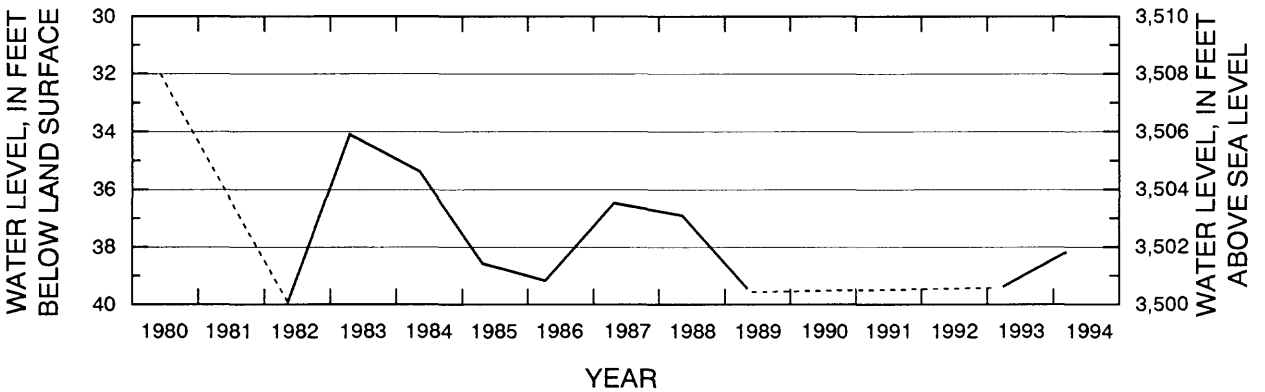

Figure 51. Hydrograph for well 6N2E4BDD.

LOCAL WELL NUMBER.—6N5E19AAAC.

SITE ID.—442804103330401.

COUNTY.—Meade.

WELL CHARACTERISTICS.—Artesian domestic well in the Fall River Formation. Diameter, 4.0 in; depth, 285 ft; opening, perforated 205-285 ft; mp, 1.00 ft above lsd; lsd, about 3,325 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 4.31 ft, Apr. 21, 1983; lowest, 7.70 ft, May 8, 1989.

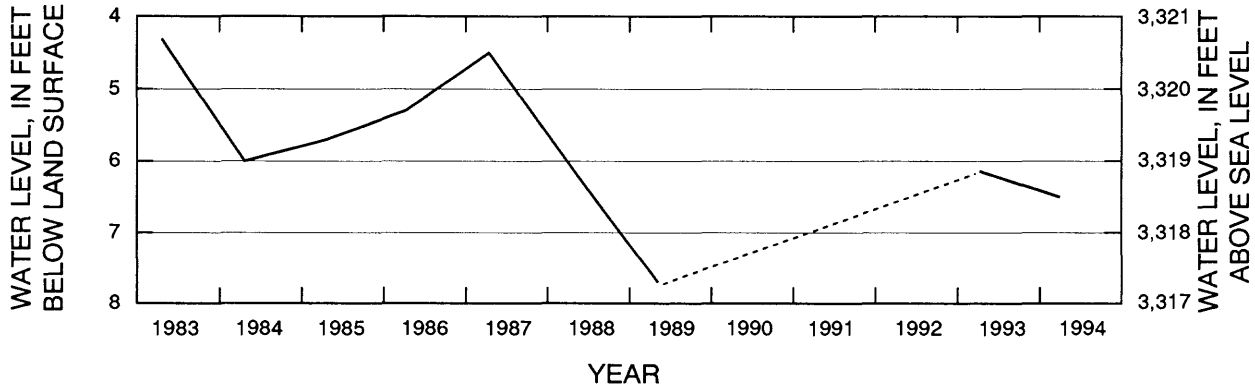

Figure 52. Hydrograph for well 6N5E19AAAC.

LOCAL WELL NUMBER.—3N6E23DCB3.

SITE ID.—441155103222501.

COUNTY.—Meade.

WELL CHARACTERISTICS.—Artesian well in the Spearfish Formation. Diameter, 6.62 in; depth, 135 ft; opening, perforated 110-120 ft; mp, 0.70 above lsd; lsd, about 3,510 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 88.00 ft, Apr. 18, 1985; lowest, 132.06 ft, Apr. 9, 1993.

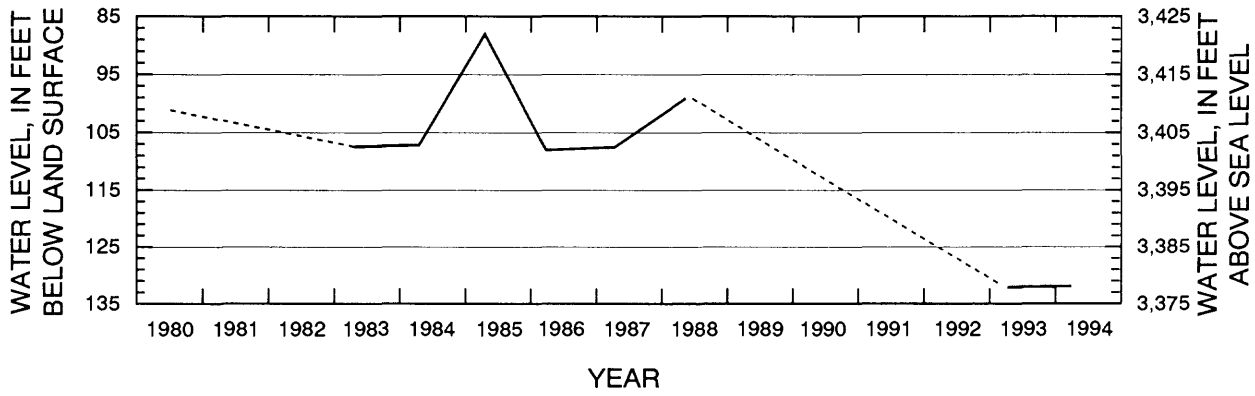

Figure 53. Hydrograph for well 3N6E23DCB3.

LOCAL WELL NUMBER.—2N8E28BCB.

SITE ID.—440622103101101.

COUNTY.—Pennington.

WELL CHARACTERISTICS.—Industrial supply well in the Lakota Formation. Diameter, unknown; depth, 1,648 ft; opening, unknown; mp, 0.00 ft at lsd; lsd, about 3,128 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 81.57 ft, Apr. 27, 1983; lowest, 136.14 ft, Mar. 17, 1994.

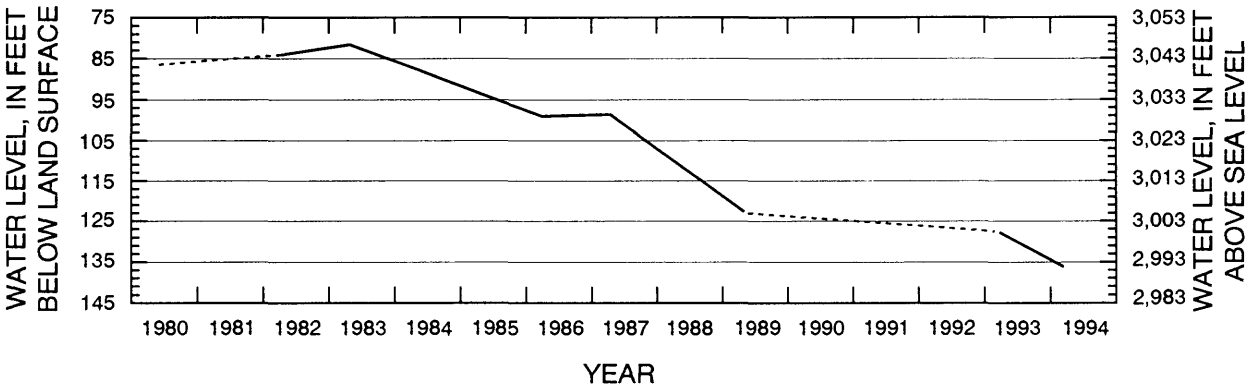

Figure 54. Hydrograph for well 2N8E28BCB.

LOCAL WELL NUMBER.—1N7E14CBBD.

SITE ID.—440243103150001.

COUNTY.—Pennington.

WELL CHARACTERISTICS.—Artesian well (usage unknown) in the Sundance Formation. Diameter, unknown; depth, unknown; opening, unknown; mp, unknown; lsd, about 3,870 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 136.14 ft, Apr. 27, 1983; lowest, 171.60 ft, June 30, 1989.

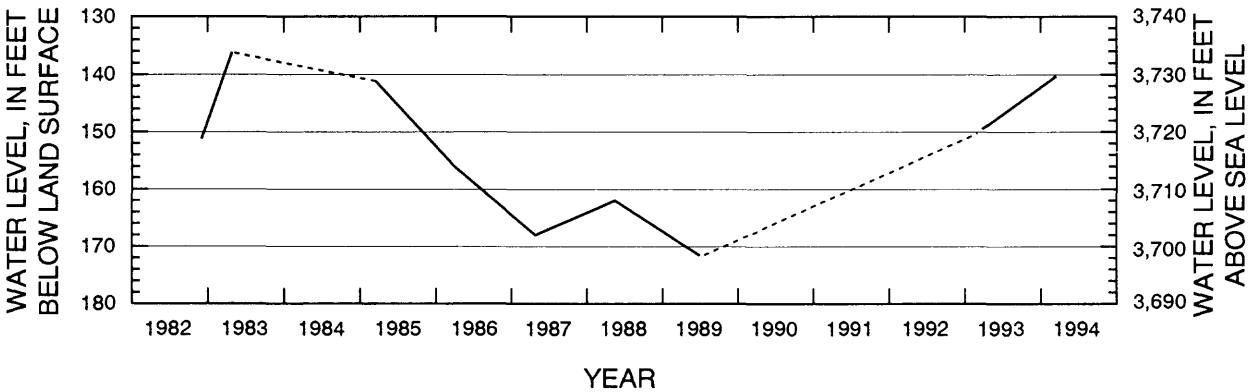

Figure 55. Hydrograph for well 1N7E14CBBD.

LOCAL WELL NUMBER.—3S7E23DDAC.

SITE ID.—434611103142501.

COUNTY.—Custer.

WELL CHARACTERISTICS.—Artesian stock well in the Lakota Formation. Diameter, 5.0 in; depth, 355 ft; opening, perforated 300-355 ft; mp, 0.0 ft at lsd; lsd, about 3,590 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 341.09 ft, May 27, 1982; lowest, 355.00 ft, Apr. 29, 1993.

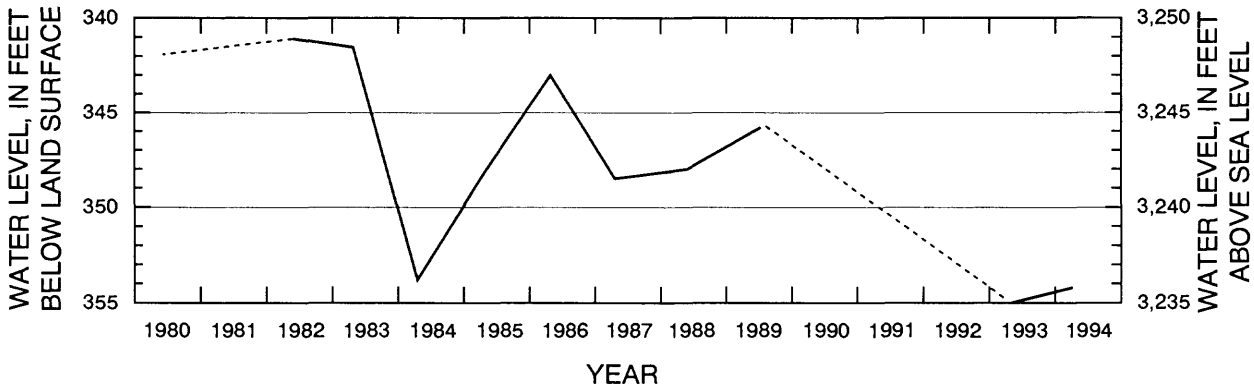

Figure 56. Hydrograph for well 3S7E23DDAC.

LOCAL WELL NUMBER.—3S7E35DBB.

SITE ID.—434443103145601.

COUNTY.—Custer.

WELL CHARACTERISTICS.—Artesian well (usage unknown) in the Lakota Formation. Diameter, unknown; depth, 345 ft; opening, unknown; mp, 0.00 ft on Apr. 15, 1987; lsd, about 3,650 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 187.17 ft, June 5, 1980; lowest, 201.59 ft, Apr. 14, 1993.

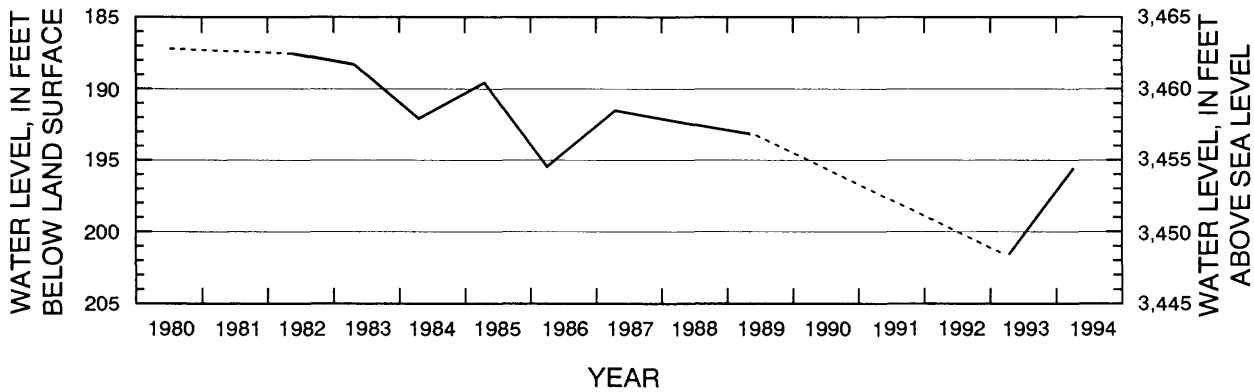

Figure 57. Hydrograph for well 3S7E35DBB.

LOCAL WELL NUMBER.—3S8E17BACB.

SITE ID.—434737103113301.

COUNTY.—Custer.

WELL CHARACTERISTICS.—Unused artesian well in the Greenhorn Formation. Diameter, 8.62 in; depth, 428 ft; opening, unknown; mp, 0.90 ft above lsd; lsd, about 3,522 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 94.10 ft, May 31, 1988; lowest, 109.93 ft, Apr. 15, 1993.

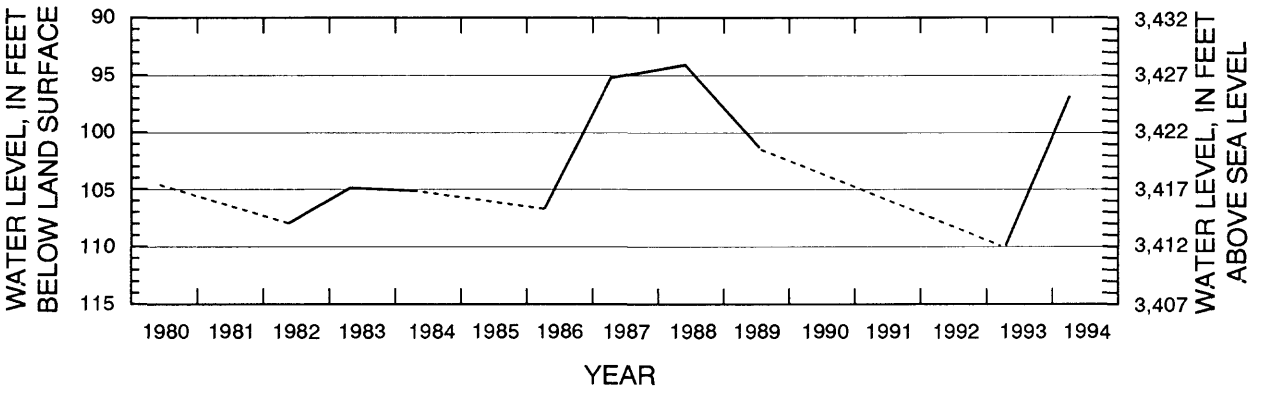

Figure 58. Hydrograph for well 3S8E17BACB.

LOCAL WELL NUMBER.—4S7E28DBBC.

SITE ID.—434016103171001.

COUNTY.—Custer.

WELL CHARACTERISTICS.—Artesian stock well in the Fall River Formation. Diameter, 6 in; depth, 250 ft; opening, unknown; mp, top of well cover, 1.5 ft above lsd (since 1973); lsd, about 3,580 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 88.92 ft, May 8, 1974; lowest, 95.50 ft, May 25, 1988.

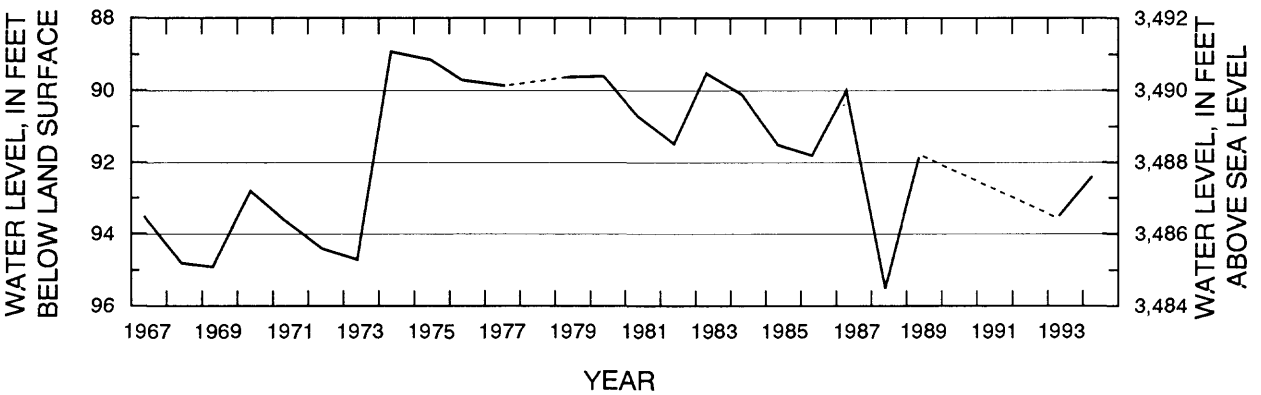

Figure 59. Hydrograph for well 4S7E28DBBC.

LOCAL WELL NUMBER.—5S6E12DAAD.

SITE ID.—433740103202801.

COUNTY.—Custer.

WELL CHARACTERISTICS.—Unused well in the Lakota Formation. Diameter, 6.0 in; depth, 220 ft; opening, unknown; mp, top of casing, 0.52 ft above lsd on July 12, 1989; lsd, about 3,765 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 54.20 ft, Apr. 28, 1986; lowest, 61.46, July 12, 1989.

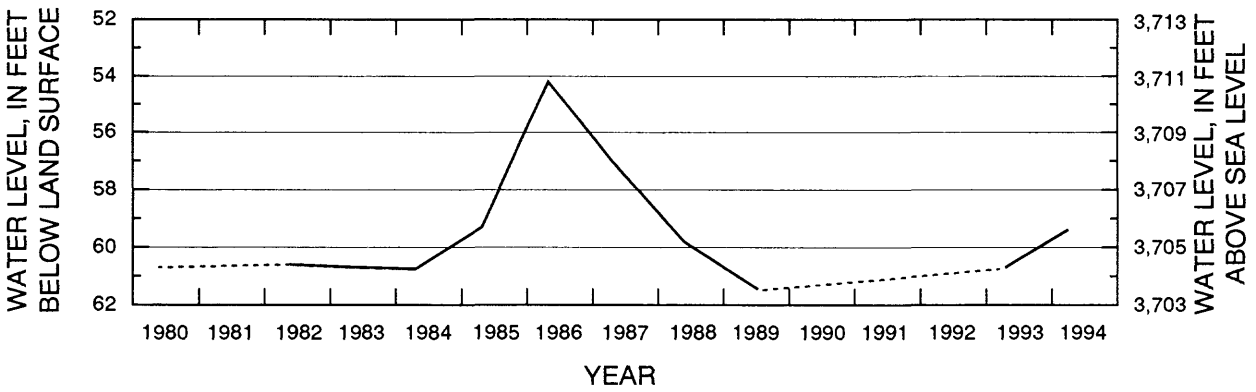

Figure 60. Hydrograph for well 5S6E12DAAD.

LOCAL WELL NUMBER.—6S6E15ABDD.

SITE ID.—433150103230501.

COUNTY.—Custer.

WELL CHARACTERISTICS.—Artesian domestic well in the Madison Limestone. Diameter, 7 in; depth, 939 ft; opening, perforated 929-939 ft and open end; mp, 0.4 ft below lsd; lsd, about 3,520 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, +83.05 ft, Apr. 8, 1994; lowest, +18.46 ft, May 25, 1988.

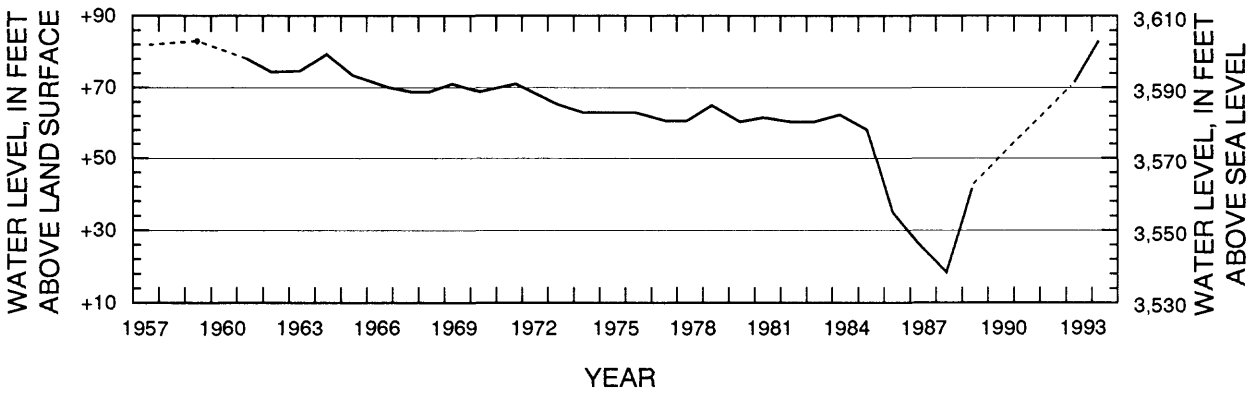

Figure 61. Hydrograph for well 6S6E15ABDD.

LOCAL WELL NUMBER.—7S2E3DAAB.

SITE ID.—432813103512701.

COUNTY.—Fall River.

