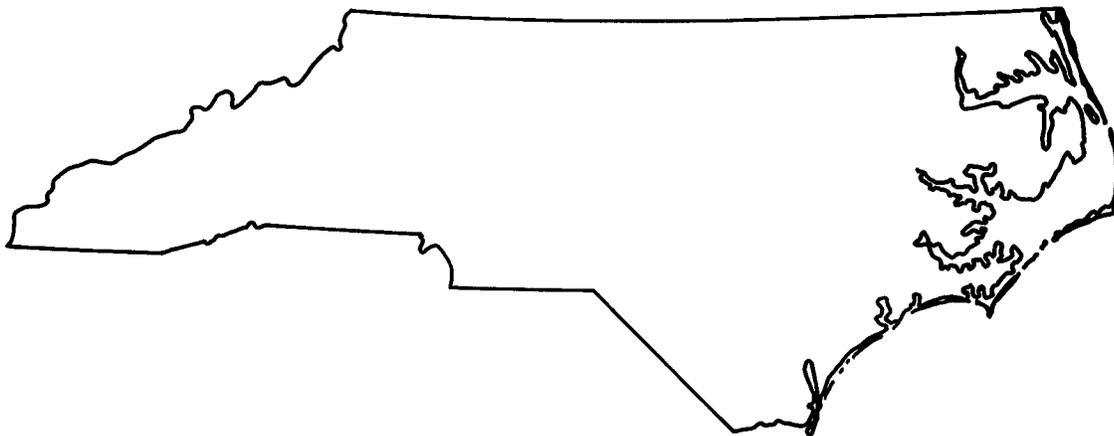


Prepared in cooperation with the North Carolina Department of Environment and Natural Resources, and with other State, municipal, and Federal agencies

# Water Resources Data North Carolina Water Year 2004

Volume 2  
Ground-Water Records



Water-Data Report NC-04-2

# Calendar for Water Year 2004

2003

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October							November							December						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
			1	2	3	4							1		1	2	3	4	5	6
5	6	7	8	9	10	11	2	3	4	5	6	7	8	7	8	9	10	11	12	13
12	13	14	15	16	17	18	9	10	11	12	13	14	15	14	15	16	17	18	19	20
19	20	21	22	23	24	25	16	17	18	19	20	21	22	21	22	23	24	25	26	27
26	27	28	29	30	31		23	24	25	26	27	28	29	28	29	30	31			
							30													

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2004

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January							February							March						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2	3	1	2	3	4	5	6	7		1	2	3	4	5	6
4	5	6	7	8	9	10	8	9	10	11	12	13	14	7	8	9	10	11	12	13
11	12	13	14	15	16	17	15	16	17	18	19	20	21	14	15	16	17	18	19	20
18	19	20	21	22	23	24	22	23	24	25	26	27	28	21	22	23	24	25	26	27
25	26	27	28	29	30	31	29							28	29	30	31			

April							May							June						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2	3							1			1	2	3	4	5
4	5	6	7	8	9	10	2	3	4	5	6	7	8	6	7	8	9	10	11	12
11	12	13	14	15	16	17	9	10	11	12	13	14	15	13	14	15	16	17	18	19
18	19	20	21	22	23	24	16	17	18	19	20	21	22	20	21	22	23	24	25	26
25	26	27	28	29	30		23	24	25	26	27	28	29	27	28	29	30			
							30	31												

July							August							September						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2	3	1	2	3	4	5	6	7				1	2	3	4
4	5	6	7	8	9	10	8	9	10	11	12	13	14	5	6	7	8	9	10	11
11	12	13	14	15	16	17	15	16	17	18	19	20	21	12	13	14	15	16	17	18
18	19	20	21	22	23	24	22	23	24	25	26	27	28	19	20	21	22	23	24	25
25	26	27	28	29	30	31	29	30	31					26	27	28	29	30		

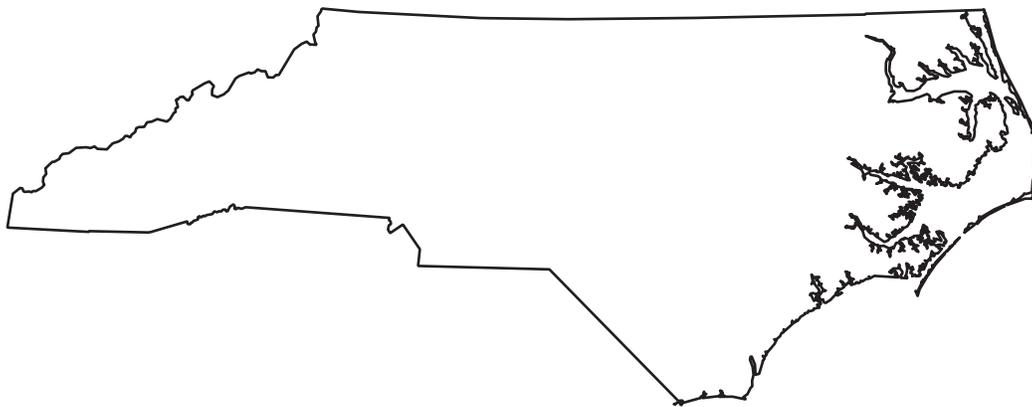
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# **Water Resources Data North Carolina Water Year 2004**

## **Volume 2. Ground-Water Records**

By S.S. Howe, P.L. Breton, and M.J. Chapman

Water-Data Report NC-04-2



Prepared in cooperation with the North Carolina Department of Environment and Natural Resources,  
and with other State, municipal, and Federal agencies

**U.S. Department of the Interior  
U.S. Geological Survey**

**U.S. Department of the Interior**

Gale A. Norton, Secretary

**U.S. Geological Survey**

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2005

U.S. Geological Survey  
3916 Sunset Ridge Road  
Raleigh, NC 27607  
(919) 571-4000

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This volume of the annual hydrologic-data report is one of a series of annual reports across the Nation that document hydrologic data gathered from the U.S. Geological Survey's ground-water data-collection networks in each State, Puerto Rico, and the Trust Territories. These records provide hydrologic information needed by State, local, and Federal agencies, and the private sector for developing and managing our Nation's land and water resources. Ground-water data for North Carolina are contained in this volume.

This report is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. In addition to the authors, who had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to Geological Survey policy and established guidelines, the following individuals contributed significantly to the collection, processing, and tabulation of the data:

R. Gene Barker	Stephen L. Harden	Eric S. Rudisill
Kirsten M. Cassingham	Brad A. Huffman	Eric M. Sadorf
W. Scott Caldwell	Philip S. Jen	Douglas G. Smith
Michelle Cienek	Joshua Manzer	Timothy B. Spruill
Alissa Coes	Michael D. Penley	Erik L. Staub
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Ronald G. Garrett	Jerald B. Robinson	Bentley T. Walton
		Beth M. Wrege

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Pamilee L. Breton edited much of the text, tables and graphs, of this report. Pamilee L. Breton and Stephen S. Howe assembled the report.

This report was prepared in cooperation with the State of North Carolina, other agencies, and under the general supervision of Gerald L. Ryan, District Chief; and Jess D. Weaver, Regional Hydrologist, Southeastern Region.

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## INTRODUCTION

Water-resources data for the 2004 water year for North Carolina consist of records of ground-water levels and water quality of ground water; records of stage, discharge, precipitation and water quality of streams; and stage and contents of lakes and reservoirs. This report contains ground-water-level data from 161 observation wells, ground-water-quality data from 38 wells, continuous water quality for 7 sites and continuous precipitation at 7 sites. The collection of water-resources data in North Carolina is a part of the National Water-Data System operated by the U.S. Geological Survey in cooperation with State, municipal, and other Federal agencies.

Records of ground-water levels were published from 1935 to 1974 in a series of Water-Supply Papers entitled "Ground-Water Levels in the United States." Water-supply papers can be found in the libraries of principal cities and universities throughout the United States or can be purchased from the U.S. Geological Survey, Earth Science Information Center, Open-File Reports Section, Denver Federal Center, Box 25286, Mail Stop 517, Denver, Colorado 80225.

Ground-water-level data beginning with the 1975 water year are published only in reports on a State-by-State basis. Beginning with the 1975 water year these Survey reports carry an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report NC-03-2. Water-data reports are for sale by the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161.

## COOPERATION

Cooperative agreements between the U.S. Geological Survey and organizations of the State of North Carolina for the systematic collection of water-resources data began in 1895 and continued through 1909. Following a lapse of 8 years, the State of North Carolina resumed cooperation in October 1918. Organizations that have cooperative agreements with the U.S. Geological Survey and assisted in collecting the water-resources data contained in this report are:

North Carolina Department of Environment and Natural Resources  
Division of Water Resources  
Division of Water Quality, Groundwater Section

The following organizations have cooperative agreements with the U.S. Geological Survey and assisted in the data-collection program by furnishing funds or services:

Brunswick County  
Lumber River Council of Governments

The following Federal agencies assisted in the data-collection program by furnishing funds or services:

U.S. Marine Corps, Camp Lejeune  
U.S. Marine Corps, Cherry Point, MCAS  
U.S. Environmental Protection Agency

### OBJECTIVE CONCEPT FOR GROUND-WATER-LEVEL DATA

The ground-water-level data collected during the 2004 water year from observation wells in the statewide program and special project wells are published in this report. The statewide program is a cooperative program between the U.S. Geological Survey (USGS) and the North Carolina Department of Environment and Natural Resources (DENR). Observation wells for this program are located so that the most significant data are obtained from the fewest number of wells in the major aquifers of the State. Monitoring wells for this program are categorized in one of two networks based on specific objectives (table 1). The first network, the natural-effects network, has the objective of measuring the effects of natural stresses on ground-water storage. This network contains climatic-effects wells, which monitor the effects of climate, such as rainfall and the duration of the growing season, on ground-water storage in unconfined aquifers. This network also contains terrane-effects wells which are used to define the effects of different depths to the water table, and topography and geology on ground-water storage in response to climatic stresses. The second network, the induced-effects network, defines the effect of human-induced stress on the ground-water system; the major induced stress being ground-water withdrawal by pumping. Within the induced-effects network are local-effects wells located near large-capacity pumping wells or well fields. These local-effects wells are used to measure daily or weekly water-level fluctuations. Areal-effects wells, also in the induced-effects network, are used to determine the status of ground-water storage in an aquifer over a large area and to aid in determining the areal extent of major aquifers.

The particular effect each well in the statewide program monitors is explained in the information header for each well. The headers for the special project wells contain a reference to those projects.

### MAJOR AQUIFERS

The major aquifers in North Carolina can be divided into two zones related to the physiographic provinces of the State. The Piedmont and Blue Ridge Provinces (fig. 1) extend across the western 60 percent of the State and are, for the most part, underlain by fractured, igneous and metamorphic rocks (fig. 2). The fractured igneous and metamorphic rocks have low permeability but are, nevertheless, the major aquifers in the Piedmont and Blue Ridge Provinces. These rocks are covered almost everywhere by regolith, which is either a clayey or sandy saprolite consisting of weathered parent material, or sand and clayey-sand alluvium. The regolith, although not a major aquifer, contains most of the ground water in storage and is a source of water to the underlying igneous and metamorphic rock aquifers. All observation wells in the Piedmont and Blue Ridge Provinces that were measured in the 1998 water year tapped the regolith.

The Coastal Plain Province covers the eastern 40 percent of North Carolina, where aquifers are within a wedge of sedimentary rock layers that dip and thicken to the southeast (fig. 2). The Coastal Plain sediments have been divided by Winner and Coble (1996) into 10 aquifers separated by confining units.

Ground water in the regolith of the Piedmont and Blue Ridge Provinces and in the surficial aquifer of the Coastal Plain Province generally is unconfined. Ground water in the other Coastal Plain aquifers generally is under confined conditions.

Table 1.--Type, objective, and use of data from the North Carolina observation-well program  
 [Adapted from Winner, 1981]

Type	Objective	Use of data
Natural effects		
Climatic effects	To define effects of climate on ground-water storage.	Hydrographs showing natural changes in storage.
Terrane effects	To define effects of climate on ground-water storage as modified by topography and geology.	Hydrographs showing natural changes in storage as modified by topography and geology.
Induced effects		
Local effects	To define effects of ground-water withdrawals on storage near points of withdrawal.	Maps showing potentiometric-surface depressions.  Hydrographs showing changes in water levels with time.
	To define the hydraulic characteristics of aquifers.	Graphs showing water levels during pumping conditions as a function of pumping rates.
	To define effectiveness of confining beds in separating aquifers.	
Areal effects	To determine status of storage over the entire areal extent of the aquifer.	Regional water-level maps.  Maps showing net change in storage over a specific time period.
	To define regional continuity of aquifers.	Define recharge and discharge areas for areal extensive aquifers.

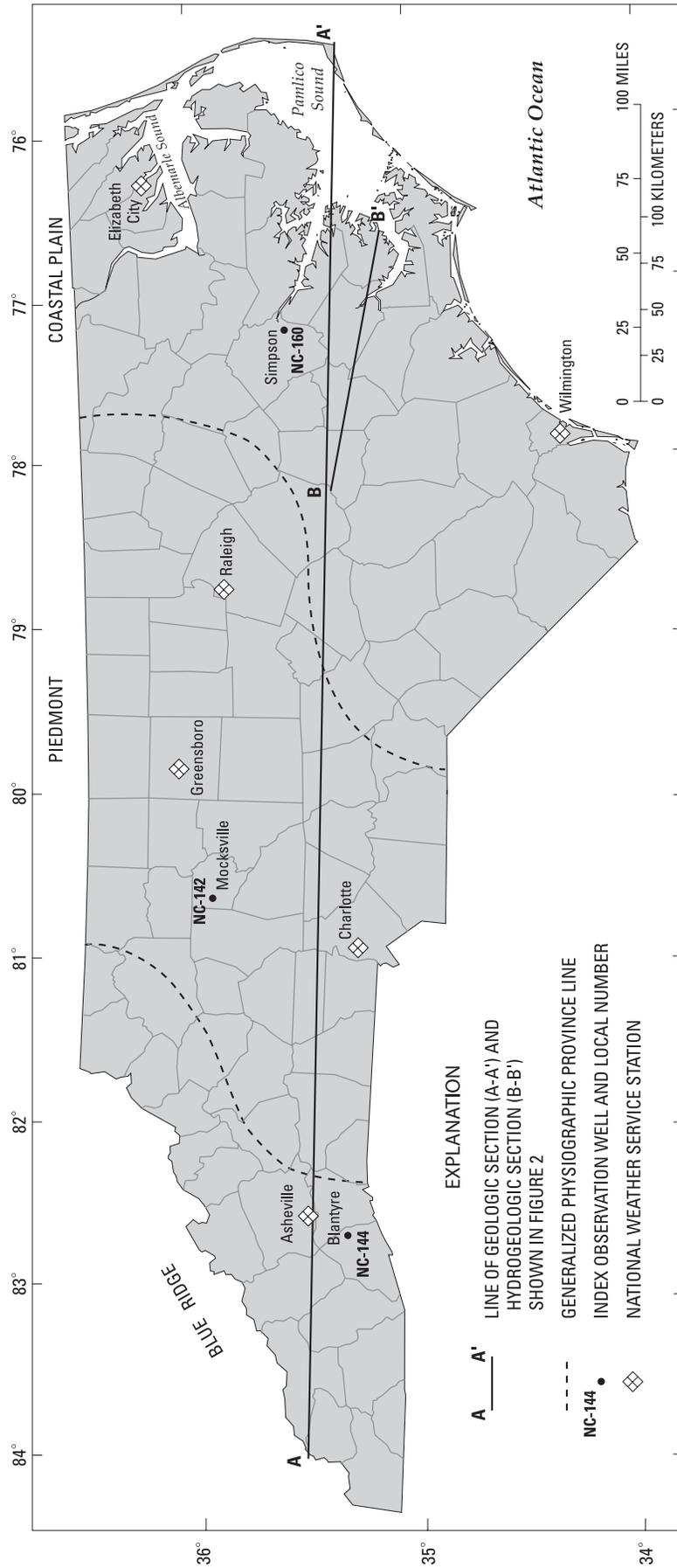


Figure 1.--Locations of National Weather Service stations, index wells, geologic section A-A', and hydrogeologic section B-B' in North Carolina.

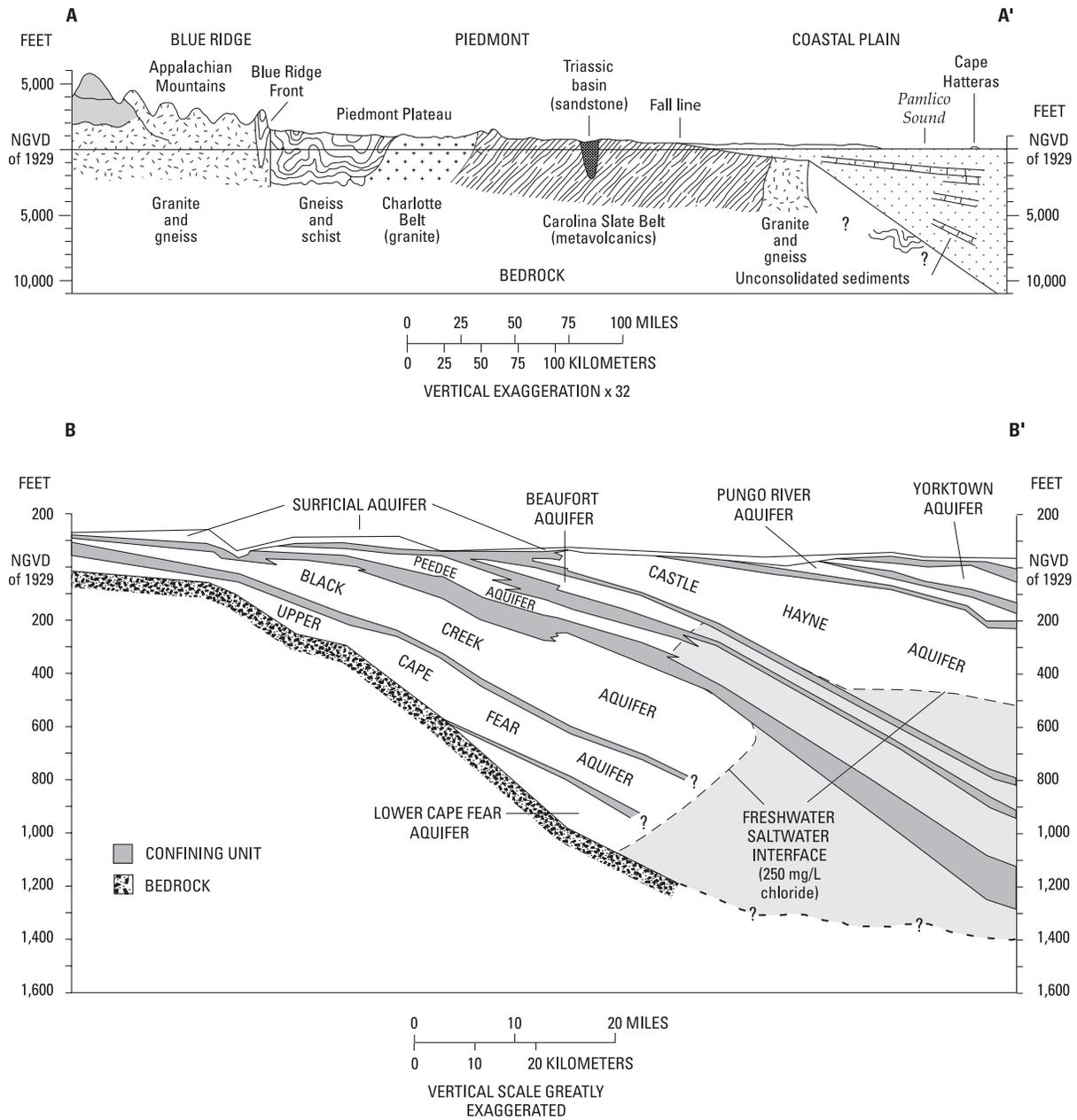


Figure 2.--Geologic section A-A' across North Carolina and hydrogeologic section B-B' in the Coastal Plain of North Carolina (as shown in figure 1).

## SUMMARY OF WATER-RESOURCES CONDITIONS

Precipitation

Precipitation amounts for the first quarter (October through December) of the 2004 water year were below average across the State except in Wilmington and Elizabeth City. Precipitation amounts in the western part of the State varied from 1.38 inches below average in Asheville to 5.53 inches below average in Charlotte, in the central part of the State from 1.24 inches below average in Raleigh to 3.28 inches below average in Greensboro, and in the eastern part of the State from 4.72 inches above average in Elizabeth City to 6.23 inches above average in Wilmington. Average precipitation amounts are mean monthly values based on data from 1971 through 2000, the 30-year base period used by the National Weather Service. Precipitation data recorded at two of the six key National Weather Service stations in the State (fig. 1) indicate that below-average precipitation amounts occurred in all months during the first quarter at Charlotte and Greensboro.

The second quarter of the 2004 water year (January through March) brought even drier conditions to the State. Precipitation was below average at all six index sites in January and March. The greatest precipitation amount recorded during the quarter was in Wilmington, but the total for the quarter remained 3.09 inches below average. Below-average precipitation for the quarter was recorded at Raleigh (3.66 inches), Asheville (5.43 inches), Greensboro (5.58 inches), and Charlotte (5.86 inches). Elizabeth City had the greatest deficit (6.28 inches below average) and the least amount of total precipitation (6.07 inches) during the second quarter.

The third quarter (April through June) brought above-average precipitation to the western and northeastern part of the State. Elizabeth City had the greatest amount of precipitation during this period (3.63 inches above average); Charlotte and Asheville also had above-average precipitation (2.30 and 1.27 inches, respectively) in the western part of the State. Precipitation amounts ranged from 4.02 (Greensboro) and 0.62 (Raleigh) inches below average in the central part of the State to 4.88 inches below average in Wilmington in the southeastern part of the State. All six National Weather Service stations recorded below-average precipitation amounts in April in all three provinces of North Carolina.

During the fourth quarter (July through September), precipitation amounts were above average throughout the entire State, primarily as a result of an active hurricane season. The six index sites reported precipitation amounts ranging from 3.61 to 10.29 inches above average for the quarter—10.29 inches at Asheville, 7.80 inches at Charlotte, 5.58 inches at Greensboro, 9.58 inches at Raleigh, 5.38 inches at Wilmington, and 3.61 inches at Elizabeth City. During September 2004, high rainfall amounts from two hurricanes, Frances and Ivan, were recorded in several Blue Ridge counties in North Carolina. As much as 18 inches of rainfall was reported during a 5-day period (September 5–9) from Hurricane Frances, and as much as 9 inches of rainfall was reported during a 3-day period (September 16–18) from Hurricane Ivan (Neal Lott, National Oceanic and Atmospheric Administration, Asheville, N.C., written commun., 2004).

In summary, despite the tropical systems affecting North Carolina during the 2004 water year, Charlotte and Greensboro still experienced below-average precipitation for the year; the four remaining sites recorded positive departures from average of less than 5 inches for the year (fig. 3). The National Weather Service reported the following total annual precipitation amounts for the 2004 water year: Asheville, 51.80 inches (4.75 inches above average); Charlotte, 42.22 inches (1.29 inches below average); Greensboro, 35.84 inches (7.30 inches below average); Raleigh, 47.11 inches (4.06 inches above average); Wilmington, 60.71 inches (3.64 inches above average); and Elizabeth City, 52.66 inches (5.68 inches above average).

Ground Water

Cross sections (locations shown in fig. 1) illustrating the simplified geology and Coastal Plain aquifers of North Carolina are shown in figure 2. Ground-water levels in the surficial aquifer of the Coastal Plain Province and in the weathered surficial layer (regolith) of the Piedmont and Blue Ridge Provinces of North Carolina respond to climatic influences. Water levels are influenced by ground-water recharge from precipitation, evapotranspiration of ground water into the air by plants, movement of ground water to deeper aquifers, and discharge of ground water to streams. Water levels in the unconfined aquifers generally decline through the growing season and typically are highest during the winter months when evapotranspiration losses are lowest (fig. 4). In addition to seasonal changes, water levels in deeper, confined aquifers in the Coastal Plain also can respond to pumping. Locations of wells discussed in this report are shown in figures 5–9.

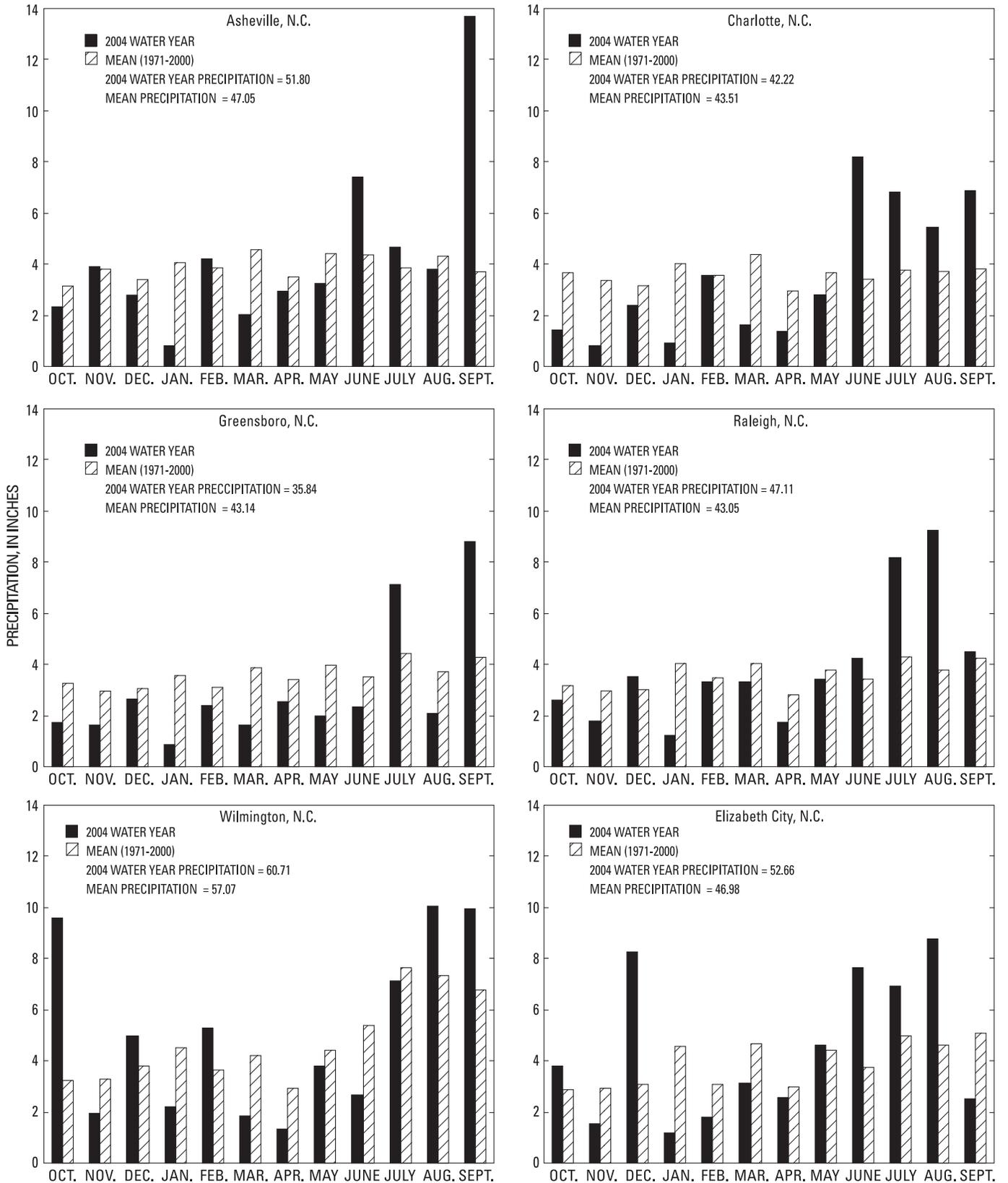


Figure 3.--Monthly precipitation for the 2004 water year and mean monthly precipitation for the period 1971-2000 at index stations across North Carolina (data from the National Oceanic and Atmospheric Administration).

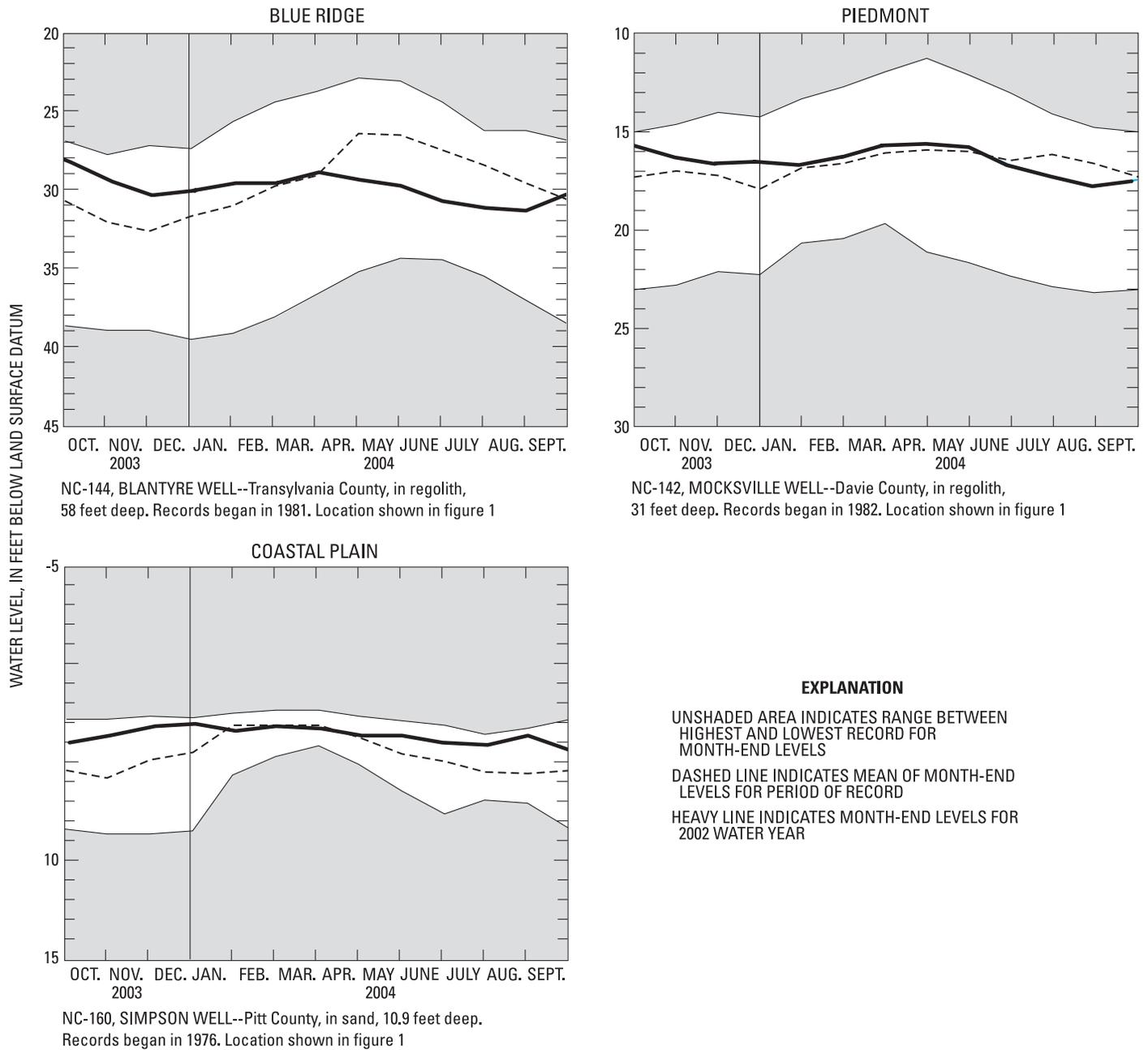


Figure 4.--Mean monthly water levels for the period of record, and record high and low month-end water levels in index observation wells in the Blue Ridge, Piedmont, and Coastal Plain Provinces of North Carolina.

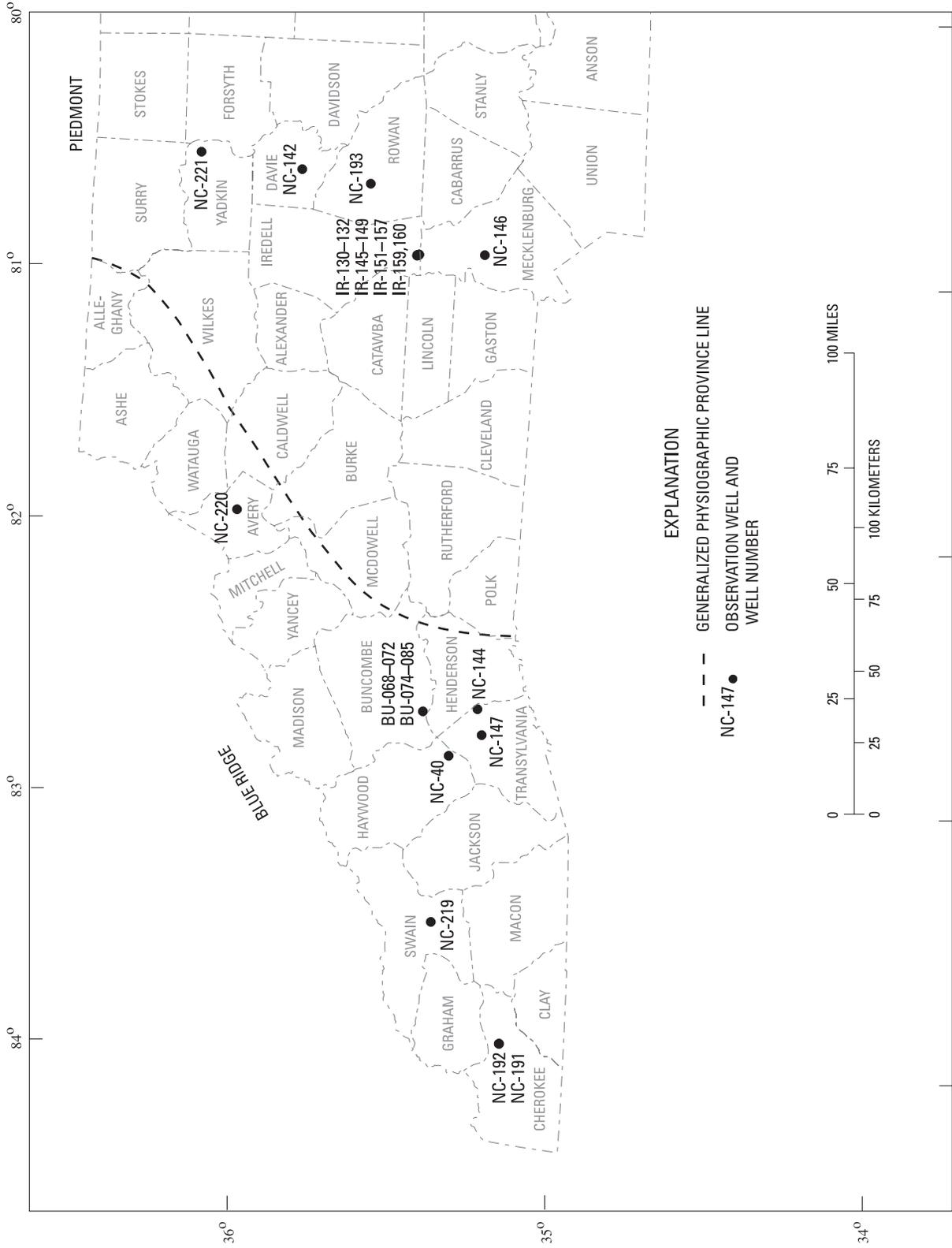


Figure 5.--Locations of observation wells in western North Carolina.

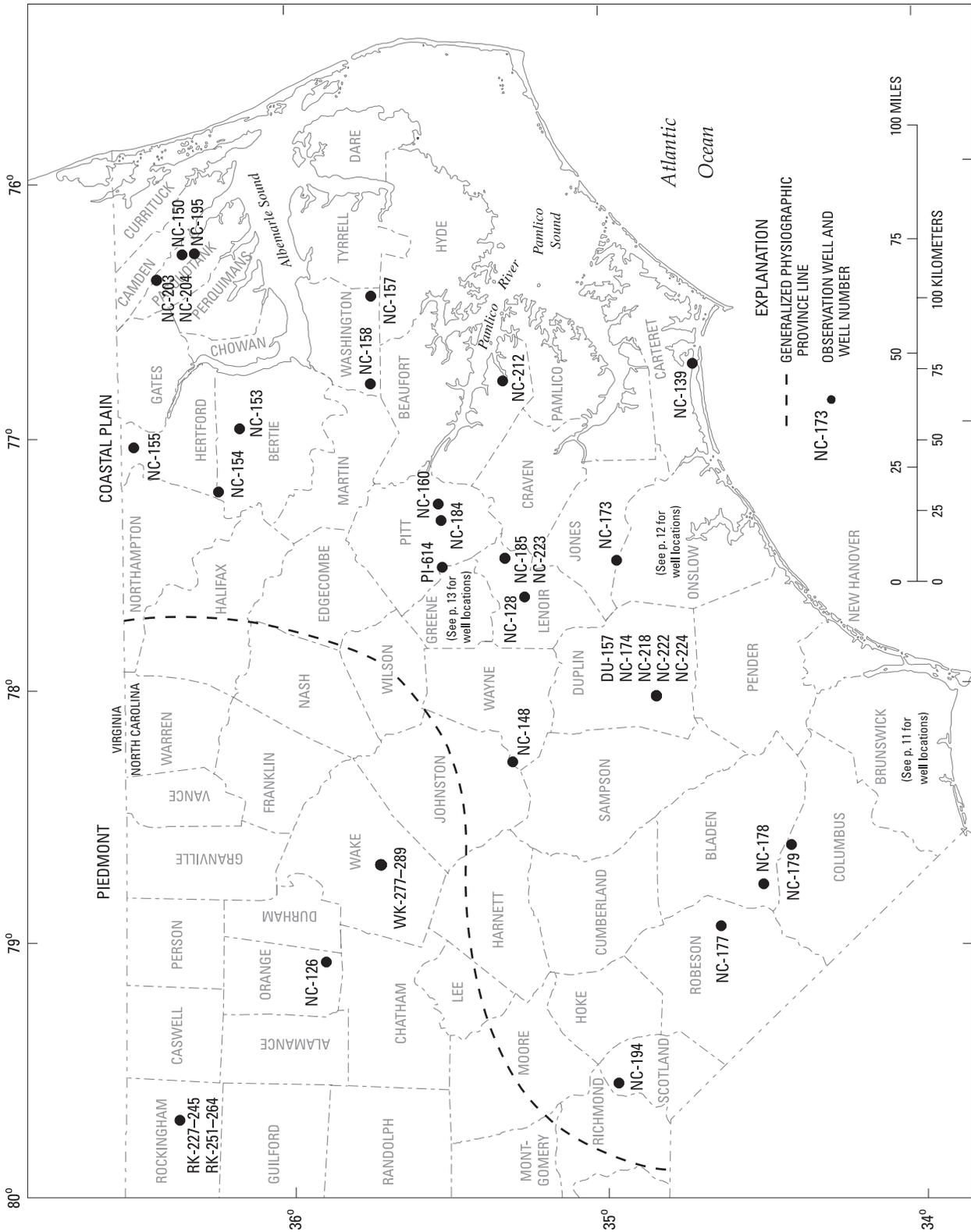
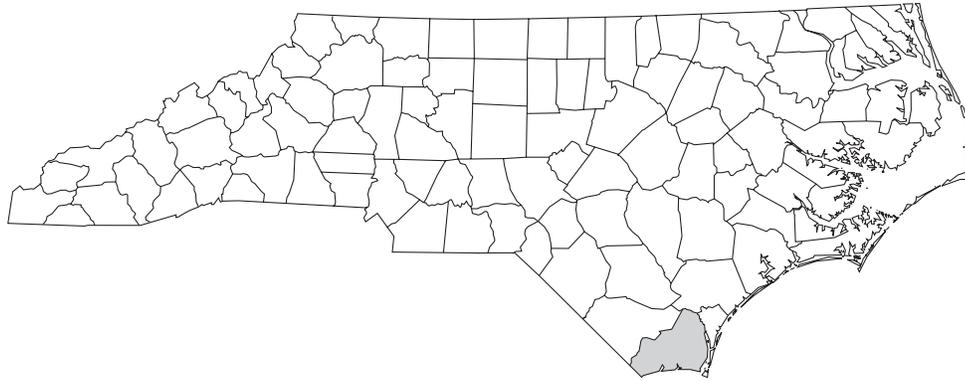


Figure 6.--Locations of observation wells in eastern North Carolina.



LOCATION OF BRUNSWICK COUNTY IN NORTH CAROLINA

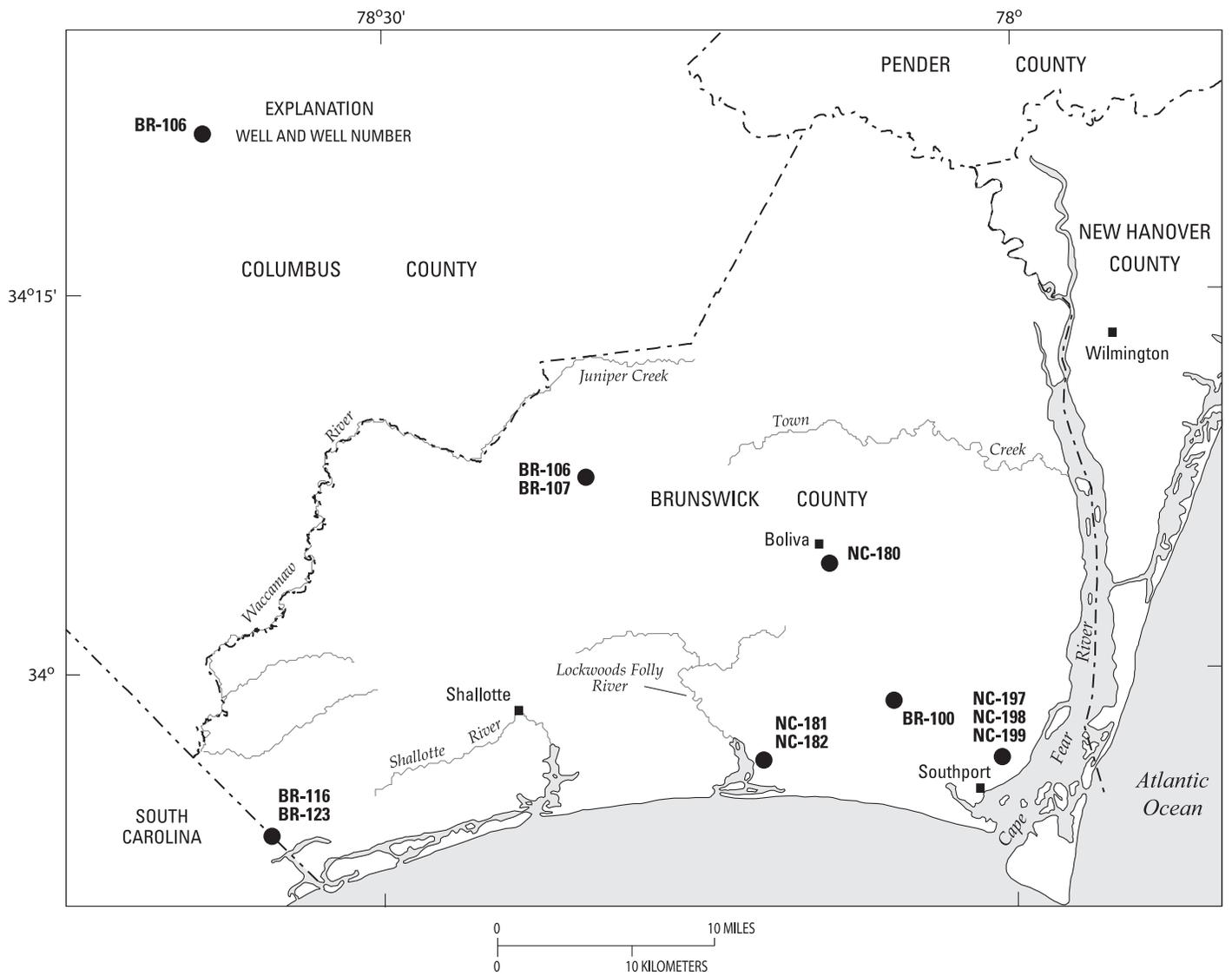
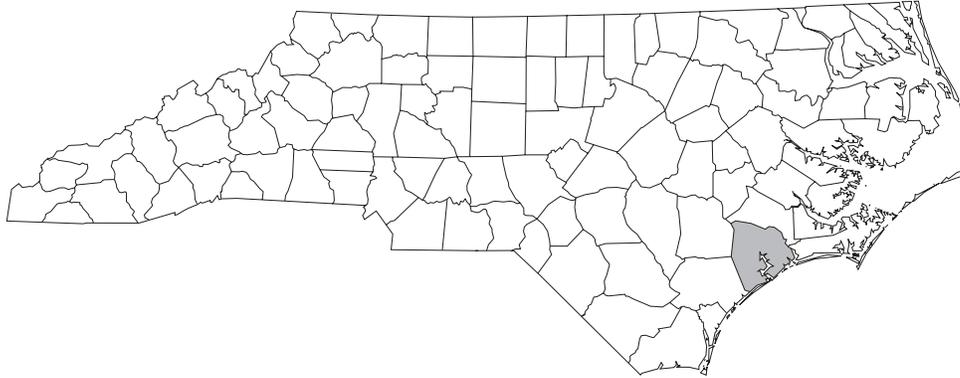


Figure 7.--Locations of observation wells in Brunswick County, North Carolina.



LOCATION OF ONSLOW COUNTY IN NORTH CAROLINA

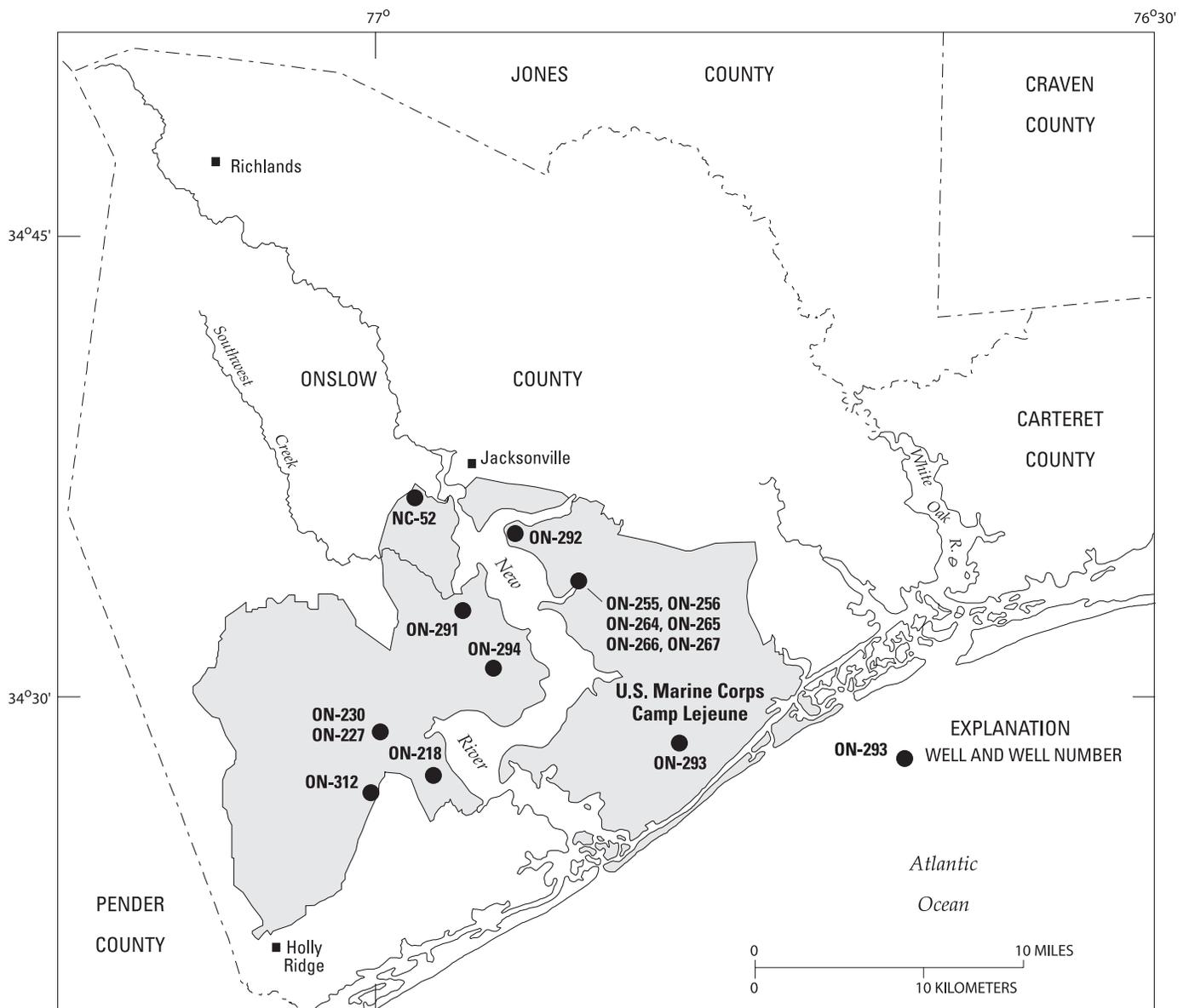


Figure 8.--Locations of observation wells in Onslow County, North Carolina.



LOCATION OF GREENE COUNTY IN NORTH CAROLINA

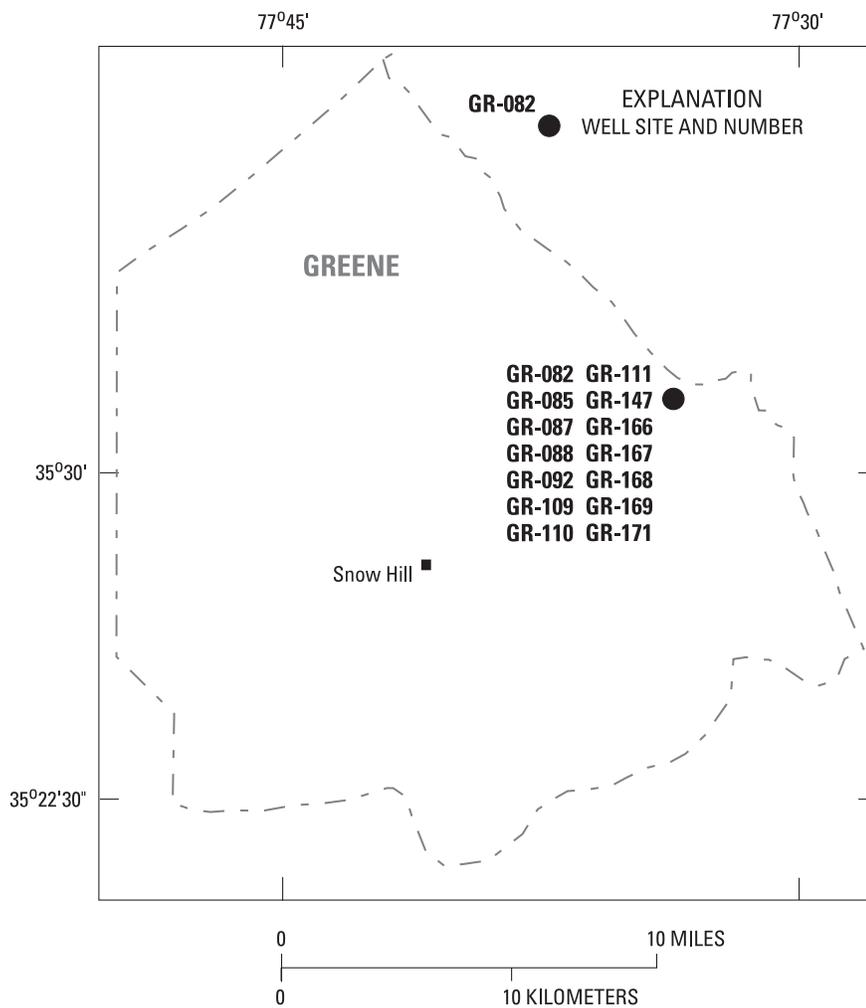


Figure 9.--Locations of observation wells in Greene County, North Carolina.

### Index Wells

Water levels in index observation wells in the Blue Ridge, Piedmont, and Coastal Plain Provinces (fig. 1) provide a general indication of ground-water fluctuations in the shallow aquifers of these provinces. Hydrographs of month-end water levels in these index observation wells during the 2004 water year include mean monthly water levels for the period of record and record high and low month-end water levels (fig. 4). Real-time plots of data for these wells can be accessed on-line at <http://nc.waterdata.usgs.gov/nwis/gw>, and long-term records are available on-line for comparison at <http://groundwaterwatch.usgs.gov/>. For the fall and winter months of the 2004 water year, shallow ground-water levels in the three index wells across North Carolina were within the normal range (25th to 75th percentiles) and near the historic daily median. During the spring and summer months, however, the water level in the Blue Ridge well declined below the historic daily median. In the Blue Ridge and western Piedmont Provinces, significant rises in ground-water levels occurred during September as a result of increased rainfall amounts from Hurricanes Frances and Ivan.

Water levels in the Blue Ridge index well NC-144 (Blantyre well, fig. 4) were within the normal range of mean monthly conditions (25th to 75th percentiles) and near or slightly below the historic daily median throughout most of the 2004 water year. In September, the daily-mean water level rose about 2.7 feet from the lowest daily-mean water level recorded during the 2004 water year (31.3 feet below land surface recorded on September 1, 2004), to the highest daily-mean water level for the 2004 water year (28.6 feet below land surface recorded first on March 16, 2004, and again on September 30, 2004).

The water levels in Piedmont index well NC-142 (Mocksville well, fig. 4) were within the normal range of monthly conditions and near the historic daily median for much of the 2004 water year. Similar to the Blue Ridge well (NC-144), the water level in well NC-142 also rose sharply during the month of September 2004, increasing by about 1.4 feet.

Water levels in the Coastal Plain index well NC-160 (Simpson well, fig. 4), were within the normal or high (greater than 75th percentile) range for mean monthly conditions and above or near the historical daily median for the 2004 water year. In contrast to water levels in the Blue Ridge and Piedmont index wells, ground-water levels in well NC-160 did not rise during September 2004 because the Coastal Plain Province received no large rainfall amounts from tropical storms or hurricanes.

### Natural-Effects Wells

Ground-water levels in North Carolina were influenced by a wide range of rainfall across the State during the 2004 water year. Overall, ground-water levels across the State were at historical median levels during the fall and winter months but declined to below-median water levels during the spring and summer months. Water levels in the Blue Ridge wells and the western Piedmont wells rose sharply during September from the high rainfall amounts associated with Hurricanes Frances and Ivan. Water levels in Blue Ridge well NC-40 (fig. 5) in Haywood County were near the historic daily median during the early winter months but dropped to lower levels during the spring and summer. However, a substantial water-level rise was recorded in this well during September following increased rainfall amounts from Hurricanes Frances and Ivan. In well NC-40, where ground-water levels have been recorded since 1955, a period-of-record high water level was recorded on September 17, 2004. The water level in well NC-40 rose more than 5 feet during September 2004. The water levels in Blue Ridge wells NC-192 (Cherokee County, fig. 5) and NC-144 (Transylvania County, fig. 5) were near the historical daily median during the fall months and declined to below the median, near the period-of-record low, during the winter and spring months. Water levels in well NC-192 recovered to near median levels during the summer months of the 2004 water year, rising by more than 3 feet during September after heavy rainfall from Hurricanes Frances and Ivan. Water levels in two of the Piedmont wells, NC-142 (Davie County) and NC-193 (Rowan County, fig. 5), were slightly above the historical daily median water levels during the fall months of the 2004 water year but declined to slightly below the median during the spring and summer months. Similar to the sharp rise in water levels observed in the Blue Ridge wells during September 2004, the water levels in the two western Piedmont wells (NC-142 and NC-193) rose more than 1 foot during that same period. Water levels in Coastal Plain wells NC-160 (Pitt County, fig. 6), NC-173 (Jones County, fig. 6), and NC-194 (Scotland County, fig. 6) were above or near the historical daily median water levels during the 2004 water year.

### Induced-Effects Wells

Ground-water withdrawals have resulted in declining water levels in confined aquifers in some areas of the Coastal Plain for a number of years. This declining trend is shown by the long-term record from several induced-effects observation wells that tap four of the major aquifers in eastern North Carolina—the Castle Hayne, Black Creek, upper Cape Fear, and lower Cape Fear aquifers (fig. 2).

The water-level record of observation well NC-212 shows the fluctuations of water levels in the Castle Hayne aquifer resulting from changes in pumping at a large mining and manufacturing operation in the eastern part of Beaufort County (fig. 6). Major pumping activities have occurred in this area for more than three decades. The range in water-level fluctuation as a result of pumping is about 40 feet during water year 2004. The areal cone of depression resulting from this pumping has covered more than 3,000 square miles (Coble and others, 1989).

The record of observation well NC-139 in Carteret County (fig. 6) shows the effects of seasonal pumping from the Castle Hayne aquifer in order to meet increased demand for water in the coastal area during the summer months. The decline in water levels in the long-term record was observed until the early-1990's when water levels became more stable. Water levels recorded in this well during the 2004 water year remained relatively stable. Water levels in observation well ON-227, completed in the Castle Hayne aquifer in Onslow County (fig. 8), declined from late 1994 through 2002; however, water levels have remained relatively stable during recent years and the 2004 water year.

Water levels in the Castle Hayne aquifer are not declining everywhere throughout the eastern Coastal Plain Province. This is especially true in areas of the aquifer that are not covered by extensive confining units (Strickland and others, 1992). The water levels in Castle Hayne well NC-52 in Onslow County (fig. 8) exhibit climatic-effect fluctuations. Although well NC-52 is near water-supply wells at U.S. Marine Corps Camp Lejeune, no effects of withdrawals from these wells can be observed in the long-term record. Water levels recorded in this well during the 2004 water year generally were near average conditions.

Ground-water withdrawals, estimated at 134 million gallons per day over 15 counties, have resulted in water-level declines in the State's central Coastal Plain Province (Walters, 1997). In August 2002, the State legislature designated those 15 counties as the Central Coastal Plain Capacity Use Area, whereby reductions in ground-water withdrawals in the Cretaceous aquifers, primarily the Black Creek and upper Cape Fear aquifers, are scheduled to begin by the year 2008. Examples of the long-term effects of these withdrawals can be observed in data from several wells. Water levels recorded in well NC-128 (Lenoir County, fig. 6) indicate the effects of pumping from the Black Creek aquifer in Lenoir County. Water-level declines of as much as 4 feet per year were recorded in well NC-128 until 1998 when water levels began to recover. The period-of-record hydrograph for well NC-128 shows a long-term decline of almost 80 feet from 1972 to 1997. Since 1998 and through the 2004 water year, water levels recovered more than 20 feet, possibly from reduced pumpage.

Water-level declines in well NC-155, which is completed in the lower Cape Fear aquifer in Hertford County (fig. 6), primarily are a result of major withdrawals in Virginia that began in the 1940's. These withdrawals have caused a regional cone of depression in the lower Cape Fear aquifer, which extends about 30 miles into North Carolina (Coble and others, 1989). Water-level records from well NC-155 indicate that the maximum (drawdown) rate of decline of 4 feet per year occurred in the late 1980's. From 1993 to 1998, the rate of decline decreased to less than 2 feet per year. A slight recovery in water levels was observed from 1999 to 2003; however, a decline was observed throughout the 2004 water year.

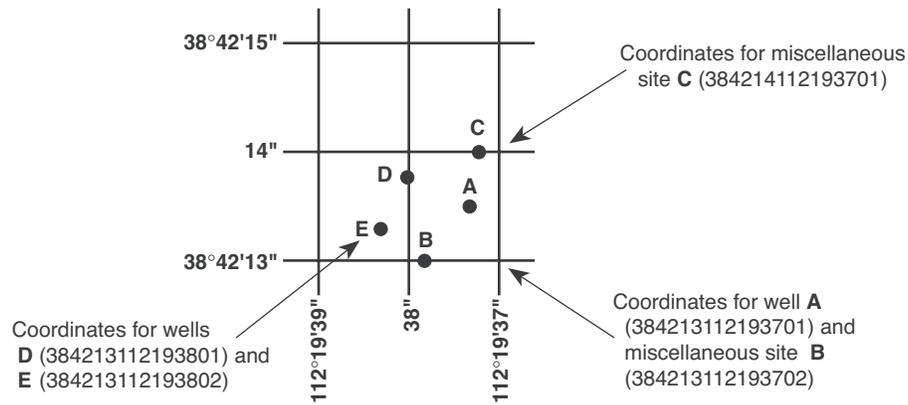
## DOWNSTREAM ORDER AND STATION NUMBER

Since October 1, 1950, hydrologic-station records in USGS reports have been listed in order of downstream direction along the main stream. All stations on a tributary entering upstream from a main-stream station are listed before that station. A station on a tributary entering between two main-stream stations is listed between those stations. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary on which a station is located with respect to the stream to which it is immediately tributary is indicated by an indentation in that list of stations in the front of this report. Each indentation represents one rank. This downstream order and system of indentation indicates which stations are on tributaries between any two stations and the rank of the tributary on which each station is located.

As an added means of identification, each hydrologic station and partial-record station has been assigned a station number. These station numbers are in the same downstream order used in this report. In assigning a station number, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list composed of both types of stations. Gaps are consecutive. The complete 8-digit (or 10-digit) number for each station such as 09004100, which appears just to the left of the station name, includes a 2-digit part number "09" plus the 6-digit (or 8-digit) downstream order number "004100." In areas of high station density, an additional two digits may be added to the station identification number to yield a 10-digit number. The stations are numbered in downstream order as described above between stations of consecutive 8-digit numbers.

## NUMBERING SYSTEM FOR WELLS AND MISCELLANEOUS SITES

The USGS well and miscellaneous site-numbering system is based on the grid system of latitude and longitude. The system provides the geographic location of the well or miscellaneous site and a unique number for each site. The number consists of 15 digits. The first 6 digits denote the degrees, minutes, and seconds of latitude, and the next 7 digits denote degrees, minutes, and seconds of longitude; the last 2 digits are a sequential number for wells within a 1-second grid. In the event that the latitude-longitude coordinates for a well and miscellaneous site are the same, a sequential number such as "01," "02," and so forth, would be assigned as one would for wells (see fig. 10). The 8-digit, downstream order station numbers are not assigned to wells and miscellaneous sites where only random water-quality samples or discharge measurements are taken.



**Figure 10.** System for numbering wells and miscellaneous sites (latitude and longitude).

Local well numbers in this report generally fall within two numbering systems. All wells are indicated by a two-letter county prefix followed by a sequential number, such as ME-301 for a well in Mecklenburg County and RB-185 for a well in Robeson County. In addition, wells that belong in the statewide North Carolina observation-well program are indicated by the prefix NC- followed by a sequential number, for example NC-160.