WELL CHARACTERISTICS.—Unused well in the Sundance Formation. Diameter, 3.0 in; depth, 220 ft; opening, unknown; mp, 0.0 ft at lsd on Apr. 23, 1987; lsd, about 4,125 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 144.23 ft, Sept. 29, 1994; lowest, 153.50 ft, May 23, 1989.

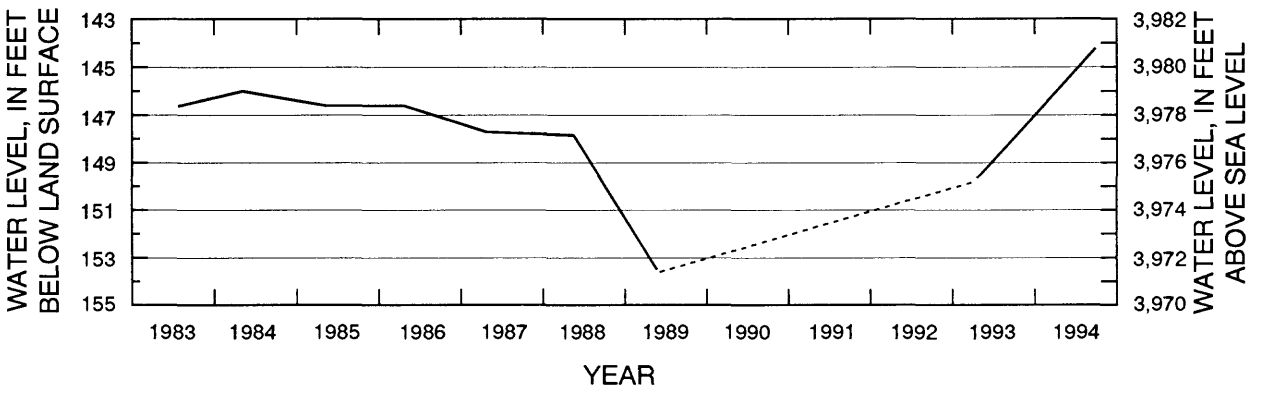

Figure 62. Hydrograph for well 7S2E3DAAB.

LOCAL WELL NUMBER.—7S5E12CDBB.

SITE ID.—432704103282801

COUNTY.—Fall River.

WELL CHARACTERISTICS.—Public supply well in the Spearfish Formation (previously published as Minnelusa Formation). Diameter, unknown; depth, 300 ft; opening, unknown; mp, 6.00 below lsd; lsd, about 3,640 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 156.90 ft, Apr. 7, 1985; lowest, 195.30 ft, May 16, 1988.

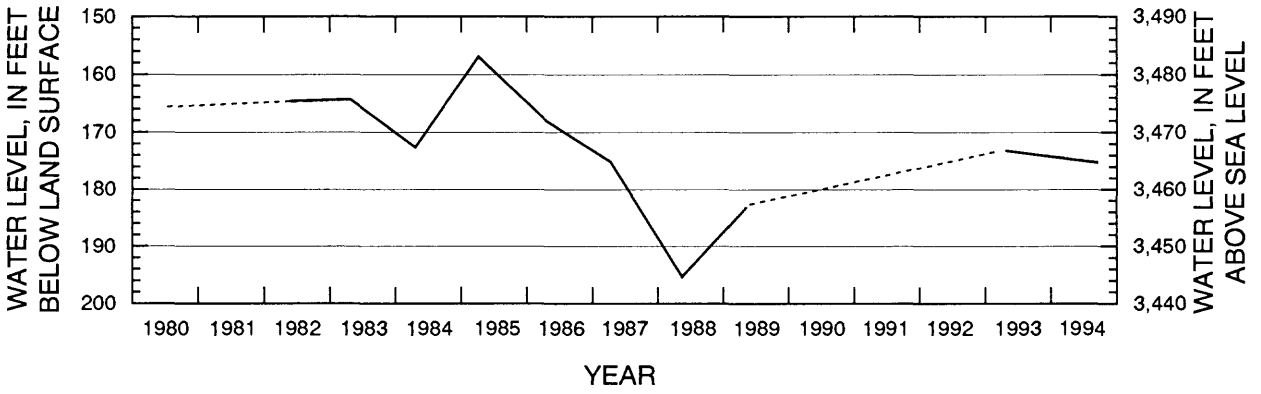

Figure 63. Hydrograph for well 7S5E12CDBB.

LOCAL WELL NUMBER.—7S6E1AAAD.

SITE ID.—432834103203301.

COUNTY.—Fall River.

WELL CHARACTERISTICS.—Artesian domestic well in the Fall River Formation. Diameter, 6.25 in; depth, 640 ft; opening, perforated 607-640 ft; mp, 0.70 ft above lsd; lsd, about 3,410 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 342.00 ft, May 22, 1980; lowest, 364.80 ft, Apr. 20, 1993.

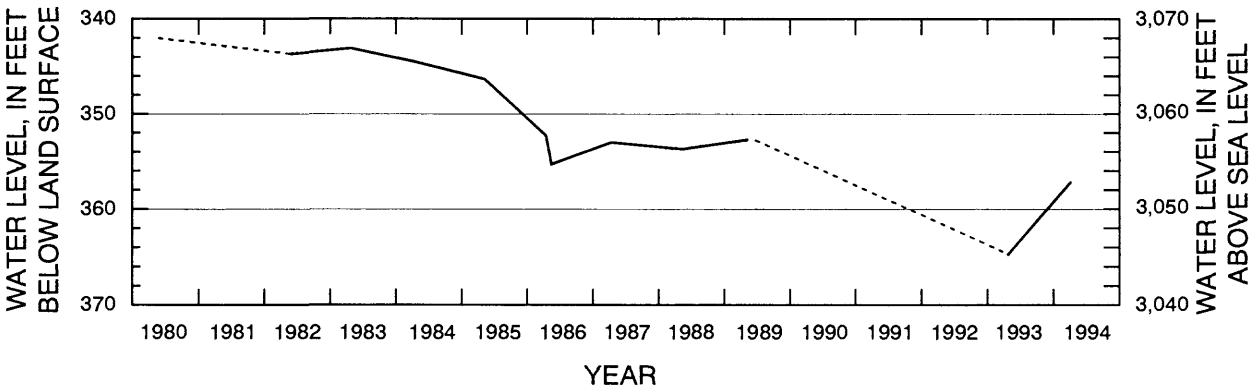

Figure 64. Hydrograph for well 7S6E1AAAD.

LOCAL WELL NUMBER: 8S2E20DACC.

SITE ID: 432015103535801

COUNTY.—Fall River.

WELL CHARACTERISTICS.—Artesian stock well in the Lakota Formation. Diameter, 5 in; depth, 410 ft; opening, open end; mp, top of casing, 0.6 ft above lsd; lsd, about 3,532 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 22.69 ft, Mar. 1, 1957; lowest, 45.10 ft, Apr. 20, 1993.

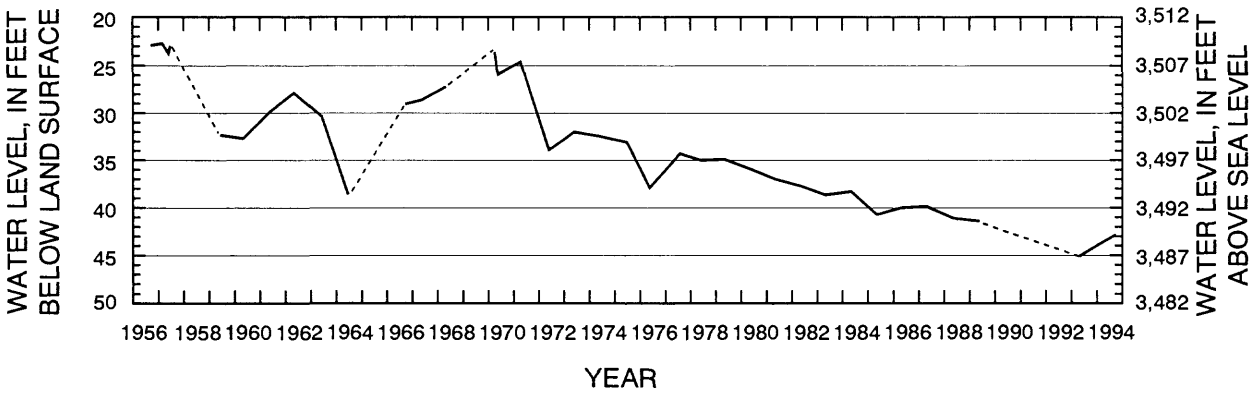

Figure 65. Hydrograph for well 8S2E20DACC.

LOCAL WELL NUMBER.—8S2E36ADBB.

SITE ID.—431855103491301.

COUNTY.—Fall River.

WELL CHARACTERISTICS.—Artesian domestic well in the Lakota Formation. Diameter, 6 in; depth, 320 ft; opening, unknown; mp, top of casing, 0.7 ft above lsd; lsd, about 3,475 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 56.50 ft, Apr. 22, 1969; lowest, 81.73 ft, June 12, 1980.

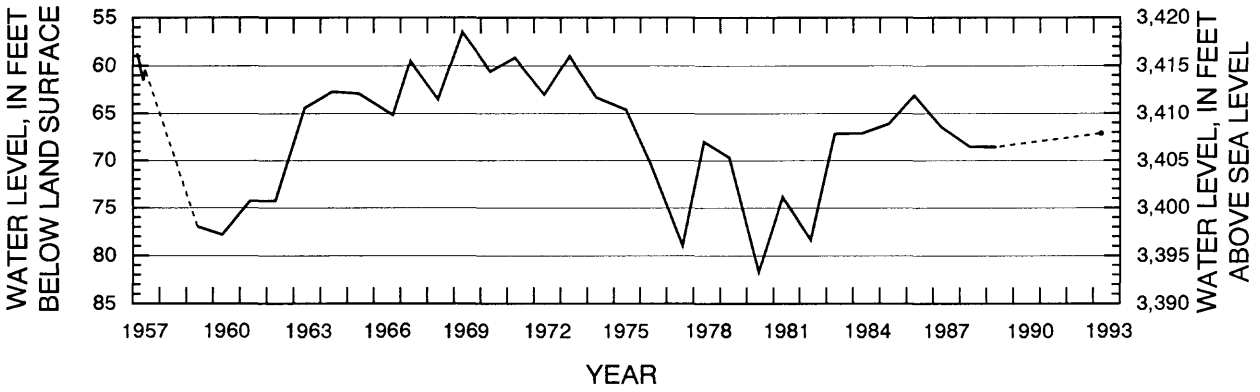

Figure 66. Hydrograph for well 8S2E36ADBB.

LOCAL WELL NUMBER.—8S2E36ADBC.

SITE ID.—431849103491301.

COUNTY.—Fall River.

WELL CHARACTERISTICS.—Artesian domestic well in the Fall River Formation. Diameter, 7.87 in; depth, 340 ft; opening, perforated 240-320 ft, 320-340 ft; mp, 0.65 above lsd; lsd, about 3,428 ft.

EXTREMES FOR PERIOD OF RECORD.—Highest, 14.65 ft, Apr. 21, 1986; lowest, 28.68 ft, May 27, 1982.

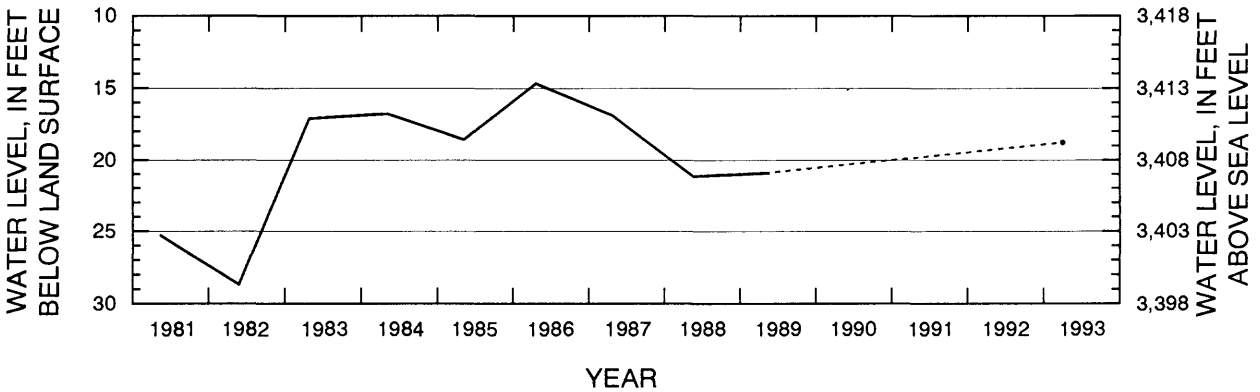

Figure 67. Hydrograph for well 8S2E36ADBC.

Drawdown and Recovery Data

Drawdown and/or recovery data were collected for five wells that were pumped (or flowed) for collection of water-quality samples. All of these wells are part of the observation well network that is operated in cooperation with DENR (fig. 7, table 1). The following section presents site information that can be referenced to figure 7 and table 1; as well as production, drawdown, and/or recovery data for each well.

Pumping rates were measured by filling a 5-gallon bucket. The production rate used to calculate specific capacity was about the maximum pumping rate for which a constant water level could be maintained without exposing the pump.

SITE NUMBER FROM FIGURE 7 AND TABLE 1.—3.

LOCAL WELL NUMBER.—7N1E33CCDD2.

SITE ID (STATION NUMBER).—443100104002002.

OTHER IDENTIFIER.—LA-87B.

AQUIFER.—Minnelusa.

DATE.—Apr. 11-12, 1994.

STATIC WATER LEVEL.—22.0 ft below top of casing.

PRODUCTION WATER LEVEL.—121.0 ft below top of casing.

PRODUCTION RATE.—30 gal/min.

PUMPING PERIOD.—1.5 hours.

SPECIFIC CAPACITY.—0.30 (gal/min)/ft.

Table 3. Drawdown and recovery data for well 7N1E33CCDD2

[N/A, not applicable; --, no data available]

Drawdown data			Recovery data		
Elapsed time since pump started (minutes:seconds)	Approximate pumping rate (gallons per minute)	Water level (feet below top of casing)	Elapsed time since pump off (minutes:seconds)	Approximate pumping rate (gallons per minute)	Water level (feet below top of casing)
0:00	0	22.0	N/A	30	121.1
1:00	8.1	31.2	0:00	Pump off	121.1
2:00	8.1	35.5	0:30	0	105.5
3:00	8.1	38.5	1:00	0	97.0
4:00	8.1	40.8	2:00	0	83.4
5:00	Undetermined	42.5	3:00	0	73.2
6:00	Undetermined	43.9	4:00	0	65.7
7:00	Undetermined	44.9	5:00	0	59.4
8:00	Undetermined	45.5	6:00	0	54.3
9:00	Undetermined	45.8	7:00	0	50.1
10:00	Undetermined	45.8	8:00	0	46.6
11:00	6.4	45.5	9:00	0	43.7
12:00	6.4	45.0	10:00	0	41.2
13:00	6.4	44.8	11:00	0	39.2
14:00	6.4	44.7	12:00	0	37.5

Table 3. Drawdown and recovery data for well 7N1E33CCDD2—Continued

Drawdown data			Recovery data		
Elapsed time since pump started (minutes:seconds)	Approximate pumping rate (gallons per minute)	Water level (feet below top of casing)	Elapsed time since pump off (minutes:seconds)	Approximate pumping rate (gallons per minute)	Water level (feet below top of casing)
15:00	Undetermined	44.8	13:00	0	36.0
16:00	20	54.8	14:00	0	34.8
17:00	Undetermined	61.6	15:00	0	33.7
18:00	Undetermined	66.0	16:00	0	32.7
19:00	Undetermined	69.2	17:00	0	31.8
20:00	Undetermined	72.1	18:00	0	31.1
21:00	Undetermined	74.2	19:00	0	30.4
22:00	20	75.9	20:00	0	29.9
23:00	Undetermined	77.3	21:00	0	29.3
24:00	Undetermined	78.5	22:00	0	28.9
25:00	Undetermined	79.7	23:00	0	28.5
30:00	20	82.7	24:00	0	28.2
35:00	Undetermined	84.2	25:00	0	27.9
40:00	19	85.0	26:00	0	27.6
45:00	Undetermined	85.2	27:00	0	27.3
46:00	30	95.1	28:00	0	27.1
47:00	Undetermined	100.9	29:00	0	26.9
48:00	Undetermined	104.8	30:00	0	26.8
49:00	Undetermined	107.6	35:00	0	26.0
50:00	Undetermined	109.8	40:00	0	25.6
51:00	Undetermined	111.4	45:00	0	25.2
52:00	Undetermined	112.8	50:00	0	24.9
53:00	30	113.9	55:00	0	24.9
54:00	Undetermined	114.8	60:00	0	24.8
55:00	Undetermined	115.7	65:00	0	24.6
60:00	Undetermined	118.0	70:00	0	24.5
65:00	30	119.1	75:00	0	24.4
70:00	Undetermined	119.7	--	--	--
75:00	30	120.1	--	--	--
80:00	Undetermined	120.4	--	--	--
85:00	30	120.5	--	--	--
90:00	Undetermined	120.6	--	--	--
94:00	Undetermined	120.7	--	--	--
95:00	15	111.6	--	--	--
96:00	Undetermined	104.0	--	--	--
97:00	Undetermined	98.8	--	--	--
98:00	Undetermined	94.8	--	--	--

Table 3. Drawdown and recovery data for well 7N1E33CCDD2—Continued

Drawdown data			Recovery data		
Elapsed time since pump started (minutes:seconds)	Approximate pumping rate (gallons per minute)	Water level (feet below top of casing)	Elapsed time since pump off (minutes:seconds)	Approximate pumping rate (gallons per minute)	Water level (feet below top of casing)
99:00	Undetermined	91.6	--	--	--
100:00	Undetermined	89.2	--	--	--
101:00	Undetermined	88.2	--	--	--
102:00	Undetermined	85.7	--	--	--
103:00	Undetermined	84.2	--	--	--
104:00	Undetermined	83.2	--	--	--
105:00	15	82.3	--	--	--
106:00	Undetermined	81.3	--	--	--
107:00	Undetermined	80.5	--	--	--
108:00	Undetermined	80.1	--	--	--
109:00	Undetermined	79.7	--	--	--
110:00	Undetermined	79.3	--	--	--
115:00	Undetermined	78.0	--	--	--
116:00	Undetermined	77.8	--	--	--
117:00	5.2	70.2	--	--	--
118:00	Undetermined	64.8	--	--	--
119:00	Undetermined	61.0	--	--	--
120:00	Undetermined	57.9	--	--	--
121:00	Undetermined	55.7	--	--	--
122:00	Undetermined	54.3	--	--	--
123:00	Undetermined	53.0	--	--	--
124:00	Undetermined	51.9	--	--	--
125:00	Undetermined	--	--	--	--
126:00	Undetermined	49.4	--	--	--
130:00	Undetermined	48.9	--	--	--
135:00	Undetermined	46.0	--	--	--
140:00	Undetermined	42.8	--	--	--
150:00	Undetermined	46.0	--	--	--
166:00	Undetermined	45.7	--	--	--

SITE NUMBER FROM FIGURE 7 AND TABLE 1.—4.
LOCAL WELL NUMBER.—7N1E33CCDD.
SITE ID (STATION NUMBER).—443100104002001.
OTHER IDENTIFIER.—LA-87A.
AQUIFER.—Madison.
DATE.—Apr. 12, 1994
STATIC WATER LEVEL.—About 73.9 ft above land-surface datum.
PRODUCTION WATER LEVEL.—Unknown.
PRODUCTION RATE.—Flowed at about 240 gal/min.
PUMPING PERIOD.—2.5 hours.
SPECIFIC CAPACITY.—Unknown.
REMARKS.—No significant change in flow rate during period.

SITE NUMBER FROM FIGURE 7 AND TABLE 1.—37.

LOCAL WELL NUMBER.—6S6E21BBBB.

SITE ID (STATION NUMBER).—433115103251401.

OTHER IDENTIFIER.—CU-91A and 7-11 Ranch 1.

AQUIFER.—Madison.

DATE.—Mar. 31, 1994.

STATIC WATER LEVEL.—8.0 ft below top of casing.

PRODUCTION WATER LEVEL.—135.8 ft below top of casing.

PRODUCTION RATE.—10.7 gal/min.

PUMPING PERIOD.—6 hours.

SPECIFIC CAPACITY.—0.084 (gal/min)/ft.

REMARKS.—Complete recovery data could not be collected because tape became stuck.

Table 4. Drawdown and recovery data for well 6S6E21BBBB

[N/A, not applicable; --, no data available]

Drawdown data			Recovery data		
Elapsed time since pump started (minutes:seconds)	Approximate pumping rate (gallons per minute)	Water level (feet below top of casing)	Elapsed time since pump off (minutes:seconds)	Approximate pumping rate (gallons per minute)	Water level (feet below top of casing)
0:00	0	8.0	N/A	10.7	135.8
1:48	10	36.0	0:00	Pump off	135.8
2:20	10	40.0	0:30	0	129.0
3:00	10	44.8	1:00	0	122.8
3:35	10	48.0	2:00	0	111.3
4:00	10	49.2	3:00	0	100.4
4:30	10	51.8	4:00	0	90.2
5:05	10	55.2	5:00	0	80.8
5:30	10	57.5	7:00	0	Stuck tape
6:00	10	59.9	--	--	--
6:30	10	62.4	--	--	--
7:00	10	64.8	--	--	--
7:30	10	67.0	--	--	--
8:00	10	69.2	--	--	--
9:00	10	74.0	--	--	--
10:00	10	77.3	--	--	--
11:00	10	79.9	--	--	--
12:00	10	82.1	--	--	--
13:00	10	84.1	--	--	--
14:00	10	85.9	--	--	--
15:00	10	87.6	--	--	--
16:00	10	89.1	--	--	--

Table 4. Drawdown and recovery data for well 6S6E21BBBB—Continued

Drawdown data			Recovery data		
Elapsed time since pump started (minutes:seconds)	Approximate pumping rate (gallons per minute)	Water level (feet below top of casing)	Elapsed time since pump off (minutes:seconds)	Approximate pumping rate (gallons per minute)	Water level (feet below top of casing)
17:00	10	90.5	--	--	--
18:00	10	91.8	--	--	--
19:00	10	93.0	--	--	--
20:00	10	94.1	--	--	--
21:00	10	95.1	--	--	--
22:00	10	96.0	--	--	--
23:00	10	96.8	--	--	--
24:00	10	97.5	--	--	--
25:00	10	98.2	--	--	--
30:00	10	101.0	--	--	--
35:00	10	102.8	--	--	--
40:00	10	104.1	--	--	--
45:00	10	105.0	--	--	--
50:00	10	105.7	--	--	--
55:00	10	106.1	--	--	--
60:00	10	106.4	--	--	--
65:00	10	106.6	--	--	--
70:00	10	106.8	--	--	--
80:00	10	107.0	--	--	--
82:07	15.8	126.5	--	--	--
83:00	15.8	133.2	--	--	--
83:30	15.8	136.8	--	--	--
84:00	15.8	140.2	--	--	--
85:00	15.8	146.2	--	--	--
86:00	15.8	152.0	--	--	--
87:00	15.8	157.2	--	--	--
88:00	15.8	162.0	--	--	--

SITE NUMBER FROM FIGURE 7 AND TABLE 1.—38.

LOCAL WELL NUMBER.—6S6E21BBBB2.

SITE ID (STATION NUMBER).—433115103251402.

OTHER IDENTIFIER.—CU-91B and 7-11 Ranch 2.

AQUIFER.—Minnelusa.

DATE.—Apr. 5, 1994.

STATIC WATER LEVEL.—161.1 ft below top of casing.

PRODUCTION WATER LEVEL.—289.6 ft below top of casing.

PRODUCTION RATE.—13 gal/min.

PUMPING PERIOD.—4 hours.

SPECIFIC CAPACITY.—0.10 (gal/min)/ft.

REMARKS.—Drawdown test interrupted because tape became stuck.

Table 5. Drawdown and recovery data for well 6S6E21BBBB2

[N/A, not applicable; --, no data available]

Drawdown data			Recovery data		
Elapsed time since pump started (minutes:seconds)	Approximate pumping rate (gallons per minute)	Water level (feet below top of casing)	Elapsed time since pump off (minutes:seconds)	Approximate pumping rate (gallons per minute)	Water level (feet below top of casing)
0:00	0	161.1	N/A	13	289.6
1:00	25	193.0	0:00	Pump off	289.6
2:00	25	209.0	0:30	0	282.2
3:00	25	Stuck tape	1:00	0	275.8
6:00	Pump off	--	2:00	0	264.2
			3:00	0	254.3
0:00	0	200.0	4:00	0	245.8
0:30	7.9	201.5	5:00	0	238.7
1:00	7.9	203.0	6:00	0	233.2
2:00	7.9	205.6	7:00	0	226.6
3:00	7.9	207.7	8:00	0	221.8
4:00	Undetermined	209.5	9:00	0	217.5
5:00	Undetermined	211.0	10:00	0	213.7
6:00	Undetermined	212.3	12:00	0	207.2
7:00	Undetermined	213.4	15:00	0	200.0
8:00	Undetermined	214.4	20:00	0	191.9
9:00	7.7	215.3	25:00	0	186.8
10:00	Undetermined	216.0	30:00	0	183.4
11:00	Undetermined	216.7	35:00	0	180.9
12:00	Undetermined	217.3	47:00	0	177.2
13:00	Undetermined	217.8	50:00	0	176.3
14:00	Undetermined	218.3	55:00	0	175.3

Table 5. Drawdown and recovery data for well 6S6E21BBBB2—Continued

Drawdown data			Recovery data		
Elapsed time since pump started (minutes:seconds)	Approximate pumping rate (gallons per minute)	Water level (feet below top of casing)	Elapsed time since pump off (minutes:seconds)	Approximate pumping rate (gallons per minute)	Water level (feet below top of casing)
15:00	Undetermined	218.8	60:00	0	174.5
20:00	7.3	220.3	--	--	--
25:00	7.3	221.3	--	--	--
26:00	7.3	221.9	--	--	--
26:30	16.7	227.1	--	--	--
27:00	16.7	231.8	--	--	--
28:00	Undetermined	239.8	--	--	--
29:00	Undetermined	246.3	--	--	--
30:00	Undetermined	251.4	--	--	--
31:00	Undetermined	255.7	--	--	--
32:00	Undetermined	258.9	--	--	--
33:00	Undetermined	261.8	--	--	--
34:00	Undetermined	264.0	--	--	--
35:00	15.0	266.0	--	--	--
36:00	Undetermined	267.8	--	--	--
37:00	Undetermined	269.2	--	--	--
38:00	Undetermined	270.5	--	--	--
39:00	Undetermined	271.6	--	--	--
40:00	Undetermined	272.6	--	--	--
46:00	Undetermined	276.4	--	--	--
50:00	Undetermined	279.2	--	--	--
55:00	Undetermined	282.0	--	--	--
60:00	14.3	283.6	--	--	--
65:00	Undetermined	284.8	--	--	--
70:00	13.6	285.2	--	--	--
71:00	18.8	289.9	--	--	--
72:00	Undetermined	294.1	--	--	--
73:00	Undetermined	297.3	--	--	--
74:00	Undetermined	299.8	--	--	--
75:00	Undetermined	301.8	--	--	--
80:00	17.6	307.4	--	--	--
83:00	Undetermined	309.0	--	--	--
85:00	16.7	310.0	--	--	--
90:00	Undetermined	311.2	--	--	--
95:00	Undetermined	311.6	--	--	--
100:00	16.7	312.2	--	--	--

SITE NUMBER FROM FIGURE 7 AND TABLE 1.—39.

LOCAL WELL NUMBER.—7S4E19BCCB.

SITE ID (STATION NUMBER).—432548103414801.

OTHER IDENTIFIER.—FR-92A.

AQUIFER.—Madison.

DATE.—Mar. 24, 1994.

STATIC WATER LEVEL.—540 ft below top of casing.

PRODUCTION WATER LEVEL.—701 ft below top of casing.

PRODUCTION RATE.—5.8 gal/min.

PUMPING PERIOD.—7 hours.

SPECIFIC CAPACITY.—0.036 (gal/min)/ft.

Table 6. Recovery data for well 7S4E19BCCB

[N/A, not applicable]

Elapsed time since pump started (minutes:seconds)	Approximate pumping rate (gallons per minute)	Water level (feet below top of casing)
N/A	5.8	701.0
0:00	Pump off	701.0
1:00	0	694.7
2:00	0	688.4
3:00	0	682.6
4:00	0	676.8
5:00	0	671.3
6:00	0	666.0
7:00	0	660.7
8:00	0	656.1
9:00	0	651.0
10:00	0	646.3
12:00	0	637.7
15:00	0	625.4
20:00	0	608.0
25:00	0	593.4
30:00	0	581.7
35:00	0	571.7

WATER-QUALITY DATA

Water-quality data are presented for 20 surface-water sites and 22 ground-water sites. Laboratory analyses for most constituents were performed by the USGS National Water Quality Laboratory. Analyses for suspended sediment and several selected isotopes were performed by other USGS laboratories.

Surface-Water Samples

Site information for 20 surface-water sampling sites is presented in table 7 and locations are shown in figure 68. Two sites are not shown in figure 68 because they are outside of the study area boundary. Station 06406500 is located on Battle Creek about 5 mi east of the study area boundary and station 06421500 is located on Rapid Creek about 10 mi east of the study area boundary.

Chemical analyses of surface-water samples collected during water years 1993-94 are presented in table 8. Additional water-quality data for samples collected prior to water year 1993 are available from the USGS upon request for many of the surface-water sampling sites. The percent difference between anions and cations (in milliequivalents per liter) for all samples was less than 5 percent. Samples collected for purposes of quality assurance are footnoted. No problems were identified from quality-assurance sampling.

Table 7. Site information for surface-water sampling sites for which chemical analyses are presented

Station identification number	Station name	Latitude (degrees)	Longitude (degrees)	Drainage area (square miles)
435240103261800	Grizzly Bear Creek near Keystone	435240	1032618	Undetermined
435337103253100	Battle Creek at Keystone	435337	1032531	Undetermined
435224103203900	Iron Creek near Keystone	435224	1032039	Undetermined
06404000	Battle Creek near Keystone	435221	1032010	66
06404800	Grace Coolidge Creek near Hayward	434807	1032603	7.48
06406500	Battle Creek below Hermosa	434330	1025415	285
435148103373500	Spring Creek near Oreville	435148	1033735	Undetermined
435628103324600	Spring Creek above Mitchell Lake	435628	1033246	Undetermined
06412200	Rapid Creek above Victoria Creek	440248	1032106	355
06421500	Rapid Creek near Farmingdale	435631	1025112	602
441635103414500	Elk Creek at Brownsville	441635	1034145	Undetermined
441647103380300	Elk Creek below Roubaix	441647	1033803	Undetermined
06424000	Elk Creek near Roubaix	441741	1033547	21.5
06429920	Bear Gulch near Maurice	442514	1040226	Undetermined
06430520	Beaver Creek near Maurice	442257	1040013	Undetermined
06430800	Annie Creek near Lead	441937	1035338	3.55
06430898	Squaw Creek near Spearfish	442404	1035335	6.95
06430950	Spearfish Creek below Robison Gulch	442614	1035232	Undetermined
06436156	Whitetail Creek at Lead	442036	1034557	6.15
06437020	Bear Butte Creek near Deadwood	442008	1033806	16.6

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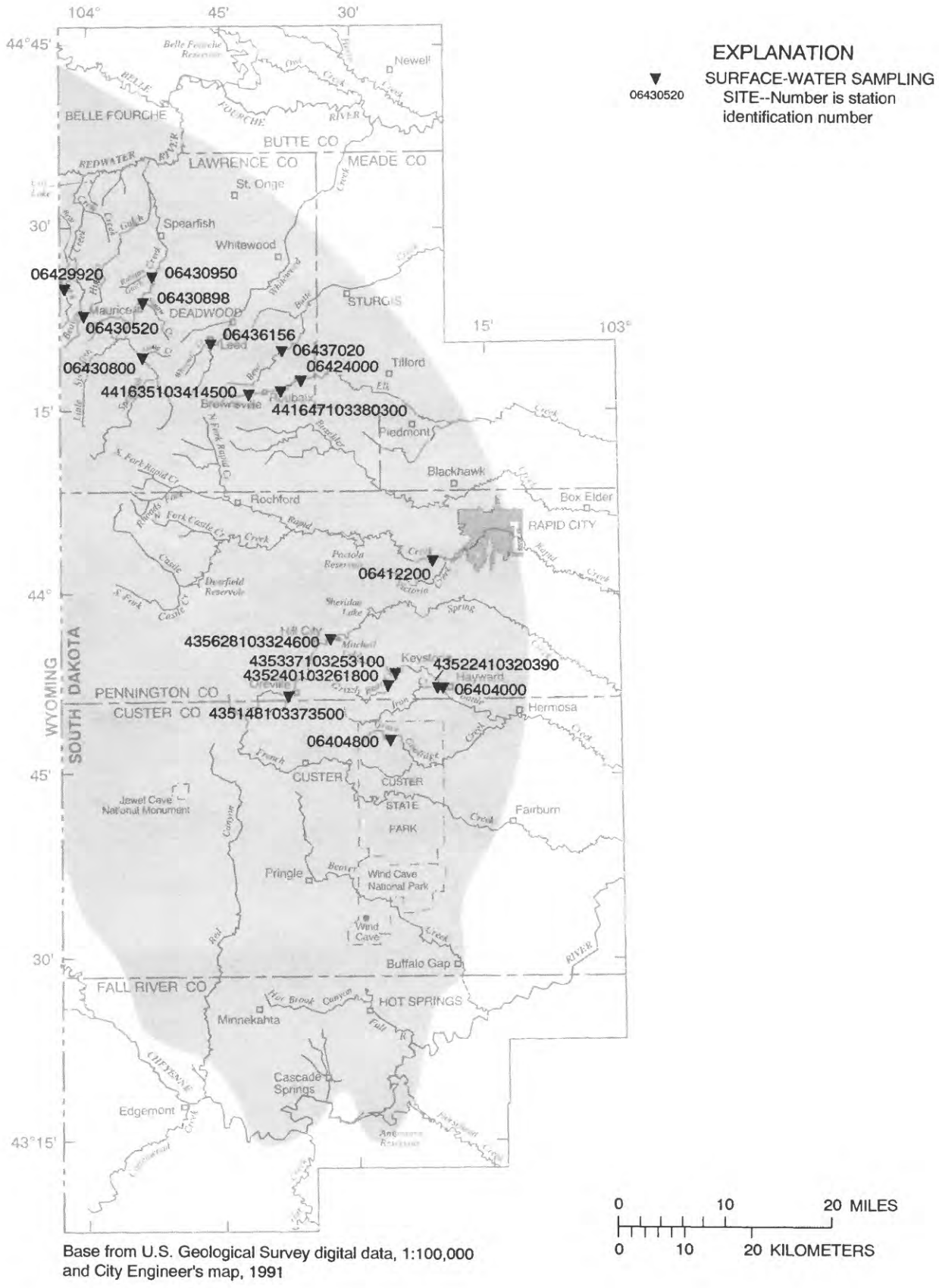

Figure 68. Location of surface-water sampling sites within the study area for which chemical analyses are presented.

Table 8. Chemical analyses of surface-water samples

[US/CM, microsiemens per centimeter; DEG C, degrees Celsius; NTU, nephelometric turbidity units; MM, millimeters; MG/L, milligrams per liter; COLS./100 ML, colonies per 100 milliliters; AC-FT, acre-feet; UG/L, micrograms per liter; PCI/L, picocuries per liter; T/DAY, tons per day; --, no data available]

STATION NUMBER	STATION NAME	DATE	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)
435240103261800	GRIZZLY BEAR CREEK NEAR KEYSTONE	01-06-94	--	101	7.1	-15.0	0.0	--
435337103253100	BATTLE CREEK AT KEYSTONE	01-06-94	0.69	345	5.9	-15.0	0.0	--
435224103203900	IRON CREEK NEAR KEYSTONE	01-05-94	1.2	173	8.6	-4.5	0.0	--
06404000	BATTLE CREEK NEAR KEYSTONE	09-07-93	5.1	353	8.4	14.5	12.5	0.80
		01-05-94	3.3	345	8.5	3.5	0.5	--
		05-31-94	5.5	275	8.3	23.0	20.0	--
		08-30-94	0.06	395	7.8	19.0	19.0	--
06404800	GRACE COOLIDGE CREEK NEAR HAYWARD	09-02-93	1.1	90	8.5	17.0	12.0	2.0
		08-30-94	0.17	110	7.7	14.5	13.0	0.40
06406500	BATTLE CREEK BELOW HERMOSA	09-07-93	19	620	8.4	21.0	16.5	3.1
		08-30-94	1.3	736	8.0	21.5	19.0	6.7
435148103373500	SPRING CREEK NEAR OREVILLE	11-09-92	1.6	385	8.3	4.0	0.5	1.6
		[1]11-09-92	--	2	7.8	--	--	0.30
435628103324600	SPRING CREEK ABOVE MITCHELL LAKE	11-09-92	2.8	358	8.6	3.5	3.0	1.3
		[2]11-09-92	2.8	358	8.6	3.5	3.0	1.3
06412200	RAPID CREEK ABOVE VICTORIA CREEK	02-09-93	18	396	8.5	-0.5	0.5	0.70
		07-28-94	68	351	8.2	14.0	12.5	--
06421500	RAPID CREEK NEAR FARMINGDALE	02-09-93	47	1030	8.5	4.0	0.0	3.8
		07-28-94	23	921	8.5	27.5	21.0	--
441635103414500	ELK CREEK AT BROWNSVILLE	11-10-92	1.4	408	8.8	-2.0	1.0	1.2
441647103380300	ELK CREEK BELOW ROUBAIX	11-10-92	2.6	384	8.3	0.0	0.0	1.6
06424000	ELK CREEK NEAR ROUBAIX	11-10-92	2.9	354	8.5	2.5	0.5	1.0
		09-07-93	4.2	339	8.6	17.0	14.0	--
		06-01-94	11	320	8.7	17.0	14.0	--
		08-29-94	2.0	352	8.2	23.0	13.5	--
06429920	BEAR GULCH NEAR MAURICE	09-08-93	0.87	273	8.4	17.0	13.0	0.30
		09-02-94	0.24	264	7.9	14.5	19.0	0.80
06430520	BEAVER CREEK NEAR MAURICE	09-08-93	0.94	264	8.3	24.0	15.0	0.30
		09-02-94	0.49	272	7.7	15.5	11.5	0.90
06430800	ANNIE CREEK NEAR LEAD	03-25-93	E0.65	376	8.4	17.0	0.0	1.7
		06-02-93	1.3	241	8.1	13.5	9.0	1.8
		08-31-93	0.29	441	8.3	22.0	10.0	--
		06-01-94	--	329	7.7	22.0	10.0	--
		08-29-94	--	508	8.2	28.5	13.0	--
06430898	SQUAW CREEK NEAR SPEARFISH	03-25-93	2.5	274	8.2	9.0	1.5	1.5
		06-02-93	3.4	249	8.1	12.5	10.0	0.50
		08-31-93	1.2	331	8.4	25.0	13.0	--
		06-03-94	2.5	334	7.5	10.5	10.5	--
		08-29-94	0.56	465	8.3	29.0	17.0	--
06430950	SPEARFISH CREEK BELOW ROBISON GULCH	01-27-93	2.0	406	8.6	7.0	4.0	--
06436156	WHITETAIL CREEK AT LEAD	03-24-93	1.8	556	8.4	19.5	7.0	15
		06-04-93	4.4	420	8.3	16.5	13.0	4.0
		09-02-93	1.7	487	8.3	11.5	9.0	--
		06-01-94	4.6	397	7.9	16.0	11.0	--
		08-29-94	1.2	463	7.8	24.0	13.5	--
06437020	BEAR BUTTE CREEK NEAR DEADWOOD	03-24-93	5.2	280	8.1	19.0	1.0	56
		06-04-93	7.5	262	8.2	15.5	9.0	3.6
		09-02-93	2.3	312	8.2	8.0	11.0	--
		06-01-94	6.7	249	8.4	17.5	12.0	--
		08-29-94	0.77	324	7.8	18.0	13.5	--

[1]Field blank collected for quality assurance.
[2]Split replicate sample collected for quality assurance.
[3]Reported values for dissolved lead of 10 or more micrograms per liter may be erroneously high.

E Estimated
K Results based on colony count outside the acceptance range (non-ideal colony count).

BAROMETRIC PRESSURE (MM OF HG) (00025)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	HARDNESS TOTAL (MG/L AS CACO3) (00900)	ALKALINITY LAB (MG/L AS CACO3) (90410)	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	CALCIUM DISSOLVED (MG/L AS CA) (00915)	MAGNESIUM, DISSOLVED (MG/L AS MG) (00925)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	SULFATE DISSOLVED (MG/L AS SO4) (00945)
640	11.6	95	35	30	--	--	9.8	2.6	4.5	21	0.3	1.6	12
638	11.6	95	120	33	--	--	34	8.7	12	17	0.5	3.5	29
650	11.8	95	66	48	--	--	17	5.8	5.3	14	0.3	2.5	28
670	9.3	100	140	104	80	1200	38	11	13	16	0.5	5.0	41
650	13.0	106	130	88	--	--	36	10	13	17	0.5	3.7	46
664	12.5	158	110	81	--	--	29	8.5	10	16	0.4	3.8	30
654	7.7	98	150	115	--	--	40	13	16	18	0.6	5.4	33
642	9.5	105	34	39	K14	K3	9.6	2.4	4.2	20	0.3	1.3	4.2
631	7.7	89	41	47	K6	57	12	2.7	5.2	21	0.4	1.5	5.0
694	9.9	112	290	185	80	89	80	22	14	9	0.4	5.3	140
680	9.1	111	340	188	920	760	89	28	24	13	0.6	5.7	190
613	11.8	102	190	174	K24	K6	41	21	3.5	4	0.1	4.4	33
--	--	--	0	2.5	--	--	0.04	0.01	<0.20	--	--	<0.10	<0.10
629	11.9	107	150	141	K3	K15	37	15	9.5	11	0.3	4.5	25
629	11.9	107	150	140	K3	K15	36	15	9.6	12	0.3	4.5	25
665	13.6	108	190	163	K1	K2	43	21	4.2	4	0.1	2.9	46
660	9.2	100	--	--	--	--	--	--	--	--	--	--	--
688	12.6	96	380	190	120	310	95	35	58	24	1	6.7	230
681	9.8	124	--	--	--	--	--	--	--	--	--	--	--
620	12.5	108	210	219	130	26	48	23	2.0	2	0.1	1.2	8.1
630	11.9	99	200	190	K14	K10	46	21	2.5	3	0.1	1.7	13
633	12.2	102	180	181	K85	27	44	18	2.7	3	0.1	1.7	13
640	9.2	107	180	176	--	--	44	17	2.7	3	0.1	1.6	10
637	9.4	110	170	169	--	--	41	16	2.3	3	0.1	1.4	7.7
627	7.7	90	180	180	--	--	42	19	2.5	3	0.1	1.8	9.8
632	9.9	114	140	140	<1	46	41	8.0	3.6	5	0.1	2.3	6.3
625	12.1	160	130	134	56	26	38	7.9	3.8	6	0.1	2.4	5.3
622	8.5	104	140	139	240	15	40	8.9	3.4	5	0.1	1.7	3.2
615	12.2	139	140	145	140	92	40	9.4	3.2	5	0.1	1.8	3.6
630	11.6	96	180	144	<1	K6	46	16	3.8	4	0.1	1.1	23
625	9.5	100	120	98	54	K14	31	9.2	2.6	5	0.1	0.90	12
628	9.4	101	220	178	--	--	55	19	5.3	5	0.2	1.3	27
628	9.7	105	160	140	--	--	41	14	4.2	5	0.1	1.2	15
621	9.4	110	250	187	--	--	61	23	7.7	6	0.2	1.4	32
645	12.0	101	130	77	K2	55	32	11	2.9	5	0.1	2.1	51
642	9.1	96	110	79	K1	K4	30	8.7	4.0	7	0.2	1.9	37
646	11.0	124	--	--	--	--	--	--	--	--	--	--	--
--	10.2	--	140	100	--	--	38	12	12	15	0.4	2.3	62
636	9.6	120	200	147	--	--	50	17	20	18	0.6	2.7	90
650	11.5	103	220	221	27	<0	47	24	2.9	3	0.1	0.80	9.0
628	10.2	102	230	160	K1	20	62	18	17	14	0.5	2.2	53
627	8.7	101	190	135	K2	K1	55	13	9.1	9	0.3	1.8	48
632	11.2	117	230	167	--	--	66	16	8.8	8	0.3	1.8	62
628	9.2	102	180	142	--	--	52	13	7.8	8	0.3	1.7	42
623	9.3	110	220	151	--	--	63	15	7.0	6	0.2	1.5	61
635	11.8	100	120	66	K9	48	34	9.4	5.8	9	0.2	3.0	63
636	10.0	104	110	66	K10	K6	32	8.0	5.6	10	0.2	1.9	52
641	8.8	95	140	93	--	--	39	10	5.3	8	0.2	2.3	58
639	9.2	102	110	77	--	--	31	7.6	4.7	8	0.2	1.8	36
631	9.4	109	150	112	--	--	42	9.9	6.2	8	0.2	2.7	40