## SPECIAL NETWORKS AND PROGRAMS

**Hydrologic Benchmark Network** is a network of 61 sites in small drainage basins in 39 States that was established in 1963 to provide consistent streamflow data representative of undeveloped watersheds nationwide, and from which data could be analyzed on a continuing basis for use in comparison and contrast with conditions observed in basins more obviously affected by human activities. At selected sites, water-quality information is being gathered on major ions and nutrients, primarily to assess the effects of acid deposition on stream chemistry. Additional information on the Hydrologic Benchmark Program may be accessed from <http://water.usgs.gov/hbn/>.

**National Stream-Quality Accounting Network (NASQAN)** is a network of sites used to monitor the water quality of large rivers within the Nation's largest river basins. From 1995 through 1999, a network of approximately 40 stations was operated in the Mississippi, Columbia, Colorado, and Rio Grande River basins. For the period 2000 through 2004, sampling was reduced to a few index stations on the Colorado and Columbia Rivers so that a network of 5 stations could be implemented on the Yukon River. Samples are collected with sufficient frequency that the flux of a wide range of constituents can be estimated. The objective of NASQAN is to characterize the water quality of these large rivers by measuring concentration and mass transport of a wide range of dissolved and suspended constituents, including nutrients, major ions, dissolved and sediment-bound heavy metals, common pesticides, and inorganic and organic forms of carbon. This information will be used (1) to describe the long-term trends and changes in concentration and transport of these constituents; (2) to test findings of the National Water-Quality Assessment (NAWQA) Program; (3) to characterize processes unique to large-river systems such as storage and remobilization of sediments and associated contaminants; and (4) to refine existing estimates of off-continent transport of water, sediment, and chemicals for assessing human effects on the world's oceans and for determining global cycles of carbon, nutrients, and other chemicals. Additional information about the NASQAN Program may be accessed from <http://water.usgs.gov/nasqan/>.

**The National Atmospheric Deposition Program/National Trends Network (NADP/NTN)** is a network of monitoring sites that provides continuous measurement and assessment of the chemical constituents in precipitation throughout the United States. As the lead Federal agency, the USGS works together with over 100 organizations to provide a long-term, spatial and temporal record of atmospheric deposition generated from this network of 250 precipitation-chemistry monitoring sites. The USGS supports 74 of these 250 sites. This long-term, nationally consistent monitoring program, coupled with ecosystem research, provides critical information toward a national scorecard to evaluate the effectiveness of ongoing and future regulations intended to reduce atmospheric emissions and subsequent impacts to the Nation's land and water resources. Reports and other information on the NADP/NTN Program, as well as data from the individual sites, may be accessed from <http://bqs.usgs.gov/acidrain/>.

**The USGS National Water-Quality Assessment (NAWQA) Program** is a long-term program with goals to describe the status and trends of water-quality conditions for a large, representative part of the Nation's ground- and surface-water resources; to provide an improved understanding of the primary natural and human factors affecting these observed conditions and trends; and to provide information that supports development and evaluation of management, regulatory, and monitoring decisions by other agencies.

Assessment activities are being conducted in 42 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents is measured in ground water, surface water, streambed sediments, and fish tissues. The coordinated application of comparative hydrologic studies at a

wide range of spatial and temporal scales will provide information for water-resources managers to use in making decisions and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest.

Communication and coordination between USGS personnel and other local, State, and Federal interests are critical components of the NAWQA Program. Each study unit has a local liaison committee consisting of representatives from key Federal, State, and local water-resources agencies, Indian nations, and universities in the study unit. Liaison committees typically meet semiannually to discuss their information needs, monitoring plans and progress, desired information products, and opportunities to collaborate efforts among the agencies. Additional information about the NAWQA Program may be accessed from <http://water.usgs.gov/nawqa/>.

**The USGS National Streamflow Information Program (NSIP)** is a long-term program with goals to provide framework streamflow data across the Nation. Included in the program are creation of a permanent Federally funded streamflow network, research on the nature of streamflow, regional assessments of streamflow data and databases, and upgrades in the streamflow information delivery systems. Additional information about NSIP may be accessed from <http://water.usgs.gov/nsip/>.

## EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS

### Data Collection and Computation

The base data collected at gaging stations consist of records of stage and measurements of discharge of streams or canals, and stage, surface area, and volume of lakes or reservoirs. In addition, observations of factors affecting the stage-discharge relation or the stage-capacity relation, weather records, and other information are used to supplement base data in determining the daily flow or volume of water in storage. Records of stage are obtained from a water-stage recorder that is either downloaded electronically in the field to a laptop computer or similar device or is transmitted using telemetry such as GOES satellite, land-line or cellular-phone modems, or by radio transmission. Measurements of discharge are made with a current meter or acoustic Doppler current profiler, using the general methods adopted by the USGS. These methods are described in standard textbooks, USGS Water-Supply Paper 2175, and the Techniques of Water-Resources Investigations of the United States Geological Survey (TWRIs), Book 3, Chapters A1 through A19 and Book 8, Chapters A2 and B2, which may be accessed from <http://water.usgs.gov/pubs/twri/>. The methods are consistent with the American Society for Testing and Materials (ASTM) standards and generally follow the standards of the International Organization for Standardization (ISO).

For stream-gaging stations, discharge-rating tables for any stage are prepared from stage-discharge curves. If extensions to the rating curves are necessary to express discharge greater than measured, the extensions are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, or computation of flow over dams and weirs), step-backwater techniques, velocity-area studies, and logarithmic plotting. The daily mean discharge is computed from gage heights and rating tables, then the monthly and yearly mean discharges are computed from the daily values. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features of the stream channel, the daily mean discharge is computed by the shifting-control method in which correction factors based on individual discharge measurements and notes by engineers and observers are used when applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the controlling section, the daily mean discharge is computed by the shifting-control method.

The stage-discharge relation at some stream-gaging stations is affected by backwater from reservoirs, tributary streams, or other sources. Such an occurrence necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in computing discharge. The slope or fall is obtained by means of an auxiliary gage at some distance from the base gage.

An index velocity is measured using ultrasonic or acoustic instruments at some stream-gaging stations and this index velocity is used to calculate an average velocity for the flow in the stream. This average velocity along with a stage-area relation is then used to calculate average discharge.

At some stations, stage-discharge relation is affected by changing stage. At these stations, the rate of change in stage is used as a factor in computing discharge.

At some stream-gaging stations in the northern United States, the stage-discharge relation is affected by ice in the winter; therefore, computation of the discharge in the usual manner is impossible. Discharge for periods of ice effect is computed on the basis of gage-height record and occasional winter-discharge measurements. Consideration is given to the available information on temperature and precipitation, notes by gage observers and hydrologists, and comparable records of discharge from other stations in the same or nearby basins.

For a lake or reservoir station, capacity tables giving the volume or contents for any stage are prepared from stage-area relation curves defined by surveys. The application of the stage to the capacity table gives the contents, from which the daily, monthly, or yearly changes are computed.

If the stage-capacity curve is subject to changes because of deposition of sediment in the reservoir, periodic resurveys of the reservoir are necessary to define new stage-capacity curves. During the period between reservoir surveys, the computed contents may be increasingly in error due to the gradual accumulation of sediment.

For some stream-gaging stations, periods of time occur when no gage-height record is obtained or the recorded gage height is faulty and cannot be used to compute daily discharge or contents. Such a situation can happen when the recorder stops or otherwise fails to operate properly, the intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods, the daily discharges are estimated on the basis of recorded range in stage, prior and subsequent records, discharge measurements, weather records, and comparison with records from other stations in the same or nearby basins. Likewise, lake or reservoir volumes may be estimated on the basis of operator's log, prior and subsequent records, inflow-outflow studies, and other information.

### **Data Presentation**

The records published for each continuous-record surface-water discharge station (stream-gaging station) consist of five parts: (1) the station manuscript or description; (2) the data table of daily mean values of discharge for the current water year with summary data; (3) a tabular statistical summary of monthly mean flow data for a designated period, by water year; (4) a summary statistics table that includes statistical data of annual, daily, and instantaneous flows as well as data pertaining to annual runoff, 7-day low-flow minimums, and flow duration; and (5) a hydrograph of discharge.

## Station Manuscript

The manuscript provides, under various headings, descriptive information, such as station location; period of record; historical extremes outside the period of record; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content. Comments follow that clarify information presented under the various headings of the station description.

**LOCATION.**—Location information is obtained from the most accurate maps available. The location of the gaging station with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileages, given for only a few stations, were determined by methods given in “River Mileage Measurement,” Bulletin 14, Revision of October 1968, prepared by the Water Resources Council or were provided by the U.S. Army Corps of Engineers.

**DRAINAGE AREA.**—Drainage areas are measured using the most accurate maps available. Because the type of maps available varies from one drainage basin to another, the accuracy of drainage areas likewise varies. Drainage areas are updated as better maps become available.

**PERIOD OF RECORD.**—This term indicates the time period for which records have been published for the station or for an equivalent station. An equivalent station is one that was in operation at a time that the present station was not and whose location was such that its flow reasonably can be considered equivalent to flow at the present station.

**REVISED RECORDS.**—If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

**GAGE.**—The type of gage in current use, the datum of the current gage referred to a standard datum, and a condensed history of the types, locations, and datums of previous gages are given under this heading.

**REMARKS.**—All periods of estimated daily discharge either will be identified by date in this paragraph of the station description for water-discharge stations or flagged in the daily discharge table. (See section titled Identifying Estimated Daily Discharge.) Information is presented relative to the accuracy of the records, to special methods of computation, and to conditions that affect natural flow at the station. In addition, information may be presented pertaining to average discharge data for the period of record; to extremes data for the period of record and the current year; and, possibly, to other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, the outlet works and spillway, and the purpose and use of the reservoir.

**COOPERATION.**—Records provided by a cooperating organization or obtained for the USGS by a cooperating organization are identified here.

**EXTREMES OUTSIDE PERIOD OF RECORD.**—Information here documents major floods or unusually low flows that occurred outside the stated period of record. The information may or may not have been obtained by the USGS.

**REVISIONS.**—Records are revised if errors in published records are discovered. Appropriate updates are made in the USGS distributed data system, NWIS, and subsequently to its Web-based National data system, NWISWeb (<http://water.usgs.gov/nwis/nwis>). Users are encouraged to obtain all required data from NWIS or NWISWeb to ensure that they have the most recent data updates. Updates to NWISWeb are made on an annual basis.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because no current or, possibly, future station manuscript would be published for these stations to document the revision in a REVISED RECORDS entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the District Office (address given on the back of the title page of this report) to determine if the published records were revised after the station was discontinued. If, however, the data for a discontinued station were obtained by computer retrieval, the data would be current. Any published revision of data is always accompanied by revision of the corresponding data in computer storage.

Manuscript information for lake or reservoir stations differs from that for stream stations in the nature of the REMARKS and in the inclusion of a stage-capacity table when daily volumes are given.

### **Peak Discharge Greater than Base Discharge**

Tables of peak discharge above base discharge are included for some stations where secondary instantaneous peak discharge data are used in flood-frequency studies of highway and bridge design, flood-control structures, and other flood-related projects. The base discharge value is selected so an average of three peaks a year will be reported. This base discharge value has a recurrence interval of approximately 1.1 years or a 91-percent chance of exceedence in any 1 year.

### **Data Table of Daily Mean Values**

The daily table of discharge records for stream-gaging stations gives mean discharge for each day of the water year. In the monthly summary for the table, the line headed TOTAL gives the sum of the daily figures for each month; the line headed MEAN gives the arithmetic average flow in cubic feet per second for the month; and the lines headed MAX and MIN give the maximum and minimum daily mean discharges, respectively, for each month. Discharge for the month is expressed in cubic feet per second per square mile (line headed CFSM); or in inches (line headed IN); or in acre-feet (line headed AC-FT). Values for cubic feet per second per square mile and runoff in inches or in acre-feet may be omitted if extensive regulation or diversion is in effect or if the drainage area includes large noncontributing areas. At some stations, monthly and (or) yearly observed discharges are adjusted for reservoir storage or diversion, or diversion data or reservoir volumes are given. These values are identified by a symbol and a corresponding footnote.

### **Statistics of Monthly Mean Data**

A tabular summary of the mean (line headed MEAN), maximum (MAX), and minimum (MIN) of monthly mean flows for each month for a designated period is provided below the mean values table. The water years of the first occurrence of the maximum and minimum monthly flows are provided immediately below those values. The designated period will be expressed as FOR WATER YEARS \_\_-\_\_, BY WATER YEAR (WY), and will list the first and last water years of the range of years selected from the PERIOD OF RECORD paragraph in the station manuscript. The designated period will consist of all of the station record within the specified water years, including complete months of record for partial water years, and may coincide with the period of record for the station. The water years for which the statistics are computed are consecutive, unless a break in the station record is indicated in the manuscript.

### **Summary Statistics**

A table titled SUMMARY STATISTICS follows the statistics of monthly mean data tabulation. This table consists of four columns with the first column containing the line headings of the statistics being

reported. The table provides a statistical summary of yearly, daily, and instantaneous flows, not only for the current water year but also for the previous calendar year and for a designated period, as appropriate. The designated period selected, WATER YEARS \_\_\_-\_\_\_, will consist of all of the station records within the specified water years, including complete months of record for partial water years, and may coincide with the period of record for the station. The water years for which the statistics are computed are consecutive, unless a break in the station record is indicated in the manuscript. All of the calculations for the statistical characteristics designated ANNUAL (see line headings below), except for the ANNUAL 7-DAY MINIMUM statistic, are calculated for the designated period using complete water years. The other statistical characteristics may be calculated using partial water years.

The date or water year, as appropriate, of the first occurrence of each statistic reporting extreme values of discharge is provided adjacent to the statistic. Repeated occurrences may be noted in the REMARKS paragraph of the manuscript or in footnotes. Because the designated period may not be the same as the station period of record published in the manuscript, occasionally the dates of occurrence listed for the daily and instantaneous extremes in the designated-period column may not be within the selected water years listed in the heading. When the dates of occurrence do not fall within the selected water years listed in the heading, it will be noted in the REMARKS paragraph or in footnotes. Selected streamflow duration-curve statistics and runoff data also are given. Runoff data may be omitted if extensive regulation or diversion of flow is in effect in the drainage basin.

The following summary statistics data are provided with each continuous record of discharge. Comments that follow clarify information presented under the various line headings of the SUMMARY STATISTICS table.

ANNUAL TOTAL.—The sum of the daily mean values of discharge for the year.

ANNUAL MEAN.—The arithmetic mean for the individual daily mean discharges for the year noted or for the designated period.

HIGHEST ANNUAL MEAN.—The maximum annual mean discharge occurring for the designated period.

LOWEST ANNUAL MEAN.—The minimum annual mean discharge occurring for the designated period.

HIGHEST DAILY MEAN.—The maximum daily mean discharge for the year or for the designated period.

LOWEST DAILY MEAN.—The minimum daily mean discharge for the year or for the designated period.

ANNUAL 7-DAY MINIMUM.—The lowest mean discharge for 7 consecutive days for a calendar year or a water year. Note that most low-flow frequency analyses of annual 7-day minimum flows use a climatic year (April 1-March 31). The date shown in the summary statistics table is the initial date of the 7-day period. This value should not be confused with the 7-day 10-year low-flow statistic.

MAXIMUM PEAK FLOW.—The maximum instantaneous peak discharge occurring for the water year or designated period. Occasionally the maximum flow for a year may occur at midnight at the beginning or end of the year, on a recession from or rise toward a higher peak in the adjoining year. In this case, the maximum peak flow is given in the table and the maximum flow may be reported in a footnote or in the REMARKS paragraph in the manuscript.

**MAXIMUM PEAK STAGE.**—The maximum instantaneous peak stage occurring for the water year or designated period. Occasionally the maximum stage for a year may occur at midnight at the beginning or end of the year, on a recession from or rise toward a higher peak in the adjoining year. In this case, the maximum peak stage is given in the table and the maximum stage may be reported in the REMARKS paragraph in the manuscript or in a footnote. If the dates of occurrence of the maximum peak stage and maximum peak flow are different, the REMARKS paragraph in the manuscript or a footnote may be used to provide further information.

**INSTANTANEOUS LOW FLOW.**—The minimum instantaneous discharge occurring for the water year or for the designated period.

**ANNUAL RUNOFF.**—Indicates the total quantity of water in runoff for a drainage area for the year. Data reports may use any of the following units of measurement in presenting annual runoff data:

Acre-foot (AC-FT) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

Cubic feet per square mile (CFSM) is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming the runoff is distributed uniformly in time and area.

Inches (INCHES) indicate the depth to which the drainage area would be covered if all of the runoff for a given time period were uniformly distributed on it.

**10 PERCENT EXCEEDS.**—The discharge that has been exceeded 10 percent of the time for the designated period.

**50 PERCENT EXCEEDS.**—The discharge that has been exceeded 50 percent of the time for the designated period.

**90 PERCENT EXCEEDS.**—The discharge that has been exceeded 90 percent of the time for the designated period.

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first table lists annual maximum stage and discharge at crest-stage stations, and the second table lists discharge measurements at low-flow partial-record stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. These measurements are often made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for a special reason are called measurements at miscellaneous sites.

### **Identifying Estimated Daily Discharge**

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified. This identification is shown either by flagging individual daily values with the letter “e” and noting in a table footnote, “e—Estimated,” or by listing the dates of the estimated record in the REMARKS paragraph of the station description.

## Accuracy of Field Data and Computed Results

The accuracy of streamflow data depends primarily on (1) the stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements, and (2) the accuracy of observations of stage, measurements of discharge, and interpretations of records.

The degree of accuracy of the records is stated in the REMARKS in the station description. "Excellent" indicates that about 95 percent of the daily discharges are within 5 percent of the true value; "good" within 10 percent; and "fair," within 15 percent. "Poor" indicates that daily discharges have less than "fair" accuracy. Different accuracies may be attributed to different parts of a given record.

Values of daily mean discharge in this report are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 ft<sup>3</sup>/s; to the nearest tenths between 1.0 and 10 ft<sup>3</sup>/s; to whole numbers between 10 and 1,000 ft<sup>3</sup>/s; and to 3 significant figures above 1,000 ft<sup>3</sup>/s. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharge values listed for partial-record stations.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, values of cubic feet per second per square mile and of runoff in inches are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge.

## Other Data Records Available

Information of a more detailed nature than that published for most of the stream-gaging stations such as discharge measurements, gage-height records, and rating tables is available from the District office. Also, most stream-gaging station records are available in computer-usable form and many statistical analyses have been made.

Information on the availability of unpublished data or statistical analyses may be obtained from the District office (see address that is shown on the back of the title page of this report).

## EXPLANATION OF PRECIPITATION RECORDS

### Data Collection and Computation

Rainfall data generally are collected using electronic data loggers that measure the rainfall in 0.01-inch increments every 15 minutes using either a tipping-bucket rain gage or a collection well gage. Twenty-four hour rainfall totals are tabulated and presented. A 24-hour period extends from just past midnight of the previous day to midnight of the current day. Snowfall-affected data can result during cold weather when snow fills the rain-gage funnel and then melts as temperatures rise. Snowfall-affected data are subject to errors. Missing values are indicated by this symbol "----" in the table.

## Data Presentation

Precipitation records collected at surface-water gaging stations are identified with the same station number and name as the stream-gaging station. Where a surface-water daily-record station is not available, the precipitation record is published with its own name and latitude-longitude identification number.

Information pertinent to the history of a precipitation station is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, period of record, and general remarks.

The following information is provided with each precipitation station. Comments that follow clarify information presented under the various headings of the station description.

**LOCATION.**—See Data Presentation in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

**PERIOD OF RECORD.**—See Data Presentation in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

**INSTRUMENTATION.**—Information on the type of rainfall collection system is given.

**REMARKS.**—Remarks provide added information pertinent to the collection, analysis, or computation of records.

## EXPLANATION OF WATER-QUALITY RECORDS

### Collection and Examination of Data

Surface-water samples for analysis usually are collected at or near stream-gaging stations. The quality-of-water records are given immediately following the discharge records at these stations.

The descriptive heading for water-quality records gives the period of record for all water-quality data; the period of daily record for parameters that are measured on a daily basis (specific conductance, water temperature, sediment discharge, and so forth); extremes for the current year; and general remarks.

For ground-water records, no descriptive statements are given; however, the well number, depth of well, sampling date, or other pertinent data are given in the table containing the chemical analyses of the ground water.

### Water Analysis

Most of the methods used for collecting and analyzing water samples are described in the TWRIs, which may be accessed from <http://water.usgs.gov/pubs/twri/>.

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross-section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled at several verticals to obtain a representative sample needed for an accurate mean concentration and for use in calculating load.

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. In the rare case where an apparent inconsistency exists between a reported pH value and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is the result of a slight uptake of carbon dioxide from the air by the sample between measurement of pH in the field and determination of carbonate and bicarbonate in the laboratory.

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum and minimum values (and sometimes mean or median values) for each constituent measured, and are based on 15-minute or 1-hour intervals of recorded data beginning at 0000 hours and ending at 2400 hours for the day of record.

## SURFACE-WATER-QUALITY RECORDS

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because discharge data are useful in the interpretation of surface-water quality. Records of surface-water quality in this report involve a variety of types of data and measurement frequencies.

### Classification of Records

Water-quality data for surface-water sites are grouped into one of three classifications. A *continuous-record station* is a site where data are collected on a regularly scheduled basis. Frequency may be one or more times daily, weekly, monthly, or quarterly. A *partial-record station* is a site where limited water-quality data are collected systematically over a period of years. Frequency of sampling is usually less than quarterly. A *miscellaneous sampling site* is a location other than a continuous- or partial-record station, where samples are collected to give better areal coverage to define water-quality conditions in the river basin.

A careful distinction needs to be made between *continuous records* as used in this report and *continuous recordings* that refer to a continuous graph or a series of discrete values recorded at short intervals. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently.

### Accuracy of the Records

One of four accuracy classifications is applied for measured physical properties at continuous-record stations on a scale ranging from poor to excellent. The accuracy rating is based on data values recorded before any shifts or corrections are made. Additional consideration also is given to the amount of publishable record and to the amount of data that have been corrected or shifted.

Rating classifications for continuous water-quality records

[≤, less than or equal to; ±, plus or minus value shown; °C, degree Celsius; >, greater than; %, percent; mg/L, milligram per liter; pH unit, standard pH unit]

Measured physical property	Rating			
	Excellent	Good	Fair	Poor
Water temperature	≤±0.2 °C	>±0.2 to 0.5 °C	>±0.5 to 0.8 °C	>±0.8 °C

Rating classifications for continuous water-quality records

[≤, less than or equal to; ±, plus or minus value shown; °C, degree Celsius; >, greater than; %, percent; mg/L, milligram per liter; pH unit, standard pH unit]

Measured physical property	Rating			
	Excellent	Good	Fair	Poor
Specific conductance	≤ ±3%	> ±3 to 10%	> ±10 to 15%	> ±15%
Dissolved oxygen	≤ ±0.3 mg/L	> ±0.3 to 0.5 mg/L	> ±0.5 to 0.8 mg/L	> ±0.8 mg/L
pH	≤ ±0.2 unit	> ±0.2 to 0.5 unit	> ±0.5 to 0.8 unit	> ±0.8 unit
Turbidity	≤ ±5%	> ±5 to 10%	> ±10 to 15%	> ±15%

### Arrangement of Records

Water-quality records collected at a surface-water daily record station are published immediately following that record, regardless of the frequency of sample collection. Station number and name are the same for both records. Where a surface-water daily record station is not available or where the water quality differs significantly from that at the nearby surface-water station, the continuing water-quality record is published with its own station number and name in the regular downstream-order sequence. Water-quality data for partial-record stations and for miscellaneous sampling sites appear in separate tables following the table of discharge measurements at miscellaneous sites.

### On-Site Measurements and Sample Collection

In obtaining water-quality data, a major concern is assuring that the data obtained represent the naturally occurring quality of the water. To ensure this, certain measurements, such as water temperature, pH, and dissolved oxygen, must be made on site when the samples are taken. To assure that measurements made in the laboratory also represent the naturally occurring water, carefully prescribed procedures must be followed in collecting the samples, in treating the samples to prevent changes in quality pending analysis, and in shipping the samples to the laboratory. Procedures for on-site measurements and for collecting, treating, and shipping samples are given in TWRI's Book 1, Chapter D2; Book 3, Chapters A1, A3, and A4; and Book 9, Chapters A1-A9. Most of the methods used for collecting and analyzing water samples are described in the TWRI's, which may be accessed from <http://water.usgs.gov/pubs/twri/>. Also, detailed information on collecting, treating, and shipping samples can be obtained from the USGS District office (see address that is shown on the back of title page in this report).

### Water Temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at the time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where recording instruments are used, either mean temperatures or maximum and minimum temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are on file in the District office.

## Sediment

Suspended-sediment concentrations are determined from samples collected by using depth-integrating samplers. Samples usually are obtained at several verticals in the cross section, or a single sample may be obtained at a fixed point and a coefficient applied to determine the mean concentration in the cross section.

During periods of rapidly changing flow or rapidly changing concentration, samples may be collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the subdivided-day method (time-discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge for that day was computed by the subdivided-day method. For periods when no samples were collected, daily discharges of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

At other stations, suspended-sediment samples are collected periodically at many verticals in the stream cross section. Although data collected periodically may represent conditions only at the time of observation, such data are useful in establishing seasonal relations between quality and streamflow and in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of suspended-sediment discharge, records of the periodic measurements of the particle-size distribution of the suspended sediment and bed material are included for some stations.

## Laboratory Measurements

Samples for biochemical oxygen demand (BOD) and indicator bacteria are analyzed locally. All other samples are analyzed in the USGS laboratory in Lakewood, Colorado, unless otherwise noted. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chapter C1. Methods used by the USGS laboratories are given in the TWRI, Book 1, Chapter D2; Book 3, Chapter C2; and Book 5, Chapters A1, A3, and A4. The TWRI publications may be accessed from <http://water.usgs.gov/pubs/twri/>. These methods are consistent with ASTM standards and generally follow ISO standards.

## Data Presentation

For continuing-record stations, information pertinent to the history of station operation is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, drainage area, period of record, type of data available, instrumentation, general remarks, cooperation, and extremes for parameters currently measured daily. Tables of chemical, physical, biological, radiochemical data, and so forth, obtained at a frequency less than daily are presented first. Tables of “daily values” of specific conductance, pH, water temperature, dissolved oxygen, and suspended sediment then follow in sequence.

In the descriptive headings, if the location is identical to that of the discharge gaging station, neither the LOCATION nor the DRAINAGE AREA statements are repeated. The following information is provided with each continuous-record station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.—See Data Presentation information in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

DRAINAGE AREA.—See Data Presentation information in the EXPLANATION OF STAGE- AND WATER-DISCHARGE RECORDS section of this report (same comments apply).

PERIOD OF RECORD.—This indicates the time periods for which published water-quality records for the station are available. The periods are shown separately for records of parameters measured daily or continuously and those measured less than daily. For those measured daily or continuously, periods of record are given for the parameters individually.

INSTRUMENTATION.—Information on instrumentation is given only if a water-quality monitor temperature record, sediment pumping sampler, or other sampling device is in operation at a station.

REMARKS.—Remarks provide added information pertinent to the collection, analysis, or computation of the records.

COOPERATION.—Records provided by a cooperating organization or obtained for the USGS by a cooperating organization are identified here.

EXTREMES.—Maximums and minimums are given only for parameters measured daily or more frequently. For parameters measured weekly or less frequently, true maximums or minimums may not have been obtained. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.—Records are revised if errors in published water-quality records are discovered. Appropriate updates are made in the USGS distributed data system, NWIS, and subsequently to its Web-based National data system, NWISWeb (<http://waterdata.usgs.gov/nwis>). Users of USGS water-quality data are encouraged to obtain all required data from NWIS or NWISWeb to ensure that they have the most recent updates. Updates to the NWISWeb are made on an annual basis.

The surface-water-quality records for partial-record stations and miscellaneous sampling sites are published in separate tables following the table of discharge measurements at miscellaneous sites. No descriptive statements are given for these records. Each station is published with its own station number and name in the regular downstream-order sequence.

### Remark Codes

The following remark codes may appear with the water-quality data in this section:

Printed Output	Remark
E	Value is estimated.
>	Actual value is known to be greater than the value shown.
<	Actual value is known to be less than the value shown.
M	Presence of material verified, but not quantified.
N	Presumptive evidence of presence of material.
U	Material specifically analyzed for, but not detected.
A	Value is an average.
V	Analyte was detected in both the environmental sample and the associated blanks.
S	Most probable value.

### Water-Quality Control Data

The USGS National Water Quality Laboratory collects quality-control data on a continuing basis to evaluate selected analytical methods to determine long-term method detection levels (LT-MDLs) and laboratory reporting levels (LRLs). These values are re-evaluated each year on the basis of the most recent quality-control data and, consequently, may change from year to year.

This reporting procedure limits the occurrence of false positive error. Falsely reporting a concentration greater than the LT-MDL for a sample in which the analyte is not present is 1 percent or less. Application of the LRL limits the occurrence of false negative error. The chance of falsely reporting a non-detection for a sample in which the analyte is present at a concentration equal to or greater than the LRL is 1 percent or less.

Accordingly, concentrations are reported as less than LRL for samples in which the analyte was either not detected or did not pass identification. Analytes detected at concentrations between the LT-MDL and the LRL and that pass identification criteria are estimated. Estimated concentrations will be noted with a remark code of "E." These data should be used with the understanding that their uncertainty is greater than that of data reported without the E remark code.

Data generated from quality-control (QC) samples are a requisite for evaluating the quality of the sampling and processing techniques as well as data from the actual samples themselves. Without QC data, environmental sample data cannot be adequately interpreted because the errors associated with the sample data are unknown. The various types of QC samples collected by this District office are described in the following section. Procedures have been established for the storage of water-quality-control data within the USGS. These procedures allow for storage of all derived QC data and are identified so that they can be related to corresponding environmental samples. These data are not presented in this report but are available from the District office.

### Blank Samples

Blank samples are collected and analyzed to ensure that environmental samples have not been contaminated in the overall data-collection process. The blank solution used to develop specific types of

blank samples is a solution that is free of the analytes of interest. Any measured value signal in a blank sample for an analyte (a specific component measured in a chemical analysis) that was absent in the blank solution is believed to be due to contamination. Many types of blank samples are possible; each is designed to segregate a different part of the overall data-collection process. The types of blank samples collected in this district are:

**Field blank**—A blank solution that is subjected to all aspects of sample collection, field processing preservation, transportation, and laboratory handling as an environmental sample.

**Trip blank**—A blank solution that is put in the same type of bottle used for an environmental sample and kept with the set of sample bottles before and after sample collection.

**Equipment blank**—A blank solution that is processed through all equipment used for collecting and processing an environmental sample (similar to a field blank but normally done in the more controlled conditions of the office).

**Sampler blank**—A blank solution that is poured or pumped through the same field sampler used for collecting an environmental sample.

**Filter blank**—A blank solution that is filtered in the same manner and through the same filter apparatus used for an environmental sample.

**Splitter blank**—A blank solution that is mixed and separated using a field splitter in the same manner and through the same apparatus used for an environmental sample.

**Preservation blank**—A blank solution that is treated with the sampler preservatives used for an environmental sample.

### Reference Samples

Reference material is a solution or material prepared by a laboratory. The reference material composition is certified for one or more properties so that it can be used to assess a measurement method. Samples of reference material are submitted for analysis to ensure that an analytical method is accurate for the known properties of the reference material. Generally, the selected reference material properties are similar to the environmental sample properties.