Table 8. Chemical analyses of surface-water samples—Continued

[US/CM, microsiemens per centimeter; DEG C, degrees Celsius; NTU, nephelometric turbidity units; MM, millimeters; MG/L, milligrams per liter; COLS./100 ML, colonies per 100 milliliters; AC-FT, acre-feet; UG/L, micrograms per liter; PCI/L, picocuries per liter; T/DAY, tons per day; --, no data available]

OTHER IDENTIFIER	DATE	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	SOLIDS, DISSOLVED (TONS PER AC-FT) (70303)	SOLIDS, DISSOLVED (TONS PER DAY) (70302)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L) (00530)	RESIDUE VOLATILE, SUSPENDED (MG/L) (00535)
GRIZZLY BEAR CREEK NEAR KEYSTONE	01-06-94	3.2	<0.10	17	69	--	0.09	--	1	2
BATTLE CREEK AT KEYSTONE	01-06-94	59	0.10	16	185	--	0.25	0.35	<1	<1
IRON CREEK NEAR KEYSTONE	01-05-94	3.8	0.10	17	109	--	0.15	0.35	1	<1
BATTLE CREEK NEAR KEYSTONE	09-07-93	21	0.30	12	204	209	0.28	2.88	<1	--
	01-05-94	23	0.30	14	201	--	0.27	1.78	<1	1
	05-31-94	17	0.30	12	159	--	0.22	2.35	4	1
	08-30-94	30	0.30	8.6	216	--	0.29	0.03	11	7
GRACE COOLIDGE CREEK NEAR HAYWARD	09-02-93	0.80	0.10	21	67	70	0.09	0.21	1	--
	08-30-94	1.7	0.10	20	77	87	0.12	0.04	6	--
BATTLE CREEK BELOW HERMOSA	09-07-93	7.5	0.30	9.9	390	385	0.52	19.4	16	--
	08-30-94	9.0	0.30	13	473	491	0.67	1.70	38	--
SPRING CREEK NEAR OREVILLE	11-09-92	2.6	0.20	12	222	220	0.30	0.97	9	--
	[1]11-09-92	0.30	<0.10	0.10	--	<1	--	--	4	--
SPRING CREEK ABOVE MITCHELL LAKE	11-09-92	14	0.20	13	203	198	0.27	1.52	3	--
	[2]11-09-92	14	0.20	13	202	203	0.28	1.56	1	--
RAPID CREEK ABOVE VICTORIA CREEK	02-09-93	4.2	0.20	8.5	228	218	0.30	10.7	8	--
	07-28-94	--	--	--	--	--	--	--	--	--
RAPID CREEK NEAR FARMINGDALE	02-09-93	72	0.40	7.8	638	630	0.86	79.9	8	--
	07-28-94	--	--	--	--	--	--	--	--	--
ELK CREEK AT BROWNSVILLE	11-10-92	1.6	0.10	9.8	226	226	0.31	0.88	5	--
ELK CREEK BELOW ROUBAIX	11-10-92	2.4	0.20	11	212	211	0.29	1.49	21	--
ELK CREEK NEAR ROUBAIX	11-10-92	2.3	0.20	11	202	202	0.27	1.60	10	--
	09-07-93	1.9	0.20	12	195	--	0.27	2.19	5	4
	06-01-94	1.3	0.20	11	182	--	0.25	5.42	6	2
	08-29-94	1.4	0.20	12	197	--	0.27	1.08	13	2
BEAR GULCH NEAR MAURICE	09-08-93	1.0	0.20	16	163	162	0.22	0.38	<1	--
	09-02-94	0.50	0.10	14	153	158	0.21	0.10	3	--
BEAVER CREEK NEAR MAURICE	09-08-93	1.4	0.20	14	156	142	0.19	0.36	1	--
	09-02-94	1.9	0.10	13	160	152	0.21	0.20	4	--
ANNIE CREEK NEAR LEAD	03-25-93	5.8	0.20	--	211	206	0.28	--	11	--
	06-02-93	3.2	0.20	14	142	152	0.21	0.53	1	--
	08-31-93	3.3	0.30	14	232	--	0.32	0.18	<1	<1
	06-01-94	4.5	0.20	13	195	--	0.27	--	5	2
	08-29-94	4.9	0.20	13	297	--	0.40	--	2	1
SQUAW CREEK NEAR SPEARFISH	03-25-93	2.5	1.2	--	152	168	0.23	1.13	9	--
	06-02-93	3.2	0.70	15	151	146	0.20	1.34	1	--
	08-31-93	--	--	--	--	--	--	--	--	--
	06-03-94	4.5	0.70	15	209	--	0.28	1.40	3	7
	08-29-94	1.7	1.0	14	285	--	0.39	0.43	17	14
SPEARFISH CREEK BELOW ROBISON GULCH	01-27-93	2.8	0.30	9.5	229	--	0.31	1.25	--	--
WHITETAIL CREEK AT LEAD	03-24-93	48	0.30	--	301	300	0.41	1.44	13	--
	06-04-93	15	0.40	14	246	254	0.35	2.99	1	--
	09-02-93	13	0.50	15	296	--	0.40	1.40	3	<1
	06-01-94	10	0.40	14	234	--	0.32	2.88	5	3
	08-29-94	9.0	0.40	15	274	--	0.37	0.85	11	3
BEAR BUTTE CREEK NEAR DEADWOOD	03-24-93	9.9	0.20	--	167	174	0.24	2.46	250	--
	06-04-93	6.3	0.30	13	159	156	0.21	3.15	1	--
	09-02-93	5.4	0.30	12	188	--	0.26	1.16	2	<1
	06-01-94	4.4	0.30	12	144	--	0.20	2.60	11	6
	08-29-94	7.4	0.30	12	188	--	0.26	0.39	<1	1

[1]Field blank collected for quality assurance.
[2]Split replicate sample collected for quality assurance.
[3]Reported values for dissolved lead of 10 or more micrograms per liter may be erroneously high.

E Estimated
K Results based on colony count outside the acceptance range (non-ideal colony count).

NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, NITRATE DISSOLVED (MG/L AS N) (00618)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	ANTIMONY, DISSOLVED (UG/L AS SB) (01095)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)
0.030	--	0.020	<0.050	--	--	0.010	--	<1	1	19	--	--	<1.0	--
0.040	--	0.020	0.640	0.620	--	0.030	--	9	8	61	--	--	<1.0	--
0.040	--	<0.010	0.110	--	--	<0.010	--	2	2	27	--	--	<1.0	--
0.040	0.20	<0.010	<0.050	--	0.030	0.020	8	30	33	51	<0.5	40	<10	<1
0.050	--	0.010	0.390	0.380	--	0.020	--	18	17	46	--	--	<1.0	--
<0.010	<0.20	<0.010	<0.050	--	0.033	0.030	--	44	43	--	--	--	--	--
0.010	<0.20	<0.010	<0.050	--	0.010	<0.010	--	--	28	58	<0.5	--	<1.0	<5
0.020	<0.20	<0.010	<0.050	--	--	0.040	<1	1	1	16	<0.5	<10	<10	<1
0.010	<0.20	<0.010	<0.050	--	0.038	0.030	<1	2	2	25	<0.5	<10	<1.0	<5
0.040	<0.20	<0.010	<0.050	--	0.008	<0.010	1	10	8	74	<0.5	40	<10	4
0.020	<0.20	<0.010	<0.050	--	0.006	<0.010	1	7	6	71	<0.5	60	2.0	<5
<0.010	--	<0.010	<0.050	--	--	<0.010	2	2	2	51	--	10	<10	<1
0.010	--	<0.010	<0.050	--	--	<0.010	<1	<1	<1	<2	--	<10	<10	<1
0.020	--	<0.010	0.100	--	--	<0.010	2	6	5	46	--	20	<10	<1
0.020	--	<0.010	0.110	--	--	<0.010	2	7	5	46	--	20	<10	<1
0.020	<0.20	0.020	0.150	0.130	<0.010	<0.010	2	1	1	28	--	20	<10	<1
0.020	<0.20	<0.010	<0.050	--	0.007	<0.010	--	--	--	--	--	--	--	--
0.460	0.80	0.070	3.40	3.33	1.00	1.10	2	1	1	40	--	120	<10	<1
0.030	0.30	0.020	0.750	0.730	0.280	0.260	--	--	--	--	--	--	--	--
0.010	--	<0.010	0.180	--	--	<0.010	<1	<1	<1	36	--	10	<10	1
<0.010	--	0.010	0.081	0.071	--	<0.010	3	15	12	36	--	<10	<10	<1
0.010	--	0.010	<0.050	--	--	0.010	6	22	20	40	--	10	<10	<1
--	--	--	<0.005	--	--	--	--	32	29	44	--	--	<1.0	--
0.020	<0.20	<0.010	<0.050	--	0.016	<0.010	--	22	19	--	--	--	--	--
0.010	<0.20	0.010	<0.050	--	0.018	0.010	--	--	37	50	<0.5	--	<1.0	<5
0.040	<0.20	<0.010	<0.050	--	0.004	<0.010	<1	<1	<1	110	<0.5	30	<10	<1
0.030	<0.20	<0.010	<0.050	--	0.002	<0.010	<1	<1	1	110	<0.5	<10	<1.0	<5
0.070	0.20	<0.010	<0.050	--	0.012	0.010	<1	<1	<1	71	--	20	<10	2
0.040	<0.20	<0.010	<0.050	--	0.004	<0.010	<1	1	1	78	<0.5	10	<1.0	<5
0.010	<0.20	<0.010	6.50	--	0.010	0.020	--	33	32	--	--	<10	<10	--
0.030	<0.20	<0.010	2.20	--	0.020	0.020	7	19	18	92	--	<10	<10	<1
--	--	--	--	--	--	--	--	28	26	140	--	--	<1.0	--
<0.010	0.20	<0.010	4.10	--	0.030	0.030	--	20	19	--	--	--	--	--
0.010	<0.20	0.010	9.30	9.29	0.017	0.010	--	--	29	150	<0.5	--	<1.0	<5
0.010	<0.20	<0.010	0.780	--	<0.010	<0.010	--	4	3	--	--	<10	<10	--
0.030	<0.20	<0.010	0.750	--	<0.010	<0.010	1	3	3	60	--	<10	<10	<1
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
0.040	<0.20	<0.010	0.450	--	0.003	<0.010	--	3	3	--	--	--	--	--
0.010	<0.20	<0.010	<0.050	--	0.006	<0.010	--	--	4	93	<0.5	--	<1.0	<5
0.010	--	0.010	<0.050	--	--	<0.010	--	--	3	--	--	--	--	--
0.010	<0.20	<0.010	1.00	--	<0.010	<0.010	--	18	13	--	--	20	<10	--
0.030	--	<0.010	1.90	--	--	0.020	5	15	10	92	--	20	<10	<1
--	--	--	2.80	--	--	--	--	15	14	98	--	--	<1.0	--
<0.010	<0.20	<0.010	1.70	--	0.013	0.020	--	14	13	--	--	--	--	--
0.020	<0.20	<0.010	2.60	--	0.005	<0.010	--	--	15	87	<0.5	--	<1.0	<5
0.020	0.20	<0.010	0.340	--	<0.010	<0.010	--	14	<1	--	--	10	<10	--
0.020	--	<0.010	0.055	--	--	<0.010	<1	2	<1	37	--	<10	<10	<1
--	--	--	<0.005	--	--	--	--	<1	1	39	--	--	<1.0	--
0.020	<0.20	<0.010	<0.050	--	0.005	<0.010	--	4	<1	--	--	--	--	--
<0.010	<0.20	<0.010	<0.050	--	0.001	<0.010	--	--	1	40	<0.5	--	<1.0	<5

Table 8. Chemical analyses of surface-water samples—Continued

[US/CM, microsiemens per centimeter; DEG C, degrees Celsius; NTU, nephelometric turbidity units; MM, millimeters; MG/L, milligrams per liter; COLS./100 ML, colonies per 100 milliliters; AC-FT, acre-feet; UG/L, micrograms per liter; PCI/L, picocuries per liter; T/DAY, tons per day; --, no data available]

OTHER IDENTIFIER	DATE	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD[3], DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN) (01055)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)
GRIZZLY BEAR CREEK NEAR KEYSTONE	01-06-94	--	--	50	26	--	10	--	--	--
BATTLE CREEK AT KEYSTONE	01-06-94	--	--	220	120	--	62	--	--	--
IRON CREEK NEAR KEYSTONE	01-05-94	--	--	220	120	--	21	--	--	--
BATTLE CREEK NEAR KEYSTONE	09-07-93	--	1	150	120	<1	37	--	5	<0.1
	01-05-94	--	--	90	43	--	31	--	--	--
	05-31-94	--	--	210	89	--	--	--	8	--
	08-30-94	<3	<10	--	79	<10	34	--	12	--
GRACE COOLIDGE CREEK NEAR HAYWARD	09-02-93	--	<1	280	95	<1	8	--	2	<0.1
	08-30-94	<3	<10	100	41	<10	<4	--	1	0.1
BATTLE CREEK BELOW HERMOSA	09-07-93	--	1	290	5	<1	26	--	2	<0.1
	08-30-94	<3	<10	570	5	<10	39	--	4	<0.1
SPRING CREEK NEAR OREVILLE	11-09-92	--	<1	--	17	<1	--	--	15	<0.1
	[1]11-09-92	--	<1	--	3	<1	--	--	<1	<0.1
SPRING CREEK ABOVE MITCHELL LAKE	11-09-92	--	<1	--	12	<1	--	--	26	<0.1
	[2]11-09-92	--	<1	--	15	<1	--	--	26	<0.1
RAPID CREEK ABOVE VICTORIA CREEK	02-09-93	--	<1	--	<3	<1	--	--	<1	0.1
	07-28-94	--	--	--	--	--	--	--	--	--
RAPID CREEK NEAR FARMINGDALE	02-09-93	--	2	--	9	<1	--	--	38	<0.1
	07-28-94	--	--	--	--	--	--	--	--	--
ELK CREEK AT BROWNSVILLE	11-10-92	--	<1	--	18	<1	--	--	8	<0.1
ELK CREEK BELOW ROUBAIX	11-10-92	--	<1	--	13	<1	--	--	5	<0.1
ELK CREEK NEAR ROUBAIX	11-10-92	--	<1	--	20	<1	--	--	10	<0.1
	09-07-93	--	--	210	20	--	--	--	--	--
	06-01-94	--	--	410	65	--	--	--	16	--
	08-29-94	<3	<10	--	68	10	<4	--	14	--
BEAR GULCH NEAR MAURICE	09-08-93	--	<1	10	4	<1	8	--	1	<0.1
	09-02-94	<3	<10	60	6	<10	4	--	1	<0.1
BEAVER CREEK NEAR MAURICE	09-08-93	--	1	--	26	2	--	--	3	<0.1
	09-02-94	<3	<10	30	8	<10	6	--	3	<0.1
ANNIE CREEK NEAR LEAD	03-25-93	--	<1	--	6	<1	--	--	<1	<0.1
	06-02-93	--	<1	--	14	<1	--	--	<1	<0.1
	08-31-93	--	--	40	<3	--	--	--	--	--
	06-01-94	--	--	150	14	--	--	--	<1	--
	08-29-94	5	<10	--	5	<10	4	--	1	--
SQUAW CREEK NEAR SPEARFISH	03-25-93	--	1	--	22	<1	--	--	<1	<0.1
	06-02-93	--	<1	--	<3	<1	--	--	<1	<0.1
	08-31-93	--	--	--	--	--	--	--	--	--
	06-03-94	--	--	60	5	--	--	--	<1	--
	08-29-94	<3	<10	--	<3	<10	<4	--	<1	--
SPEARFISH CREEK BELOW ROBISON GULCH	01-27-93	--	--	<10	--	--	--	<10	--	--
WHITETAIL CREEK AT LEAD	03-24-93	--	<1	--	4	<1	--	--	11	<0.1
	06-04-93	--	<1	--	7	<1	--	--	21	<0.1
	09-02-93	--	--	100	8	--	--	--	--	--
	06-01-94	--	--	190	11	--	--	--	10	--
	08-29-94	<3	<10	--	10	<10	<4	--	4	--
BEAR BUTTE CREEK NEAR DEADWOOD	03-24-93	--	20	--	28	<1	--	--	77	<0.1
	06-04-93	--	28	--	41	<1	--	--	100	<0.1
	09-02-93	--	--	40	30	--	--	--	--	--
	06-01-94	--	--	800	110	--	--	--	75	--
	08-29-94	<3	20	--	20	10	6	--	15	--

[1]Field blank collected for quality assurance.
[2]Split replicate sample collected for quality assurance.
[3]Reported values for dissolved lead of 10 or more micrograms per liter may be erroneously high.

E Estimated
K Results based on colony count outside the acceptance range (non-ideal colony count).

MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	GROSS ALPHA, DIS-SOLVED (UG/L AS U-NAT) (80030)	ALPHA, COUNT, 2 SIGMA WAT DIS AS NAT U (UG/L) (75986)	ALPHA RADIO. WATER DISS AS TH-230 (PCI/L) (04126)	ALPHA COUNT, 2 SIGMA WAT DIS AS TH-230 (PCI/L) (75987)	GROSS BETA, DIS-SOLVED (PCI/L AS CS-137) (03515)
--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	<1	<1	--	--	--	<10	<3	2.1	1.6	1.3	1.0	5.2
--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--
<10	<10	--	--	<1.0	150	<6	--	<3	1.6	1.3	1.0	0.84	7.4
--	--	<1	<1	--	--	--	<10	<3	0.6	0.57	<0.6	0.40	1.8
<10	<10	<1	<1	<1.0	48	<6	<10	<3	<0.6	0.56	<0.6	0.39	1.8
--	--	<1	<1	--	--	--	<10	4	6.9	3.5	4.9	2.5	7.2
20	<10	<1	<1	<1.0	750	<6	<10	<3	14	5.2	9.9	3.7	11
--	--	--	<1	--	--	--	--	5	--	--	--	--	--
--	--	--	<1	--	--	--	--	<3	--	--	--	--	--
--	--	--	<1	--	--	--	--	<3	--	--	--	--	--
--	--	--	<1	--	--	--	--	6	--	--	--	--	--
--	--	--	<1	--	--	--	--	<3	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	1	--	--	--	--	4	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	<1	--	--	--	--	5	--	--	--	--	--
--	--	--	<1	--	--	--	--	3	--	--	--	--	--
--	--	--	<1	--	--	--	--	<3	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--
<10	<10	--	--	<1.0	86	<6	--	<3	1.1	0.94	0.9	0.72	2.5
--	--	<1	<1	--	--	--	<10	<3	1.6	1.0	1.1	0.72	3.2
<10	<10	<1	<1	1.0	250	<6	10	4	2.4	1.3	1.5	0.82	2.7
--	--	--	<1	--	--	--	--	33	--	--	--	--	--
<10	<10	<1	<1	1.0	250	<6	<10	9	1.5	1.0	1.1	0.73	2.6
--	--	--	3	--	--	--	--	4	--	--	--	--	--
--	--	--	1	--	--	--	--	<3	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--
10	10	--	--	1.0	180	<6	--	<3	6.7	2.5	4.8	1.8	3.9
--	--	--	<1	--	--	--	--	4	--	--	--	--	--
--	--	--	<1	--	--	--	--	<3	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--
<10	<10	--	--	<1.0	330	<6	--	<3	8.0	3.1	5.7	2.2	6.2
--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	<1	--	--	--	--	<3	--	--	--	--	--
--	--	--	1	--	--	--	--	<3	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--
<10	<10	--	--	<1.0	300	<6	--	<3	6.2	2.7	4.6	2.0	4.5
--	--	--	<1	--	--	--	--	40	--	--	--	--	--
--	--	--	<1	--	--	--	--	10	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--	--
<10	<10	--	--	<1.0	140	<6	--	8	1.6	1.1	1.2	0.82	4.0

Table 8. Chemical analyses of surface-water samples—Continued

[US/CM, microsiemens per centimeter; DEG C, degrees Celsius; NTU, nephelometric turbidity units; MM, millimeters; MG/L, milligrams per liter; COLS./100 ML, colonies per 100 milliliters; AC-FT, acre-feet; UG/L, micrograms per liter; PCI/L, picocuries per liter; T/DAY, tons per day; --, no data available]