### Replicate Samples

Replicate samples are a set of environmental samples collected in a manner such that the samples are thought to be essentially identical in composition. Replicate is the general case for which a duplicate is the special case consisting of two samples. Replicate samples are collected and analyzed to establish the amount of variability in the data contributed by some part of the collection and analytical process. Many types of replicate samples are possible, each of which may yield slightly different results in a dynamic hydrologic setting, such as a flowing stream. The types of replicate samples collected in this district are:

**Concurrent samples**—A type of replicate sample in which the samples are collected simultaneously with two or more samplers or by using one sampler and alternating the collection of samples into two or more compositing containers.

**Sequential samples**—A type of replicate sample in which the samples are collected one after the other, typically over a short time.

**Split sample**—A type of replicate sample in which a sample is split into subsamples, each subsample contemporaneous in time and space.

### **Spike Samples**

Spike samples are samples to which known quantities of a solution with one or more well-established analyte concentrations have been added. These samples are analyzed to determine the extent of matrix interference or degradation on the analyte concentration during sample processing and analysis.

## **EXPLANATION OF GROUND-WATER-LEVEL RECORDS**

Generally, only ground-water-level data from selected wells with continuous recorders from a basic network of observation wells are published in this report. This basic network contains observation wells located so that the most significant data are obtained from the fewest wells in the most important aquifers.

### **Site Identification Numbers**

Each well is identified by means of (1) a 15-digit number that is based on latitude and longitude and (2) a local number that is produced for local needs. (See NUMBERING SYSTEM FOR WELLS AND MISCELLANEOUS SITES, p. 16, for a detailed explanation).

### **Data Collection and Computation**

Measurements are made in many types of wells, under varying conditions of access and at different temperatures; hence, neither the method of measurement nor the equipment can be standardized. At each observation well, however, the equipment and techniques used are those that will ensure that measurements at each well are consistent.

Most methods for collecting and analyzing water samples are described in the TWRI's referred to in the On-site Measurements and Sample Collection and the Laboratory Measurements sections in this report. In addition, TWRI Book 1, Chapter D2, describes guidelines for the collection and field analysis of ground-water samples for selected unstable constituents. Procedures for on-site measurements and for collecting, treating, and shipping samples are given in TWRI's Book 1, Chapter D2; Book 3, Chapters A1, A3, and A4; and Book 9, Chapters A1 through A9. The TWRI publications may be accessed from <http://water.usgs.gov/pubs/twri/>. The values in this report represent water-quality conditions at the time of sampling, as much as possible, and that are consistent with available sampling techniques and methods of analysis. These methods are consistent with ASTM standards and generally follow ISO standards. Trained personnel collected all samples. The wells sampled were pumped long enough to ensure that the water collected came directly from the aquifer and had not stood for a long time in the well casing where it would have been exposed to the atmosphere and to the material, possibly metal, comprising the casings.

Water-level measurements in this report are given in feet with reference to land-surface datum (lsd). Land-surface datum is a datum plane that is approximately at land surface at each well. If known, the elevation of the land-surface datum above sea level is given in the well description. The height of the measuring point (MP) above or below land-surface datum is given in each well description. Water levels in wells equipped with recording gages are reported for every fifth day and the end of each month (EOM).

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth of water of several hundred feet, the error in determining the absolute value of the total depth to water may be a few tenths of a foot, whereas the error in determining the net change of water level between successive measurements may be only a hundredth or a few hundredths of a foot. For lesser depths to water the accuracy is greater. Accordingly, most measurements are reported to a hundredth of a foot, but some are given only to a tenth of a foot or a larger unit.

### Data Presentation

Water-level data are presented in alphabetical order by county. The primary identification number for a given well is the 15-digit site identification number that appears in the upper left corner of the table. The secondary identification number is the local or county well number. Well locations are shown in figures 5 and 6: each well is identified on the map by its local well or county well number.

Each well record consists of three parts: the well description, the data table of water levels observed during the water year, and, for most wells, a hydrograph following the data table. Well descriptions are presented in the headings preceding the tabular data.

The following comments clarify information presented in these various headings.

**LOCATION.**—This paragraph follows the well-identification number and reports the hydrologic-unit number and a geographic point of reference. Latitudes and longitudes used in this report are referenced to the North American Datum of 1983 (NAD83).

**AQUIFER.**—This entry designates by name and geologic age the aquifer that the well taps.

**WELL CHARACTERISTICS.**—This entry describes the well in terms of depth, casing diameter and depth or screened interval, method of construction, use, and changes since construction.

**INSTRUMENTATION.**—This paragraph provides information on both the frequency of measurement and the collection method used, allowing the user to better evaluate the reported water-level extremes by knowing whether they are based on continuous, monthly, or some other frequency of measurement.

**DATUM.**—This entry describes both the measuring point and the land-surface elevation at the well. The altitude of the land-surface datum is described in feet above the altitude datum; it is reported with a precision depending on the method of determination. The measuring point is described physically (such as top of casing, top of instrument shelf, and so forth), and in relation to land surface (such as 1.3 ft above land-surface datum). The elevation of the land-surface datum is described in feet above National Geodetic Vertical Datum of 1929 (NGVD 29); it is reported with a precision depending on the method of determination.

**REMARKS.**—This entry describes factors that may influence the water level in a well or the measurement of the water level, when various methods of measurement were begun, and the network (climatic, terrane, local, or areal effects) or the special project to which the well belongs.

**PERIOD OF RECORD.**—This entry indicates the time period for which records are published for the well, the month and year at the start of publication of water-level records by the USGS, and the words “to current year” if the records are to be continued into the following year. Time periods for which water-level records are available, but are not published by the USGS, may be noted.

**EXTREMES FOR PERIOD OF RECORD.**—This entry contains the highest and lowest instantaneously recorded or measured water levels of the period of published record, with respect to land-surface datum or sea level, and the dates of occurrence.

### **Water-Level Tables**

A table of water levels follows the well description for each well. Water-level measurements in this report are given in feet with reference to either sea level or land-surface datum (lsl). Missing records are indicated by dashes in place of the water-level value.

For wells not equipped with recorders, water-level measurements were obtained periodically by steel or electric tape. Tables of periodic water-level measurements in these wells show the date of measurement and the measured water-level value.

### **Hydrographs**

Hydrographs are a graphic display of water-level fluctuations over a period of time. In this report, current water year and, when appropriate, period-of-record hydrographs are shown. Hydrographs that display periodic water-level measurements show points that may be connected with a dashed line from one measurement to the next. Hydrographs that display recorder data show a solid line representing the mean water level recorded for each day. Missing data are indicated by a blank space or break in a hydrograph. Missing data may occur as a result of recorder malfunctions, battery failures, or mechanical problems related to the response of the recorder's float mechanism to water-level fluctuations in a well.

## **GROUND-WATER-QUALITY DATA**

### **Data Collection and Computation**

The ground-water-quality data in this report were obtained as a part of special studies in specific areas. Consequently, a number of chemical analyses are presented for some wells within a county but not for others. As a result, the records for this year, by themselves, do not provide a balanced view of ground-water quality Statewide.

Most methods for collecting and analyzing water samples are described in the Techniques of Water-Resources Investigations of the United States Geological Survey (TWRI), which may be accessed from <http://water.usgs.gov/pubs/twri/>. Procedures for on-site measurements and for collecting, treating, and shipping samples are given in TWRI, Book 1, Chapter D2; Book 5, Chapters A1, A3, and A4; and Book 9, Chapters A1-A6. Also, detailed information on collecting, treating, and shipping samples may be obtained from the USGS District office (see address shown on back of title page in this report).

### **Laboratory Measurements**

Analysis for sulfide and measurement of alkalinity, pH, water temperature, specific conductance, and dissolved oxygen are performed on site. All other sample analyses are performed at the USGS laboratory in Lakewood, Colorado, unless otherwise noted. Methods used by the USGS laboratory are given in TWRI, Book 1, Chapter D2; Book 5, Chapters A1, A3, and A4, which may be accessed from <http://water.usgs.gov/pubs/twri/>.

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### Spike Samples

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### ACCESS TO USGS WATER DATA

The USGS provides near real-time stage and discharge data for many of the gaging stations equipped with the necessary telemetry and historic daily mean and peak-flow discharge data for most current or discontinued gaging stations through the World Wide Web (WWW). These data may be accessed from <http://water.usgs.gov>.

Water-quality data and ground-water data also are available through the WWW. In addition, data can be provided in various machine-readable formats on various media. Information about the availability of specific types of data or products, and user charges, can be obtained locally from each Water Discipline District Office (See address that is shown on the back of the title page of this report.)

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## DEFINITION OF TERMS

Specialized technical terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. Terms such as algae, water level, and precipitation are used in their common everyday meanings, definitions of which are given in standard dictionaries. Not all terms defined in this alphabetical list apply to every State. See also table for converting English units to International System (SI) Units. Other glossaries that also define water-related terms are accessible from <http://water.usgs.gov/glossaries.html>.

**Acid neutralizing capacity** (ANC) is the equivalent sum of all bases or base-producing materials, solutes plus particulates, in an aqueous system that can be titrated with acid to an equivalence point. This term designates titration of an “unfiltered” sample (formerly reported as alkalinity).

**Acre-foot** (AC-FT, acre-ft) is a unit of volume, commonly used to measure quantities of water used or stored, equivalent to the volume of water required to cover 1 acre to a depth of 1 foot and equivalent to 43,560 cubic feet, 325,851 gallons, or 1,233 cubic meters. (See also “Annual runoff”)

**Adenosine triphosphate** (ATP) is an organic, phosphate-rich compound important in the transfer of energy in organisms. Its central role in living cells makes ATP an excellent indicator of the presence of living material in water. A measurement of ATP therefore provides a sensitive and rapid estimate of biomass. ATP is reported in micrograms per liter.

**Adjusted discharge** is discharge data that have been mathematically adjusted (for example, to remove the effects of a daily tide cycle or reservoir storage).

**Algal growth potential** (AGP) is the maximum algal dry weight biomass that can be produced in a natural water sample under standardized laboratory conditions. The growth potential is the algal biomass present at stationary phase and is expressed as milligrams dry weight of algae produced per liter of sample. (See also “Biomass” and “Dry weight”)

**Alkalinity** is the capacity of solutes in an aqueous system to neutralize acid. This term designates titration of a “filtered” sample.

**Annual runoff** is the total quantity of water that is discharged (“runs off”) from a drainage basin in a year. Data reports may present annual runoff data as volumes in acre-feet, as discharges per unit of drainage area in cubic feet per second per square mile, or as depths of water on the drainage basin in inches.

**Annual 7-day minimum** is the lowest mean value for any 7-consecutive-day period in a year. Annual 7-day minimum values are reported herein for the calendar year and the water year (October 1 through September 30). Most

low-flow frequency analyses use a climatic year (April 1–March 31), which tends to prevent the low-flow period from being artificially split between adjacent years. The date shown in the summary statistics table is the initial date of the 7-day period. (This value should not be confused with the 7-day, 10-year low-flow statistic.)

**Aroclor** is the registered trademark for a group of polychlorinated biphenyls that were manufactured by the Monsanto Company prior to 1976. Aroclors are assigned specific 4-digit reference numbers dependent upon molecular type and degree of substitution of the biphenyl ring hydrogen atoms by chlorine atoms. The first two digits of a numbered aroclor represent the molecular type, and the last two digits represent the percentage weight of the hydrogen-substituted chlorine.

**Artificial substrate** is a device that purposely is placed in a stream or lake for colonization of organisms. The artificial substrate simplifies the community structure by standardizing the substrate from which each sample is collected. Examples of artificial substrates are basket samplers (made of wire cages filled with clean streamside rocks) and multi-plate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton collection. (See also “Substrate”)

**Ash mass** is the mass or amount of residue present after the residue from a dry-mass determination has been ashed in a muffle furnace at a temperature of 500 °C for 1 hour. Ash mass of zooplankton and phytoplankton is expressed in grams per cubic meter ( $\text{g}/\text{m}^3$ ), and periphyton and benthic organisms in grams per square meter ( $\text{g}/\text{m}^2$ ). (See also “Biomass” and “Dry mass”)

**Aspect** is the direction toward which a slope faces with respect to the compass.

**Bacteria** are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, whereas others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

**Bankfull stage**, as used in this report, is the stage at which a stream first overflows its natural banks formed by floods with 1- to 3-year recurrence intervals.

**Base discharge** (for peak discharge) is a discharge value, determined for selected stations, above which peak discharge data are published. The base discharge at each station is selected so that an average of about three peak flows per year will be published. (See also "Peak flow")

**Base flow** is sustained flow of a stream in the absence of direct runoff. It includes natural and human-induced streamflows. Natural base flow is sustained largely by ground-water discharge.

**Bed material** is the sediment mixture of which a streambed, lake, pond, reservoir, or estuary bottom is composed. (See also "Bedload" and "Sediment")

**Bedload** is material in transport that primarily is supported by the streambed. In this report, bedload is considered to consist of particles in transit from the bed to the top of the bedload sampler nozzle (an elevation ranging from 0.25 to 0.5 foot). These particles are retained in the bedload sampler. A sample collected with a pressure-differential bedload sampler also may contain a component of the suspended load.

**Bedload discharge** (tons per day) is the rate of sediment moving as bedload, reported as dry weight, that passes through a cross section in a given time. NOTE: Bedload discharge values in this report may include a component of the suspended-sediment discharge. A correction may be necessary when computing the total sediment discharge by summing the bedload discharge and the suspended-sediment discharge. (See also "Bedload," "Dry weight," "Sediment," and "Suspended-sediment discharge")

**Benthic organisms** are the group of organisms inhabiting the bottom of an aquatic environment. They include a number of types of organisms, such as bacteria, fungi, insect larvae and nymphs, snails, clams, and crayfish. They are useful as indicators of water quality.

**Biochemical oxygen demand (BOD)** is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by microorganisms, such as bacteria.

**Biomass** is the amount of living matter present at any given time, expressed as mass per unit area or volume of habitat.

**Biomass pigment ratio** is an indicator of the total proportion of periphyton that are autotrophic (plants). This also is called the Autotrophic Index.

**Blue-green algae** (*Cyanophyta*) are a group of phytoplankton and periphyton organisms with a blue pigment in addition to a green pigment called chlorophyll. Blue-green algae can cause nuisance water-quality conditions in lakes and slow-flowing rivers; however, they are found commonly in streams throughout the year. The abundance of blue-green algae in phytoplankton samples is expressed as the number of cells per milliliter (cells/mL) or biovolume in cubic micrometers per milliliter ( $\mu\text{m}^3/\text{mL}$ ). The abundance of blue-green algae in periphyton samples is given in cells per square centimeter (cells/cm<sup>2</sup>) or biovolume per square centimeter ( $\mu\text{m}^3/\text{cm}^2$ ). (See also "Phytoplankton" and "Periphyton")

**Bottom material** (See "Bed material")

**Bulk electrical conductivity** is the combined electrical conductivity of all material within a doughnut-shaped volume surrounding an induction probe. Bulk conductivity is affected by different physical and chemical properties of the material including the dissolved-solids content of the pore water, and the lithology and porosity of the rock.

**Canadian Geodetic Vertical Datum 1928** is a geodetic datum derived from a general adjustment of Canada's first order level network in 1928.

**Cell volume** (biovolume) determination is one of several common methods used to estimate biomass of algae in aquatic systems. Cell members of algae are used frequently in aquatic surveys as an indicator of algal production. However, cell numbers alone cannot represent true biomass because of considerable cell-size variation among the algal species. Cell volume ( $\mu\text{m}^3$ ) is determined by obtaining critical cell measurements or cell dimensions (for example, length, width, height, or radius) for 20 to 50 cells of each important species to obtain an average biovolume per cell. Cells are categorized according to the correspondence of their cellular shape to the nearest geometric solid or combinations of simple solids (for example, spheres, cones, or cylinders). Representative formulae used to compute biovolume are as follows:

$$\text{sphere } \frac{4}{3} \pi r^3 \quad \text{cone } \frac{1}{3} \pi r^2 h \quad \text{cylinder } \pi r^2 h.$$

pi ( $\pi$ ) is the ratio of the circumference to the diameter of a circle;  $\pi = 3.14159\dots$

From cell volume, total algal biomass expressed as biovolume ( $\mu\text{m}^3/\text{mL}$ ) is thus determined by multiplying the number of cells of a given species by its average cell volume and then summing these volumes for all species.

**Cells/volume** refers to the number of cells of any organism that is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per

sample volume, and generally are reported as cells or units per milliliter (mL) or liter (L).

**Cfs-day** (See “Cubic foot per second-day”)

**Channel bars**, as used in this report, are the lowest prominent geomorphic features higher than the channel bed.

**Chemical oxygen demand** (COD) is a measure of the chemically oxidizable material in the water and furnishes an approximation of the amount of organic and reducing material present. The determined value may correlate with BOD or with carbonaceous organic pollution from sewage or industrial wastes. [See also “Biochemical oxygen demand (BOD)”]

***Clostridium perfringens*** (*C. perfringens*) is a spore-forming bacterium that is common in the feces of human and other warmblooded animals. Clostridial spores are being used experimentally as an indicator of past fecal contamination and the presence of microorganisms that are resistant to disinfection and environmental stresses. (See also “Bacteria”)

**Coliphages** are viruses that infect and replicate in coliform bacteria. They are indicative of sewage contamination of water and of the survival and transport of viruses in the environment.

**Color unit** is produced by 1 milligram per liter of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

**Confined aquifer** is a term used to describe an aquifer containing water between two relatively impermeable boundaries. The water level in a well tapping a confined aquifer stands above the top of the confined aquifer and can be higher or lower than the water table that may be present in the material above it. In some cases, the water level can rise above the ground surface, yielding a flowing well.

**Contents** is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

**Continuous-record station** is a site where data are collected with sufficient frequency to define daily mean values and variations within a day.

**Control** designates a feature in the channel that physically affects the water-surface elevation and thereby determines the stage-discharge relation at the gage. This feature may be a constriction of the channel, a bedrock outcrop, a gravel bar, an artificial structure, or a uniform cross section over a long reach of the channel.

**Control structure**, as used in this report, is a structure on a stream or canal that is used to regulate the flow or stage of the stream or to prevent the intrusion of saltwater.

**Cubic foot per second** (CFS, ft<sup>3</sup>/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point in 1 second. It is equivalent to approximately 7.48 gallons per second or approximately 449 gallons per minute, or 0.02832 cubic meters per second. The term “second-foot” sometimes is used synonymously with “cubic foot per second” but is now obsolete.

**Cubic foot per second-day** (CFS-DAY, Cfs-day, [(ft<sup>3</sup>/s)/d]) is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.98347 acre-feet, 646,317 gallons, or 2,446.6 cubic meters. The daily mean discharges reported in the daily value data tables numerically are equal to the daily volumes in cfs-days, and the totals also represent volumes in cfs-days.

**Cubic foot per second per square mile** [CFSM, (ft<sup>3</sup>/s)/mi<sup>2</sup>] is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming the runoff is distributed uniformly in time and area. (See also “Annual runoff”)

**Daily mean suspended-sediment concentration** is the time-weighted mean concentration of suspended sediment passing a stream cross section during a 24-hour day. (See also “Sediment” and “Suspended-sediment concentration”)

**Daily record station** is a site where data are collected with sufficient frequency to develop a record of one or more data values per day. The frequency of data collection can range from continuous recording to data collection on a daily or near-daily basis.

**Data collection platform** (DCP) is an electronic instrument that collects, processes, and stores data from various sensors, and transmits the data by satellite data relay, line-of-sight radio, and/or landline telemetry.

**Data logger** is a microprocessor-based data acquisition system designed specifically to acquire, process, and store data. Data usually are downloaded from onsite data loggers for entry into office data systems.

**Datum** is a surface or point relative to which measurements of height and/or horizontal position are reported. A vertical datum is a horizontal surface used as the zero point for measurements of gage height, stage, or elevation; a horizontal datum is a reference for positions given in terms of latitude-longitude, State Plane coordinates, or Universal Transverse Mercator (UTM) coordinates. (See also “Gage datum,” “Land-surface datum,” “National Geodetic Verti-

cal Datum of 1929,” and “North American Vertical Datum of 1988”)

**Diatoms** (*Bacillariophyta*) are unicellular or colonial algae with a siliceous cell wall. The abundance of diatoms in phytoplankton samples is expressed as the number of cells per milliliter (cells/mL) or biovolume in cubic micrometers per milliliter ( $\mu\text{m}^3/\text{mL}$ ). The abundance of diatoms in periphyton samples is given in cells per square centimeter ( $\text{cells}/\text{cm}^2$ ) or biovolume per square centimeter ( $\mu\text{m}^3/\text{cm}^2$ ). (See also “Phytoplankton” and “Periphyton”)

**Diel** is of or pertaining to a 24-hour period of time; a regular daily cycle.

**Discharge, or flow**, is the rate that matter passes through a cross section of a stream channel or other water body per unit of time. The term commonly refers to the volume of water (including, unless otherwise stated, any sediment or other constituents suspended or dissolved in the water) that passes a cross section in a stream channel, canal, pipeline, and so forth, within a given period of time (cubic feet per second). Discharge also can apply to the rate at which constituents, such as suspended sediment, bedload, and dissolved or suspended chemicals, pass through a cross section, in which cases the quantity is expressed as the mass of constituent that passes the cross section in a given period of time (tons per day).

**Dissolved** refers to that material in a representative water sample that passes through a 0.45-micrometer membrane filter. This is a convenient operational definition used by Federal and State agencies that collect water-quality data. Determinations of “dissolved” constituent concentrations are made on sample water that has been filtered.

**Dissolved oxygen (DO)** is the molecular oxygen (oxygen gas) dissolved in water. The concentration in water is a function of atmospheric pressure, temperature, and dissolved-solids concentration of the water. The ability of water to retain oxygen decreases with increasing temperature or dissolved-solids concentration. Photosynthesis and respiration by plants commonly cause diurnal variations in dissolved-oxygen concentration in water from some streams.

**Dissolved-solids concentration** in water is the quantity of dissolved material in a sample of water. It is determined either analytically by the “residue-on-evaporation” method, or mathematically by totaling the concentrations of individual constituents reported in a comprehensive chemical analysis. During the analytical determination, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. In the mathematical calculation, the bicarbonate value, in milligrams per liter, is multiplied by 0.4917 to convert it to carbonate. Alternately,

alkalinity concentration (as mg/L  $\text{CaCO}_3$ ) can be converted to carbonate concentration by multiplying by 0.60.

**Diversity index (H)** (Shannon index) is a numerical expression of evenness of distribution of aquatic organisms. The formula for diversity index is:

$$\bar{d} = - \sum_{i \approx 1}^s \frac{n_i}{n} \log_2 \frac{n_i}{n},$$

where  $n_i$  is the number of individuals per taxon,  $n$  is the total number of individuals, and  $s$  is the total number of taxa in the sample of the community. Index values range from zero, when all the organisms in the sample are the same, to some positive number, when some or all of the organisms in the sample are different.

**Drainage area** of a stream at a specific location is that area upstream from the location, measured in a horizontal plane, that has a common outlet at the site for its surface runoff from precipitation that normally drains by gravity into a stream. Drainage areas given herein include all closed basins, or noncontributing areas, within the area unless otherwise specified.

**Drainage basin** is a part of the Earth’s surface that contains a drainage system with a common outlet for its surface runoff. (See “Drainage area”)

**Dry mass** refers to the mass of residue present after drying in an oven at 105 °C, until the mass remains unchanged. This mass represents the total organic matter, ash and sediment, in the sample. Dry-mass values are expressed in the same units as ash mass. (See also “Ash mass,” “Biomass,” and “Wet mass”)

**Dry weight** refers to the weight of animal tissue after it has been dried in an oven at 65 °C until a constant weight is achieved. Dry weight represents total organic and inorganic matter in the tissue. (See also “Wet weight”)

**Embeddedness** is the degree to which gravel-sized and larger particles are surrounded or enclosed by finer-sized particles. (See also “Substrate embeddedness class”)

**Enterococcus bacteria** commonly are found in the feces of humans and other warmblooded animals. Although some strains are ubiquitous and not related to fecal pollution, the presence of enterococci in water is an indication of fecal pollution and the possible presence of enteric pathogens. Enterococcus bacteria are those bacteria that produce pink to red colonies with black or reddish-brown precipitate after incubation at 41 °C on mE agar (nutrient medium for bacterial growth) and subsequent transfer to EIA medium. Enterococci include *Streptococcus faecalis*, *Streptococcus*

*faecium*, *Streptococcus avium*, and their variants. (See also “Bacteria”)

**EPT Index** is the total number of distinct taxa within the insect orders Ephemeroptera, Plecoptera, and Trichoptera. This index summarizes the taxa richness within the aquatic insects that generally are considered pollution sensitive; the index usually decreases with pollution.

***Escherichia coli* (*E. coli*)** are bacteria present in the intestine and feces of warmblooded animals. *E. coli* are a member species of the fecal coliform group of indicator bacteria. In the laboratory, they are defined as those bacteria that produce yellow or yellow-brown colonies on a filter pad saturated with urea substrate broth after primary culturing for 22 to 24 hours at 44.5 °C on mTEC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample. (See also “Bacteria”)

**Estimated (E) value** of a concentration is reported when an analyte is detected and all criteria for a positive result are met. If the concentration is less than the method detection limit (MDL), an E code will be reported with the value. If the analyte is identified qualitatively as present, but the quantitative determination is substantially more uncertain, the National Water Quality Laboratory will identify the result with an E code even though the measured value is greater than the MDL. A value reported with an E code should be used with caution. When no analyte is detected in a sample, the default reporting value is the MDL preceded by a less than sign (<). For bacteriological data, concentrations are reported as estimated when results are based on non-ideal colony counts.

**Euglenoids (*Euglenophyta*)** are a group of algae that usually are free-swimming and rarely creeping. They have the ability to grow either photosynthetically in the light or heterotrophically in the dark. (See also “Phytoplankton”)

**Extractable organic halides (EOX)** are organic compounds that contain halogen atoms such as chlorine. These organic compounds are semivolatile and extractable by ethyl acetate from air-dried streambed sediment. The ethyl acetate extract is combusted, and the concentration is determined by microcoulometric determination of the halides formed. The concentration is reported as micrograms of chlorine per gram of the dry weight of the streambed sediment.

**Fecal coliform bacteria** are present in the intestines or feces of warmblooded animals. They often are used as indicators of the sanitary quality of the water. In the laboratory, they are defined as all organisms that produce blue colonies within 24 hours when incubated at 44.5 °C plus or minus 0.2 °C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample. (See also “Bacteria”)

**Fecal streptococcal bacteria** are present in the intestines of warmblooded animals and are ubiquitous in the environment. They are characterized as gram-positive, cocci bacteria that are capable of growth in brain-heart infusion broth. In the laboratory, they are defined as all the organisms that produce red or pink colonies within 48 hours at 35 °C plus or minus 1.0 °C on KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample. (See also “Bacteria”)

**Filtered** pertains to constituents in a water sample passed through a filter of specified pore diameter, most commonly 0.45 micrometer or less for inorganic analytes and 0.7 micrometer for organic analytes.

**Filtered, recoverable** is the amount of a given constituent that is in solution after the part of a representative water-suspended sediment sample that has passed through a filter has been extracted. Complete recovery is not achieved by the extraction procedure and thus the analytical determination represents something less than 95 percent of the total constituent concentration in the sample. To achieve comparability of analytical data, equivalent extraction procedures are required of all laboratories performing such analyses because different procedures are likely to produce different analytical results.

**Fire algae (*Pyrrhophyta*)** are free-swimming unicells characterized by a red pigment spot. (See also “Phytoplankton”)

**Flow-duration percentiles** are values on a scale of 100 that indicate the percentage of time for which a flow is not exceeded. For example, the 90th percentile of river flow is greater than or equal to 90 percent of all recorded flow rates.

**Gage datum** is a horizontal surface used as a zero point for measurement of stage or gage height. This surface usually is located slightly below the lowest point of the stream bottom such that the gage height is usually slightly greater than the maximum depth of water. Because the gage datum is not an actual physical object, the datum is usually defined by specifying the elevations of permanent reference marks such as bridge abutments and survey monuments, and the gage is set to agree with the reference marks. Gage datum is a local datum that is maintained independently of any national geodetic datum. However, if the elevation of the gage datum relative to the national datum (North American Vertical Datum of 1988 or National Geodetic Vertical Datum of 1929) has been determined, then the gage readings can be converted to elevations above the national datum by adding the elevation of the gage datum to the gage reading.

**Gage height** (G.H.) is the water-surface elevation, in feet above the gage datum. If the water surface is below the gage datum, the gage height is negative. Gage height often is used interchangeably with the more general term “stage,” although gage height is more appropriate when used in reference to a reading on a gage.

**Gage values** are values that are recorded, transmitted, and/or computed from a gaging station. Gage values typically are collected at 5-, 15-, or 30-minute intervals.

**Gaging station** is a site on a stream, canal, lake, or reservoir where systematic observations of stage, discharge, or other hydrologic data are obtained.

**Gas chromatography/flame ionization detector** (GC/FID) is a laboratory analytical method used as a screening technique for semivolatile organic compounds that are extractable from water in methylene chloride.

**Geomorphic channel units**, as used in this report, are fluvial geomorphic descriptors of channel shape and stream velocity. Pools, riffles, and runs are types of geomorphic channel units considered for National Water-Quality Assessment (NAWQA) Program habitat sampling.

**Green algae** (*Chlorophyta*) are unicellular or colonial algae with chlorophyll pigments similar to those in terrestrial green plants. Some forms of green algae produce mats or floating “moss” in lakes. The abundance of green algae in phytoplankton samples is expressed as the number of cells per milliliter (cells/mL) or biovolume in cubic micrometers per milliliter ( $\mu\text{m}^3/\text{mL}$ ). The abundance of green algae in periphyton samples is given in cells per square centimeter ( $\text{cells}/\text{cm}^2$ ) or biovolume per square centimeter ( $\mu\text{m}^3/\text{cm}^2$ ). (See also “Phytoplankton” and “Periphyton”)

**Habitat**, as used in this report, includes all nonliving (physical) aspects of the aquatic ecosystem, although living components like aquatic macrophytes and riparian vegetation also are usually included. Measurements of habitat typically are made over a wider geographic scale than are measurements of species distribution.

**Habitat quality index** is the qualitative description (level 1) of instream habitat and riparian conditions surrounding the reach sampled. Scores range from 0 to 100 percent with higher scores indicative of desirable habitat conditions for aquatic life. Index only applicable to wadable streams.

**Hardness** of water is a physical-chemical characteristic that commonly is recognized by the increased quantity of soap required to produce lather. It is computed as the sum of equivalents of polyvalent cations (primarily calcium and magnesium) and is expressed as the equivalent concentration of calcium carbonate ( $\text{CaCO}_3$ ).

**High tide** is the maximum height reached by each rising tide. The high-high and low-high tides are the higher and lower of the two high tides, respectively, of each tidal day. See NOAA Web site: <http://www.csc.noaa.gov/text/glossary.html> (see “High water”)

**Hilsenhoff’s Biotic Index** (HBI) is an indicator of organic pollution that uses tolerance values to weight taxa abundances; usually increases with pollution. It is calculated as follows:

$$HBI = \frac{\sum(n)(a)}{N},$$

where  $n$  is the number of individuals of each taxon,  $a$  is the tolerance value of each taxon, and  $N$  is the total number of organisms in the sample.

**Horizontal datum** (See “Datum”)

**Hydrologic index stations** referred to in this report are continuous-record gaging stations that have been selected as representative of streamflow patterns for their respective regions. Station locations are shown on index maps.

**Hydrologic unit** is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as defined by the former Office of Water Data Coordination and delineated on the State Hydrologic Unit Maps by the USGS. Each hydrologic unit is identified by an 8-digit number.

**Inch** (IN., in.), in reference to streamflow, as used in this report, refers to the depth to which the drainage area would be covered with water if all of the runoff for a given time period were distributed uniformly on it. (See also “Annual runoff”)

**Instantaneous discharge** is the discharge at a particular instant of time. (See also “Discharge”)

**International Boundary Commission Survey Datum** refers to a geodetic datum established at numerous monuments along the United States-Canada boundary by the International Boundary Commission.

**Island**, as used in this report, is a mid-channel bar that has permanent woody vegetation, is flooded once a year, on average, and remains stable except during large flood events.

**Laboratory reporting level** (LRL) generally is equal to twice the yearly determined long-term method detection level (LT-MDL). The LRL controls false negative error. The probability of falsely reporting a nondetection for a sample that contained an analyte at a concentration equal to or greater than the LRL is predicted to be less than or

equal to 1 percent. The value of the LRL will be reported with a “less than” (<) remark code for samples in which the analyte was not detected. The National Water Quality Laboratory (NWQL) collects quality-control data from selected analytical methods on a continuing basis to determine LT-MDLs and to establish LRLs. These values are reevaluated annually on the basis of the most current quality-control data and, therefore, may change. The LRL replaces the term ‘non-detection value’ (NDV).

**Land-surface datum** (lsd) is a datum plane that is approximately at land surface at each ground-water observation well.

**Latent heat flux** (often used interchangeably with latent heat-flux density) is the amount of heat energy that converts water from liquid to vapor (evaporation) or from vapor to liquid (condensation) across a specified cross-sectional area per unit time. Usually expressed in watts per square meter.

**Light-attenuation coefficient**, also known as the extinction coefficient, is a measure of water clarity. Light is attenuated according to the Lambert-Beer equation:

$$I = I_o e^{-\lambda L},$$

where  $I_o$  is the source light intensity,  $I$  is the light intensity at length  $L$  (in meters) from the source,  $\lambda$  is the light-attenuation coefficient, and  $e$  is the base of the natural logarithm. The light-attenuation coefficient is defined as

$$\lambda = -\frac{1}{L} \log_e \frac{I}{I_o}.$$

**Lipid** is any one of a family of compounds that are insoluble in water and that make up one of the principal components of living cells. Lipids include fats, oils, waxes, and steroids. Many environmental contaminants such as organochlorine pesticides are lipophilic.

**Long-term method detection level** (LT-MDL) is a detection level derived by determining the standard deviation of a minimum of 24 method detection limit (MDL) spike-sample measurements over an extended period of time. LT-MDL data are collected on a continuous basis to assess year-to-year variations in the LT-MDL. The LT-MDL controls false positive error. The chance of falsely reporting a concentration at or greater than the LT-MDL for a sample that did not contain the analyte is predicted to be less than or equal to 1 percent.

**Low tide** is the minimum height reached by each falling tide. The high-low and low-low tides are the higher and lower of the two low tides, respectively, of each tidal day. See NOAA Web site: <http://www.csc.noaa.gov/txt/glossary.html> (see “Low water”)

**Macrophytes** are the macroscopic plants in the aquatic environment. The most common macrophytes are the rooted vascular plants that usually are arranged in zones in aquatic ecosystems and restricted in the area by the extent of illumination through the water and sediment deposition along the shoreline.

**Mean concentration of suspended sediment** (Daily mean suspended-sediment concentration) is the time-weighted concentration of suspended sediment passing a stream cross section during a given time period. (See also “Daily mean suspended-sediment concentration” and “Suspended-sediment concentration”)

**Mean discharge** (MEAN) is the arithmetic mean of individual daily mean discharges during a specific period. (See also “Discharge”)

**Mean high or low tide** is the average of all high or low tides, respectively, over a specific period.

**Mean sea level** is a local tidal datum. It is the arithmetic mean of hourly heights observed over the National Tidal Datum Epoch. Shorter series are specified in the name; for example, monthly mean sea level and yearly mean sea level. In order that they may be recovered when needed, such datums are referenced to fixed points known as benchmarks. (See also “Datum”)

**Measuring point** (MP) is an arbitrary permanent reference point from which the distance to water surface in a well is measured to obtain water level.

**Megahertz** is a unit of frequency. One megahertz equals one million cycles per second.

**Membrane filter** is a thin microporous material of specific pore size used to filter bacteria, algae, and other very small particles from water.

**Metamorphic stage** refers to the stage of development that an organism exhibits during its transformation from an immature form to an adult form. This developmental process exists for most insects, and the degree of difference from the immature stage to the adult form varies from relatively slight to pronounced, with many intermediates. Examples of metamorphic stages of insects are egg-larva-adult or egg-nymph-adult.

**Method code** is a one-character code that identifies the analytical or field method used to determine a value stored in the National Water Information System (NWIS).

**Method detection limit** (MDL) is the minimum concentration of a substance that can be measured and reported with 99-percent confidence that the analyte concentration is greater than zero. It is determined from the analysis of a

sample in a given matrix containing the analyte. At the MDL concentration, the risk of a false positive is predicted to be less than or equal to 1 percent.

**Method of Cubatures** is a method of computing discharge in tidal estuaries based on the conservation of mass equation.

**Methylene blue active substances (MBAS)** indicate the presence of detergents (anionic surfactants). The determination depends on the formation of a blue color when methylene blue dye reacts with synthetic anionic detergent compounds.

**Micrograms per gram (UG/G,  $\mu\text{g/g}$ )** is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the element per unit mass (gram) of material analyzed.

**Micrograms per kilogram (UG/KG,  $\mu\text{g/kg}$ )** is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the constituent per unit mass (kilogram) of the material analyzed. One microgram per kilogram is equivalent to 1 part per billion.

**Micrograms per liter (UG/L,  $\mu\text{g/L}$ )** is a unit expressing the concentration of chemical constituents in water as mass (micrograms) of constituent per unit volume (liter) of water. One thousand micrograms per liter is equivalent to 1 milligram per liter. One microgram per liter is equivalent to 1 part per billion.

**Microsiemens per centimeter (US/CM,  $\mu\text{S/cm}$ )** is a unit expressing the amount of electrical conductivity of a solution as measured between opposite faces of a centimeter cube of solution at a specified temperature. Siemens is the International System of Units nomenclature. It is synonymous with mhos and is the reciprocal of resistance in ohms.

**Milligrams per liter (MG/L,  $\text{mg/L}$ )** is a unit for expressing the concentration of chemical constituents in water as the mass (milligrams) of constituent per unit volume (liter) of water. Concentration of suspended sediment also is expressed in milligrams per liter and is based on the mass of dry sediment per liter of water-sediment mixture.

**Minimum reporting level (MRL)** is the smallest measured concentration of a constituent that may be reliably reported by using a given analytical method.

**Miscellaneous site**, miscellaneous station, or miscellaneous sampling site is a site where streamflow, sediment, and/or water-quality data or water-quality or sediment samples are collected once, or more often on a random or discontinuous basis to provide better areal coverage for defining

hydrologic and water-quality conditions over a broad area in a river basin.

**Most probable number (MPN)** is an index of the number of coliform bacteria that, more probably than any other number, would give the results shown by the laboratory examination; it is not an actual enumeration. MPN is determined from the distribution of gas-positive cultures among multiple inoculated tubes.

**Multiple-plate samplers** are artificial substrates of known surface area used for obtaining benthic invertebrate samples. They consist of a series of spaced, hardboard plates on an eyebolt.

**Nanograms per liter (NG/L,  $\text{ng/L}$ )** is a unit expressing the concentration of chemical constituents in solution as mass (nanograms) of solute per unit volume (liter) of water. One million nanograms per liter is equivalent to 1 milligram per liter.

**National Geodetic Vertical Datum of 1929 (NGVD 29)** is a fixed reference adopted as a standard geodetic datum for elevations determined by leveling. It formerly was called "Sea Level Datum of 1929" or "mean sea level." Although the datum was derived from the mean sea level at 26 tide stations, it does not necessarily represent local mean sea level at any particular place. *See NOAA Web site: <http://www.ngs.noaa.gov/faq.shtml#WhatVD29VD88>* (See "North American Vertical Datum of 1988")

**Natural substrate** refers to any naturally occurring immersed or submersed solid surface, such as a rock or tree, upon which an organism lives. (See also "Substrate")

**Nekton** are the consumers in the aquatic environment and consist of large, free-swimming organisms that are capable of sustained, directed mobility.

**Nonfilterable** refers to the portion of the total residue retained by a filter.

**North American Datum of 1927 (NAD 27)** is the horizontal control datum for the United States that was defined by a location and azimuth on the Clarke spheroid of 1866.

**North American Datum of 1983 (NAD 83)** is the horizontal control datum for the United States, Canada, Mexico, and Central America that is based on the adjustment of 250,000 points including 600 satellite Doppler stations that constrain the system to a geocentric origin. NAD 83 has been officially adopted as the legal horizontal datum for the United States by the Federal government.

**North American Vertical Datum of 1988 (NAVD 88)** is a fixed reference adopted as the official civilian vertical datum for elevations determined by Federal surveying and

mapping activities in the United States. This datum was established in 1991 by minimum-constraint adjustment of the Canadian, Mexican, and United States first-order terrestrial leveling networks.

**Open or screened interval** is the length of unscreened opening or of well screen through which water enters a well, in feet below land surface.

**Organic carbon (OC)** is a measure of organic matter present in aqueous solution, suspension, or bottom sediment. May be reported as dissolved organic carbon (DOC), particulate organic carbon (POC), or total organic carbon (TOC).

**Organic mass or volatile mass** of a living substance is the difference between the dry mass and ash mass and represents the actual mass of the living matter. Organic mass is expressed in the same units as for ash mass and dry mass. (See also "Ash mass," "Biomass," and "Dry mass")

**Organism count/area** refers to the number of organisms collected and enumerated in a sample and adjusted to the number per area habitat, usually square meter (m<sup>2</sup>), acre, or hectare. Periphyton, benthic organisms, and macrophytes are expressed in these terms.

**Organism count/volume** refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume, usually milliliter (mL) or liter (L). Numbers of planktonic organisms can be expressed in these terms.

**Organochlorine compounds** are any chemicals that contain carbon and chlorine. Organochlorine compounds that are important in investigations of water, sediment, and biological quality include certain pesticides and industrial compounds.

**Parameter code** is a 5-digit number used in the USGS computerized data system, National Water Information System (NWIS), to uniquely identify a specific constituent or property.

**Partial-record station** is a site where discrete measurements of one or more hydrologic parameters are obtained over a period of time without continuous data being recorded or computed. A common example is a crest-stage gage partial-record station at which only peak stages and flows are recorded.

**Particle size** is the diameter, in millimeters (mm), of a particle determined by sieve or sedimentation methods. The sedimentation method uses the principle of Stokes Law to calculate sediment particle sizes. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube, sedimentograph) determine fall diameter of particles in either

distilled water (chemically dispersed) or in native water (the river water at the time and point of sampling).

**Particle-size classification**, as used in this report, agrees with the recommendation made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

Classification	Size (mm)	Method of analysis
Clay	>0.00024 - 0.004	Sedimentation
Silt	>0.004 - 0.062	Sedimentation
Sand	>0.062 - 2.0	Sedimentation/sieve
Gravel	>2.0 - 64.0	Sieve
Cobble	>64 - 256	Manual measurement
Boulder	>256	Manual measurement

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. For the sedimentation method, most of the organic matter is removed, and the sample is subjected to mechanical and chemical dispersion before analysis in distilled water. Chemical dispersion is not used for native water analysis.

**Peak flow (peak stage)** is an instantaneous local maximum value in the continuous time series of streamflows or stages, preceded by a period of increasing values and followed by a period of decreasing values. Several peak values ordinarily occur in a year. The maximum peak value in a year is called the annual peak; peaks lower than the annual peak are called secondary peaks. Occasionally, the annual peak may not be the maximum value for the year; in such cases, the maximum value occurs at midnight at the beginning or end of the year, on the recession from or rise toward a higher peak in the adjoining year. If values are recorded at a discrete series of times, the peak recorded value may be taken as an approximation of the true peak, which may occur between the recording instants. If the values are recorded with finite precision, a sequence of equal recorded values may occur at the peak; in this case, the first value is taken as the peak.

**Percent composition or percent of total** is a unit for expressing the ratio of a particular part of a sample or population to the total sample or population, in terms of types, numbers, weight, mass, or volume.

**Percent shading** is a measure of the amount of sunlight potentially reaching the stream. A clinometer is used to measure left and right bank canopy angles. These values are added together, divided by 180, and multiplied by 100 to compute percentage of shade.

**Periodic-record station** is a site where stage, discharge, sediment, chemical, physical, or other hydrologic measure-

ments are made one or more times during a year but at a frequency insufficient to develop a daily record.

**Periphyton** is the assemblage of microorganisms attached to and living upon submerged solid surfaces. Although primarily consisting of algae, they also include bacteria, fungi, protozoa, rotifers, and other small organisms. Periphyton are useful indicators of water quality.

**Pesticides** are chemical compounds used to control undesirable organisms. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides.

**pH** of water is the negative logarithm of the hydrogen-ion activity. Solutions with pH less than 7.0 standard units are termed “acidic,” and solutions with a pH greater than 7.0 are termed “basic.” Solutions with a pH of 7.0 are neutral. The presence and concentration of many dissolved chemical constituents found in water are affected, in part, by the hydrogen-ion activity of water. Biological processes including growth, distribution of organisms, and toxicity of the water to organisms also are affected, in part, by the hydrogen-ion activity of water.

**Phytoplankton** is the plant part of the plankton. They usually are microscopic, and their movement is subject to the water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials to the surrounding water, the phytoplankton have a profound effect upon the quality of the water. They are the primary food producers in the aquatic environment and commonly are known as algae. (See also “Plankton”)

**Picocurie (PC, pCi)** is one-trillionth ( $1 \times 10^{-12}$ ) of the amount of radioactive nuclide represented by a curie (Ci). A curie is the quantity of radioactive nuclide that yields  $3.7 \times 10^{10}$  radioactive disintegrations per second (dps). A picocurie yields 0.037 dps, or 2.22 dpm (disintegrations per minute).

**Plankton** is the community of suspended, floating, or weakly swimming organisms that live in the open water of lakes and rivers. Concentrations are expressed as a number of cells per milliliter (cells/mL) of sample.

**Polychlorinated biphenyls (PCBs)** are industrial chemicals that are mixtures of chlorinated biphenyl compounds having various percentages of chlorine. They are similar in structure to organochlorine insecticides.

**Polychlorinated naphthalenes (PCNs)** are industrial chemicals that are mixtures of chlorinated naphthalene compounds. They have properties and applications similar to polychlorinated biphenyls (PCBs) and have been identified in commercial PCB preparations.

**Pool**, as used in this report, is a small part of a stream reach with little velocity, commonly with water deeper than surrounding areas.

**Primary productivity** is a measure of the rate at which new organic matter is formed and accumulated through photosynthetic and chemosynthetic activity of producer organisms (chiefly, green plants). The rate of primary production is estimated by measuring the amount of oxygen released (oxygen method) or the amount of carbon assimilated (carbon method) by the plants.

**Primary productivity (carbon method)** is expressed as milligrams of carbon per area per unit time [ $\text{mg C}/(\text{m}^2/\text{time})$ ] for periphyton and macrophytes or per volume [ $\text{mg C}/(\text{m}^3/\text{time})$ ] for phytoplankton. The carbon method defines the amount of carbon dioxide consumed as measured by radioactive carbon (carbon-14). The carbon-14 method is of greater sensitivity than the oxygen light- and dark-bottle method and is preferred for use with unenriched water samples. Unit time may be either the hour or day, depending on the incubation period. (See also “Primary productivity”)

**Primary productivity (oxygen method)** is expressed as milligrams of oxygen per area per unit time [ $\text{mg O}/(\text{m}^2/\text{time})$ ] for periphyton and macrophytes or per volume [ $\text{mg O}/(\text{m}^3/\text{time})$ ] for phytoplankton. The oxygen method defines production and respiration rates as estimated from changes in the measured dissolved-oxygen concentration. The oxygen light- and dark-bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period. (See also “Primary productivity”)

**Radioisotopes** are isotopic forms of elements that exhibit radioactivity. Isotopes are varieties of a chemical element that differ in atomic weight but are very nearly alike in chemical properties. The difference arises because the atoms of the isotopic forms of an element differ in the number of neutrons in the nucleus; for example, ordinary chlorine is a mixture of isotopes having atomic weights of 35 and 37, and the natural mixture has an atomic weight of about 35.453. Many of the elements similarly exist as mixtures of isotopes, and a great many new isotopes have been produced in the operation of nuclear devices such as the cyclotron. There are 275 isotopes of the 81 stable elements, in addition to more than 800 radioactive isotopes.

**Reach**, as used in this report, is a length of stream that is chosen to represent a uniform set of physical, chemical, and biological conditions within a segment. It is the principal sampling unit for collecting physical, chemical, and biological data.

**Recoverable** is the amount of a given constituent that is in solution after a representative water sample has been

extracted or digested. Complete recovery is not achieved by the extraction or digestion and thus the determination represents something less than 95 percent of the constituent present in the sample. To achieve comparability of analytical data, equivalent extraction or digestion procedures are required of all laboratories performing such analyses because different procedures are likely to produce different analytical results. (See also “Bed material”)

**Recurrence interval**, also referred to as return period, is the average time, usually expressed in years, between occurrences of hydrologic events of a specified type (such as exceedances of a specified high flow or nonexceedance of a specified low flow). The terms “return period” and “recurrence interval” do not imply regular cyclic occurrence. The actual times between occurrences vary randomly, with most of the times being less than the average and a few being substantially greater than the average. For example, the 100-year flood is the flow rate that is exceeded by the annual maximum peak flow at intervals whose average length is 100 years (that is, once in 100 years, on average); almost two-thirds of all exceedances of the 100-year flood occur less than 100 years after the previous exceedance, half occur less than 70 years after the previous exceedance, and about one-eighth occur more than 200 years after the previous exceedance. Similarly, the 7-day, 10-year low flow ( $7Q_{10}$ ) is the flow rate below which the annual minimum 7-day-mean flow dips at intervals whose average length is 10 years (that is, once in 10 years, on average); almost two-thirds of the nonexceedances of the  $7Q_{10}$  occur less than 10 years after the previous nonexceedance, half occur less than 7 years after, and about one-eighth occur more than 20 years after the previous nonexceedance. The recurrence interval for annual events is the reciprocal of the annual probability of occurrence. Thus, the 100-year flood has a 1-percent chance of being exceeded by the maximum peak flow in any year, and there is a 10-percent chance in any year that the annual minimum 7-day-mean flow will be less than the  $7Q_{10}$ .

**Replicate samples** are a group of samples collected in a manner such that the samples are thought to be essentially identical in composition.

**Return period** (See “Recurrence interval”)

**Riffle**, as used in this report, is a shallow part of the stream where water flows swiftly over completely or partially submerged obstructions to produce surface agitation.

**River mileage** is the curvilinear distance, in miles, measured upstream from the mouth along the meandering path of a stream channel in accordance with Bulletin No. 14 (October 1968) of the Water Resources Council and typically is used to denote location along a river.

**Run**, as used in this report, is a relatively shallow part of a stream with moderate velocity and little or no surface turbulence.

**Runoff** is the quantity of water that is discharged (“runs off”) from a drainage basin during a given time period. Runoff data may be presented as volumes in acre-feet, as mean discharges per unit of drainage area in cubic feet per second per square mile, or as depths of water on the drainage basin in inches. (See also “Annual runoff”)

**Salinity** is the total quantity of dissolved salts, measured by weight in parts per thousand. Values in this report are calculated from specific conductance and temperature. Seawater has an average salinity of about 35 parts per thousand (for additional information, refer to: Miller, R.L., Bradford, W.L., and Peters, N.E., 1988, Specific conductance: theoretical considerations and application to analytical quality control: U.S. Geological Survey Water-Supply Paper 2311, 16 p.)

**Sea level**, as used in this report, refers to one of the two commonly used national vertical datums (NGVD 1929 or NAVD 1988). See separate entries for definitions of these datums.

**Sediment** is solid material that originates mostly from disintegrated rocks; when transported by, suspended in, or deposited from water, it is referred to as “fluvial sediment.” Sediment includes chemical and biochemical precipitates and decomposed organic material, such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are affected by environmental and land-use factors. Some major factors are topography, soil characteristics, land cover, and depth and intensity of precipitation.

**Sensible heat flux** (often used interchangeably with latent sensible heat-flux density) is the amount of heat energy that moves by turbulent transport through the air across a specified cross-sectional area per unit time and goes to heating (cooling) the air. Usually expressed in watts per square meter.

**Seven-day, 10-year low flow ( $7Q_{10}$ )** is the discharge below which the annual 7-day minimum flow falls in 1 year out of 10 on the long-term average. The recurrence interval of the  $7Q_{10}$  is 10 years; the chance that the annual 7-day minimum flow will be less than the  $7Q_{10}$  is 10 percent in any given year. (See also “Annual 7-day minimum” and “Recurrence interval”)

**Shelves**, as used in this report, are streambank features extending nearly horizontally from the flood plain to the lower limit of persistent woody vegetation.

**Sodium adsorption ratio (SAR)** is the expression of relative activity of sodium ions in exchange reactions within soil and is an index of sodium or alkali hazard to the soil. Sodium hazard in water is an index that can be used to evaluate the suitability of water for irrigating crops.

**Soil heat flux** (often used interchangeably with soil heat-flux density) is the amount of heat energy that moves by conduction across a specified cross-sectional area of soil per unit time and goes to heating (or cooling) the soil. Usually expressed in watts per square meter.

**Soil-water content** is the water lost from the soil upon drying to constant mass at 105 °C; expressed either as mass of water per unit mass of dry soil or as the volume of water per unit bulk volume of soil.

**Specific electrical conductance (conductivity)** is a measure of the capacity of water (or other media) to conduct an electrical current. It is expressed in microsiemens per centimeter at 25 °C. Specific electrical conductance is a function of the types and quantity of dissolved substances in water and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is from 55 to 75 percent of the specific conductance (in microsiemens). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

**Stable isotope ratio** (per MIL) is a unit expressing the ratio of the abundance of two radioactive isotopes. Isotope ratios are used in hydrologic studies to determine the age or source of specific water, to evaluate mixing of different water, as an aid in determining reaction rates, and other chemical or hydrologic processes.

**Stage** (See “Gage height”)

**Stage-discharge relation** is the relation between the water-surface elevation, termed stage (gage height), and the volume of water flowing in a channel per unit time.

**Streamflow** is the discharge that occurs in a natural channel. Although the term “discharge” can be applied to the flow of a canal, the word “streamflow” uniquely describes the discharge in a surface stream course. The term “streamflow” is more general than “runoff” as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

**Substrate** is the physical surface upon which an organism lives.

**Substrate embeddedness class** is a visual estimate of riffle streambed substrate larger than gravel that is surrounded or covered by fine sediment (<2 mm, sand or finer). Below

are the class categories expressed as the percentage covered by fine sediment:

0	no gravel or larger substrate	3	26-50 percent
1	> 75 percent	4	5-25 percent
2	51-75 percent	5	< 5 percent

**Surface area of a lake** is that area (acres) encompassed by the boundary of the lake as shown on USGS topographic maps, or other available maps or photographs. Because surface area changes with lake stage, surface areas listed in this report represent those determined for the stage at the time the maps or photographs were obtained.

**Surficial bed material** is the upper surface (0.1 to 0.2 foot) of the bed material that is sampled using U.S. Series Bed-Material Samplers.

**Surrogate** is an analyte that behaves similarly to a target analyte, but that is highly unlikely to occur in a sample. A surrogate is added to a sample in known amounts before extraction and is measured with the same laboratory procedures used to measure the target analyte. Its purpose is to monitor method performance for an individual sample.

**Suspended** is the amount (concentration) of undissolved material in a water-sediment mixture. Most commonly refers to that material retained on a 0.45-micrometer filter.

**Suspended, recoverable** is the amount of a given constituent that is in solution after the part of a representative water-suspended sediment sample that is retained on a 0.45-micrometer filter has been extracted or digested. Complete recovery is not achieved by the extraction or digestion procedures and thus the determination represents less than 95 percent of the constituent present in the sample. To achieve comparability of analytical data, equivalent extraction or digestion procedures are required of all laboratories performing such analyses because different procedures are likely to produce different analytical results. (See also “Suspended”)

**Suspended sediment** is sediment carried in suspension by the turbulent components of the fluid or by the Brownian movement (a law of physics). (See also “Sediment”)

**Suspended-sediment concentration** is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 foot above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L). The analytical technique uses the mass of all of the sediment and the net weight of the water-sediment mixture in a sample to compute the suspended-sediment concentration. (See also “Sediment” and “Suspended sediment”)

**Suspended-sediment discharge** (tons/d) is the rate of sediment transport, as measured by dry mass or volume, that passes a cross section in a given time. It is calculated in units of tons per day as follows: concentration (mg/L) x discharge (ft<sup>3</sup>/s) x 0.0027. (See also “Sediment,” “Suspended sediment,” and “Suspended-sediment concentration”)

**Suspended-sediment load** is a general term that refers to a given characteristic of the material in suspension that passes a point during a specified period of time. The term needs to be qualified, such as “annual suspended-sediment load” or “sand-size suspended-sediment load,” and so on. It is not synonymous with either suspended-sediment discharge or concentration. (See also “Sediment”)

**Suspended solids, total residue at 105 °C concentration** is the concentration of inorganic and organic material retained on a filter, expressed as milligrams of dry material per liter of water (mg/L). An aliquot of the sample is used for this analysis.

**Suspended, total** is the total amount of a given constituent in the part of a water-sediment sample that is retained on a 0.45-micrometer membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. Knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as “suspended, total.” Determinations of “suspended, total” constituents are made either by directly analyzing portions of the suspended material collected on the filter or, more commonly, by difference, on the basis of determinations of (1) dissolved and (2) total concentrations of the constituent. (See also “Suspended”)

**Synoptic studies** are short-term investigations of specific water-quality conditions during selected seasonal or hydrologic periods to provide improved spatial resolution for critical water-quality conditions. For the period and conditions sampled, they assess the spatial distribution of selected water-quality conditions in relation to causative factors, such as land use and contaminant sources.

**Taxa (Species) richness** is the number of species (taxa) present in a defined area or sampling unit.

**Taxonomy** is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon a hierarchical scheme beginning with Kingdom and ending with Species at the base. The higher the classification level, the fewer features the organisms have in common. For example, the taxonomy of a particular mayfly, *Hexagenia limbata*, is the following:

Kingdom:	Animal
Phylum:	Arthropoda
Class:	Insecta
Order:	Ephemeroptera
Family:	Ephemeridae
Genus:	<i>Hexagenia</i>
Species:	<i>Hexagenia limbata</i>

**Thalweg** is the line formed by connecting points of minimum streambed elevation (deepest part of the channel).

**Thermograph** is an instrument that continuously records variations of temperature on a chart. The more general term “temperature recorder” is used in the table descriptions and refers to any instrument that records temperature whether on a chart, a tape, or any other medium.

**Time-weighted average** is computed by multiplying the number of days in the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water resulting from the mixing of flow proportionally to the duration of the concentration.

**Tons per acre-foot** (T/acre-ft) is the dry mass (tons) of a constituent per unit volume (acre-foot) of water. It is computed by multiplying the concentration of the constituent, in milligrams per liter, by 0.00136.

**Tons per day** (T/DAY, tons/d) is a common chemical or sediment discharge unit. It is the quantity of a substance in solution, in suspension, or as bedload that passes a stream section during a 24-hour period. It is equivalent to 2,000 pounds per day, or 0.9072 metric ton per day.

**Total** is the amount of a given constituent in a representative whole-water (unfiltered) sample, regardless of the constituent’s physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as “total.” (Note that the word “total” does double duty here, indicating both that the sample consists of a water-suspended sediment mixture and that the analytical method determined at least 95 percent of the constituent in the sample.)

**Total coliform bacteria** are a particular group of bacteria that are used as indicators of possible sewage pollution. This group includes coliforms that inhabit the intestine of warmblooded animals and those that inhabit soils. They are characterized as aerobic or facultative anaerobic, gram-

negative, nonspore-forming, rod-shaped bacteria that ferment lactose with gas formation within 48 hours at 35 °C. In the laboratory, these bacteria are defined as all the organisms that produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35 °C plus or minus 1.0 °C on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 milliliters of sample. (See also “Bacteria”)

**Total discharge** is the quantity of a given constituent, measured as dry mass or volume, that passes a stream cross section per unit of time. When referring to constituents other than water, this term needs to be qualified, such as “total sediment discharge,” “total chloride discharge,” and so on.

**Total in bottom material** is the amount of a given constituent in a representative sample of bottom material. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as “total in bottom material.”

**Total length** (fish) is the straight-line distance from the anterior point of a fish specimen’s snout, with the mouth closed, to the posterior end of the caudal (tail) fin, with the lobes of the caudal fin squeezed together.

**Total load** refers to all of a constituent in transport. When referring to sediment, it includes suspended load plus bed load.

**Total organism count** is the number of organisms collected and enumerated in any particular sample. (See also “Organism count/volume”)

**Total recoverable** is the amount of a given constituent in a whole-water sample after a sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the “total” amount (that is, less than 95 percent) of the constituent present in the dissolved and suspended phases of the sample. To achieve comparability of analytical data for whole-water samples, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures may produce different analytical results.

**Total sediment discharge** is the mass of suspended-sediment plus bed-load transport, measured as dry weight, that passes a cross section in a given time. It is a rate and is reported as tons per day. (See also “Bedload,” “Bedload

discharge,” “Sediment,” “Suspended sediment,” and “Suspended-sediment concentration”)

**Total sediment load or total load** is the sediment in transport as bedload and suspended-sediment load. The term may be qualified, such as “annual suspended-sediment load” or “sand-size suspended-sediment load,” and so on. It differs from total sediment discharge in that load refers to the material, whereas discharge refers to the quantity of material, expressed in units of mass per unit time. (See also “Sediment,” “Suspended-sediment load,” and “Total load”)

**Transect**, as used in this report, is a line across a stream perpendicular to the flow and along which measurements are taken, so that morphological and flow characteristics along the line are described from bank to bank. Unlike a cross section, no attempt is made to determine known elevation points along the line.

**Turbidity** is an expression of the optical properties of a liquid that causes light rays to be scattered and absorbed rather than transmitted in straight lines through water. Turbidity, which can make water appear cloudy or muddy, is caused by the presence of suspended and dissolved matter, such as clay, silt, finely divided organic matter, plankton and other microscopic organisms, organic acids, and dyes (ASTM International, 2003, D1889–00 Standard test method for turbidity of water, *in* ASTM International, Annual Book of ASTM Standards, Water and Environmental Technology, v. 11.01: West Conshohocken, Pennsylvania, 6 p.). The color of water, whether resulting from dissolved compounds or suspended particles, can affect a turbidity measurement. To ensure that USGS turbidity data can be understood and interpreted properly within the context of the instrument used and site conditions encountered, data from each instrument type are stored and reported in the National Water Information System (NWIS) using parameter codes and measurement reporting units that are specific to the instrument type, with specific instruments designated by the method code. The respective measurement units, many of which also are in use internationally, fall into two categories: (1) the designations NTU, NTRU, BU, AU, and NTMU signify the use of a broad spectrum incident light in the wavelength range of 400–680 nanometers (nm), but having different light detection configurations; (2) The designations FNU, FNRU, FBU, FAU, and FNMU generally signify an incident light in the range between 780–900 nm, also with varying light detection configurations. These reporting units are equivalent when measuring a calibration solution (for example, formazin or polymer beads), but their respective instruments may not produce equivalent results for environmental samples. Specific reporting units are as follows:

**NTU** (Nephelometric Turbidity Units): white or broad-band [400–680 nm] light source, 90 degree detection angle, one detector.