OTHER IDENTIFIER	DATE	BETA, 2 SIGMA WATER, DISS, AS CS-137 (PCI/L) (75989)	GROSS BETA, DIS-SOLVED (PCI/L AS SR/Y-90) (80050)	BETA, 2 SIGMA WATER, DISS, AS SR90 /Y90 (PCI/L (75988)	URANIUM NATURAL DIS-SOLVED (UG/L AS U) (22703)	URANIUM NATURAL 2 SIGMA WATER, DISS, (UG/L) (75990)	CYANIDE TOTAL (MG/L AS CN) (00720)	CYANIDE DIS-SOLVED (MG/L AS CN) (00723)	PHENOLS TOTAL (UG/L) (32730)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) (80155)
GRIZZLY BEAR CREEK NEAR KEYSTONE	01-06-94	--	--	--	0.08	<1.0	--	--	--	3	--
BATTLE CREEK AT KEYSTONE	01-06-94	--	--	--	0.55	<1.0	--	--	--	8	0.02
IRON CREEK NEAR KEYSTONE	01-05-94	--	--	--	0.21	<1.0	--	--	--	8	0.03
BATTLE CREEK NEAR KEYSTONE	09-07-93	1.2	4.0	0.92	1.0	0.1	--	<0.01	1	1	0.01
	01-05-94	--	--	--	1.0	<1.0	--	--	--	5	0.04
	05-31-94	--	--	--	--	--	--	--	--	4	0.06
	08-30-94	1.8	5.5	1.8	1.1	0.2	--	--	--	0	0.0
GRACE COOLIDGE CREEK NEAR HAYWARD	09-02-93	0.64	1.6	0.56	0.40	0.1	--	<0.01	<1	4	0.01
	08-30-94	0.73	1.5	0.57	<0.40	0.0	--	--	<1	5	0.00
BATTLE CREEK BELOW HERMOSA	09-07-93	1.6	5.5	1.2	4.2	0.6	--	<0.01	<1	36	1.8
	08-30-94	2.0	8.2	1.5	6.0	0.9	--	--	<1	116	0.40
SPRING CREEK NEAR OREVILLE	11-09-92	--	--	--	--	--	<0.010	<0.01	1	9	0.04
	[1]11-09-92	--	--	--	--	--	<0.010	<0.01	--	--	--
SPRING CREEK ABOVE MITCHELL LAKE	11-09-92	--	--	--	--	--	<0.010	<0.01	1	12	0.09
	[2]11-09-92	--	--	--	--	--	<0.010	<0.01	--	--	--
RAPID CREEK ABOVE VICTORIA CREEK	02-09-93	--	--	--	--	--	<0.010	<0.01	1	10	0.49
	07-28-94	--	--	--	--	--	--	--	--	--	--
RAPID CREEK NEAR FARMINGDALE	02-09-93	--	--	--	--	--	<0.010	<0.01	1	9	1.1
	07-28-94	--	--	--	--	--	--	--	--	--	--
ELK CREEK AT BROWNSVILLE	11-10-92	--	--	--	--	--	<0.010	<0.01	1	21	0.08
ELK CREEK BELOW ROUBAIX	11-10-92	--	--	--	--	--	<0.010	<0.01	2	26	0.18
ELK CREEK NEAR ROUBAIX	11-10-92	--	--	--	--	--	<0.010	<0.01	2	21	0.17
	09-07-93	--	--	--	0.80	<1.0	--	--	--	--	--
	06-01-94	--	--	--	--	--	--	--	--	40	1.2
	08-29-94	0.97	1.8	0.67	0.80	0.1	--	--	--	5	0.03
BEAR GULCH NEAR MAURICE	09-08-93	0.90	2.5	0.71	1.1	0.2	--	<0.01	--	1	0.00
	09-02-94	0.83	2.1	0.66	1.2	0.2	--	--	<1	2	0.00
BEAVER CREEK NEAR MAURICE	09-08-93	--	--	--	--	--	--	<0.01	--	1	0.00
	09-02-94	0.96	2.0	0.67	1.1	0.2	--	--	<1	3	0.00
ANNIE CREEK NEAR LEAD	03-25-93	--	--	--	--	--	<0.010	<0.01	1	5	--
	06-02-93	--	--	--	--	--	<0.010	<0.01	2	3	0.01
	08-31-93	--	--	--	6.4	950	--	--	--	3	0.00
	06-01-94	--	--	--	--	--	--	--	--	21	--
	08-29-94	1.1	2.9	0.82	6.1	0.9	--	--	--	10	--
SQUAW CREEK NEAR SPEARFISH	03-25-93	--	--	--	--	--	<0.010	<0.01	1	5	0.03
	06-02-93	--	--	--	--	--	<0.010	<0.01	1	1	0.01
	08-31-93	--	--	--	3.7	<1.0	--	--	--	1	0.00
	06-03-94	--	--	--	--	--	--	--	--	1	0.01
	08-29-94	1.3	4.7	1.0	5.0	0.7	--	--	--	6	0.01
SPEARFISH CREEK BELOW ROBISON GULCH	01-27-93	--	--	--	--	--	<0.010	<0.01	2	3	0.02
WHITETAIL CREEK AT LEAD	03-24-93	--	--	--	--	--	<0.010	<0.01	1	59	0.28
	06-04-93	--	--	--	--	--	<0.010	<0.01	<1	45	0.53
	09-02-93	--	--	--	2.0	<1.0	--	--	--	4	0.02
	06-01-94	--	--	--	--	--	--	--	--	9	0.11
	08-29-94	1.2	3.4	0.87	3.2	0.5	--	--	--	1	0.00
BEAR BUTTE CREEK NEAR DEADWOOD	03-24-93	--	--	--	--	--	<0.010	<0.01	1	246	3.5
	06-04-93	--	--	--	--	--	<0.010	<0.01	1	5	0.10
	09-02-93	--	--	--	3.1	<1.0	--	--	--	3	0.02
	06-01-94	--	--	--	--	--	--	--	--	5	0.09
	08-29-94	1.2	3.0	0.76	1.8	0.3	--	--	--	1	0.00

[1]Field blank collected for quality assurance.
[2]Split replicate sample collected for quality assurance.
[3]Reported values for dissolved lead of 10 or more micrograms per liter may be erroneously high.

E Estimated
K Results based on colony count outside the acceptance range (non-ideal colony count).

Ground-Water Samples

Site information for 22 ground-water sampling sites is presented in table 9 and locations of ground-water sampling sites are shown in figure 69. The ground-water sampling sites include both wells and springs.

Some of the wells are public- or privately-owned production wells. These wells are used frequently to supply water for municipal, domestic, or agricultural purposes. With the exception of flowing wells, samples were obtained using pumps that were already in place. Samples were collected from the first possible discharge points, which were all located upstream from storage or treatment facilities.

Some of the wells are observation wells (fig. 7, table 1), for which daily water-level records are presented in a previous section of this report. Sequential site numbers for these wells (table 9) are referenced to the different sequential site numbers that were used in figure 7 and table 1. Several of these are flowing wells, which were sampled without pumping. Several other wells were pumped using a submersible pump suspended with steel pipe. One well (3S1E18DDDB) was bailed because of the extreme depth to water level. With the exception of the bailed well, a minimum of three borehole volumes were produced from each well before sampling.

Spring samples were collected from a variety of settings. Samples generally were collected as close as possible to the spring source, but far enough downstream to include the majority of the flow of each spring.

Chemical analyses of ground-water samples are presented in table 10. Samples collected for purposes of quality assurance are footnoted. Water-quality data for samples collected prior to water year 1993 are presented for several sites for supplemental purposes. The earlier data should be used with caution because sampling methods, analytical methods, or reporting limits may have been somewhat different than current methods.

SPRING DATA

An inventory of springs was initiated during 1990 as part of the Black Hills Hydrology Study. This effort consisted of visiting the majority of mapped springs within the study area. Discharge and field water-quality parameters (including temperature, specific conductance, dissolved oxygen, and pH) were measured at most sites.

Spring data collected through water year 1992 were published in a previous project data report (Driscoll and Bradford, 1994). Most of the springs visited through water year 1992 were located in the northern Black Hills, especially in Lawrence County. Most of the field work was performed during the summers of 1990 and 1991. Precipitation during these years, and several preceding years, generally was somewhat less than normal (U.S. Department of Commerce, 1988-91); hence, many springs that usually might have measurable discharge were dry. Other springs were so close to dry that measurement of discharge or water quality was impossible. Some springs discharged into pools with no outlet point, such that water quality could be measured, but discharge could only be estimated.

Climatic conditions in the northern Black Hills generally were wetter during 1993-94 than during the preceding several years (U.S. Department of Commerce, 1988-94). This resulted in increased flow from many of the springs that were dry, or nearly dry, during the 1990-91 spring visits. Thus, additional visits were made, primarily during water year 1994, to many of the springs that were visited during previous years. This was done to document discharge and water-quality that occurs during wetter climatic conditions.

Spring data collected since water year 1992 are presented in tables 11 and 12. Data collected through 1992 also are presented in the same tables for comparative purposes. Data for two types of springs are presented in tables 11 and 12. Data for 94 springs, where the actual point of discharge of the spring could be identified and the flow of the individual spring could be measured, are presented in table 11. Data for 21 stream reaches with significant springflow components, but where the discharge of an individual spring could not be measured, are presented in table 12. Examples might include a headwater reach with multiple springs within the reach, a stream reach with one or more springs within the channel, or a stream reach originating from both spring and well discharge. In all cases, table 12 represents data for streams with significant springflow components, as opposed to streams in which the magnitude of discharge simply increases from tributary inflow or with increasing drainage area.

Table 9. Site information for ground-water sampling sites for which chemical analyses are presented

[DENR, South Dakota Department of Environment and Natural Resources; GF&P, South Dakota Department of Game, Fish and Parks. --, not applicable]

Site number	Station identification number	USGS local number	Other identifier(s) or spring name[1]	Site number[2] from figure 7 and table 1	Latitude (degrees)	Longitude (degrees)	Well depth (feet)	Aquifer/geohydrologic unit[3]	Owner
1	444129103514801	9N 2E34CDDC	Municipal well (Belle Fourche)	--	444129	1035148	3,320	Madison	Belle Fourche
2	443237103525801	7N 2E28BACD	(Higgins Gulch)	--	443237	1035258	Spring	Alluvium	Private
3	443309103532401	7N 2E20DAAD	Old Spearfish Hatchery (Old Hatchery)	--	443309	1035324	Spring	Spearfish	Private
4	443515103513901	7N 2E10BADC	LA-62A/(Redwater 1)	2	443515	1035139	1,306	Minnelusa	DENR
5	443100104002003	7N 1E33CCDD3	(LA-94A)	--	443100	1040020	333	Minnekahta	DENR
6	443100104002002	7N 1E33CCDD2	(LA-87B)	3	443105	1040020	458	Minnelusa	DENR
7	443100104002001	7N 1E33CCDD	(LA-87A)	4	443105	1040020	1,100	Madison	DENR
8	443330104003401	7N 1E21BBCD	McNenny Rearing Pond (McNenny Pond)	--	443330	1040034	Spring	Spearfish	GF&P
9	443320104004501	7N 1E20AAD	McNenny Well No. 2 (McNenny Well)	--	443328	1040045	281	Minnelusa	GF&P
10	443335104010001	7N 1E20AABC	(Mirror Lake)	--	443335	1040100	Spring	Spearfish	GF&P
11	443356103593701	7N 1E16DADC	(Cox Lake)	--	443356	1035937	Spring	Spearfish	GF&P
12	443515103572501	7N 1E11ACAC	(Swanson well)	--	443515	1035725	1,004	Minnelusa	John Swanson
13	434700104021401	3S 1E18DDDB	CU-93C/(Boles Canyon 1)	31	434700	1040214	1,054	Madison	DENR
14	433003103420701	6S 3E25ADDC	(Myrvik well)	--	433000	1034158	280	Minnelusa	Richard Myrvik
15	433128103223401	6S 6E14CDB	Beaver Creek Spring (Beaver Creek)	--	433128	1032234	Spring	Minnekahta	Frank Schroth
16	433115103251401	6S 6E21BBBB	CU-91A/(7-11 Ranch 1)	37	433115	1032514	1,165	Madison	DENR
17	433115103251402	6S 6E21BBBB2	CU-91B/(7-11 Ranch 2)	38	433115	1032514	480	Minnelusa	DENR
18	432548103414801	7S 4E19BCCB	(FR-92A)	39	432548	1034148	1,540	Madison	DENR
19	432703103302801	7S 5E10DCBA	Hot Brook Spring (Hot Brook)	--	432703	1033028	Spring	Alluvium	Hot Springs
20	432630103284701	7S 5E13BCCC	Evans Plunge Spring (Evans Plunge)	--	432630	1032847	Spring	Minnekahta	Private
21	432136103321001	8S 5E16BBAD	(Fetters well)	--	432136	1033210	1,140	Madison[4] Minnelusa[4]	Barb Fetters
22	432127103325601	8S 5E17ACBB	(Chiller well)	--	432127	1033256	680	Minnelusa	William Chiller

[1]Identifier used for table 10 shown in parentheses.

[2]Applies only to wells for which daily water-level records are presented in previous section.

[3]Refers to aquifer of completion for wells and surficial geohydrologic unit for springs.

[4]Completed in both Madison and Minnelusa aquifers; however, Madison is primary source of water.

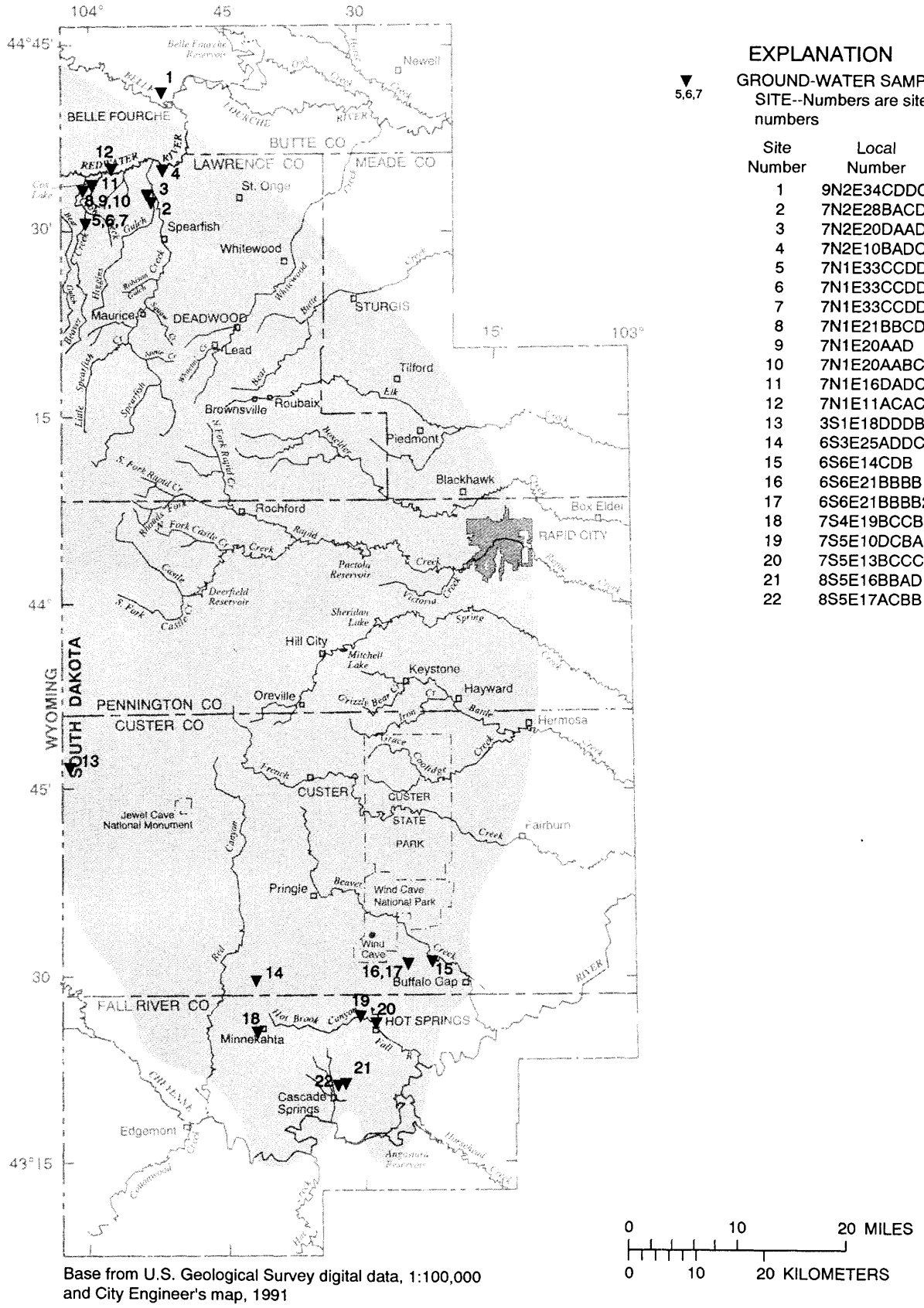

Figure 69. Location of ground-water sampling sites for which chemical analyses are presented.

Table 10. Chemical analyses of ground-water samples

[GAL/MIN, gallons per minute; DEG C, degrees Celsius; US/CM, microsiemens per centimeter; MM, millimeters; MG/L, milligrams per liter; UG/L, micrograms per liter; AC-FT, acre-feet; PCI/L, picocuries per liter; DPM/L, disintegrations per minute per liter; --, no data available]

STATION NUMBER	OTHER IDENTIFIER	DATE	FLOW RATE, INSTANTANEOUS (GAL/MIN) (00059)	DISCHARGE, INST. CUBIC FEET PER SECOND (00061)	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	TEMPERATURE AIR (DEG C) (00020)	TEMPERATURE WATER (DEG C) (00010)	BAROMETRIC PRESSURE (MM OF HG) (00025)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)
444129103514801	BELLE FOURCHE	08-17-94	650	--	570	7.2	28.0	29.5	669	9.6	144
443237103525801	HIGGINS GULCH	[1]09-26-94	--	7.1	657	8.0	20.0	13.0	660	8.0	88
443309103532401	OLD HATCHERY	09-26-94	--	7.6	906	7.9	--	10.0	660	8.8	91
443515103513901	REDWATER 1	06-27-62	--	--	--	--	--	--	--	--	--
		04-12-94	12	--	2210	7.3	--	13.5	675	1.7	19
		[2]04-12-94	--	--	--	--	--	--	--	--	--
443100104002003	LA-94A	08-18-94	3.1	--	593	7.4	25.0	10.5	656	4.2	44
443100104002002	LA-87B	04-11-94	5.0	--	554	7.4	--	10.5	670	7.4	76
443100104002001	LA-87A	04-11-94	250	--	705	7.4	--	11.5	670	7.8	81
443330104003401	MCNENNY POND	09-28-94	--	0.89	570	7.6	20.0	E12.0	661	7.0	--
		[3]09-28-94	--	--	2	5.6	--	--	--	--	--
		[4]10-04-94	--	--	--	--	--	--	--	--	--
443320104004501	MCNENNY WELL	05-14-68	--	--	612	8.1	--	11.0	--	--	--
		08-05-80	--	--	689	7.3	--	11.5	--	--	--
		08-17-94	E300	--	650	7.4	31.0	11.5	665	6.8	72
443335104010001	MIRROR LAKE	09-28-94	--	0.46	2560	7.8	20.0	13.5	660	7.8	87
443356103593701	COX LAKE	09-06-91	--	4.6	1200	7.7	26.5	15.0	670	10.5	119
		09-27-94	--	4.1	1110	7.8	22.0	11.0	662	8.2	86
443515103572501	SWANSON WELL	[5] - -66	--	--	--	7.9	--	--	--	--	--
		04-27-67	--	--	2470	7.7	--	17.0	--	--	--
		08-16-94	8.0	--	--	7.1	31.0	18.5	660	0.2	--
434700104021401	BOLES CANYON 1	[6]03-22-94	--	--	485	8.1	12.0	10.0	631	8.0	86
433003103420701	MYRVIK WELL	06-08-79	--	--	740	6.6	--	11.5	--	7.3	--
		05-04-94	2.0	--	450	7.5	20.0	14.0	648	5.4	62
433128103223401	BEAVER CREEK	09-10-63	--	--	2370	7.1	--	--	--	--	--
		04-25-94	--	--	2150	7.0	10.0	19.0	658	4.6	58
		10-03-94	--	--	2420	7.3	8.0	18.5	650	3.7	47
433115103251401	7-11 RANCH 1	03-31-94	10	--	410	7.7	20.0	17.0	666	3.7	44
433115103251402	7-11 RANCH 2	04-05-94	13	--	390	7.8	8.0	14.0	665	8.8	99
432548103414801	FR-92A	03-24-94	5.6	--	500	7.5	5.0	21.0	653	0	0
432703103302801	HOT BROOK	12-17-58	--	--	801	7.4	--	23.0	--	--	--
		11-10-67	--	--	--	7.6	--	--	--	--	--
		06-25-70	--	--	--	7.6	--	--	--	--	--
		12-30-75	--	--	--	8.0	--	--	--	--	--
		03-31-80	--	--	--	7.6	--	--	--	--	--
		01-13-81	--	--	--	--	--	--	--	--	--
		[5]10-28-81	--	--	--	7.4	--	--	--	--	--
		04-21-94	--	--	704	7.3	20.0	24.0	668	6.0	82
		10-03-94	--	--	696	7.6	9.5	23.5	660	6.1	84
432630103284701	EVANS PLUNGE	03-15-56	--	--	1620	7.7	--	30.0	--	--	--
		12-17-58	--	--	1610	7.1	--	29.0	--	--	--
		[7] - -78	--	--	--	6.9	--	30.5	--	--	--
		04-21-94	--	--	1590	--	25.0	30.5	668	3.0	46
432136103321001	FETTERS WELL	05-12-94	5.0	--	1380	7.3	27.0	21.5	662	3.0	39
432127103325601	CHILLER WELL	05-11-94	12	--	2640	7.0	25.0	19.5	--	0	0

[1]Percent difference between anions and cations (in milliequivalents per liter) exceeds 5 percent; data should be used with caution.
[2]Replicate sample collected for quality assurance.
[3]Field blank collected for quality assurance.
[4]Spike sample collected for quality assurance.
[5]Percent difference between anions and cations (in milliequivalents per liter) exceeds 10 percent; data should be used with extreme caution.
[6]Sample collected by bailing; various parameters may be affected by exposure to atmosphere.
[7]Date unknown; sample probably collected during 1978.
[8]A large, unexplained difference exists for this parameter for samples collected on different dates.
[9]Reported values for dissolved lead of 10 or more micrograms per liter may be erroneously high.
[10]One tritium unit equals 3.24 PCI/L.
E Estimated.

CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2) (00405)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3 (00902)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L) (00904)	ALKA-LINITY WAT WH TOT FET FIELD MG/L AS CACO3 (00410)	ALKA-LINITY WAT WH TOT IT FIELD MG/L AS CACO3 (00419)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA-LINITY LAB (MG/L AS CACO3) (90410)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD-SORP-TION RATIO (00931)
--	310	--	110	--	--	202	206	71	33	2.9	2	0.1
--	390	--	57	--	--	333	302	100	34	6.7	4	0.1
--	550	--	320	--	--	230	233	160	36	3.3	1	0.1
--	1400	--	--	176	--	--	--	450	72	3.0	--	0.0
--	1600	--	--	--	212	--	210	500	82	7.4	1	0.1
--	1600	--	--	--	--	--	208	500	81	7.1	1	0.1
--	290	--	--	--	257	--	214	66	30	14	9	0.4
--	280	--	60	--	--	216	215	74	22	1.9	1	0.0
--	350	--	--	--	214	--	218	100	25	2.3	1	0.0
--	340	--	120	--	--	215	209	94	25	2.3	1	0.0
--	--	--	--	--	1	--	<1.0	<0.02	<0.01	<0.20	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
3.3	340	130	--	214	--	--	--	92	26	2.6	2	0.1
22	340	110	--	230	--	--	--	95	25	2.5	2	0.1
--	360	--	130	--	--	222	218	100	26	2.4	1	0.1
--	1800	--	1700	--	--	132	139	620	61	16	2	0.2
--	710	--	--	--	--	--	200	230	34	2.8	1	0.0
--	710	--	510	--	--	202	206	230	34	2.5	1	0.0
--	3100	--	--	170	--	--	--	650	350	5.0	0	0.0
6.7	1700	1500	--	173	--	--	--	550	83	6.8	1	0.1
--	1800	--	1600	--	--	170	173	570	88	7.6	1	0.1
--	240	--	0	--	--	246	238	58	24	5.1	4	0.1
--	210	--	--	228	--	--	--	56	18	3.9	--	0.1
--	230	--	5	--	--	221	--	59	19	4.9	4	0.1
29	1600	1400	--	185	--	--	--	470	93	28	4	0.3
--	--	--	--	--	--	--	--	--	--	--	--	--
--	1600	--	1400	--	--	180	188	490	85	29	4	0.3
--	170	--	0	--	--	181	181	40	17	15	16	0.5
--	170	--	5	--	--	166	169	39	18	12	13	0.4
--	230	--	0	--	--	242	235	52	24	13	11	0.4
16	280	70	--	206	--	--	--	67	26	40	24	1
--	270	--	--	--	--	--	--	70	23	46	26	1
--	270	--	--	--	--	--	--	74	19	43	26	1
--	280	--	--	--	--	--	--	68	26	40	24	1
--	270	--	--	--	--	--	--	68	26	43	25	1
--	--	--	--	--	--	--	--	--	--	--	--	--
--	170	--	--	--	--	--	--	24	26	43	35	1
--	--	--	--	--	--	--	--	--	--	--	--	--
--	270	--	61	--	--	211	215	66	26	39	23	1
7.5	720	530	--	194	--	--	--	230	38	79	19	1
30	720	530	--	191	--	--	--	230	38	110	25	2
--	690	--	--	--	--	--	--	210	41	86	21	1
--	--	--	--	--	--	--	--	--	--	--	--	--
--	480	--	--	--	205	--	208	140	32	100	30	2
--	1900	--	--	--	196	--	198	590	110	34	4	0.3

Table 10. Chemical analyses of ground-water samples—Continued

OTHER IDENTIFIER	DATE	POTASSIUM, TOTAL RECOVERABLE (MG/L AS K) (00937)	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	BICARBONATE WATER WH FET FIELD MG/L AS HCO3 (00440)	BICARBONATE WATER WH IT FIELD MG/L AS HCO3 (00450)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	BICARBONATE IT-LAB (MG-L - HCO3) (90440)	CARBONATE WATER WH FET FIELD MG/L AS CO3 (00445)	CARBONATE WATER WH IT FIELD MG/L AS CO3 (00447)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DISSOLVED (MG/L AS SO4) (00945)
BELLE FOURCHE	08-17-94	--	1.6	--	--	246	--	--	--	0	120
HIGGINS GULCH	[1]09-26-94	--	2.2	--	--	406	--	--	--	0	110
OLD HATCHERY	09-26-94	--	1.2	--	--	281	--	--	--	0	340
REDWATER 1	06-27-62	--	--	--	--	--	--	ND	--	--	1300
	04-12-94	--	2.5	--	259	--	--	--	0	--	1400
	[2]04-12-94	--	2.4	--	--	--	--	--	--	--	1300
LA-94A	08-18-94	--	3.0	--	313	--	--	--	0	--	67
LA-87B	04-11-94	--	1.5	--	--	263	--	--	--	0	73
LA-87A	04-11-94	--	1.3	--	262	--	--	--	0	--	150
MCNENNY POND	09-28-94	--	1.3	--	--	262	--	--	--	0	130
	[3]09-28-94	--	<0.10	--	1	--	--	--	0	--	<0.10
	[4]10-04-94	--	--	--	--	--	--	--	--	--	--
MCNENNY WELL	05-14-68	--	1.6	260	--	--	--	0	--	--	120
	08-05-80	--	1.4	270	--	--	--	--	--	--	120
	08-17-94	--	1.1	--	--	271	--	--	--	0	130
MIRROR LAKE	09-28-94	--	2.7	--	--	162	--	--	--	0	1600
COX LAKE	09-06-91	--	1.4	--	--	--	--	--	--	--	[8]320
	09-27-94	--	1.4	--	--	247	--	--	--	0	[8]520
SWANSON WELL	[5] - -66	--	4.0	--	--	--	--	--	--	--	1800
	04-27-67	--	4.1	210	--	--	--	0	--	--	1500
	08-16-94	--	4.1	--	--	208	--	--	--	0	1600
BOLES CANYON 1	[6]03-22-94	--	2.7	--	--	300	--	--	--	0	8.3
MYRVIK WELL	06-08-79	2.6	--	290	--	--	--	0	--	--	<5.0
	05-04-94	--	3.0	--	--	269	--	--	--	0	13
BEAVER CREEK	09-10-63	--	5.3	230	--	--	--	0	--	--	1300
	04-25-94	--	--	--	--	--	--	--	--	--	--
	10-03-94	--	4.7	--	--	220	--	--	--	0	1300
7-11 RANCH 1	03-31-94	--	3.2	--	--	221	--	--	--	0	24
7-11 RANCH 2	04-05-94	--	3.5	--	--	203	--	--	--	0	32
FR-92A	03-24-94	--	3.2	--	--	295	--	--	--	0	37
HOT BROOK	12-17-58	--	5.4	250	--	--	--	0	--	--	76
	11-10-67	--	4.9	210	--	--	--	--	--	--	79
	06-25-70	--	5.6	250	--	--	--	--	--	--	78
	12-30-75	--	5.2	250	--	--	--	--	--	--	76
	03-31-80	--	5.6	--	--	--	257	--	--	--	76
	01-13-81	--	--	--	--	--	--	--	--	--	--
	[5]10-28-81	--	3.0	250	--	--	--	--	--	--	77
	04-21-94	--	--	--	--	--	--	--	--	--	--
	10-03-94	--	5.6	--	--	257	--	--	--	0	73
EVANS PLUNGE	03-15-56	--	9.6	240	--	--	--	0	--	--	540
	12-17-58	--	9.0	230	--	--	--	0	--	--	610
	[7] - -78	--	11	230	--	--	--	--	--	--	550
	04-21-94	--	--	--	--	--	--	--	--	--	--
FETTERS WELL	05-12-94	--	12	--	250	--	--	--	0	--	310
CHILLER WELL	05-11-94	--	8.8	--	240	--	--	--	0	--	1700

[1]Percent difference between anions and cations (in milliequivalents per liter) exceeds 5 percent; data should be used with caution.
[2]Replicate sample collected for quality assurance.
[3]Field blank collected for quality assurance.
[4]Spike sample collected for quality assurance.
[5]Percent difference between anions and cations (in milliequivalents per liter) exceeds 10 percent; data should be used with extreme caution.
[6]Sample collected by bailing; various parameters may be affected by exposure to atmosphere.
[7]Date unknown; sample probably collected during 1978.
[8]A large, unexplained difference exists for this parameter for samples collected on different dates.
[9]Reported values for dissolved lead of 10 or more micrograms per liter may be erroneously high.
[10]One tritium unit equals 3.24 PCI/L.
E Estimated.

CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) (70301)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	NITROGEN, TOTAL (MG/L AS N) (00600)	NITROGEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITROGEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN, NITRITE TOTAL (MG/L AS N) (00615)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)
0.90	1.9	12	366	--	--	--	--	0.020	--	<0.20	--	<0.010
12	0.20	13	478	--	--	--	--	--	--	--	--	--
2.3	0.20	10	691	--	--	--	--	--	--	--	--	--
ND	1.0	--	--	2130	--	--	--	--	--	--	--	--
0.90	0.60	13	2160	--	--	--	--	0.050	--	<0.20	--	0.020
0.90	0.60	13	2050	--	--	--	--	0.050	--	<0.20	--	0.020
1.6	0.50	12	353	--	--	--	--	0.070	--	<0.20	--	<0.010
0.50	0.20	11	315	--	--	--	--	0.020	--	<0.20	--	0.020
0.70	0.30	11	422	--	--	--	--	0.020	--	<0.20	--	0.020
0.80	0.30	11	394	--	--	--	--	--	--	--	--	--
0.30	0.10	0.16	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
1.7	0.40	12	385	419	--	--	--	--	--	--	--	--
1.0	0.40	12	394	411	0.88	0.49	0.010	0.020	0.50	--	0.010	0.010
0.80	0.70	12	406	--	--	--	--	--	--	--	--	--
2.7	0.40	15	2400	--	--	--	--	--	--	--	--	--
[8]190	0.30	12	911	920	--	--	--	<0.010	--	<0.20	--	<0.010
[8]0.70	0.30	11	921	--	--	--	--	--	--	--	--	--
5.0	--	--	2920	2980	--	--	--	--	--	--	--	--
0.90	0.70	12	2270	2510	--	--	--	--	--	--	--	--
1.2	0.80	11	2380	--	--	--	--	--	--	--	--	--
1.1	0.20	9.0	258	--	--	--	--	0.040	--	<0.20	--	<0.010
<10	--	5.7	--	--	--	--	--	--	--	--	--	--
2.5	--	12	250	--	--	--	--	0.020	--	<0.20	--	<0.010
30	0.80	17	2050	2250	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
36	0.80	16	2070	--	--	--	--	--	--	--	--	--
6.4	0.60	12	229	--	--	--	--	0.030	--	<0.20	--	0.030
4.3	0.60	12	225	--	--	--	--	<0.010	--	<0.20	--	<0.010
5.2	0.50	10	294	--	--	--	--	0.070	--	<0.20	--	0.020
54	0.80	19	413	413	--	--	--	--	--	--	--	--
48	0.45	--	375	446	--	--	--	--	--	--	--	--
47	0.54	--	392	447	--	--	--	--	--	--	--	--
52	--	--	390	447	--	--	--	--	--	--	--	--
55	<20	--	399	434	--	--	--	--	--	--	<0.010	--
--	--	--	--	--	--	--	--	--	--	--	<0.010	--
54	0.90	--	350	398	--	--	--	--	--	--	<0.010	--
--	--	--	--	--	--	--	--	--	--	--	--	--
48	0.60	19	404	--	--	--	--	--	--	--	--	--
110	0.80	28	1150	1220	--	--	--	--	--	--	--	--
110	0.80	30	1250	1200	--	--	--	--	--	--	--	--
110	1.1	23	1150	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
140	0.90	22	884	--	--	--	--	0.010	--	<0.20	--	<0.010
52	1.2	14	2640	--	--	--	--	0.080	--	<0.20	--	<0.010

Table 10. Chemical analyses of ground-water samples—Continued

OTHER IDENTIFIER	DATE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, NITRATE TOTAL (MG/L AS N) (00620)	NITROGEN, NITRATE TOTAL (MG/L AS NO3) (71850)	NITROGEN, NITRATE DISSOLVED (MG/L AS N) (00618)	PHOSPHATE, TOTAL (MG/L AS PO4) (00650)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL) (01105)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)
BELLE FOURCHE	08-17-94	0.220	--	--	--	--	--	0.010	<0.010	--	--
HIGGINS GULCH	[1]09-26-94	--	--	--	--	--	--	--	--	--	--
OLD HATCHERY	09-26-94	--	--	--	--	--	--	--	--	--	--
REDWATER 1	06-27-62	--	0.070	--	--	--	--	--	--	--	--
	04-12-94	0.180	--	--	0.160	--	--	<0.010	<0.010	--	--
	[2]04-12-94	0.180	--	--	0.160	--	--	0.010	<0.010	--	--
LA-94A	08-18-94	0.820	--	--	--	--	--	0.010	<0.010	--	--
LA-87B	04-11-94	0.210	--	--	0.190	--	--	0.020	0.010	--	--
LA-87A	04-11-94	0.370	--	--	0.350	--	--	0.020	0.020	--	--
MCNENNY POND	09-28-94	--	--	--	--	--	--	--	--	--	--
	[3]09-28-94	--	--	--	--	--	--	--	--	--	--
	[4]10-04-94	--	--	--	--	--	--	--	--	--	--
MCNENNY WELL	05-14-68	--	--	0.10	--	--	--	--	--	--	--
	08-05-80	0.410	0.370	--	0.400	--	--	2.10	--	--	0
	08-17-94	--	--	--	--	--	--	--	--	--	--
MIRROR LAKE	09-28-94	--	--	--	--	--	--	--	--	--	--
COX LAKE	09-06-91	0.150	0.150	--	--	--	--	<0.010	<0.010	--	--
	09-27-94	--	--	--	--	--	--	--	--	--	--
SWANSON WELL	[5] - -66	--	<0.100	--	--	--	--	--	--	--	--
	04-27-67	--	--	0.0	--	--	--	--	--	--	--
	08-16-94	--	--	--	--	--	--	--	--	--	--
BOLES CANYON 1	[6]03-22-94	0.460	--	--	--	--	--	<0.010	<0.010	--	--
MYRVIK WELL	06-08-79	--	--	--	--	--	<0.040	--	--	<10	--
	05-04-94	0.860	--	--	--	--	--	<0.010	<0.010	--	--
BEAVER CREEK	09-10-63	--	--	--	0.360	--	--	--	--	--	--
	04-25-94	--	--	--	--	--	--	--	--	--	--
	10-03-94	--	--	--	--	--	--	--	--	--	--
7-11 RANCH 1	03-31-94	0.340	--	--	0.310	--	--	<0.010	<0.010	--	--
7-11 RANCH 2	04-05-94	0.700	--	--	--	--	--	<0.010	<0.010	--	--
FR-92A	03-24-94	0.380	--	--	0.360	--	--	<0.010	<0.010	--	--
HOT BROOK	12-17-58	--	--	2.2	--	0.0	--	--	--	0	--
	11-10-67	--	0.300	--	--	--	--	--	--	--	--
	06-25-70	--	0.400	--	--	--	--	--	--	--	--
	12-30-75	--	0.400	--	--	--	--	--	--	--	--
	03-31-80	--	0.300	--	--	--	--	--	--	--	--
	01-13-81	--	<0.300	--	--	--	--	--	--	--	--
	[5]10-28-81	--	1.35	--	--	--	--	--	--	--	--
	04-21-94	--	--	--	--	--	--	--	--	--	--
	10-03-94	--	--	--	--	--	--	--	--	--	--
EVANS PLUNGE	03-15-56	--	--	2.1	--	--	--	--	--	--	--
	12-17-58	--	--	0.70	--	0.0	--	--	--	0	--
	[7] - -78	--	--	--	--	--	--	--	--	--	--
	04-21-94	--	--	--	--	--	--	--	--	--	--
FETTERS WELL	05-12-94	0.290	--	--	--	--	--	<0.010	<0.010	--	--
CHILLER WELL	05-11-94	<0.050	--	--	--	--	--	<0.010	<0.010	--	--

[1]Percent difference between anions and cations (in milliequivalents per liter) exceeds 5 percent; data should be used with caution.
[2]Replicate sample collected for quality assurance.
[3]Field blank collected for quality assurance.
[4]Spike sample collected for quality assurance.
[5]Percent difference between anions and cations (in milliequivalents per liter) exceeds 10 percent; data should be used with extreme caution.
[6]Sample collected by bailing; various parameters may be affected by exposure to atmosphere.
[7]Date unknown; sample probably collected during 1978.
[8]A large, unexplained difference exists for this parameter for samples collected on different dates.
[9]Reported values for dissolved lead of 10 or more micrograms per liter may be erroneously high.
[10]One tritium unit equals 3.24 PCI/L.
E Estimated.

ANTIMONY, DISSOLVED (UG/L AS SB) (01095)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA) (01007)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	BORON, TOTAL RECOVERABLE (UG/L AS B) (01022)	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD) (01027)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, TOTAL RECOVERABLE (UG/L AS CO) (01037)
<1	--	3	--	44	<0.5	--	30	--	<1.0	--	<5	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
<1	--	<1	--	11	<2	--	120	--	<1.0	--	<20	--
<1	--	<1	--	11	<2	--	110	--	<1.0	--	<20	--
<1	--	3	--	44	<0.5	--	40	--	<1.0	--	<5	--
1	--	2	--	68	0.6	--	20	--	<1.0	--	<5	--
<1	--	2	--	78	<0.5	--	30	--	<1.0	--	<5	--
--	--	--	--	--	--	--	--	--	--	--	--	--
<1	--	<1	--	<2	<0.5	--	<10	--	<1.0	--	<5	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	30	--	--	--	--	--
--	--	4	--	90	--	--	30	--	<1.0	--	10	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
<1	<1	<1	--	18	--	--	30	--	<10	--	<1	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	40	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
<1	--	<1	--	84	<0.5	--	40	--	<1.0	--	<5	--
--	26	--	80	--	--	30	--	--	--	<4	--	<2
2	--	18	--	140	<0.5	--	40	--	<1.0	--	<5	--
--	--	--	--	--	--	--	140	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
1	--	4	--	32	<0.5	--	30	--	<1.0	--	<5	--
2	--	12	--	56	<0.5	--	40	--	<1.0	--	<5	--
<1	--	<1	--	170	<0.5	--	50	--	<1.0	--	<5	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	5	--	90	--	--	--	--	<1	--	2	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	260	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
1	--	8	--	24	<0.5	--	280	--	<1.0	--	<5	--
<1	--	<1	--	5	<2	--	210	--	<1.0	--	<20	--

Table 10. Chemical analyses of ground-water samples—Continued

OTHER IDENTIFIER	DATE	COBALT, DISSOLVED (UG/L AS CO) (01035)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	IRON, DISSOLVED (UG/L AS FE) (01046)	IRON (UG/L AS FE) (71885)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	[9]LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI) (01132)	LITHIUM DISSOLVED (UG/L AS LI) (01130)
BELLE FOURCHE	08-17-94	<3	--	<10	--	4	--	--	<10	--	<4
HIGGINS GULCH	[1]09-26-94	--	--	--	--	--	--	--	--	--	--
OLD HATCHERY	09-26-94	--	--	--	--	--	--	--	--	--	--
REDWATER 1	06-27-62	--	--	--	1600	--	--	--	--	--	--
	04-12-94	<9	--	<30	--	<9	--	--	<30	--	17
	[2]04-12-94	<9	--	<30	--	<9	--	--	<30	--	21
LA-94A	08-18-94	<3	--	<10	--	320	--	--	10	--	11
LA-87B	04-11-94	<3	--	<10	--	210	--	--	<10	--	10
LA-87A	04-11-94	<3	--	<10	--	52	--	--	<10	--	11
MCNENNY POND	09-28-94	--	--	--	--	--	--	--	--	--	--
	[3]09-28-94	<3	--	<10	--	<3	--	--	<10	--	<4
	[4]10-04-94	--	--	--	--	--	--	--	--	--	--
MCNENNY WELL	05-14-68	--	--	--	70	--	--	--	--	--	--
	08-05-80	--	--	12	--	<10	--	--	0	--	10
	08-17-94	--	--	--	--	--	--	--	--	--	--
MIRROR LAKE	09-28-94	--	--	--	--	--	--	--	--	--	--
COX LAKE	09-06-91	--	--	<1	--	5	--	--	<1	--	--
	09-27-94	--	--	--	--	--	--	--	--	--	--
SWANSON WELL	[5] - -66	--	--	--	0	--	--	--	--	--	--
	04-27-67	--	--	--	60	--	--	--	--	--	--
	08-16-94	--	--	--	--	--	--	--	--	--	--
BOLES CANYON 1	[6]03-22-94	<3	--	<10	--	<3	--	--	<10	--	8
MYRVIK WELL	06-08-79	--	<2	--	<10	--	--	--	--	7	--
	05-04-94	<3	--	<10	--	<3	--	--	<10	--	7
BEAVER CREEK	09-10-63	--	--	--	--	--	20	--	--	--	--
	04-25-94	--	--	--	--	--	--	--	--	--	--
	10-03-94	--	--	--	--	--	--	--	--	--	--
7-11 RANCH 1	03-31-94	<3	--	<10	--	370	--	--	<10	--	20
7-11 RANCH 2	04-05-94	<3	--	<10	--	72	--	--	<10	--	17
FR-92A	03-24-94	<3	--	<10	--	1000	--	--	<10	--	21
HOT BROOK	12-17-58	--	--	--	--	0	--	--	--	--	--
	11-10-67	--	--	--	10	--	--	--	--	--	--
	06-25-70	--	--	--	40	--	--	--	--	--	--
	12-30-75	--	--	--	500	--	--	--	--	--	--
	03-31-80	--	--	--	<20	--	--	--	--	--	--
	01-13-81	--	10	--	--	--	--	2	--	--	--
	[5]10-28-81	--	--	--	<50	--	--	--	--	--	--
	04-21-94	--	--	--	--	--	--	--	--	--	--
	10-03-94	--	--	--	--	--	--	--	--	--	--
EVANS PLUNGE	03-15-56	--	--	--	10	0	--	--	--	--	--
	12-17-58	--	--	--	--	0	--	--	--	--	--
	[7] - -78	--	--	--	--	--	--	--	--	--	--
	04-21-94	--	--	--	--	--	--	--	--	--	--
FETTERS WELL	05-12-94	<3	--	<10	--	4	--	--	<10	--	180
CHILLER WELL	05-11-94	<9	--	<30	--	170	--	--	<30	--	79

[1]Percent difference between anions and cations (in milliequivalents per liter) exceeds 5 percent; data should be used with caution.
[2]Replicate sample collected for quality assurance.
[3]Field blank collected for quality assurance.
[4]Spike sample collected for quality assurance.
[5]Percent difference between anions and cations (in milliequivalents per liter) exceeds 10 percent; data should be used with extreme caution.
[6]Sample collected by bailing; various parameters may be affected by exposure to atmosphere.
[7]Date unknown; sample probably collected during 1978.
[8]A large, unexplained difference exists for this parameter for samples collected on different dates.
[9]Reported values for dissolved lead of 10 or more micrograms per liter may be erroneously high.
[10]One tritium unit equals 3.24 PCI/L.
E Estimated.