**NTRU** (Nephelometric Turbidity Ratio Units): white or broadband [400-680 nm] light source, 90 degree detection angle, multiple detectors with ratio compensation.

**BU** (Backscatter Units): white or broadband [400-680 nm] light source,  $30 \pm 15$  degree detection angle (backscatter).

**AU** (Attenuation Units): white or broadband [400-680 nm] light source, 180 degree detection angle (attenuation).

**NTMU** (Nephelometric Turbidity Multibeam Units): white or broadband [400-680 nm] light source, multiple light sources, detectors at 90 degrees and possibly other angles to each beam.

**FNU** (Formazin Nephelometric Units): near infrared [780-900 nm] or monochrome light source, 90 degree detection angle, one detector.

**FNRU** (Formazin Nephelometric Ratio Units): near infrared [780-900 nm] or monochrome light source, 90 degree detection angle, multiple detectors, ratio compensation.

**FBU** (Formazin Backscatter Units): near infrared [780-900 nm] or monochrome light source,  $30 \pm 15$  degree detection angle.

**FAU** (Formazin Attenuation Units): near infrared [780-900 nm] light source, 180 degree detection angle.

**FNMU** (Formazin Nephelometric Multibeam Units): near infrared [780-900 nm] or monochrome light source, multiple light sources, detectors at 90 degrees and possibly other angles to each beam.

For more information please see [http://water.usgs.gov/owq/FieldManual/Chapter6/6.7\\_contents.html](http://water.usgs.gov/owq/FieldManual/Chapter6/6.7_contents.html).

**Ultraviolet (UV) absorbance (absorption)** at 254 or 280 nanometers is a measure of the aggregate concentration of the mixture of UV absorbing organic materials dissolved in the analyzed water, such as lignin, tannin, humic substances, and various aromatic compounds. UV absorbance (absorption) at 254 or 280 nanometers is measured in UV absorption units per centimeter of path length of UV light through a sample.

**Unconfined aquifer** is an aquifer whose upper surface is a water table free to fluctuate under atmospheric pressure. (See “Water-table aquifer”)

**Unfiltered** pertains to the constituents in an unfiltered, representative water-suspended sediment sample.

**Unfiltered, recoverable** is the amount of a given constituent in a representative water-suspended sediment sample that has been extracted or digested. Complete recovery is not achieved by the extraction or digestion treatment and thus the determination represents less than 95 percent of the

constituent present in the sample. To achieve comparability of analytical data, equivalent extraction or digestion procedures are required of all laboratories performing such analyses because different procedures are likely to produce different analytical results.

**Vertical datum** (See “Datum”)

**Volatile organic compounds (VOCs)** are organic compounds that can be isolated from the water phase of a sample by purging the water sample with inert gas, such as helium, and, subsequently, analyzed by gas chromatography. Many VOCs are human-made chemicals that are used and produced in the manufacture of paints, adhesives, petroleum products, pharmaceuticals, and refrigerants. They often are components of fuels, solvents, hydraulic fluids, paint thinners, and dry-cleaning agents commonly used in urban settings. VOC contamination of drinking-water supplies is a human-health concern because many are toxic and are known or suspected human carcinogens.

**Water table** is that surface in a ground-water body at which the water pressure is equal to the atmospheric pressure.

**Water-table aquifer** is an unconfined aquifer within which the water table is found.

**Water year** in USGS reports dealing with surface-water supply is the 12-month period October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 2002, is called the “2002 water year.”

**Watershed** (See “Drainage basin”)

**WDR** is used as an abbreviation for “Water-Data Report” in the REVISED RECORDS paragraph to refer to State annual hydrologic-data reports. (WRD was used as an abbreviation for “Water-Resources Data” in reports published prior to 1976.)

**Weighted average** is used in this report to indicate discharge-weighted average. It is computed by multiplying the discharge for a sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all the water passing a given location during the water year after thorough mixing in the reservoir.

**Wet mass** is the mass of living matter plus contained water. (See also “Biomass” and “Dry mass”)

**Wet weight** refers to the weight of animal tissue or other substance including its contained water. (See also “Dry weight”)

**WSP** is used as an acronym for “Water-Supply Paper” in reference to previously published reports.

**Zooplankton** is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column and often are large enough to be seen with the unaided eye. Zooplankton are secondary consumers feeding upon bacteria, phytoplankton, and detritus. Because they are the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic food web. The zooplankton community is dominated by small crustaceans and rotifers. (See also “Plankton”)

AVERY COUNTY

360455081530101. Local number NC-220; DENR Linville Research Station well H78d8; County number, AV-074.

LOCATION.--Lat 36°04'55", long 81°53'02", Hydrologic Unit 03050101, near Linville. Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Phyllite.

WELL CHARACTERISTICS.--Drilled observation well, drilled to 300 ft, diameter 6 in., cased to 10 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 3,919.00 ft above NGVD of 1929 (levels by DENR). Measuring point: Top of instrument shelf, 1.00 ft above land-surface datum.

REMARKS.--Well is part of terrane-effects network.

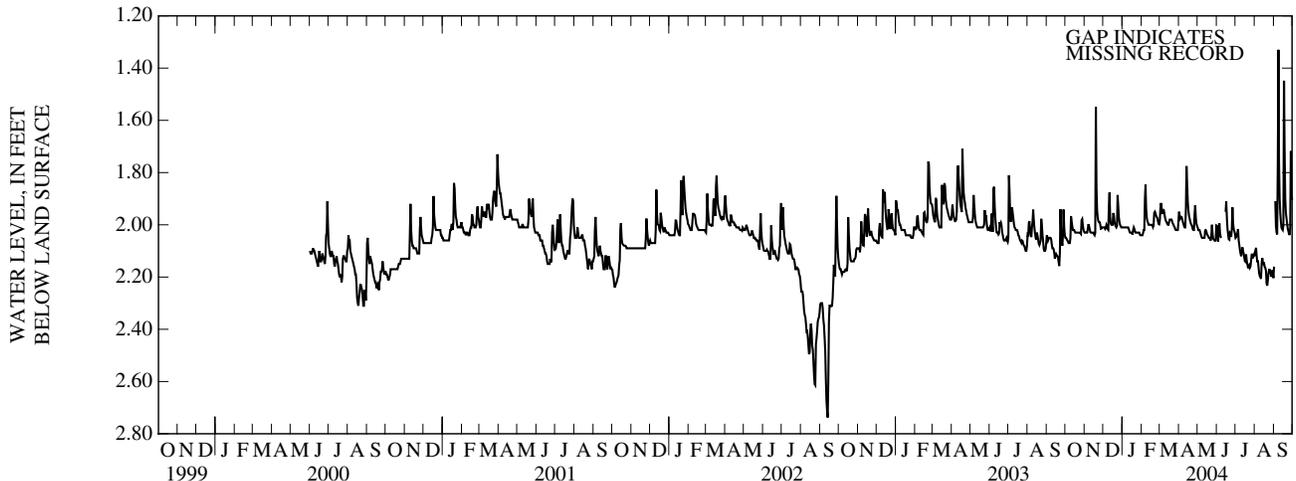
PERIOD OF RECORD.--June 2000 to current year. Records from March 1972 to March 2000 are unpublished and available in the files of the Division of Water Quality, DENR.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 1.16 ft below land-surface datum, Sept. 8, 2004; lowest water level recorded, 2.74 ft below land-surface datum, Sept. 13, 14, 2002.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.05	2.03	2.01	2.01	2.04	1.98	1.95	2.01	2.00	2.05	2.12	2.16
2	2.05	2.03	2.01	2.01	2.04	1.94	1.96	2.02	2.04	2.05	2.10	---
3	2.05	2.03	2.01	2.01	2.03	1.92	1.98	2.02	2.06	2.04	2.09	1.91
4	2.06	2.03	2.02	2.01	2.02	1.94	1.97	2.02	2.02	2.03	2.12	2.00
5	2.06	2.03	2.01	2.01	2.02	1.96	1.97	2.03	1.99	2.02	2.14	2.03
6	2.07	2.02	2.00	2.01	1.90	1.95	1.98	2.04	2.03	2.06	2.14	2.04
7	2.07	2.00	2.01	2.01	1.85	1.94	1.99	2.05	2.05	2.08	2.16	1.77
8	2.07	2.00	2.02	2.01	1.94	1.95	2.00	2.05	2.05	2.10	2.19	1.33
9	2.05	2.02	2.02	2.01	1.97	1.97	2.00	2.05	---	2.11	2.20	1.76
10	1.97	2.03	1.92	2.01	1.99	1.98	2.01	2.05	---	2.12	2.20	1.90
11	1.99	2.03	1.88	2.02	1.99	1.99	2.01	2.05	---	2.11	2.21	1.96
12	2.01	2.03	1.97	2.02	2.00	1.99	1.94	2.05	---	2.09	2.15	1.99
13	2.02	2.03	2.00	2.03	2.00	2.00	1.78	2.02	---	2.10	2.13	2.01
14	2.02	2.03	2.00	2.03	2.00	2.00	1.84	2.02	---	2.11	2.14	2.02
15	2.02	2.03	2.00	2.03	2.00	2.00	1.91	2.03	1.95	2.12	2.15	2.02
16	2.03	2.04	2.00	2.03	2.00	1.99	1.94	2.04	1.91	2.14	2.15	2.00
17	2.03	2.04	1.96	2.04	2.00	1.98	1.97	2.04	1.97	2.14	2.16	1.45
18	2.03	2.03	1.96	2.02	2.00	1.98	1.98	2.04	2.02	2.11	2.16	1.71
19	2.03	1.55	1.99	2.01	2.01	1.98	1.99	2.05	2.04	2.14	2.18	1.90
20	2.03	1.86	2.00	2.02	2.00	1.98	2.00	2.05	2.06	2.15	2.23	1.95
21	2.03	1.95	2.01	2.03	1.95	1.99	2.00	2.05	2.06	2.16	2.23	1.97
22	2.03	1.97	2.01	2.03	1.95	2.00	2.01	2.06	2.03	2.16	2.21	1.99
23	2.03	1.99	2.00	2.03	1.96	2.00	2.02	2.04	2.03	2.16	2.19	2.01
24	2.03	1.99	1.89	2.03	1.97	2.01	2.02	2.00	2.05	2.16	2.17	2.02
25	2.03	1.99	1.93	2.03	1.97	2.01	2.02	2.04	2.01	2.16	2.17	2.03
26	2.04	2.00	1.97	2.03	1.97	2.02	1.96	2.05	1.93	2.14	2.18	2.04
27	1.98	2.02	1.99	2.03	1.99	2.02	1.92	2.06	1.99	2.11	2.19	2.01
28	1.98	2.01	2.00	2.03	2.00	2.02	1.97	2.06	2.02	2.11	2.20	1.72
29	2.00	2.01	2.01	2.04	2.00	2.02	2.00	2.06	2.02	2.13	2.17	1.84
30	2.02	2.01	2.01	2.04	---	2.02	2.00	2.06	2.03	2.12	2.19	1.91
31	2.03	---	2.01	2.04	---	1.99	---	2.00	---	2.11	2.20	---

WTR YR 2004 MEAN 2.02 HIGH 1.33 LOW 2.23



GROUND-WATER LEVELS

BEAUFORT COUNTY

351934076481001. Local number, NC-212; County number, BO-200.

LOCATION.--Lat 35°19'33.7", long 76°48'12.0", Hydrologic Unit 03020104, 1.5 mi north of Aurora, west of State Highway 306 on service road to south gate of PCS Phosphate. Owner: PCS Phosphate, Aurora Division.

AQUIFER.--Castle Hayne aquifer of Oligocene and Eocene age.

WELL CHARACTERISTICS.--Drilled observation well, drilled to 168 ft, diameter 4 in., cased to 160 ft, open hole to 168 ft; measured depth 168 ft, December 1999.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals.

DATUM.--Land-surface datum is 7 ft above NGVD of 1929 (from topographic map). Measuring point: Recorder shelf, 3.00 ft above land-surface datum.

REMARKS.--Well drilled to replace NC-13 (station number 35193207648001). Well is part of local-effects network.

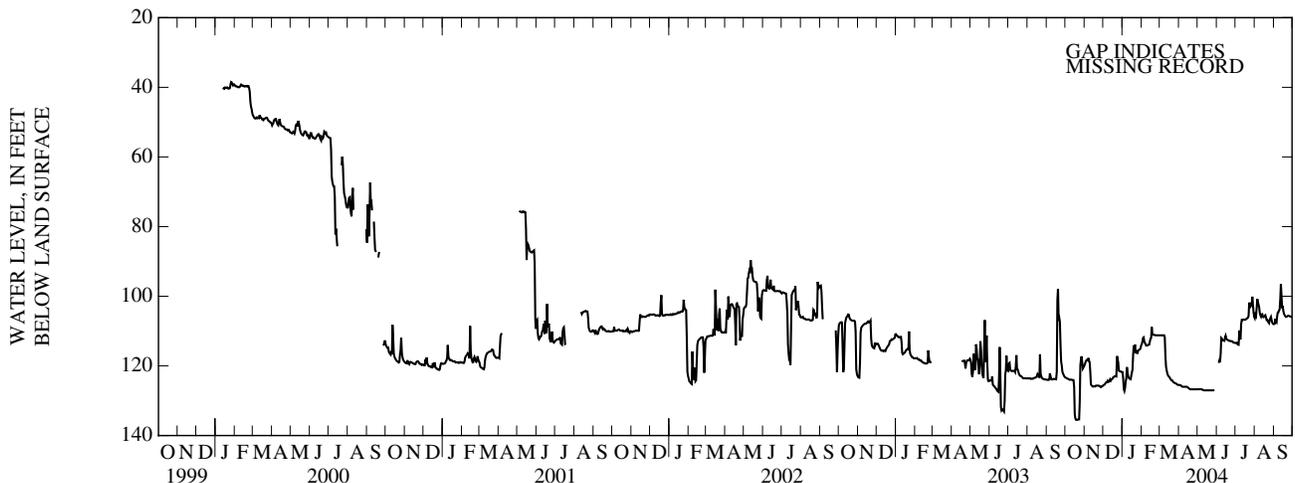
PERIOD OF RECORD.--January 2000 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 38.37 ft below land-surface datum, Jan. 26, 2000; lowest water level recorded, 135.57 ft below land-surface datum, Oct. 20, 2003.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	123.31	119.65	125.56	121.80	113.73	111.22	125.47	126.72	---	113.43	106.29	108.01
2	123.45	119.11	125.45	123.66	113.00	111.22	125.47	126.71	---	113.39	105.33	107.92
3	123.57	118.61	125.37	126.64	111.95	111.22	125.53	126.71	---	113.33	105.67	106.48
4	123.61	118.32	125.14	127.20	111.80	111.22	125.61	126.71	119.14	113.69	103.35	107.41
5	123.71	118.31	124.80	126.39	113.00	111.22	125.81	126.71	118.45	113.92	100.80	107.58
6	123.81	118.41	124.69	124.51	113.45	111.22	125.96	126.71	118.91	113.96	101.72	105.70
7	123.90	117.73	124.65	123.67	113.66	111.22	125.99	126.69	116.51	109.83	102.38	104.67
8	124.01	118.58	124.27	120.35	114.17	111.22	125.99	126.75	111.99	111.91	103.10	104.62
9	123.95	118.92	124.58	122.03	114.17	111.81	125.99	126.91	112.20	112.40	104.73	104.06
10	123.93	121.69	124.54	122.92	114.07	117.20	125.99	126.95	112.63	108.00	105.46	103.82
11	123.99	125.27	124.27	123.45	114.05	120.20	125.99	126.99	112.73	106.81	105.84	100.84
12	124.03	125.61	123.86	123.60	113.92	121.24	125.99	127.03	112.76	106.88	105.21	96.47
13	124.04	125.78	124.22	123.78	113.86	122.09	125.99	127.03	112.82	106.75	105.13	99.74
14	124.07	125.94	123.89	123.85	112.95	122.65	126.04	127.03	111.91	106.68	105.93	103.44
15	126.06	125.91	123.81	122.83	112.19	122.95	126.16	127.02	111.37	106.75	106.02	102.84
16	133.90	125.90	123.60	121.95	112.01	123.11	126.32	127.02	112.17	106.77	105.90	104.23
17	135.13	125.85	123.25	121.05	108.85	123.39	126.47	127.02	112.41	106.71	105.61	105.01
18	135.49	125.88	123.17	116.96	110.88	123.71	126.63	127.02	112.51	106.56	105.45	105.39
19	135.49	125.68	123.00	114.18	111.04	123.97	126.72	127.02	112.60	106.44	106.07	105.71
20	135.51	125.65	122.96	115.61	111.10	124.15	126.72	127.02	112.76	106.28	106.78	105.92
21	135.42	125.66	123.02	113.84	111.11	124.17	126.72	127.02	112.83	106.14	106.76	105.91
22	135.32	125.68	123.05	116.42	111.13	124.44	126.72	127.02	112.80	105.65	107.18	105.80
23	135.34	125.66	117.19	115.48	111.21	124.69	126.72	127.02	112.85	101.80	107.51	105.66
24	130.50	125.68	117.97	116.24	111.22	124.81	126.72	127.02	112.93	102.65	107.74	105.58
25	119.80	125.88	119.01	116.33	111.22	124.89	126.72	127.02	112.90	102.92	106.79	105.61
26	118.15	125.96	121.35	115.74	111.22	124.98	126.72	127.02	112.95	102.30	106.31	105.73
27	117.24	126.09	121.55	115.42	111.22	125.03	126.72	127.02	113.22	102.48	105.92	105.81
28	118.96	125.93	121.59	115.33	111.22	125.19	126.72	127.01	113.31	100.12	106.79	105.83
29	120.76	125.92	121.60	115.23	111.22	125.34	126.72	---	113.35	102.42	107.51	105.95
30	120.41	125.74	121.67	114.92	---	125.45	126.72	---	113.38	104.62	107.86	106.02
31	120.09	---	121.82	114.11	---	125.47	---	---	---	105.88	108.00	---

WTR YR 2004 MEAN 117.43 HIGH 96.47 LOW 135.51

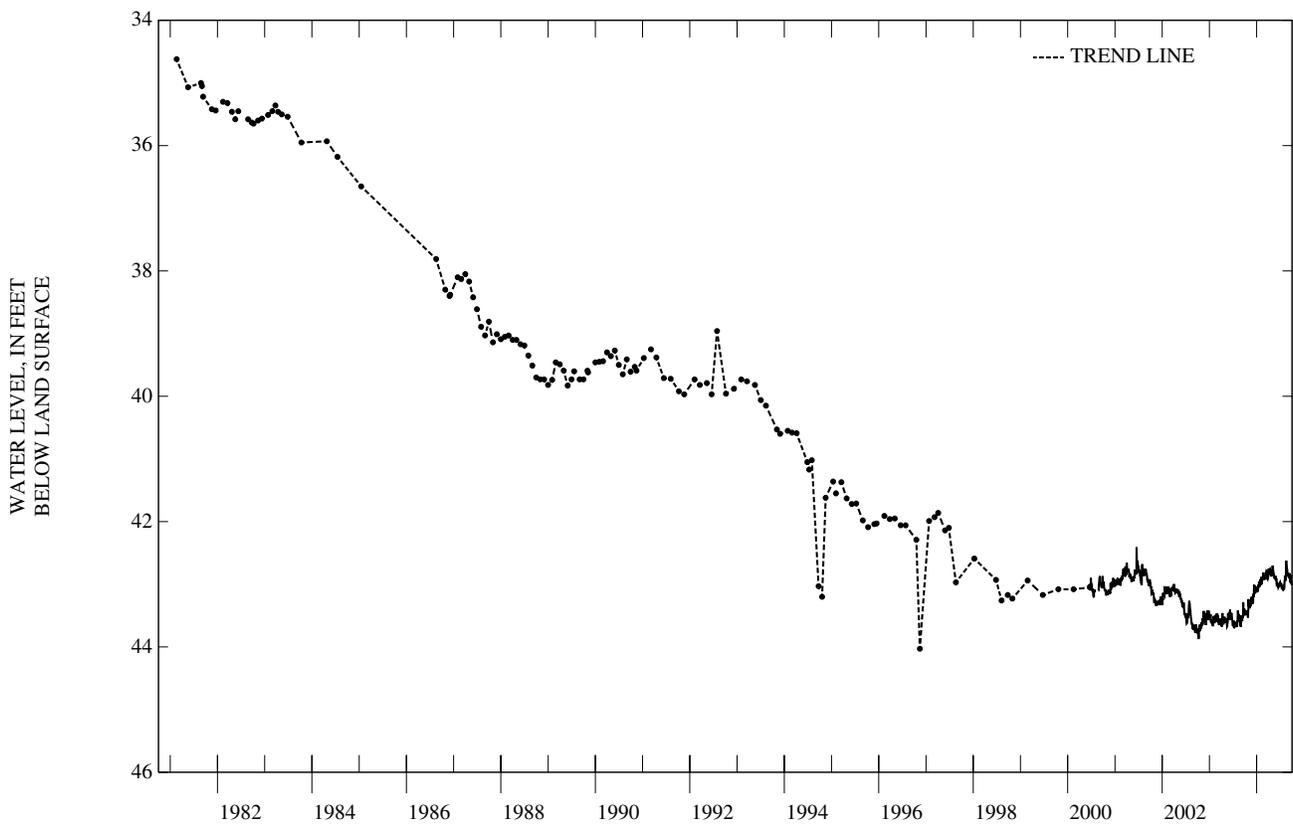
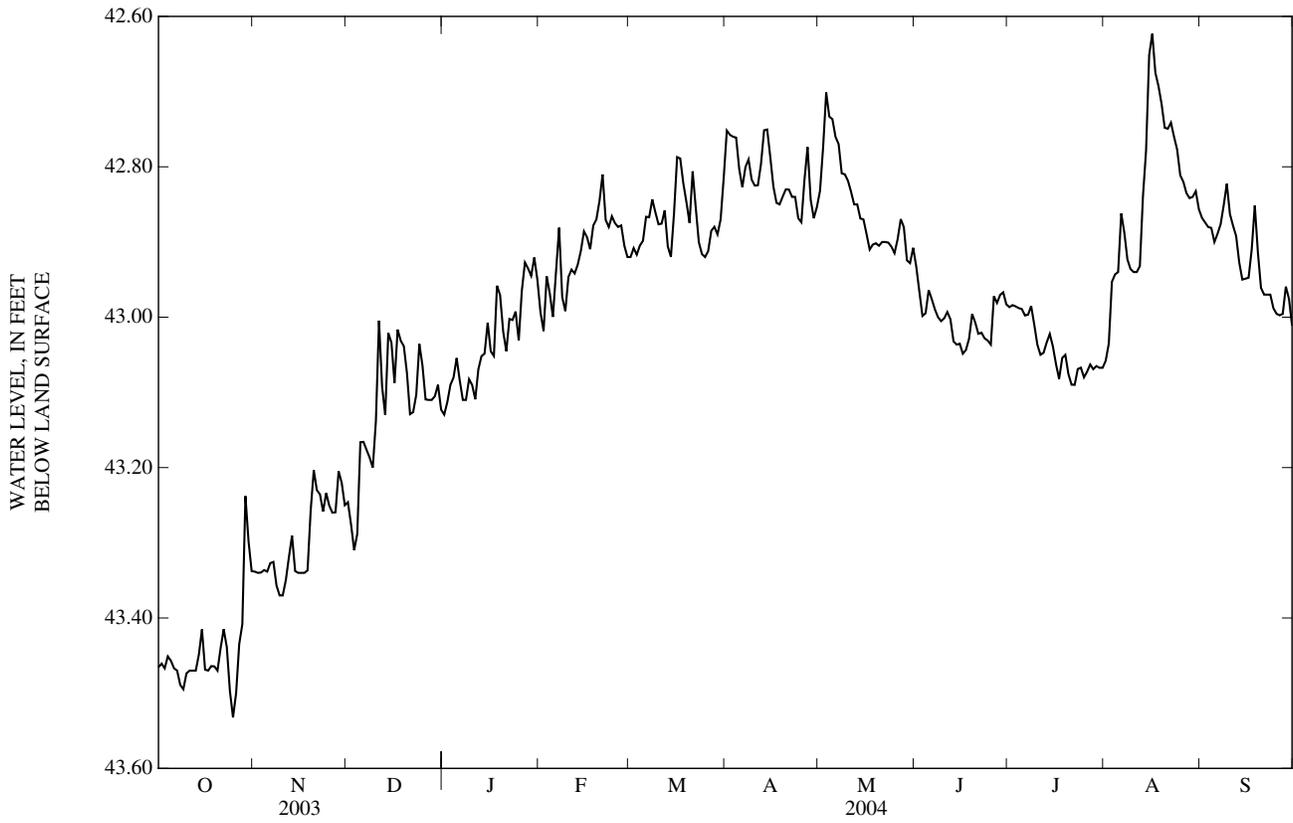




GROUND-WATER LEVELS

BERTIE COUNTY—Continued

361002076562106. Local number, NC-153; DENR Cremo Research Station well G19b6; County number, BE-087.



## BERTIE COUNTY—Continued

36142007711407. Local number, NC-154; DENR Roxobel Research Station well F22b7; County number, BE-080.

LOCATION.--Lat 36°14'21", long 77°11'13", Hydrologic Unit 03010203, 3.8 mi northeast of Roxobel on Secondary Road 1249. Owner: DENR (North Carolina Department of Environment and Natural Resources).

## WATER-LEVEL RECORDS

AQUIFER.--Surficial aquifer of post-Miocene age.

WELL CHARACTERISTICS.--Drilled observation well, drilled to 12 ft, diameter 4 in., cased to 7 ft, screened interval from 7 to 12 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals.

DATUM.--Land-surface datum is 74 ft above NGVD of 1929 (from topographic map). Measuring point: Top of instrument shelf, 3.05 ft above land-surface datum.

REMARKS.--Well is part of climatic-effects network.

PERIOD OF RECORD.--November 1986 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 0.27 ft below land-surface datum, Jan. 30, 31, 2000; lowest water level recorded, 9.31 ft below land-surface datum, Sept. 5, 1987.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