MANGANESE, TOTAL RECOVERABLE (UG/L AS MN) (01055)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MANGANESE (UG/L AS MN) (71883)	MERCURY TOTAL RECOVERABLE (UG/L AS HG) (71900)	MERCURY DISSOLVED (UG/L AS HG) (71890)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO) (01062)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOVERABLE (UG/L AS AG) (01077)	SILVER, DISSOLVED (UG/L AS AG) (01075)
--	<1	--	--	<0.1	--	<10	--	<10	--	5	--	<1.0
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
0	--	--	--	--	--	--	--	--	--	--	--	--
--	3	--	--	<0.1	--	<30	--	<30	--	6	--	<3.0
--	<3	--	--	<0.1	--	<30	--	<30	--	6	--	<3.0
--	13	--	--	<0.1	--	<10	--	<10	--	2	--	<1.0
--	8	--	--	<0.1	--	<10	--	<10	--	<1	--	<1.0
--	2	--	--	<0.1	--	<10	--	<10	--	1	--	<1.0
--	--	--	--	--	--	--	--	--	--	--	--	--
--	<1	--	--	--	--	<10	--	<10	--	<1	--	<1.0
--	--	--	--	--	--	--	--	--	--	--	--	--
0	--	--	--	--	--	--	--	--	--	--	--	--
--	<1	--	--	0	--	<10	--	--	--	1	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	<1	--	--	<0.1	--	--	--	--	--	2	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
ND	--	--	--	--	--	--	--	--	--	--	--	--
40	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	47	--	--	<0.1	--	<10	--	<10	--	2	--	<1.0
<2	--	--	--	--	8	--	<4	--	1	--	<2	--
--	1	--	--	<0.1	--	<10	--	<10	--	1	--	<1.0
--	--	10	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	41	--	--	<0.1	--	<10	--	<10	--	2	--	<1.0
--	4	--	--	<0.1	--	10	--	<10	--	3	--	<1.0
--	110	--	--	<0.1	--	10	--	<10	--	2	--	<1.0
--	0	--	--	--	--	--	--	--	--	--	--	--
0	--	--	--	--	--	--	--	--	--	--	--	--
10	--	--	--	--	--	--	--	--	--	--	--	--
<20	--	--	--	--	--	--	--	--	--	--	--	--
20	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	<0.20	--	--	--	--	--	<1	--	<1	--
<30	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	0	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--	--
--	<1	--	--	<0.1	--	20	--	<10	--	3	--	<1.0
--	14	--	--	<0.1	--	<30	--	<30	--	<1	--	<3.0

Table 10. Chemical analyses of ground-water samples—Continued

OTHER IDENTIFIER	DATE	TITANIUM TOTAL (UG/L AS TI) (01152)	STRONTIUM, TOTAL RECOVERABLE (UG/L AS SR) (01082)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)	THALLIUM, DISSOLVED (UG/L AS TL) (01057)	VANADIUM, TOTAL (UG/L AS V) (01087)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	ZIRCONIUM, TOTAL (UG/L AS ZR) (01162)	C-13 / C-12 STABLE ISOTOPE RATIO PER MIL (82081)
BELLE FOURCHE	08-17-94	--	--	700	<1	--	<6	--	15	--	-7.20
HIGGINS GULCH	[1]09-26-94	--	--	--	--	--	--	--	--	--	-11.40
OLD HATCHERY	09-26-94	--	--	--	--	--	--	--	--	--	-9.60
REDWATER 1	06-27-62	--	--	--	--	--	--	--	--	--	--
	04-12-94	--	--	11000	<1	--	<18	--	10000	--	-7.40
	[2]04-12-94	--	--	11000	--	--	<18	--	10000	--	--
LA-94A	08-18-94	--	--	1100	<1	--	<6	--	7	--	-9.10
LA-87B	04-11-94	--	--	460	--	--	<6	--	20	--	-11.20
LA-87A	04-11-94	--	--	810	--	--	<6	--	<3	--	-12.00
MCNENNY POND	09-28-94	--	--	--	--	--	--	--	--	--	-11.00
	[3]09-28-94	--	--	<1	--	--	<6	--	<3	--	--
	[4]10-04-94	--	--	--	--	--	--	--	--	--	--
MCNENNY WELL	05-14-68	--	--	--	--	--	--	--	--	--	--
	08-05-80	--	--	1100	--	--	5	--	30	--	--
	08-17-94	--	--	--	--	--	--	--	--	--	-11.80
MIRROR LAKE	09-28-94	--	--	--	--	--	--	--	--	--	-5.60
COX LAKE	09-06-91	--	--	--	--	--	--	--	7	--	--
	09-27-94	--	--	--	--	--	--	--	--	--	-8.70
SWANSON WELL	[5] - -66	--	--	--	--	--	--	--	--	--	--
	04-27-67	--	--	--	--	--	--	--	--	--	--
	08-16-94	--	--	--	--	--	--	--	--	--	-8.40
BOLES CANYON 1	[6]03-22-94	--	--	110	--	--	<6	--	<3	--	-11.50
MYRVIK WELL	06-08-79	<2	360	--	--	<4	--	360	--	<2	--
	05-04-94	--	--	350	<1	--	16	--	240	--	-9.00
BEAVER CREEK	09-10-63	--	--	--	--	--	--	--	--	--	--
	04-25-94	--	--	--	--	--	--	--	--	--	--
	10-03-94	--	--	--	--	--	--	--	--	--	-5.40
7-11 RANCH 1	03-31-94	--	--	320	<1	--	<6	--	5	--	-9.80
7-11 RANCH 2	04-05-94	--	--	360	<1	--	6	--	6	--	-9.10
FR-92A	03-24-94	--	--	640	--	--	<6	--	12	--	-9.60
HOT BROOK	12-17-58	--	--	1000	--	--	--	--	--	--	--
	11-10-67	--	--	--	--	--	--	--	--	--	--
	06-25-70	--	--	--	--	--	--	--	--	--	--
	12-30-75	--	--	--	--	--	--	--	--	--	--
	03-31-80	--	--	--	--	--	--	--	--	--	--
	01-13-81	--	--	--	--	--	--	100	--	--	--
	[5]10-28-81	--	--	--	--	--	--	--	--	--	--
	04-21-94	--	--	--	--	--	--	--	--	--	--
	10-03-94	--	--	--	--	--	--	--	--	--	-9.20
EVANS PLUNGE	03-15-56	--	--	--	--	--	--	--	--	--	--
	12-17-58	--	--	--	--	--	--	--	--	--	--
	[7] - -78	--	--	3	--	--	--	--	--	--	-9.70
	04-21-94	--	--	--	--	--	--	--	--	--	--
FETTERS WELL	05-12-94	--	--	2100	<1	--	8	--	34	--	-8.10
CHILLER WELL	05-11-94	--	--	8500	<1	--	<18	--	<9	--	-7.40

[1]Percent difference between anions and cations (in milliequivalents per liter) exceeds 5 percent; data should be used with caution.
[2]Replicate sample collected for quality assurance.
[3]Field blank collected for quality assurance.
[4]Spike sample collected for quality assurance.
[5]Percent difference between anions and cations (in milliequivalents per liter) exceeds 10 percent; data should be used with extreme caution.
[6]Sample collected by bailing; various parameters may be affected by exposure to atmosphere.
[7]Date unknown; sample probably collected during 1978.
[8]A large, unexplained difference exists for this parameter for samples collected on different dates.
[9]Reported values for dissolved lead of 10 or more micrograms per liter may be erroneously high.
[10]One tritium unit equals 3.24 PCI/L.
E Estimated.

H-2 / H-1 STABLE ISOTOPE RATIO PER MIL (82082)	O-18 / O-16 STABLE ISOTOPE RATIO PER MIL (82085)	S-34 / S-32 STABLE ISOTOPE RATIO PER MIL (82086)	GROSS ALPHA TOTAL (UG/L AS U NATRL) (80029)	GROSS ALPHA, DIS-SOLVED (PCI/L AS U-NAT) (01515)	GROSS ALPHA, DIS-SOLVED (UG/L AS U-NAT) (80030)	ALPHA, COUNT, 2 SIGMA WAT DIS AS NAT U (UG/L) (75986)	ALPHA RADIO. WATER DISS AS TH-230 (PCI/L) (04126)	ALPHA COUNT, 2 SIGMA WAT DIS AS TH-230 (PCI/L) (75987)	GROSS BETA, DIS-SOLVED (PCI/L AS CS-137) (03515)	BETA, 2 SIGMA WATER, DISS, AS CS-137 (PCI/L) (75989)	GROSS BETA, DIS-SOLVED (PCI/L AS SR/Y-90) (80050)
-131.0	-17.07	10.50	--	--	9.8	4.1	6.9	2.9	4.5	1.3	3.3
-126.0	-16.47	10.30	--	--	--	--	--	--	--	--	--
-128.0	-16.71	12.60	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
-127.0	-16.88	12.60	--	--	12	13	8.5	9.1	4.9	3.2	3.7
-126.0	-16.84	12.50	--	--	11	13	7.6	8.9	6.5	3.6	4.9
-121.0	-15.58	9.40	--	--	3.0	2.2	2.1	1.5	5.8	1.5	4.3
-128.0	-16.98	11.60	--	--	6.3	3.0	4.9	2.3	3.0	0.99	2.2
-130.0	-17.28	11.80	--	--	6.9	3.9	4.4	2.5	2.7	1.0	2.0
-132.0	-17.19	11.60	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	11.20	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	<5.1	<7.5	--	--	--	<3.2	--	<3.0
-132.0	-17.07	11.50	--	--	--	--	--	--	--	--	--
-123.0	-15.34	12.60	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
-129.0	-16.95	12.70	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
-133.0	-17.45	12.80	--	--	--	--	--	--	--	--	--
-125.0	-16.32	-0.7	--	--	1.7	1.5	1.1	0.97	4.4	1.2	3.3
--	--	--	--	--	--	--	--	--	--	--	--
-109.0	-14.27	3.40	--	--	5.9	2.3	4.2	1.7	5.6	1.3	4.3
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
-108.0	-14.10	--	--	--	--	--	--	--	--	--	--
-88.7	-11.93	17.30	--	--	5.5	2.6	4.2	2.0	4.5	1.1	3.5
-93.3	-12.38	0.40	--	--	13	4.3	8.4	2.8	6.2	1.6	4.6
-114.0	-14.88	8.60	--	--	6.5	2.8	4.7	2.0	5.7	1.3	4.3
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	8.0	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
-113.0	-14.86	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
-121.0	-16.71	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
-127.0	-16.59	12.10	--	--	9.3	6.6	6.7	4.7	18	3.7	13
-118.0	-15.15	13.30	--	--	78	34	50	22	21	6.4	16

Table 10. Chemical analyses of ground-water samples—Continued

OTHER IDENTIFIER	DATE	BETA, 2 SIGMA WATER, DISS, AS SR90 /Y90 (PCI/L (75988)	CERIUM 144, TOTAL (PCI/L) (28901)	RA-228/ RA-226 ACTIVITY RATIO (99911)	RA-228/ RA-226 1 SIGMA (99912)	RA-226 RADON EMAN-ATION (DPM/L) (99913)	RA-226 1 SIGMA (DPM/L) (99914)	RA-228 ARITH-METIC (DPM/L) (99915)	RA-226, DIS-SOLVED, PLAN-CHET COUNT (PCI/L) (09510)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L) (09511)
BELLE FOURCHE	08-17-94	0.95	--	0.110	0.006	0.840	0.070	0.090	--	--
HIGGINS GULCH	[1]09-26-94	--	--	1.277	0.060	0.280	0.010	0.358	--	--
OLD HATCHERY	09-26-94	--	--	0.869	0.042	0.150	0.020	0.130	--	--
REDWATER 1	06-27-62	--	--	--	--	--	--	--	--	--
	04-12-94	2.4	--	1.240	0.029	0.150	0.050	0.190	--	--
	[2]04-12-94	2.7	--	--	--	--	--	--	--	--
LA-94A	08-18-94	1.1	--	0.264	0.015	0.610	0.060	0.160	--	--
LA-87B	04-11-94	0.74	--	0.575	0.036	0.440	0.050	0.250	--	--
LA-87A	04-11-94	0.76	--	0.664	0.022	0.120	0.010	0.080	--	--
MCNENNY POND	09-28-94	--	--	0.885	0.049	0.160	0.010	0.140	--	--
	[3]09-28-94	--	--	--	--	--	--	--	--	--
	[4]10-04-94	--	--	--	--	--	--	--	--	--
MCNENNY WELL	05-14-68	--	--	--	--	--	--	--	--	--
	08-05-80	--	--	--	--	--	--	--	--	0.11
	08-17-94	--	--	0.679	0.049	0.200	0.030	0.140	--	--
MIRROR LAKE	09-28-94	--	--	1.318	0.080	0.260	0.040	0.340	--	--
COX LAKE	09-06-91	--	--	--	--	--	--	--	--	--
	09-27-94	--	--	0.225	0.013	0.280	0.010	0.060	--	--
SWANSON WELL	[5] - -66	--	--	--	--	--	--	--	--	--
	04-27-67	--	--	--	--	--	--	--	--	--
	08-16-94	--	--	0.021	0.002	35.080	1.600	0.740	--	--
BOLES CANYON 1	[6]03-22-94	0.88	--	--	--	0.490	0.020	--	--	--
MYRVIK WELL	06-08-79	--	57	--	--	--	--	--	--	--
	05-04-94	0.96	--	0.278	0.008	1.270	0.200	0.350	--	--
BEAVER CREEK	09-10-63	--	--	--	--	--	--	--	--	--
	04-25-94	--	--	0.491	0.021	0.570	0.060	0.280	--	--
	10-03-94	--	--	--	--	--	--	--	--	--
7-11 RANCH 1	03-31-94	0.85	--	0.138	0.013	0.520	0.040	0.070	--	--
7-11 RANCH 2	04-05-94	1.6	--	1.000	0.053	0.220	0.020	0.220	--	--
FR-92A	03-24-94	1.0	--	0.287	0.012	1.160	0.110	0.330	--	--
HOT BROOK	12-17-58	--	--	--	--	--	--	--	--	--
	11-10-67	--	--	--	--	--	--	--	--	--
	06-25-70	--	--	--	--	--	--	--	--	--
	12-30-75	--	--	--	--	--	--	--	--	--
	03-31-80	--	--	--	--	--	--	--	--	--
	01-13-81	--	--	--	--	--	--	--	0.3	--
	[5]10-28-81	--	--	--	--	--	--	--	--	--
	04-21-94	--	--	0.193	0.049	0.480	0.050	0.090	--	--
	10-03-94	--	--	--	--	--	--	--	--	--
EVANS PLUNGE	03-15-56	--	--	--	--	--	--	--	--	--
	12-17-58	--	--	--	--	--	--	--	--	--
	[7] - -78	--	--	--	--	--	--	--	--	--
	04-21-94	--	--	0.206	0.010	0.840	0.050	0.170	--	--
FETTERS WELL	05-12-94	2.8	--	0.221	0.020	0.780	0.100	0.170	--	--
CHILLER WELL	05-11-94	4.8	--	0.022	0.002	24.770	4.010	0.540	--	--

[1]Percent difference between anions and cations (in milliequivalents per liter) exceeds 5 percent; data should be used with caution.
[2]Replicate sample collected for quality assurance.
[3]Field blank collected for quality assurance.
[4]Spike sample collected for quality assurance.
[5]Percent difference between anions and cations (in milliequivalents per liter) exceeds 10 percent; data should be used with extreme caution.
[6]Sample collected by bailing; various parameters may be affected by exposure to atmosphere.
[7]Date unknown; sample probably collected during 1978.
[8]A large, unexplained difference exists for this parameter for samples collected on different dates.
[9]Reported values for dissolved lead of 10 or more micrograms per liter may be erroneously high.
[10]One tritium unit equals 3.24 PCI/L.
E Estimated.

SR-87/ SR-86 RATIO (99916)	STRON- TIUM (UG/L) (99917)	THORIUM TOTAL (UG/L AS TH) (82364)	TRITIUM TOTAL (PCI/L) (07000)	TRITIUM 2 SIGMA WATER, WHOLE, TOTAL (PCI/L) (75985)	TRITIUM TOTAL (TRITIUM UNITS[10])	URANIUM NATURAL TOTAL (UG/L AS U) (28011)	URANIUM DIS- SOLVED, EXTRAC- TION (UG/L) (80020)	URANIUM NATURAL DIS- SOLVED (UG/L AS U) (22703)	URANIUM NATURAL 2 SIGMA WATER, DISS, (UG/L) (75990)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)
--	--	--	<1.0	1.0	<1.0	--	--	5.5	<1.0	--
0.709	770	--	100	6.0	31	--	--	--	--	--
0.708	1270	--	83	5.0	26	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--
0.708	11100	--	3.0	1.0	0.9	--	--	3.3	<1.0	--
--	--	--	3.0	1.0	0.9	--	--	3.9	<1.0	--
0.709	1180	--	24	2.0	7.4	--	--	2.7	<1.0	--
0.709	480	--	<1.0	1.0	<1.0	--	--	2.2	<1.0	--
0.708	860	--	61	5.0	19	--	--	2.6	<1.0	--
0.708	930	--	66	4.0	20	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	2.5	--	--	2.1
--	--	--	62	4.0	19	--	--	--	--	--
0.708	6430	--	54	3.0	17	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--
0.708	2660	--	67	4.0	21	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--
--	--	--	2.0	1.0	0.6	--	--	--	--	--
0.710	120	--	9.0	1.0	3	--	--	0.10	<1.0	--
--	--	<5.0	--	--	--	4.9	--	--	--	--
0.710	360	--	<1.0	1.0	<1.0	--	--	4.5	<1.0	--
--	--	--	--	--	--	--	--	--	--	--
0.709	5160	--	19	2.0	5.9	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--
0.718	340	--	<1.0	1.0	<1.0	--	--	2.6	<1.0	--
0.713	380	--	<1.0	1.0	<1.0	--	--	5.4	<1.0	--
0.711	670	--	<1.0	1.0	<1.0	--	--	2.3	<1.0	--
--	--	--	--	--	--	--	--	--	--	--
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--	--	--	--	--	--	--	--	--	--	--
0.715	850	--	13	1.0	4.0	--	--	--	--	--
--	--	--	12	1.0	3.7	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--
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--	--	--	--	--	--	--	--	--	--	--
0.711	3190	--	2.0	1.0	0.6	--	--	--	--	--
0.714	2230	--	<1.0	1.0	<1.0	--	--	6.4	<1.0	--
0.709	8940	--	<1.0	1.0	<1.0	--	--	5.5	<1.0	--

Table 11. Data for selected springs

[Owner: USFS, U.S. Forest Service; GF&P, South Dakota Game, Fish and Parks. Primary use of water: H, domestic; I, irrigation; N, industrial; P, public supply; R, recreation; S, stock, U, unused or unknown; Z, other. --, no data available; ft, feet; gal/min, gallons per minute; deg C, degrees Celsius; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter]

Local number	Site ID	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)	Elevation of land surface (ft)	Owner	
2N 1E 4BCDC	440947104004301	440947	1040043	6,540	USFS	
2N 1E 7CDCA	440830104025201	440830	1040252	6,380	USFS	
2N 1E24CCAD	440650103570101	440650	1035701	6,790	USFS	
2N 2E10DBDD	440840103513801	440840	1035138	6,075	USFS	
2N 3E 4CADC	440932103460501	440932	1034605	5,940	USFS	
2N 3E11BDBA	440905103433701	440905	1034337	5,730	USFS	
3N 1E 2BACC	441512103580501	441512	1035805	6,380	USFS	
3N 1E 6AABB	441524104022301	441524	1040223	6,350		--
3N 1E 8DDCC	441343104010801	441343	1040108	6,625		--
3N 1E 9ABAC	441427104000501	441427	1040005	6,620	USFS	
3N 1E 9DCCA	441346104001301	441346	1040013	6,720	USFS	
3N 1E11CDCD	441343103580201	441343	1035802	6,332	USFS	
3N 1E12DACD	441358103561401	441358	1035614	6,050	USFS	
3N 1E21DACB	441213103595701	441213	1035957	6,585	USFS	
3N 1E24ADCD	441223103561501	441223	1035615	6,240	USFS	
3N 2E10AAAC	441426103512301	441426	1035123	6,030	USFS	
3N 2E12BBAA	441430103495001	441430	1034950	6,060	City of Lead	
3N 2E15ABAB	441337103514401	441337	1035144	6,155	City of Lead	

Name of spring	Geohydrologic unit[1]	Primary use of water	Date of measurement	Dis-charge (gal/min)	Tempera-ture (deg C)	Specific conduc-tance (µS/cm)	Oxygen, dissolved (mg/L)	pH (standard units)
McInerny Spring	Madison	S	07-18-1990	0.10	9.0	440	7.4	--
			06-07-1994	2.69	6.5	436	8	7.66
Deer Spring	Madison	H	06-10-1994	9.87	6.5	458	10.5	7.7
Oatman Spring	Madison	S	06-14-1994	8.56	7	493	8.1	7.8
Beaver Spring	Madison	S	07-25-1990	0	--	--	--	--
			07-19-1994	.9	8	486	9.1	7.4
--	Precambrian	S	07-19-1990	0	--	--	--	--
			07-18-1994	0	--	--	--	--
--	Precambrian	S	07-19-1990	.01	--	--	--	--
			06-15-1994	1.80	6.5	400	1.6	5.9
What The Hell Spring	Madison	S	08-14-1990	0	--	--	--	--
			07-26-1994	.45	9	650	11.2	7.3
Billie Spring	Minnelusa	S	07-26-1990	0	--	--	--	--
			07-08-1994	1.33	10	571	1	6.8
Crowley Spring	Madison	S	07-26-1990	.01	--	--	--	--
			06-14-1994	10.3	7	480	11.5	7.3
Valley Spring	Madison	S	08-15-1990	.01	--	--	--	--
			06-15-1994	4.04	6	400	10	7.8
Little Spearfish Spring	Madison	S	10-01-1981	1	6.0	--	--	--
			08-15-1990	0	--	--	--	--
			06-14-1994	4.41	6.5	493	9	7.4
Potato Spring	Madison	S	07-26-1990	1.19	16.0	580	11.0	7.6
			07-27-1994	1.13	12.5	568	8.2	7.8
--	Madison	S	07-26-1990	.01	--	--	--	--
			08-01-1994	0	--	--	--	--
--	Madison	S	11-24-1981	--	5.9	--	--	--
			11-27-1981	2	--	510	--	--
			07-26-1990	12.5	6.5	550	9.3	7.3
			08-05-1994	25	4	536	9.5	7.51
Lander Spring	Madison	S	10-01-1981	--	5.0	--	--	--
			08-02-1990	.10	9.5	400	7.6	7.6
			08-01-1994	.9	8	522	12.6	8
Graveyard Spring	Englewood	S	10-07-1981	.35	3.0	--	--	--
			07-24-1990	.01	--	--	--	--
			07-01-1994	.45	5	368	14.8	7.9
Keough Draw	Englewood	P	11-03-1981	120	6.0	475	--	--
			08-27-1990	11.7	8.7	498	8.4	7.7
			08-04-1994	520	4	488	13.4	7.55
Ward Draw	Madison	P	11-03-1981	120	6.0	490	--	--
			08-27-1990	66.9	7.0	494	8.6	7.5
			08-04-1994	1,050	5	485	15.6	7.77

Table 11. Data for selected springs—Continued

Local number	Site ID	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)	Elevation of land surface (ft)	Owner	
3N 2E17BDCC	441315103543301	441315	1035433	6,155	USFS	
3N 2E19CDAC	441201103553201	441201	1035532	6,220	USFS	
3N 2E20BCBC	441230103545501	441230	1035455	6,200		--
3N 2E24DBAC	441216103491701	441216	1034917	6,440	USFS	
3N 2E26ACDC	441132103502901	441132	1035029	6,300		--
3N 2E34BBAD	441058103521401	441058	1035214	6,510	USFS	
3N 3E 4BAAC	441521103455201	441521	1034552	6,130	Homestake	
3N 3E 4BBBA	441524103462101	441524	1034621	6,120	Homestake	
3N 3E 5AABD	441518103464001	441518	1034640	6,120	Homestake	
3N 3E 6DDAD	441440103474701	441440	1034747	6,220	USFS	
3N 3E10ACAD	441412103442201	441412	1034422	6,260	USFS	
3N 3E10ADCC	441405103441801	441405	1034418	6,190	USFS	
3N 3E10DAAB	441404103440801	441404	1034408	6,130	USFS	
3N 3E14CBBB	441310103435901	441310	1034359	6,120	USFS	
3N 3E18CDAC	441225103482601	441225	1034826	6,195	USFS	
3N 3E36CDCD	441013103422801	441013	1034228	5,800	USFS	
3N 4E27AAAA	441153103365501	441153	1033655	5,420	USFS	
3N 4E31DADC	441023103403501	441023	1034035	5,840	USFS	
3N 5E 2DBDA	441450103284401	441450	1032844	4,820	USFS	
3N 5E 4BACC	441512103313901	441512	1033139	4,860		--
3N 5E16BDAA	441323103312301	441323	1033123	4,850	USFS	
4N 1E 9BADC	441934104002301	441934	1040023	5,820	USFS	