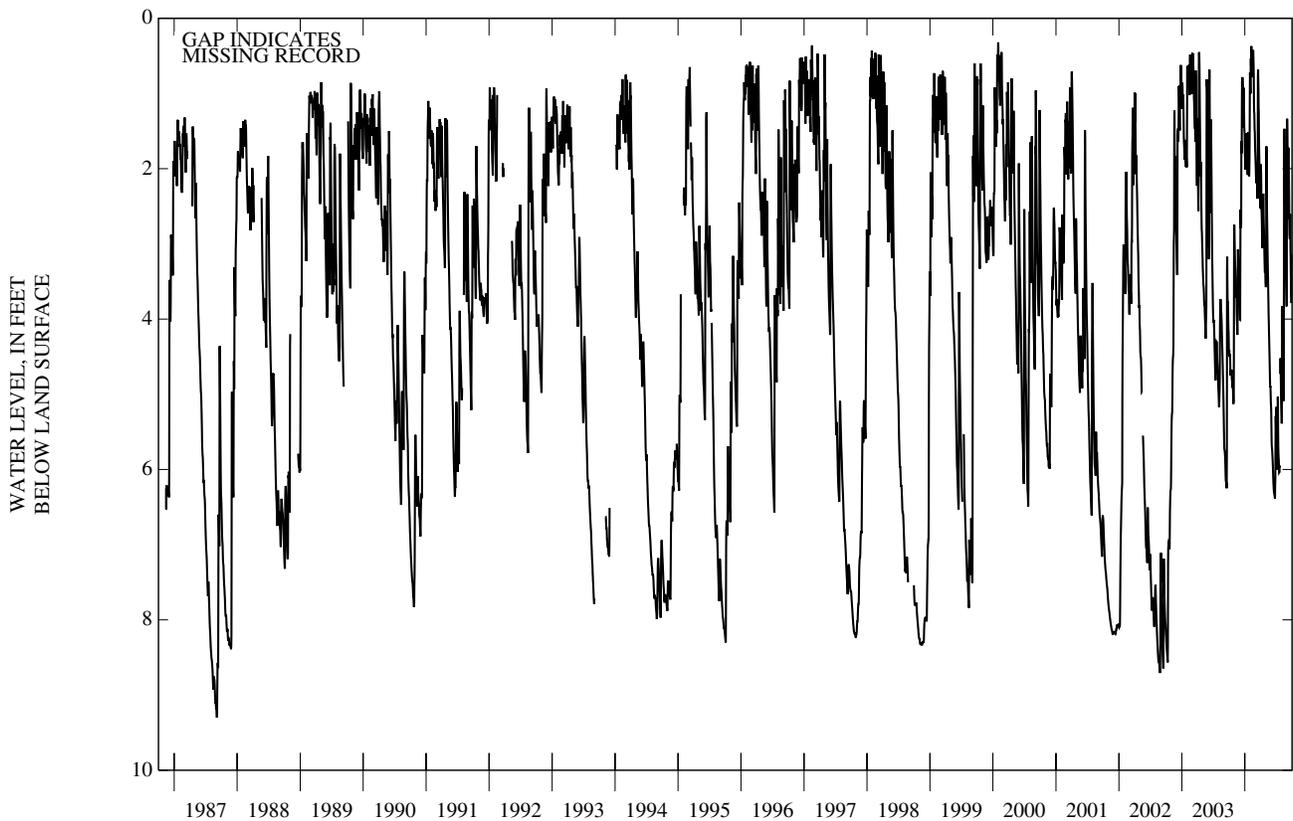
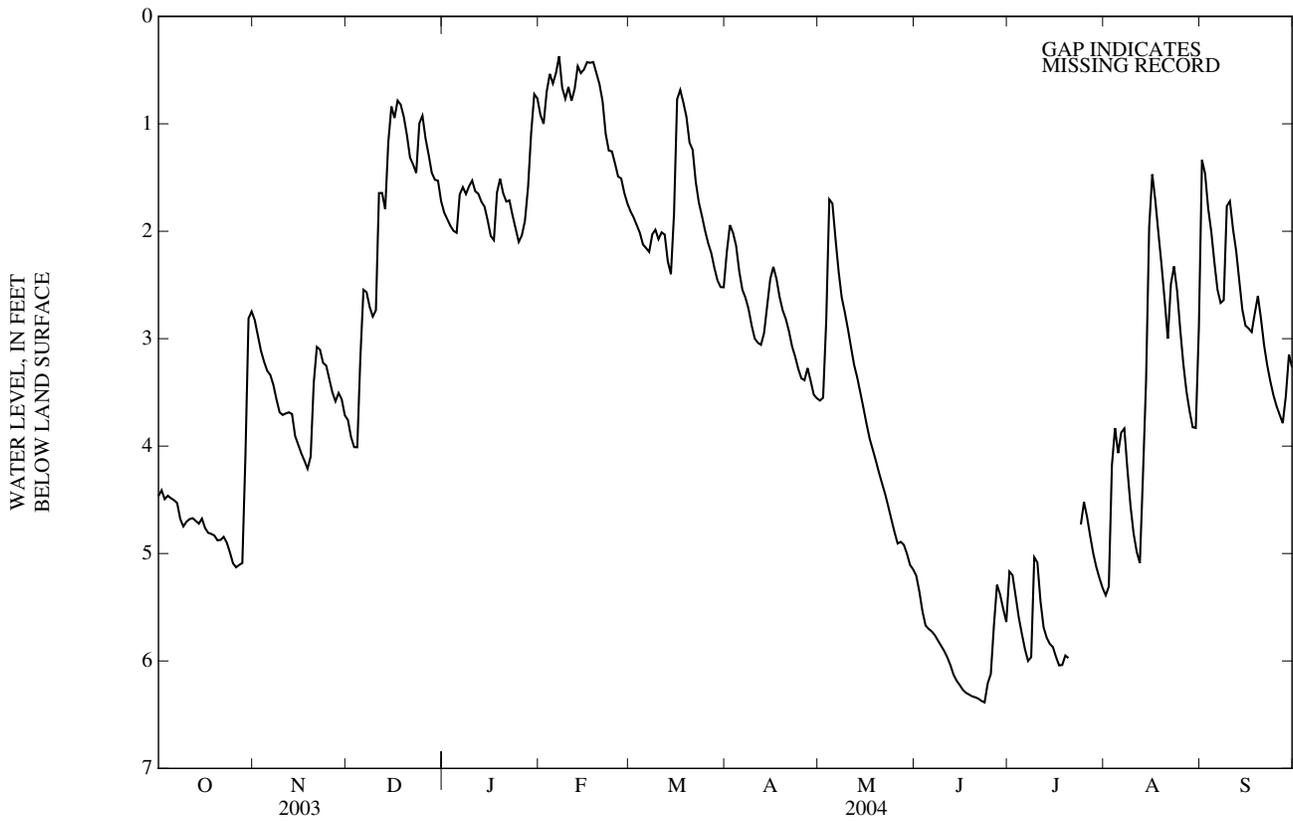
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.46	2.83	3.76	1.83	0.92	1.81	2.19	3.58	5.21	5.17	5.39	1.34
2	4.41	2.97	3.92	1.89	1.00	1.87	1.94	3.55	5.36	5.20	5.31	1.46
3	4.49	3.11	4.01	1.95	0.70	1.94	2.01	2.84	5.54	5.40	4.18	1.79
4	4.46	3.21	4.01	2.00	0.54	2.02	2.14	1.70	5.67	5.59	3.83	2.01
5	4.49	3.30	3.18	2.01	0.62	2.12	2.37	1.74	5.70	5.75	4.07	2.29
6	4.50	3.34	2.54	1.66	0.53	2.16	2.54	2.07	5.73	5.89	3.87	2.54
7	4.53	3.43	2.57	1.59	0.37	2.19	2.62	2.37	5.76	6.00	3.84	2.67
8	4.68	3.57	2.70	1.65	0.67	2.03	2.72	2.62	5.81	5.96	4.22	2.64
9	4.75	3.69	2.79	1.58	0.77	1.99	2.88	2.76	5.86	5.03	4.56	1.77
10	4.70	3.71	2.74	1.53	0.66	2.07	3.00	2.91	5.91	5.08	4.82	1.72
11	4.68	3.70	1.64	1.63	0.79	2.01	3.04	3.08	5.97	5.44	4.99	1.98
12	4.67	3.69	1.64	1.65	0.68	2.03	3.06	3.25	6.04	5.69	5.09	2.18
13	4.70	3.70	1.79	1.73	0.46	2.28	2.95	3.36	6.13	5.78	4.27	2.46
14	4.72	3.91	1.17	1.77	0.53	2.40	2.69	3.50	6.18	5.84	3.39	2.73
15	4.67	3.99	0.84	1.90	0.49	1.84	2.44	3.65	6.22	5.87	1.96	2.88
16	4.76	4.07	0.95	2.04	0.43	0.77	2.33	3.79	6.27	5.96	1.47	2.90
17	4.81	4.14	0.78	2.08	0.43	0.68	2.44	3.93	6.30	6.04	1.72	2.94
18	4.82	4.21	0.82	1.64	0.43	0.80	2.61	4.03	6.31	6.04	2.03	2.76
19	4.83	4.10	0.94	1.51	0.53	0.93	2.74	4.14	6.33	5.95	2.32	2.60
20	4.88	3.41	1.11	1.65	0.63	1.18	2.82	4.25	6.34	5.97	2.65	2.81
21	4.87	3.08	1.31	1.72	0.79	1.24	2.93	4.35	6.35	---	3.00	3.06
22	4.84	3.10	1.38	1.71	1.09	1.54	3.07	4.45	6.37	---	2.49	3.25
23	4.90	3.22	1.46	1.85	1.25	1.73	3.17	4.56	6.39	---	2.33	3.40
24	4.99	3.25	0.99	1.98	1.26	1.86	3.28	4.68	6.21	4.73	2.56	3.53
25	5.09	3.38	0.92	2.10	1.37	2.00	3.37	4.80	6.12	4.52	2.92	3.63
26	5.13	3.50	1.14	2.04	1.49	2.11	3.39	4.91	5.67	4.66	3.24	3.71
27	5.11	3.58	1.29	1.90	1.51	2.20	3.27	4.89	5.29	4.84	3.49	3.79
28	5.09	3.51	1.46	1.59	1.64	2.34	3.39	4.92	5.38	5.00	3.67	3.53
29	4.09	3.56	1.52	1.08	1.74	2.46	3.52	5.00	5.52	5.13	3.82	3.15
30	2.81	3.71	1.53	0.72	---	2.52	3.55	5.11	5.64	5.23	3.83	3.27
31	2.75	---	1.72	0.76	---	2.52	---	5.15	---	5.32	2.89	---

WTR YR 2004 MEAN 3.20 HIGH 0.37 LOW 6.39

GROUND-WATER LEVELS

BERTIE COUNTY—Continued

361420077111407. Local number, NC-154; DENR Roxobel Research Station well F22b7; County number, BE-080.



361420077111407 Local number, NC-154; DENR Roxobel Research Station well F22b7; County number, BE-080--Continued

PRECIPITATION RECORDS

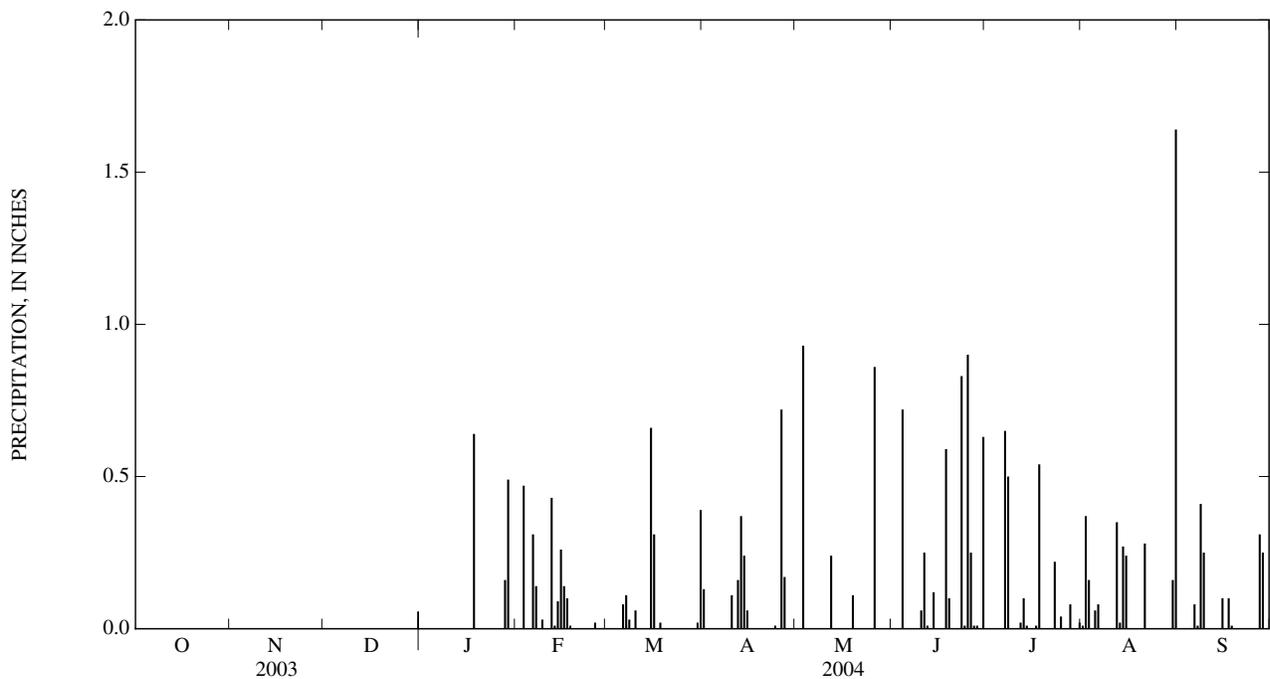
PERIOD OF RECORD.--January 2004 to September 2004.

GAGE.--Tipping-bucket raingage and electronic datalogger. Satellite telemetry at station.

REMARKS.--Gage is operated as part of a U.S. Geological Survey Ground-water Resources Program recharge study. Precipitation data collected during freezing periods may not be accurately reflected in daily record; consequently, winter record is poor.

PRECIPITATION, TOTAL, INCHES  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	0.00	0.00	0.13	---	0.00	0.00	0.01	0.00
2	---	---	---	---	0.00	0.00	0.00	---	0.00	0.00	0.37	0.00
3	---	---	---	---	0.47	0.00	0.00	0.93	0.00	0.00	0.16	0.00
4	---	---	---	---	0.00	0.00	0.00	0.00	0.72	0.00	0.00	0.00
5	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00
6	---	---	---	---	0.31	0.08	0.00	0.00	0.00	0.00	0.08	0.08
7	---	---	---	---	0.14	0.11	0.00	0.00	0.00	0.65	0.00	0.01
8	---	---	---	0.00	0.00	0.03	0.00	0.00	0.00	0.50	0.00	0.41
9	---	---	---	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.25
10	---	---	---	0.00	0.00	0.06	0.11	---	0.06	0.00	0.00	0.00
11	---	---	---	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00
12	---	---	---	0.00	0.43	0.00	0.16	0.24	0.01	0.02	0.35	0.00
13	---	---	---	0.00	0.01	0.00	0.37	0.00	0.00	0.10	0.02	0.00
14	---	---	---	0.00	0.09	0.00	0.24	0.00	0.12	0.01	0.27	0.00
15	---	---	---	0.00	0.26	0.66	0.06	0.00	0.00	0.00	0.24	0.10
16	---	---	---	0.00	0.14	0.31	0.00	0.00	---	0.00	0.00	0.00
17	---	---	---	0.00	0.10	0.00	0.00	0.00	0.00	0.01	0.00	0.10
18	---	---	---	0.64	0.01	0.02	0.00	0.00	0.59	0.54	0.00	0.01
19	---	---	---	0.00	0.00	0.00	0.00	0.11	0.10	0.00	0.00	0.00
20	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00
22	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00	---	0.00	0.00
23	---	---	---	0.00	0.00	0.00	0.00	0.00	0.83	0.22	0.00	0.00
24	---	---	---	0.00	0.00	0.00	0.01	0.00	0.01	---	0.00	0.00
25	---	---	---	0.00	0.00	0.00	0.00	0.00	0.90	0.04	0.00	0.00
26	---	---	---	0.00	0.02	0.00	0.72	0.86	0.25	---	0.00	0.00
27	---	---	---	0.00	0.00	0.00	0.17	0.00	0.01	0.00	0.00	0.31
28	---	---	---	0.16	0.00	0.00	0.00	0.00	0.01	0.08	0.00	0.25
29	---	---	---	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	---	---	---	0.00	---	0.02	0.00	0.00	0.63	0.00	0.16	0.00
31	---	---	---	0.00	---	0.39	---	0.00	---	0.02	1.64	---
TOTAL	---	---	---	---	2.01	1.68	1.97	---	---	---	3.64	1.52



## GROUND-WATER LEVELS

## BLADEN COUNTY

343027078451903. Local number, NC-178; DENR Bladenboro Research Station well Z41u3; County number, BL-101.

LOCATION.--Lat 34°30'28", long 78°45'16", Hydrologic Unit 03040206, 3 mi southeast of Bladenboro, south of State Highway 211 on Secondary Road 1172.  
Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Peedee aquifer of Late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation well, depth 110 ft, diameter 6 in. to 82 ft, diameter 4 in. from 58 to 110 ft, screened interval from 100 to 110 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals.

DATUM.--Land-surface datum is 116.45 ft above NGVD of 1929 (levels by DENR). Measuring point: Top of collar on 6-inch casing, 2.69 ft above land-surface datum; revised from 2.78, May 19, 1999.

REMARKS.--Well is part of the areal-effects network. Records prior to January 1987 are from Bladenboro Research Station well Z41u4 which was adjacent to and of similar construction to well Z41u3.

PERIOD OF RECORD.--Miscellaneous water-level measurements November 1975 to current year. Continuous record began January 1987. Records for well Z41u4 from March 1976 to December 1986 are unpublished and available in the files of the Division of Water Quality, DENR.

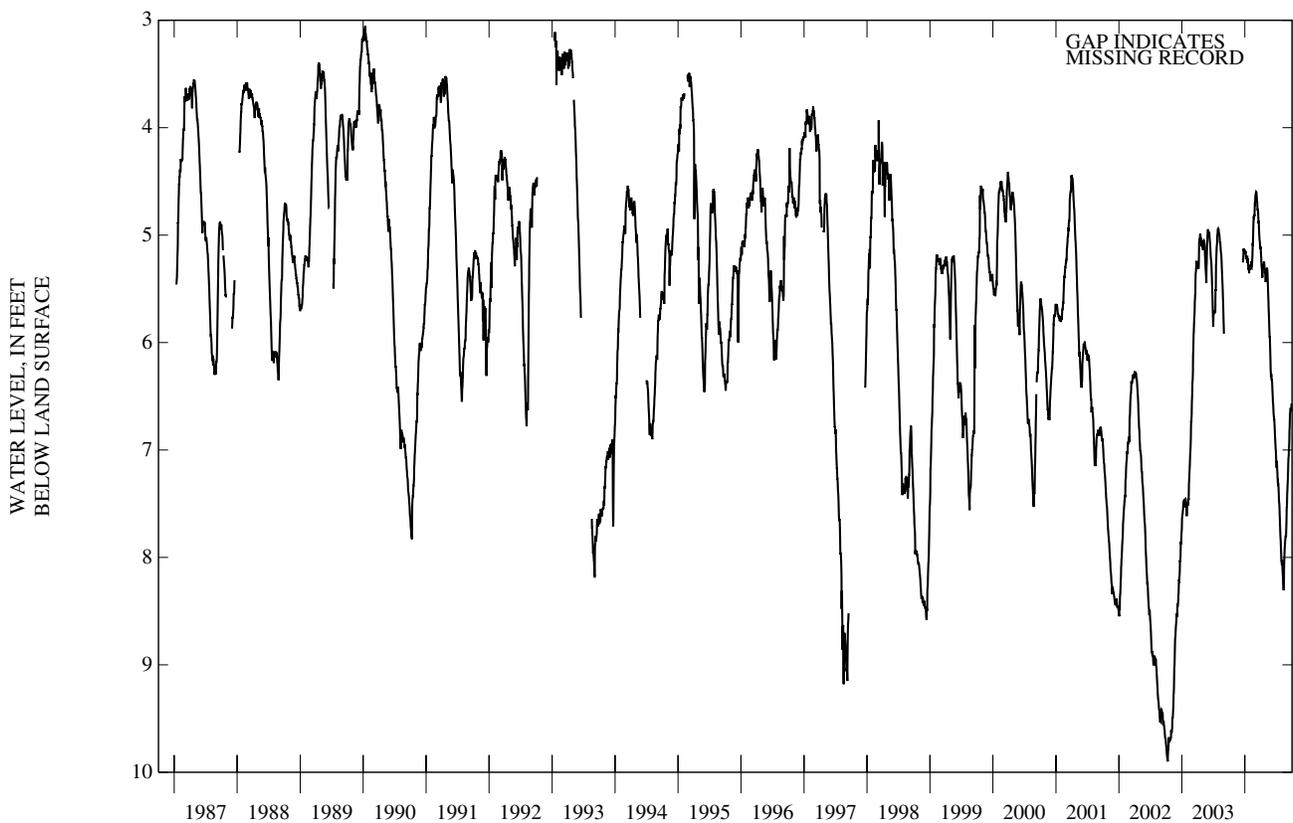
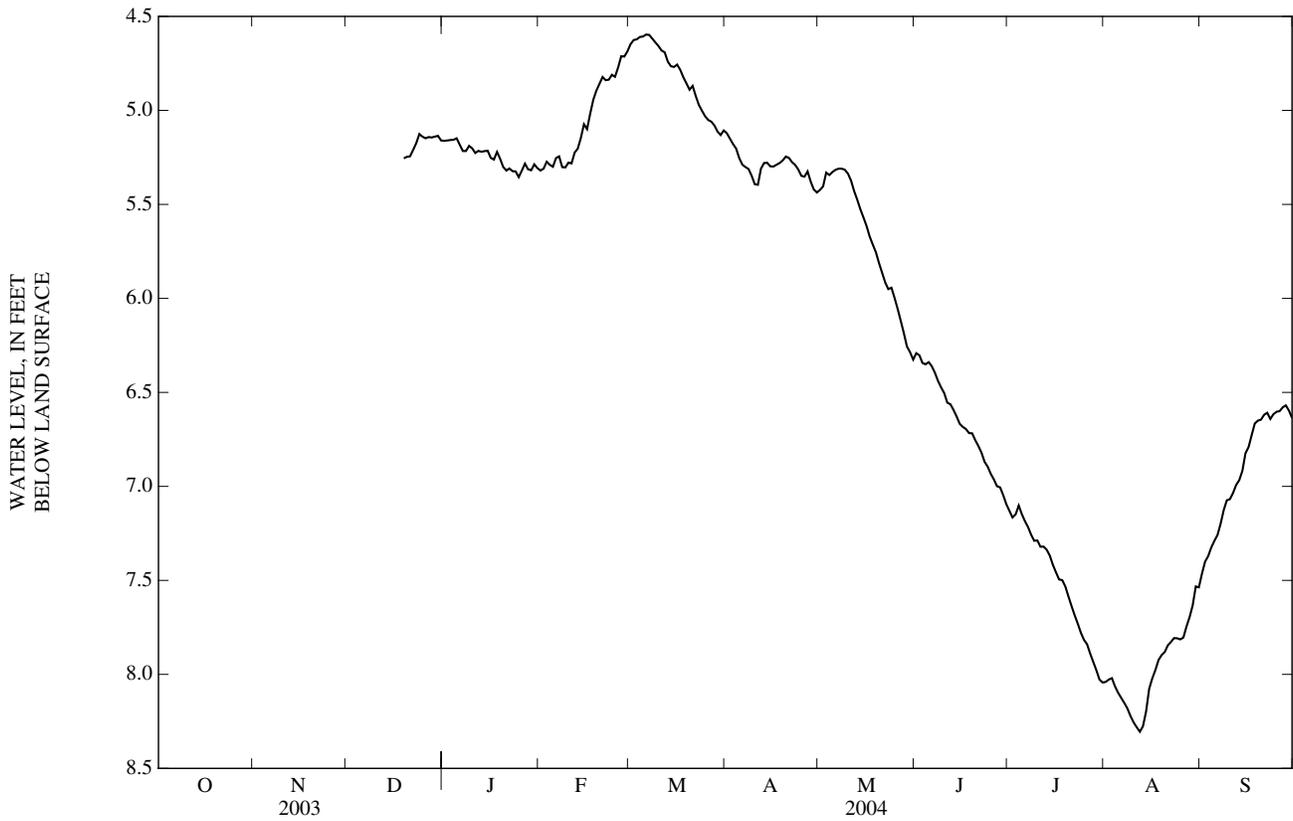
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.73 ft below land-surface datum, Apr. 19, 1978; lowest water level recorded, 9.90 ft below land-surface datum, Oct. 9-11, 2002.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	
1	---	---	---	5.16	5.32	4.65	5.12	5.42	6.29	7.13	8.04	7.46	
2	---	---	---	5.16	5.31	4.63	5.15	5.40	6.30	7.17	8.03	7.40	
3	---	---	---	5.16	5.27	4.62	5.18	5.33	6.34	7.15	8.02	7.37	
4	---	---	---	5.16	5.29	4.61	5.20	5.34	6.35	7.10	8.06	7.32	
5	---	---	---	5.15	5.30	4.61	5.25	5.33	6.34	7.15	8.10	7.29	
6	---	---	---	5.18	5.25	4.60	5.29	5.32	6.36	7.18	8.13	7.26	
7	---	---	---	5.22	5.24	4.60	5.30	5.31	6.40	7.22	8.15	7.20	
8	---	---	---	5.22	5.30	4.62	5.31	5.31	6.44	7.26	8.18	7.13	
9	---	---	---	5.19	5.30	4.64	5.35	5.32	6.47	7.29	8.22	7.07	
10	---	---	---	5.20	5.28	4.66	5.39	5.34	6.50	7.29	8.26	7.07	
11	---	---	---	5.23	5.28	4.68	5.40	5.37	6.55	7.32	8.28	7.04	
12	---	---	---	5.22	5.22	4.69	5.31	5.43	6.56	7.32	8.31	6.99	
13	---	---	---	5.22	5.20	4.74	5.28	5.48	6.59	7.34	8.28	6.97	
14	---	---	---	5.22	5.15	4.76	5.28	5.53	6.63	7.37	8.20	6.92	
15	---	---	---	5.21	5.07	4.77	5.30	5.57	6.67	7.42	8.08	6.82	
16	---	---	---	5.25	5.10	4.76	5.30	5.62	6.68	7.46	8.02	6.79	
17	---	---	---	5.26	5.02	4.78	5.29	5.67	6.70	7.50	7.98	6.73	
18	---	---	---	5.22	4.94	4.82	5.28	5.71	6.72	7.50	7.92	6.67	
19	---	---	5.25	5.26	4.89	4.86	5.27	5.75	6.72	7.53	7.90	6.65	
20	---	---	5.25	5.30	4.86	4.89	5.25	5.81	6.75	7.59	7.88	6.64	
21	---	---	5.24	5.32	4.82	4.87	5.25	5.86	6.79	7.64	7.85	6.62	
22	---	---	5.21	5.31	4.84	4.92	5.28	5.92	6.82	7.69	7.83	6.61	
23	---	---	5.17	5.32	4.84	4.97	5.29	5.95	6.87	7.73	7.81	6.64	
24	---	---	5.13	5.32	4.81	5.00	5.31	5.94	6.90	7.78	7.81	6.62	
25	---	---	5.14	5.36	4.82	5.03	5.35	6.00	6.93	7.82	7.81	6.60	
26	---	---	5.15	5.32	4.77	5.05	5.35	6.06	6.96	7.84	7.80	6.60	
27	---	---	5.14	5.28	4.71	5.06	5.32	6.12	7.00	7.89	7.75	6.58	
28	---	---	5.14	5.31	4.71	5.08	5.38	6.18	7.01	7.93	7.70	6.57	
29	---	---	5.14	5.32	4.69	5.11	5.42	6.26	7.05	7.98	7.63	6.60	
30	---	---	5.14	5.29	---	5.13	5.44	6.29	7.09	8.03	7.53	6.64	
31	---	---	5.16	5.31	---	5.11	---	6.33	---	8.04	7.54	---	
WTR YR	2004	MEAN	6.09	HIGH	4.60	LOW	8.31						

BLADEN COUNTY—Continued

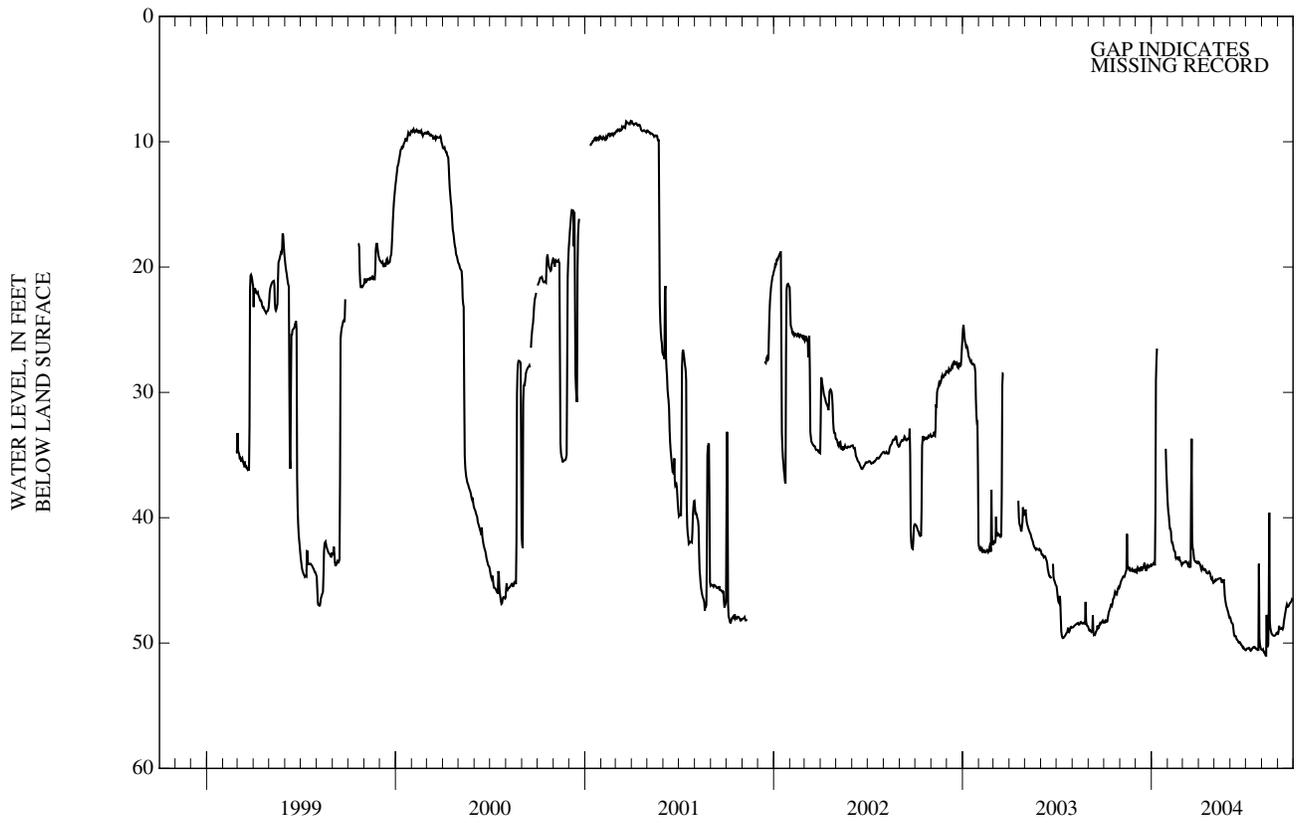
343027078451903. Local number, NC-178; DENR Bladenboro Research Station well Z41u3; County number, BL-101.





BRUNSWICK COUNTY—Continued

335849078054301. County number, BR-100; Well 15A.



GROUND-WATER LEVELS  
BRUNSWICK COUNTY—Continued

340743078202002. County number, BR-106; DENR Bear Pen Research Station well EE36k5.

LOCATION.--Lat 34°07'43", long 78°20'20", Hydrologic Unit 03040206, 9 mi north of Supply on Federal Road, near North Carolina Forest Service airstrip.  
Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Black Creek aquifer of Late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation well, depth 654 ft, diameter 2.5 in.; cased to 644 ft, screened interval from 644 to 654 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 15-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 61.50 ft above NGVD of 1929. Measuring point: Top of casing, 3.56 ft above land-surface datum.

REMARKS.--Well is part of Brunswick County ground-water study.

PERIOD OF RECORD.--January 1974 to current year. Continuous record began October 1999.