Name of spring	Geohydrologic unit[1]	Primary use of water	Date of measurement	Discharge (gal/min)	Temperature (deg C)	Specific conductance (µS/cm)	Oxygen, dissolved (mg/L)	pH (standard units)
Merow Spring	Madison	S	10-01-1981	4	4.0	--	--	--
			08-02-1990	0	--	--	--	--
			07-21-1994	2.02	5	461	12	7.2
Yellow Jacket Spring	Madison	S	10-01-1981	.20	6.0	--	--	--
			07-25-1990	0	--	--	--	--
			07-21-1994	1.37	7	477	8.4	6.9
Clayton Draw	Madison	U	10-01-1981	40.0	6.0	--	--	--
			08-05-1994	13.9	8.0	460	14.6	7.90
Harvey Spring	Madison	S	07-16-1990	.45	9.0	500	8.1	--
			06-29-1994	.15	9	418	5.2	7.7
--	Deadwood	--	07-17-1990	0.01	7.0	480	10.6	7.5
			07-18-1994	--	5	483	13.5	7.8
--	Madison	S	07-05-1994	.90	15	464	10	8
--	Madison	N	08-21-1994	30	5.5	495	8.2	7.5
--	Englewood	N	08-21-1994	33.7	8	499	9	8.5
--	Madison		08-21-1994	63.3	6	434	9.8	8.4
--	Madison	S	07-24-1990	7.7	13	450	7.0	8.5
			06-30-1994	4.93	6	480	12.2	7.7
--	Deadwood	S	07-24-1990	70.9	11.8	160	12.8	7.6
			06-28-1994	8.08	10	158	7.6	7.15
--	Madison	H	08-06-1990	.13	--	--	--	--
			09-07-1994	14.4	3.5	475	9.1	7.57
--	Deadwood	S	08-06-1990	.01	--	--	--	--
			09-07-1994	1.80	6	441	7.4	7.77
--	Deadwood	S	08-06-1990	0	--	--	--	--
			06-14-1994	--	8	539	9.9	7.4
			06-23-1994	39.5	--	--	--	--
Irey Spring	Madison	S	07-17-1990	.01	--	--	--	--
			06-29-1994	2.24	6	494	4.7	7.3
--	Precambrian	S	08-10-1990	1.80	21	350	8.1	7.9
			06-16-1994	22.9	6.5	205	10.2	7.8
--	Precambrian	S	07-19-1990	.01	--	--	--	--
			06-03-1994	13.9	9.0	131	10.2	7.09
--	Deadwood	U	08-06-1990	0	--	--	--	--
			06-08-1994	.45	11.5	85.6	6.5	6.63
--	Madison	S	07-19-1990	.01	--	--	--	--
			09-22-1994	.45	7	588	10	6.92
--	Deadwood	U	07-23-1990	0	--	--	--	--
			06-03-1994	168	6.5	482	10.5	7.5
--	Deadwood	S	07-23-1990	0	--	--	--	--
			06-02-1994	197	7.5	680	8.6	7.5
Schoolhouse Spring	Madison	S	08-02-1990	0	--	--	--	--
			07-08-1994	.63	8	482	12	8.1

Table 11. Data for selected springs—Continued

Local number	Site ID	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)	Elevation of land surface (ft)	Owner
4N 1E 9DBBB	441917104001501	441917	1040015	5,835	USFS
4N 1E18BCCB	441833104031601	441833	1040316	6,010	USFS
4N 1E26BCDB	441647103581801	441647	1035818	6,360	USFS
4N 1E30AAAA	441707104020701	441707	1040207	6,160	USFS
4N 1E35CDAB	441534103575901	441534	1035759	6,390	USFS
4N 2E 3ABCA	442030103514801	442030	1035148	5,920	Wharf Resources
4N 2E 3BCA	442022103521601	442022	1035216	5,840	Wharf Resources
4N 2E 3BDA	442018103520001	442018	1035200	5,760	Wharf Resources
4N 2E 5BCCD	442013103544901	442013	1035449	5,040	Max Lieurance
4N 2E 9CCAA	441904103532601	441904	1035326	5,180	Fred Welker
4N 2E 9CDCD	441854103531801	441854	1035318	5,240	Kenneth Scott
4N 2E 9CDDB	441858103531301	441858	1035313	5,180	Jack Cole
4N 2E21BBAB	441756103533501	441756	1035335	5,810	--
4N 2E33DBBC	441543103530101	441543	1035301	6,100	USFS
4N 3E14ADCC	441826103430401	441826	1034304	5,720	USFS
4N 3E33ACDB	441553103454301	441553	1034543	6,130	Homestake
4N 3E33BBAB	441615103451701	441615	1034517	6,130	Homestake
4N 4E19AAAC	441755103403701	441755	1034037	5,270	--
4N 4E21AACC	441748103381701	441748	1033817	5,280	USFS
4N 4E21DBBD	441730103383301	441730	1033833	5,480	USFS
4N 4E25BBDC	441656103352701	441656	1033527	5,150	USFS
4N 4E26ACAC	441646103360301	441646	1033603	5,280	USFS

Name of spring	Geohydrologic unit[1]	Primary use of water	Date of measurement	Discharge (gal/min)	Temperature (deg C)	Specific conductance (µS/cm)	Oxygen, dissolved (mg/L)	pH (standard units)
--	Deadwood	S	10-15-1981	3	11.0	--	--	--
			08-02-1990	0	--	--	--	--
			07-08-1994	3.7	8	551	8.4	7
Wagon Canyon Spring	Deadwood	S	08-03-1990	.01	--	--	--	--
			08-05-1994	21.1	6	522	14.4	7.03
Dry Gulch Spring	Minnelusa	S	08-14-1990	0	--	--	--	--
			07-26-1994	1.66	6.5	582	8.1	7.2
McGeorge Spring	Minnelusa	S	08-02-1990	.01	--	--	--	--
			09-22-1994	2.86	6	537	11.2	7.03
Dead Ox Spring	Madison	S	10-13-1981	2.5	6.0	--	--	--
			08-14-1990	0	--	--	--	--
			07-25-1994	.71	13	525	10.4	8.2
Annie Creek Spring	Igneous	S	10-08-1981	1	7.0	--	--	--
			08-22-1990	104	14.0	376	7.9	8.3
			08-17-1994	44.7	4	589	8.5	7.4
Ross Springs	Whitewood	S	06-19-1991	.09	8.0	462	--	7.9
			08-23-1994	20	6.5	531	18.2	7.48
Beaver Spring	Igneous	U	06-19-1991	.04	7.0	430	--	7.5
			08-17-1994	20.7	4	627	10.1	7.8
--	--	--	08-07-1990	3.38	12.6	397	8.9	--
--	--	--	08-03-1990	--	10.1	421	9.3	--
--	--	--	08-02-1990	--	16.5	432	7.3	--
--	--	--	08-03-1990	2.57	12.1	488	8.8	--
Park Camp Spring	Madison	S	10-13-1981	20	5.0	--	--	--
			08-27-1990	1.8	15.1	479	8.0	8.0
			07-26-1994	28.3	8	500	8.8	8
Holland Camp Spring	Madison	S	07-25-1990	13.6	6.0	510	9.6	7.3
			07-21-1994	4.95	6	511	9.5	7.1
--	Igneous	S	08-15-1990	.9	12.0	57	9.8	6.1
			08-27-1993	129	6.5	53	9.7	6.1
			08-10-1994	4.9	5	49	6.2	5.9
--	Madison	N	08-21-1994	25.6	5	520	10.3	7.6
--	Madison	N	08-21-1994	30	5	496	10.8	7.5
--	Precambrian	H	08-01-1990	0	--	--	--	--
			08-10-1994	.45	15	368	5.1	6.9
--	Precambrian	S	07-23-1990	0	--	--	--	--
			08-10-1994	.9	15	428	2.3	6.9
--	Precambrian	S	07-23-1990	0	--	--	--	--
			09-14-1994	25.6	11.5	166	7.2	7.14
--	Deadwood	U	07-23-1990	0	--	--	--	--
			09-28-1994	0	--	--	--	--
--	Deadwood	S	07-23-1990	0	--	--	--	--
			06-06-1994	13.9	7.4	505	10.6	7.6

Table 11. Data for selected springs—Continued

Local number	Site ID	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)	Elevation of land surface (ft)	Owner
4N 5E24ABAB	441800103273701	441800	1032737	3,880	--
5N 1E 1DADA	442517103554701	442517	1035547	5,155	USFS
5N 1E 3DCDB	442504103583501	442504	1035835	5,155	--
5N 1E 4AACB	442545103593901	442545	1035939	5,190	--
5N 1E 5BBBC	442542104014701	442542	1040147	5,260	USFS
5N 1E 8CDAA	442418104011401	442418	1040114	5,500	--
5N 1E10BDAB	442445103585301	442445	1035853	5,280	--
5N 1E11CBDB	442425103580201	442425	1035802	5,540	USFS
5N 1E13DBBD	442337103561501	442337	1035615	5,340	--
5N 1E15ACCA	442345103584001	442345	1035840	5,590	--
5N 1E19BBBA	442313104025701	442313	1040257	5,720	Richard Sleep
5N 1E19BDCB	442254104025501	442254	1040255	5,880	Richard Sleep
5N 1E20ACDD	442252104010101	442252	1040101	5,630	USFS
5N 2E31CABA	442105103552301	442105	1035523	5,050	Arlendo Lillehaug
5N 3E 3ADDA	442532103434901	442532	1034349	4,380	USFS
5N 3E14BABC	442404103432601	442404	1034326	4,880	USFS
6N 1E24CCAB	442746103565201	442746	1035652	4,240	USFS
6N 1E25BCBB	442719103570301	442719	1035703	4,640	USFS
6N 1E30DAAD	442706104015401	442706	1040154	4,640	USFS

Name of spring	Geohydrologic unit[1]	Primary use of water	Date of measurement	Discharge (gal/min)	Temperature (deg C)	Specific conductance (µS/cm)	Oxygen, dissolved (mg/L)	pH (standard units)
Tilford Gulch	--		09-14-1994	2.36	7.0	536	9.2	7.3
--	Minnelusa	S	10-15-1981	.13	4.6	503	--	--
			08-07-1990	1.62	12.0	540	7.5	7.2
			08-15-1994	2.0	6.5	551	5.5	7.1
--	Minnelusa	U	10-19-1981	4	3.7	505	--	--
			08-20-1990	0	--	--	--	--
			08-15-1994	.9	8	540	3.2	7.1
--	Minnelusa	H	10-19-1981	3	7.9	468	--	--
			08-20-1990	1.8	15.8	363	7.9	7.8
			08-29-1994	6.73	6	471	14.6	7.56
Soldier Spring	Madison	S	08-09-1990	1.58	13.3	605	7.4	7.3
			07-20-1994	1.78	8	576	11.2	7.2
Christianson Spring	Igneous	S	08-21-1990	1.8	10.5	207	6.9	8.6
			09-22-1994	.9	5	285	6.2	7.3
Higgins Spring	Minnelusa	S	10-21-1981	1.41	5.9	508	--	--
			08-13-1990	4.55	8.0	510	12.9	7.3
			08-30-1994	5.77	5	528	9.9	7.1
Jay Spring	Minnelusa	S	10-19-1981	--	5.3	--	--	--
			08-13-1990	1.25	11.2	370	9.6	7.5
			08-30-1994	.80	6	569	12.2	7.14
Cabin Spring	Minnelusa	S	10-20-1981	10	6.7	543	--	--
			08-13-1990	33.7	13.7	590	9.6	8.2
			08-29-1994	15.7	7	548	4.2	8.3
--	Minnelusa	S	10-21-1981	.01	--	--	--	--
			08-09-1990	.01	16.3	390	6.4	7.5
			08-15-1994	.9	9.5	412	10.8	7.2
--	--	S	08-21-1990	0	--	--	--	--
Centennial Spring	Igneous	S	08-21-1990	0	--	--	--	--
			07-14-1994	.14	14.5	153	0	7.1
Potato Spring	Deadwood	Z	08-07-1990	6.98	10.2	180	9.3	7.5
			07-14-1994	4.04	9	129	7.1	7.9
--	--	H	08-08-1990	2.37	14.8	418	8.9	--
--	Minnelusa	S	08-14-1990	.01	--	--	--	--
			08-23-1994	.01	7	512	6.9	7.8
--	Madison	U	08-13-1990	0	--	--	--	--
			08-18-1994	0	--	--	--	--
--	Minnelusa	S	10-22-1981	10	7.4	405	--	--
			08-27-1990	1.80	16.5	390	8.7	7.8
			08-15-1994	8.01	8	402	9.5	7.6
--	Minnelusa	S	10-22-1981	30	6.4	400	--	--
			08-20-1990	18.0	18.0	464	7.9	8.2
			08-18-1994	4.04	9	407	10	7.9
Knight Spring	Minnelusa	S	08-21-1990	.90	7.5	577	11.5	7.6
			09-21-1994	5	7	530	10	7.3

Table 11. Data for selected springs—Continued

Local number	Site ID	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)	Elevation of land surface (ft)	Owner
6N 1E34AADA	442637103581501	442637	1035815	4,720	USFS
7N 1E15DAAD	443402103581701	443402	1035817	3,415	--
7N 1E16BACA	443424104001701	443424	1040017	3,360	Robert Ferrell
7N 1E16BACC	443421104002001	443421	1040020	3,360	Robert Ferrell
7N 1E16DADC	443356103593701	443356	1035937	3,415	GF&P
7N 1E16DCCC	443344104000201	443344	1040002	3,400	Robert Ferrell
7N 1E20AABC	443335104010001	443335	1040100	3,425	GF&P
7N 1E21BBCB	443331104003601	443331	1040036	3,400	GF&P
7N 1E21BBCD	443330104003401	443330	1040034	3,400	GF&P
7N 2E 4DCBC	443530103522801	443530	1035228	3,220	Carl Chenoweth
7N 2E 9BBA	443522103531401	443522	1035314	3,250	Jeffries
7N 2E28ACAB	443234103523601	443234	1035236	3,400	--
7N 2E33ABDA	443147103523201	443147	1035232	3,455	John Ward

[1]Refers to surficial geohydrologic unit and is not necessarily indicative of spring source.

Name of spring	Geohydrologic unit[1]	Primary use of water	Date of measurement	Discharge (gal/min)	Temperature (deg C)	Specific conductance (µS/cm)	Oxygen, dissolved (mg/L)	pH (standard units)
Big Spring	Minnelusa	U	10-22-1981	--	--	426	--	--
			08-13-1990	.45	11.5	430	7.8	8.1
			08-18-1994	1.80	10	413	17.1	7.6
--	Spearfish	S	07-30-1991	82.6	18.0	2,620	8.0	7.4
			07-03-1994	22.9	17	2,570	6.8	7.2
--	Spearfish	S	07-31-1991	15.71	16.7	2,560	--	7.0
			07-11-1994	9.87	18.0	2,420	1.9	7.0
--	Spearfish	S	07-31-1991	11.7	11.8	2,620	10.0	7.2
			07-11-1994	8.98	13	2,530	5.4	7.3
Cox Lake	Spearfish	R	09-06-1991	2,060	15.0	1,200	10.5	7.7
			09-27-1994	1,860	11	1,110	8.2	7.8
--	Spearfish	S	08-01-1991	28.3	14.2	2,540	--	7.4
			07-11-1994	9.87	16	2,430	6.1	7.5
Mirror Lake Outfall	Spearfish	R	08-02-1991	--	22.0	2,540	8.0	7.8
			08-25-1993	142	20.5	2,450	8.2	7.9
			09-28-1994	205	13.5	2,560	7.8	7.8
McNenny Viewing Pond	Spearfish	Z	08-05-1991	471	--	--	--	--
			07-22-1992	390	13	681	--	--
			09-28-1994	531	12	680	6.9	7.1
McNenny Rearing Pond	Spearfish	Z	08-05-1991	597	--	--	--	--
			01-04-1992	427	8	656	--	--
			09-28-1994	401	12	566	7.0	7.57
--	Alluvium	S	07-24-1991	74.5	18.6	836	8.0	8.2
			09-28-1994	52.6	13	885	--	7.85
--	Alluvium	I	08-26-1993	317	14.5	1,798	10.4	7.9
			09-16-1994	803	16	1,556	--	7.42
--	Alluvium	S	07-11-1991	100	9.7	611	10.0	7.4
			09-20-1994	150	11	683	10	7.22
--	Alluvium	I	07-10-1991	477	11.9	603	9.0	8.0
			07-21-1994	1,000	14	613	5.5	7.45

Table 12. Data for selected streams with significant springflow components

[Owner: USFS, U.S. Forest Service; GF&P, South Dakota Game, Fish and Parks. Primary use of water: H, domestic; I, irrigation; N, industrial; P, public supply; R, recreation; S, stock, U, unused or unknown; Z, other. --, no data available; ft, feet; gal/min, gallons per minute; deg C, degrees Celsius; µS/cm, microsiemens per centimeter; mg/L, milligrams per liter]

Local number	Site ID	Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)	Elevation of land surface (ft)	Owner
2N 1E 6CDCD	440823104025801	440823	1040258	6,200	--
2N 2E 4DACB	440943103524701	440943	1035247	6,180	USFS
2N 2E 4DACC	440935103524601	440935	1035246	6,180	USFS
2N 2E 4DDBA	440933103524101	440933	1035241	6,180	USFS
3N 2E 6CCCD	441434103560001	441434	1035600	5,880	City of Lead
4N 1E 9DACA	441855103594701	441910	1035950	5,765	Howard Morrison
6N 3E 3DCD	443016103441001	443016	1034410	3,650	Doyle O'Dell
6N 3E15DCCD	442832103441601	442832	1034416	3,770	--
7N 1E13CDA	443353103563101	443353	1035631	3,350	--
7N 1E13DCBB	443353103562401	443353	1035624	3,340	--
7N 1E13DDAA	443354103555201	443354	1035552	3,360	--
7N 1E14CCDC	443343103580201	443343	1035802	3,485	--
7N 1E20BAAD	443248104003301	443248	1040033	3,440	--
7N 1E21BBBA	443338104011901	443338	1040119	3,440	GF&P
7N 1E22BBB	443340103592301	443340	1035923	3,420	Joe Schenk
7N 1E23DAB	443311103571901	443311	1035719	3,410	--
7N 2E11CBB	443459103505201	443459	1035052	3,220	--
7N 2E12BCCB	443502103494201	443502	1034942	3,200	--
7N 2E20ACDD	443317103534401	443317	1035344	3,390	--
7N 2E20DAAD	443309103532401	443309	1035324	3,380	--
7N 2E28BACD	443237103525801	443237	1035258	3,400	--

[1]Refers to surficial geohydrologic unit and is not necessarily indicative of spring source.
[2]Source of flow determined to be from flowing well, not spring flow.

Name of spring	Geohydrologic unit[1]	Primary use of water	Date of measurement	Discharge (gal/min)	Temperature (deg C)	Specific conductance (µS/cm)	Oxygen, dissolved (mg/L)	pH (standard units)
Cold Spring Creek	Madison	--	07-18-1990	2,090	11.8	410	8.4	9.7
			06-07-1994	2,220	12.0	434	9.2	8.6
South Fork Rapid Creek	Madison	S	07-16-1990	31.0	10.5	480	12.1	8.0
			05-31-1994	352	5.5	467	9.9	7.81
South Fork Rapid Creek	Madison	S	07-16-1990	304	8.4	470	12.2	7.7
			05-31-1994	371	7.5	462	10.4	8.5
South Fork Rapid Creek	Madison	S	07-16-1990	941	9.0	500	9.4	7.8
			05-31-1994	1,320	7	477	11.7	8.2
Spearfish Creek at Intake Gulch	Madison	P	12-09-1981	3,780	--	--	--	--
			11-24-1981	--	6.6	453	--	--
			04-27-1993	3,140	10.5	458	9.9	8.4
			08-01-1994	4,650	8	466	10.4	7.88
Little Spearfish Creek	Madison	T	08-23-1990	1,230	--	--	--	--
			05-14-1993	1,380	14	448	9.5	8.3
			07-26-1994	1,670	9	458	18.4	8.15
False Bottom Creek	--	S	08-06-1990	22.9	22.4	858	14.0	8.4
Miller Creek	--	S	08-07-1991	100	15.2	--	5	7.1
			08-26-1993	31	15.0	1,894	10.1	7.9
			09-16-1994	97.9	13	1,580	6.3	7.28
Chicken Creek	--	I	07-24-1990	548	16.7	1,700	10.0	8.0
			08-20-1994	231	8.6	1,872	9.2	7.82
Chicken Creek	Spearfish	U	07-16-1991	42.6	30.9	2,630	6.0	7.7
			07-13-1994	20.6	29	2,520	2.1	7.55
Chicken Creek	Spearfish	S	07-16-1991	147	21.9	3,000	7.0	7.6
			07-10-1994	20.5	21	3,200	5.2	8.01
Unnamed tributary to Redwater River[2]	--	I	07-29-1991	249	15.3	1,517	11.0	8.1
Crow Creek	Spearfish	I	08-16-1990	1,080	20.5	1,168	9.6	7.9
			08-26-1994	1,900	18	1,330	9.0	7.8
			12-01-1994	2,630	5.9	1,130	10.9	8.22
Crow Creek tributary below McNenny Hatchery	Spearfish	Z	08-16-1990	1,090	13.0	695	8.2	7.6
			12-01-1994	2,400	10.5	675	9.3	7.9
Lake Creek	--	S	07-30-1991	36.8	20.9	1,472	6.0	7.9
			07-21-1994	.0	--	--	--	
Chicken Creek	--	S	07-29-1991	500	15.1	1,500	12.0	8.1
			08-18-1994	104	15	1,495	10	7.64
Unnamed tributary to Redwater River	--	I	07-26-1991	22.9	18.4	1,699	8.0	7.9
			08-14-1994	56.1	18	1,640	12.7	7.71
Spring Creek	Spearfish	S	07-26-1991	583	21.3	1,455	6.0	8.0
			09-20-1994	200	16	1,654	--	7.62
Unnamed drainage	--	I	07-11-1991	113	18.0	1,624	8.0	7.5
			07-21-1994	152	15.5	1,680	7.3	7.45
Unnamed tributary to Spearfish Creek	Spearfish	I	07-15-1991	1,580	18.2	1,700	13.0	7.7
			09-16-1994	2,180	--	1,486	--	7.64
			09-26-1994	3,430	10	--	8.8	7.9
Higgins Gulch	Alluvium	I	07-12-1991	1,540	17.2	746	10.0	8.0
			09-05-1994	--	13.2	760	10.9	7.59
			09-26-1994	3,200	13.0	657	8	8

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