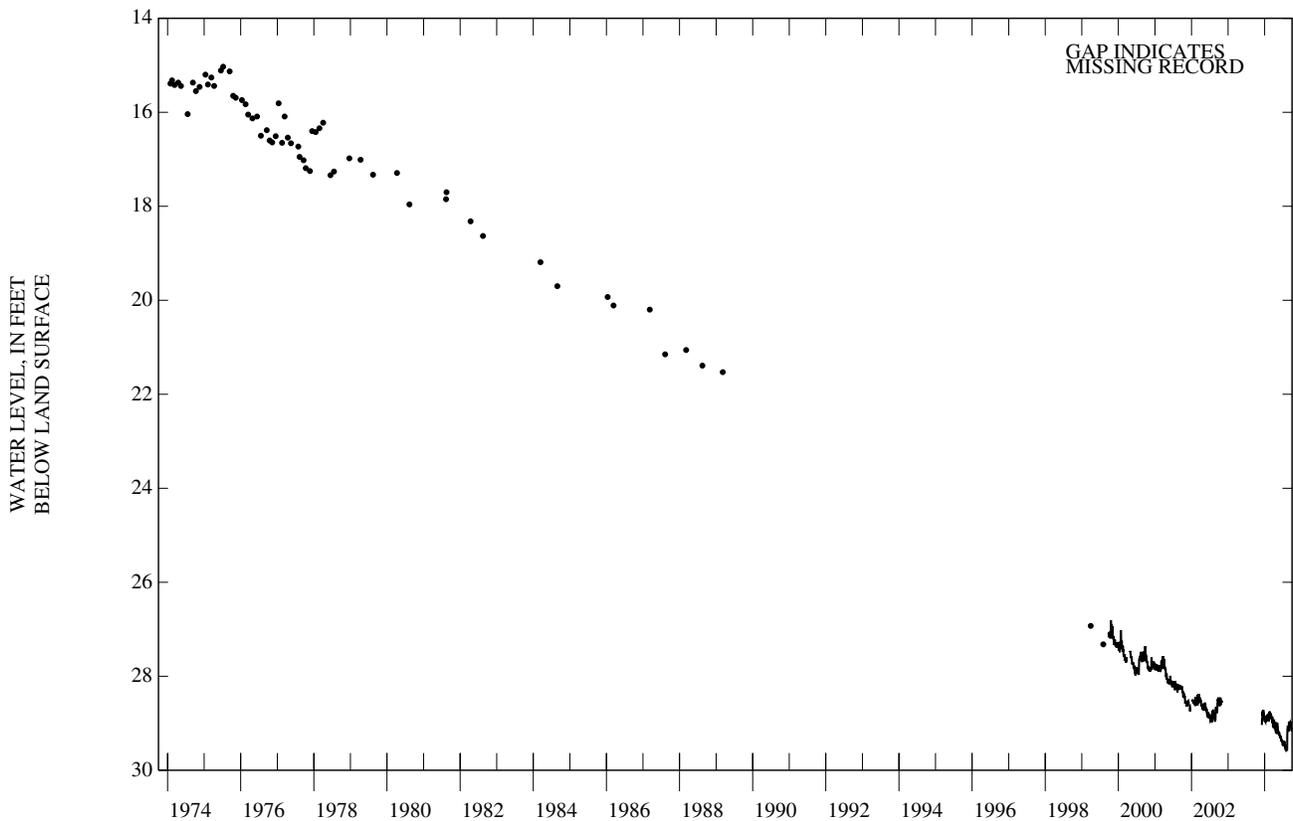
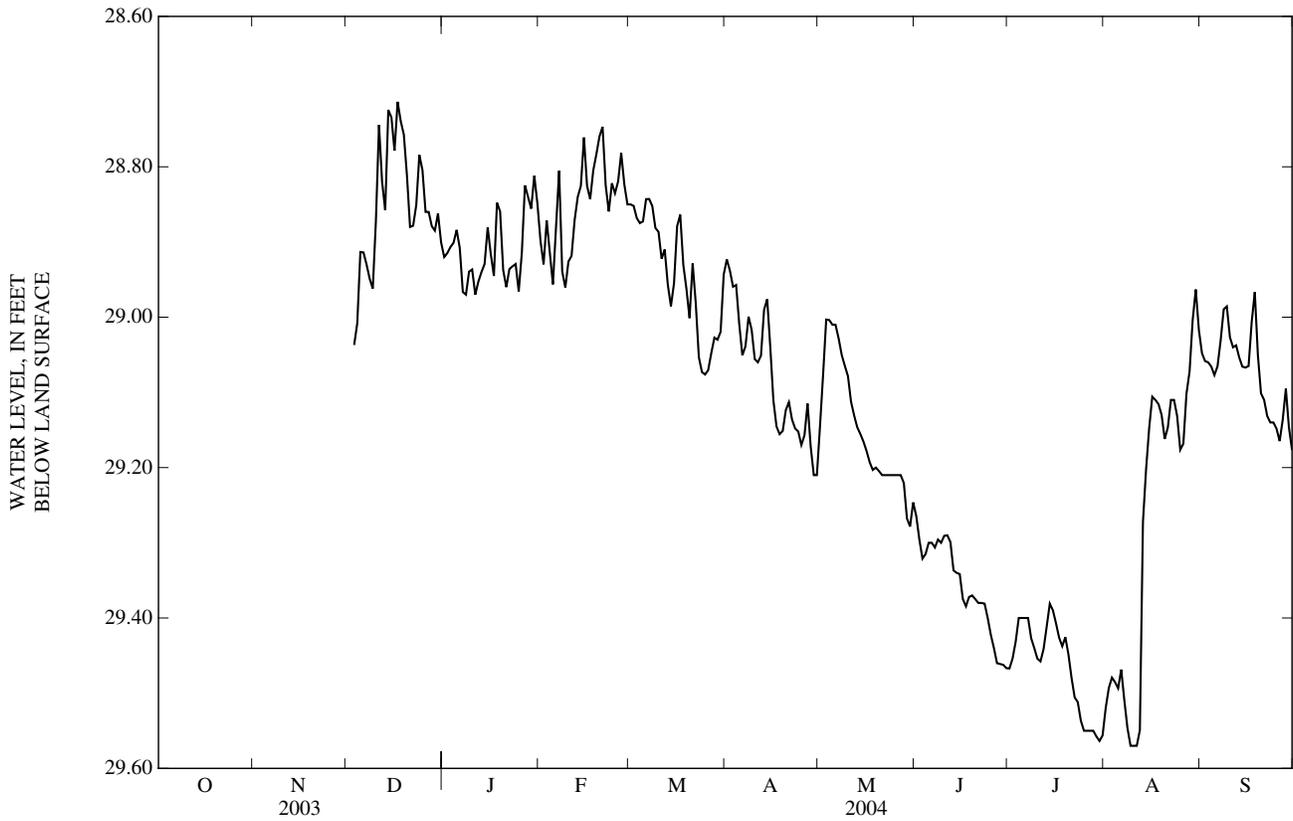
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.03 ft below land-surface datum, July 9, 1975; lowest water level recorded, 29.57 ft below land-surface datum, July 29-30, Aug. 8-12, 2004.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	
1	---	---	---	28.92	28.90	28.85	28.92	29.14	29.26	29.47	29.52	29.05	
2	---	---	---	28.91	28.93	28.85	28.94	29.08	29.30	29.45	29.49	29.06	
3	---	---	29.04	28.91	28.87	28.87	28.96	29.00	29.32	29.43	29.48	29.06	
4	---	---	29.01	28.90	28.91	28.87	28.96	29.00	29.31	29.40	29.49	29.07	
5	---	---	28.91	28.88	28.96	28.87	29.01	29.01	29.30	29.40	29.49	29.08	
6	---	---	28.91	28.91	28.88	28.84	29.05	29.01	29.30	29.40	29.47	29.07	
7	---	---	28.93	28.97	28.81	28.84	29.04	29.03	29.31	29.40	29.51	29.03	
8	---	---	28.95	28.97	28.94	28.85	29.00	29.05	29.30	29.43	29.55	28.99	
9	---	---	28.96	28.94	28.96	28.88	29.02	29.06	29.30	29.44	29.57	28.99	
10	---	---	28.87	28.94	28.93	28.89	29.06	29.08	29.29	29.45	29.57	29.03	
11	---	---	28.74	28.97	28.92	28.92	29.06	29.11	29.29	29.46	29.57	29.04	
12	---	---	28.82	28.95	28.87	28.91	29.05	29.13	29.30	29.44	29.55	29.04	
13	---	---	28.86	28.94	28.84	28.96	28.99	29.15	29.34	29.41	29.27	29.05	
14	---	---	28.72	28.93	28.83	28.99	28.98	29.16	29.34	29.38	29.20	29.07	
15	---	---	28.73	28.88	28.76	28.95	29.04	29.17	29.34	29.39	29.15	29.07	
16	---	---	28.78	28.92	28.83	28.88	29.11	29.18	29.37	29.41	29.11	29.06	
17	---	---	28.71	28.95	28.84	28.86	29.15	29.19	29.38	29.43	29.11	29.01	
18	---	---	28.74	28.85	28.80	28.93	29.16	29.20	29.37	29.44	29.12	28.97	
19	---	---	28.76	28.86	28.78	28.96	29.15	29.20	29.37	29.43	29.13	29.05	
20	---	---	28.81	28.94	28.76	29.00	29.12	29.20	29.37	29.45	29.16	29.10	
21	---	---	28.88	28.96	28.75	28.93	29.11	29.21	29.38	29.48	29.15	29.11	
22	---	---	28.88	28.94	28.83	28.98	29.14	29.21	29.38	29.51	29.11	29.13	
23	---	---	28.85	28.93	28.86	29.05	29.15	29.21	29.38	29.51	29.11	29.14	
24	---	---	28.78	28.93	28.82	29.07	29.15	29.21	29.40	29.54	29.13	29.14	
25	---	---	28.80	28.97	28.84	29.08	29.17	29.21	29.42	29.55	29.18	29.15	
26	---	---	28.86	28.91	28.82	29.07	29.16	29.21	29.44	29.55	29.17	29.16	
27	---	---	28.86	28.82	28.78	29.05	29.11	29.21	29.46	29.55	29.10	29.14	
28	---	---	28.88	28.84	28.82	29.03	29.17	29.22	29.46	29.55	29.07	29.10	
29	---	---	28.88	28.86	28.85	29.03	29.21	29.27	29.46	29.56	29.00	29.15	
30	---	---	28.86	28.81	---	29.02	29.21	29.28	29.47	29.56	28.96	29.18	
31	---	---	28.90	28.85	---	28.94	---	29.25	---	29.56	29.02	---	
WTR YR	2004	MEAN	29.10	HIGH	28.71	LOW	29.57						

BRUNSWICK COUNTY—Continued

340743078202002. County number, BR-106; DENR Bear Pen Research Station well EE36k5.



GROUND-WATER LEVELS  
BRUNSWICK COUNTY—Continued

340743078202006. County number, BR-107; DENR Bear Pen Research Station well EE36k6.

LOCATION.--Lat 34°07'43", long 78°20'20", Hydrologic Unit 03040206, 9 mi north of Supply on Federal Road, near North Carolina Forest Service airstrip.  
Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Peedee aquifer of Late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation well, depth 110 ft, diameter 4 in.; cased to 48 ft, open interval from 48 to 110 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 15-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 61.00 ft above NGVD of 1929. Measuring point: Top of instrument shelf, 0.69 ft above land-surface datum.

REMARKS.--Well is part of Brunswick County ground-water study. Water-level data may be influenced by local pumping.

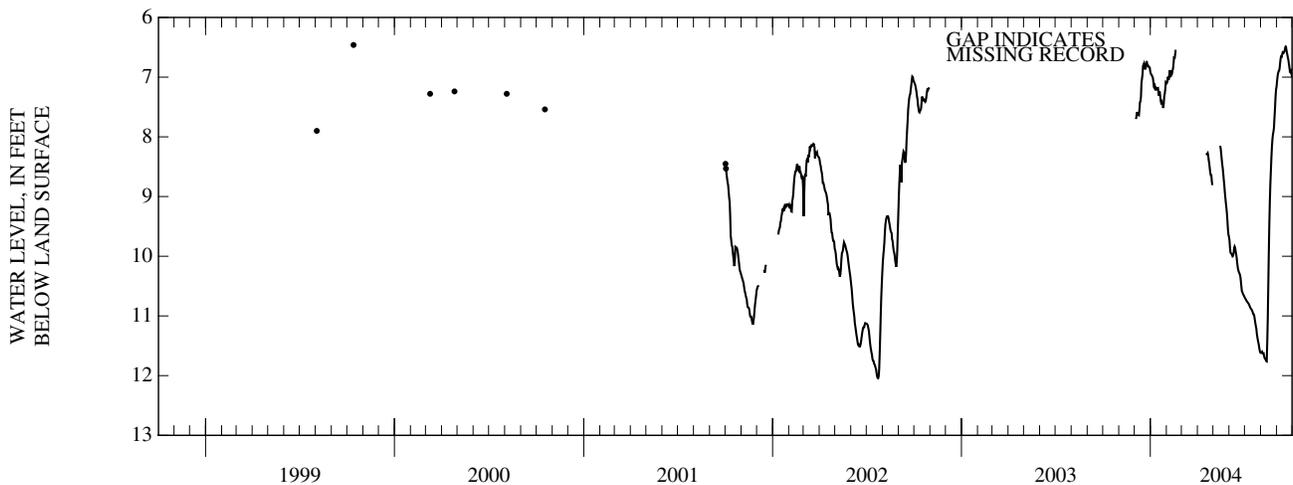
PERIOD OF RECORD.--August 1999 to current year. Continuous record began April 2000.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 6.37 ft below land-surface datum, Sept. 26, 2000; lowest water level recorded, 12.06 ft below land-surface datum, July 23, 2002.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	6.94	7.10	---	---	---	9.73	10.70	11.62	7.07
2	---	---	---	6.96	7.08	---	---	---	9.85	10.71	11.61	6.98
3	---	---	7.70	6.97	7.00	---	---	---	9.94	10.73	11.60	6.93
4	---	---	7.68	6.99	7.02	---	---	---	9.95	10.75	11.62	6.90
5	---	---	7.60	7.01	7.03	---	---	---	9.96	10.76	11.63	6.89
6	---	---	7.60	7.08	6.94	---	---	---	9.98	10.77	11.63	6.85
7	---	---	7.62	7.16	6.88	---	---	---	10.00	10.78	11.68	6.76
8	---	---	7.63	7.18	6.99	---	---	---	9.99	10.79	11.71	6.69
9	---	---	7.64	7.15	6.98	---	---	---	9.95	10.81	11.72	6.65
10	---	---	7.54	7.18	6.92	---	---	---	9.88	10.83	11.73	6.66
11	---	---	7.42	7.22	6.93	---	---	---	9.84	10.86	11.76	6.62
12	---	---	7.41	7.19	6.89	---	---	---	9.86	10.87	11.76	6.58
13	---	---	7.33	7.19	6.85	---	---	---	9.92	10.89	11.46	6.58
14	---	---	7.09	7.19	6.77	---	---	8.15	9.96	10.90	11.06	6.59
15	---	---	7.03	7.19	6.65	---	---	8.19	10.03	10.91	10.52	6.57
16	---	---	6.95	7.28	6.69	---	---	8.27	10.11	10.94	9.97	6.55
17	---	---	6.81	7.31	6.63	---	8.28	8.37	10.19	10.97	9.49	6.50
18	---	---	6.79	7.24	6.54	---	8.29	8.45	10.23	10.97	9.10	6.48
19	---	---	6.77	7.30	---	---	8.29	8.52	10.26	11.00	8.80	6.54
20	---	---	6.81	7.39	---	---	8.27	8.61	10.28	11.06	8.58	6.59
21	---	---	6.87	7.43	---	---	8.32	8.71	10.30	11.12	8.36	6.63
22	---	---	6.85	7.41	---	---	8.39	8.81	10.34	11.17	8.18	6.67
23	---	---	6.81	7.44	---	---	8.45	8.92	10.41	11.22	8.05	6.72
24	---	---	6.73	7.45	---	---	8.53	9.01	10.50	11.30	7.96	6.78
25	---	---	6.78	7.52	---	---	8.61	9.10	10.58	11.36	7.91	6.84
26	---	---	6.81	7.45	---	---	8.64	9.18	10.60	11.41	7.85	6.91
27	---	---	6.81	7.32	---	---	8.64	9.27	10.63	11.45	7.68	6.92
28	---	---	6.83	7.28	---	---	8.75	9.40	10.64	11.50	7.53	6.90
29	---	---	6.83	7.20	---	---	8.81	9.54	10.66	11.56	7.34	6.95
30	---	---	6.84	7.08	---	---	---	9.64	10.68	11.60	7.21	7.00
31	---	---	6.91	7.09	---	---	---	9.67	---	11.62	7.16	---

WTR YR 2004 MEAN 8.56 HIGH 6.48 LOW 11.76



## GROUND-WATER LEVELS

69

## BRUNSWICK COUNTY—Continued

335334078352102. County number, BR-116; DENR Calabash Research Station well HH39j3.

LOCATION.--Lat 33°53'34", long 78°35'21", Hydrologic Unit 03040207, .75 mi west of Country Club Drive on Carolina Shores Drive. Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Black Creek aquifer of Late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation well, depth 660 ft, diameter 2.5 in.; cased to 644 ft and from 654 to 660 ft, screened interval from 644 to 654 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 47.59 ft above NGVD of 1929. Measuring point: Top of casing, 2.79 ft above land-surface datum.

REMARKS.--Well is part of Brunswick County ground-water study.

PERIOD OF RECORD.--May 1973 to current year. Continuous record began October 1999.

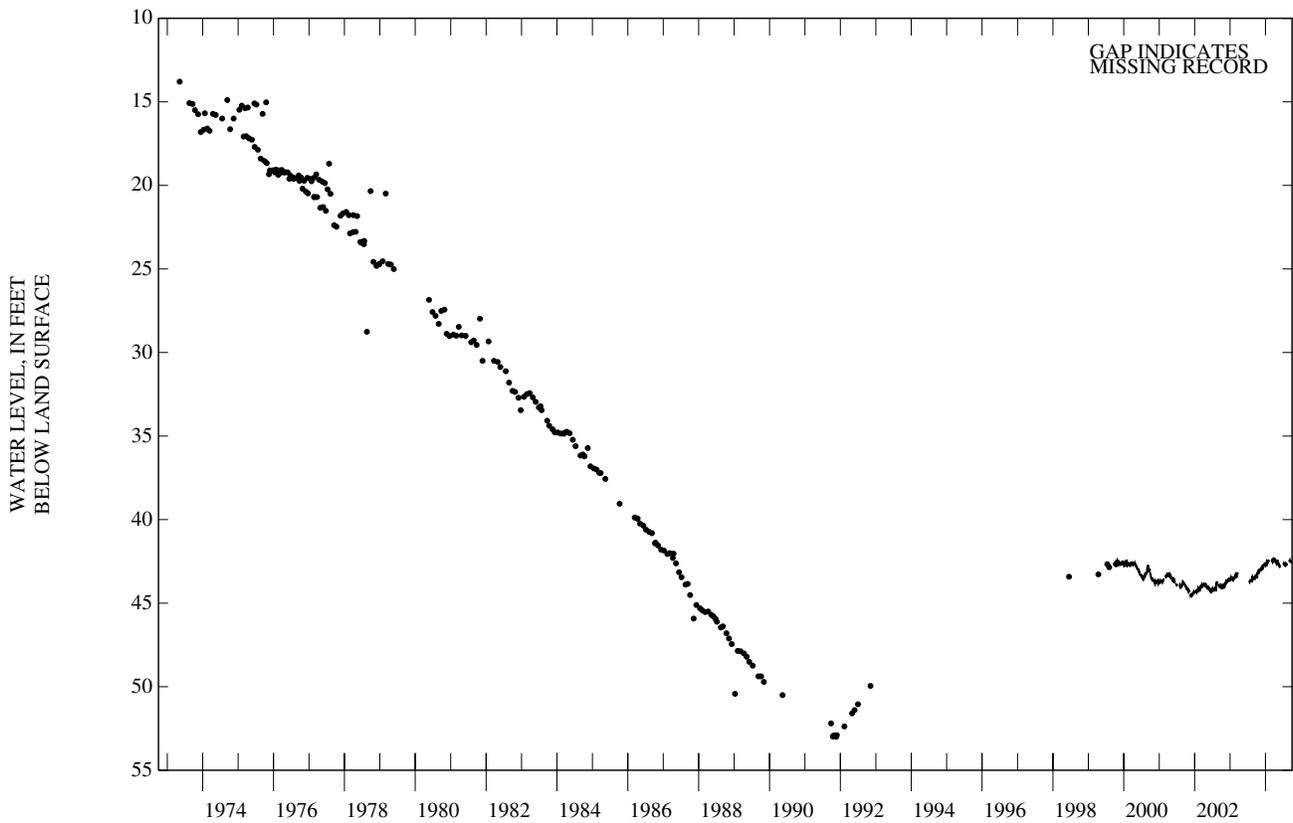
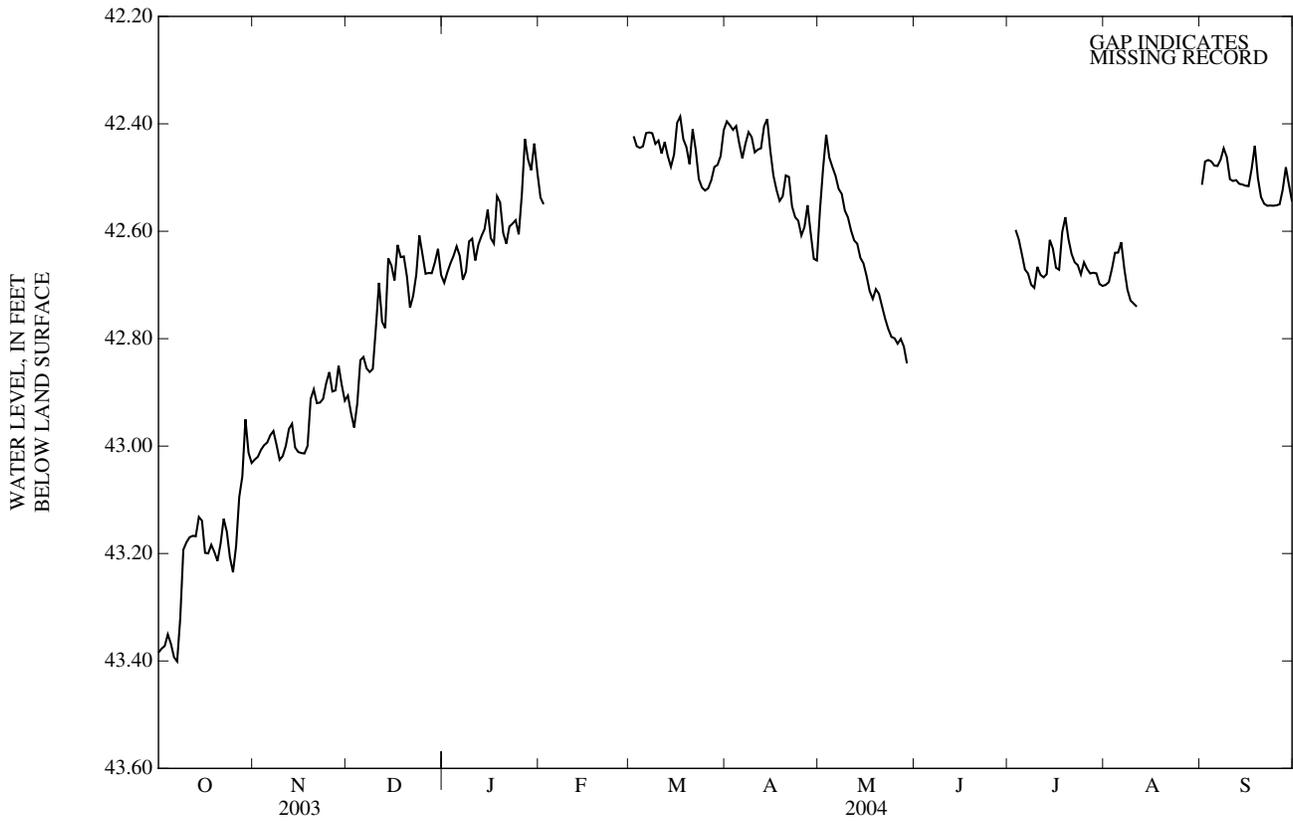
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.79 ft below land-surface datum, May 7, 1973; lowest water level recorded, 53.00 ft below land-surface datum, Nov. 11, 1991.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43.38	43.02	42.91	42.70	42.54	---	42.40	42.56	---	---	42.70	42.51
2	43.38	43.02	42.94	42.68	42.55	42.42	42.40	42.48	---	---	42.69	42.47
3	43.37	43.01	42.97	42.66	---	42.44	42.41	42.42	---	42.60	42.67	42.47
4	43.35	43.00	42.92	42.65	---	42.44	42.40	42.46	---	42.62	42.64	42.47
5	43.37	42.99	42.84	42.63	---	42.44	42.44	42.48	---	42.64	42.64	42.48
6	43.39	42.98	42.83	42.65	---	42.42	42.46	42.50	---	42.67	42.62	42.48
7	43.40	42.97	42.86	42.69	---	42.42	42.44	42.52	---	42.68	42.67	42.47
8	43.32	43.00	42.86	42.68	---	42.42	42.42	42.53	---	42.70	42.71	42.45
9	43.19	43.03	42.86	42.62	---	42.44	42.42	42.56	---	42.71	42.73	42.46
10	43.18	43.02	42.78	42.61	---	42.43	42.45	42.57	---	42.67	42.73	42.50
11	43.17	43.00	42.70	42.65	---	42.46	42.45	42.60	---	42.68	42.74	42.51
12	43.17	42.97	42.77	42.62	---	42.43	42.45	42.62	---	42.69	---	42.50
13	43.17	42.96	42.78	42.61	---	42.46	42.40	42.62	---	42.68	---	42.51
14	43.13	43.00	42.65	42.60	---	42.48	42.39	42.65	---	42.62	---	42.51
15	43.14	43.01	42.66	42.56	---	42.46	42.45	42.66	---	42.63	---	42.52
16	43.20	43.01	42.69	42.61	---	42.40	42.50	42.68	---	42.67	---	42.52
17	43.20	43.01	42.63	42.62	---	42.39	42.52	42.71	---	42.67	---	42.48
18	43.18	43.00	42.65	42.53	---	42.43	42.54	42.73	---	42.60	---	42.44
19	43.20	42.91	42.65	42.55	---	42.44	42.53	42.71	---	42.57	---	42.50
20	43.21	42.89	42.68	42.60	---	42.48	42.50	42.72	---	42.61	---	42.54
21	43.18	42.92	42.74	42.62	---	42.41	42.50	42.74	---	42.64	---	42.55
22	43.14	42.92	42.72	42.59	---	42.45	42.55	42.76	---	42.66	---	42.55
23	43.16	42.91	42.68	42.59	---	42.50	42.57	42.78	---	42.66	---	42.55
24	43.21	42.88	42.61	42.58	---	42.52	42.58	42.80	---	42.68	---	42.55
25	43.23	42.86	42.64	42.61	---	42.52	42.61	42.80	---	42.66	---	42.55
26	43.19	42.90	42.68	42.53	---	42.52	42.59	42.81	---	42.67	---	42.55
27	43.09	42.90	42.68	42.43	---	42.50	42.55	42.80	---	42.68	---	42.52
28	43.06	42.85	42.68	42.47	---	42.48	42.60	42.81	---	42.68	---	42.48
29	42.95	42.89	42.66	42.49	---	42.48	42.65	42.85	---	42.68	---	42.51
30	43.01	42.92	42.63	42.44	---	42.46	42.65	---	---	42.70	---	42.54
31	43.03	---	42.68	42.49	---	42.41	---	---	---	42.70	---	---
WTR YR	2004	MEAN	42.70	HIGH	42.39	LOW	43.40					

GROUND-WATER LEVELS  
BRUNSWICK COUNTY—Continued

335334078352102. County number, BR-116; DENR Calabash Research Station well HH39j3.



## GROUND-WATER LEVELS

71

## BRUNSWICK COUNTY—Continued

335334078352106. Local number, BR-123; DENR Calabash Research Station well HH39j7.

LOCATION.--Lat 33°53'34", long 78°35'21", Hydrologic Unit 03040207, .75 miles west of Country Club Drive on Carolina Shores Drive. Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Surficial Aquifer.

WELL CHARACTERISTICS.--Drilled observation well, depth 56 ft, diameter 4 in., cased to 46 ft, screened interval from 46 to 56 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 47.28 ft above NGVD of 1929. Measuring point: Top of casing, 1.97 ft above land-surface datum.

REMARKS.-- Well is part of Brunswick County ground-water study. Water-level data may be influenced by local pumping.

PERIOD OF RECORD.--April 1999 to current year. Continuous record began October 2000.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 1.05 ft below land-surface datum, Sept. 2, 2004; lowest water level recorded, 23.12 ft below land-surface datum, May 11, 2001.

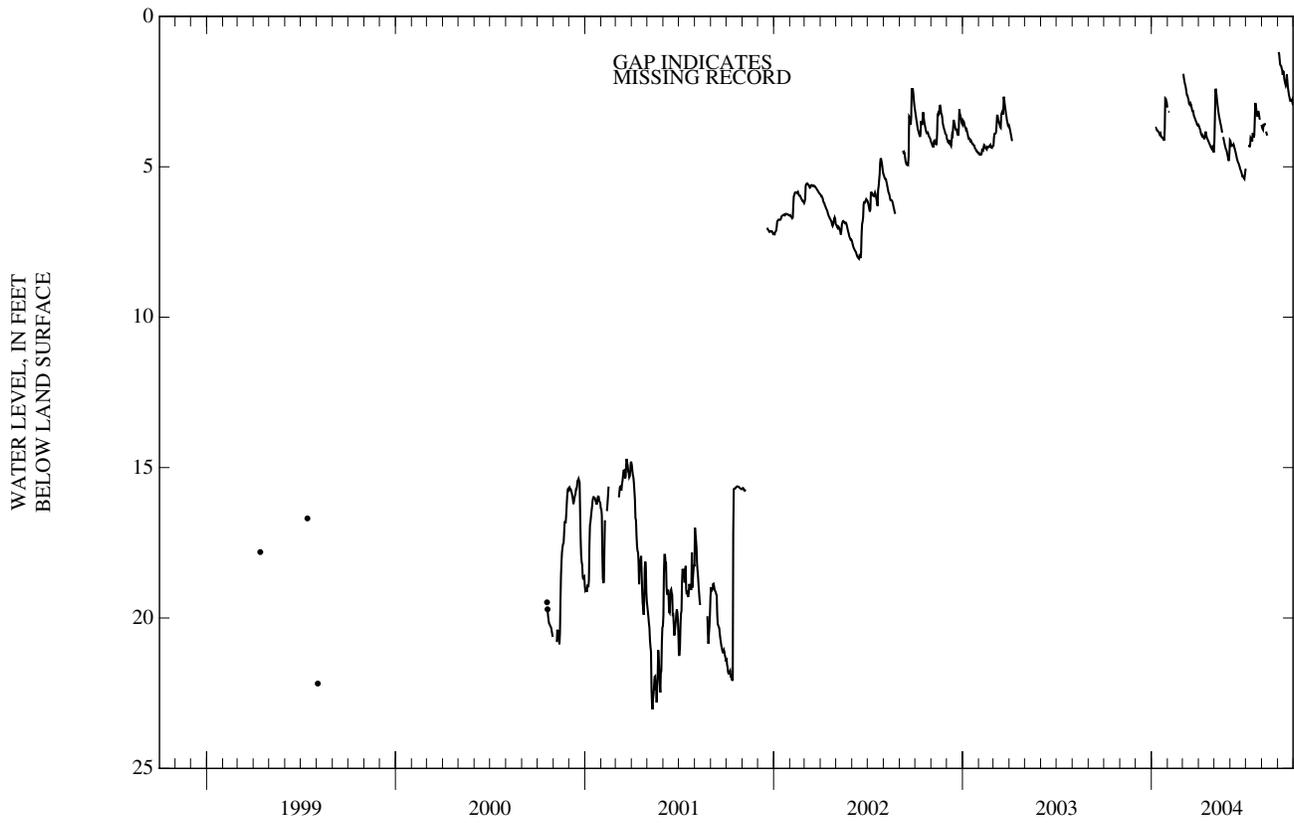
DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	3.64	4.11	4.14	5.06	3.68	---
2	---	---	---	---	3.17	1.91	3.69	3.33	4.23	---	3.74	1.19
3	---	---	---	---	---	2.05	3.75	2.43	4.31	---	3.77	1.24
4	---	---	---	---	---	2.15	3.80	2.43	4.30	---	3.58	1.41
5	---	---	---	---	---	2.24	3.89	2.59	4.28	---	3.64	1.59
6	---	---	---	---	---	2.30	3.93	2.77	4.30	---	3.56	1.63
7	---	---	---	---	---	2.40	3.97	2.93	4.26	4.27	3.61	1.65
8	---	---	---	3.71	---	2.53	3.95	3.08	4.33	4.34	---	1.73
9	---	---	---	3.70	---	2.62	3.99	3.21	4.38	4.29	3.83	1.79
10	---	---	---	3.74	---	2.63	4.02	3.32	4.45	4.04	3.90	1.94
11	---	---	---	3.79	---	2.72	4.06	3.41	4.52	4.07	3.96	1.81
12	---	---	---	3.79	---	2.77	4.05	3.50	4.60	---	---	1.88
13	---	---	---	3.82	---	2.89	3.92	3.58	4.69	4.17	---	2.07
14	---	---	---	3.84	---	2.93	3.83	3.65	4.76	3.88	---	2.17
15	---	---	---	3.86	---	2.95	3.92	3.76	4.82	3.92	---	2.24
16	---	---	---	3.93	---	2.90	4.00	3.86	4.86	4.03	---	2.31
17	---	---	---	3.95	---	2.95	4.05	---	4.90	3.96	---	2.26
18	---	---	---	3.90	---	3.03	4.09	4.01	4.95	3.47	---	1.93
19	---	---	---	3.98	---	3.12	4.14	4.09	5.01	2.88	---	2.15
20	---	---	---	4.02	---	3.16	4.17	4.18	5.08	2.95	---	2.35
21	---	---	---	4.03	---	3.16	4.22	4.26	5.13	3.09	---	2.48
22	---	---	---	4.03	---	3.27	4.25	4.33	5.17	3.21	---	2.60
23	---	---	---	4.07	---	3.33	4.30	4.40	5.24	3.34	---	2.68
24	---	---	---	4.09	---	3.37	4.34	4.43	5.31	---	---	2.77
25	---	---	---	4.13	---	3.42	4.38	4.50	5.31	3.14	---	2.84
26	---	---	---	3.75	---	3.47	4.40	4.58	5.34	3.23	---	---
27	---	---	---	2.72	---	3.51	4.36	4.67	5.38	3.37	---	2.80
28	---	---	---	2.74	---	3.56	4.43	4.75	5.40	3.43	---	2.77
29	---	---	---	2.80	---	3.61	4.48	4.80	5.25	---	---	2.89
30	---	---	---	2.88	---	3.63	4.52	4.55	5.10	---	---	2.95
31	---	---	---	3.03	---	3.60	---	4.11	---	3.61	---	---

WTR YR 2004 MEAN 3.60 HIGH 1.19 LOW 5.40

GROUND-WATER LEVELS  
BRUNSWICK COUNTY—Continued

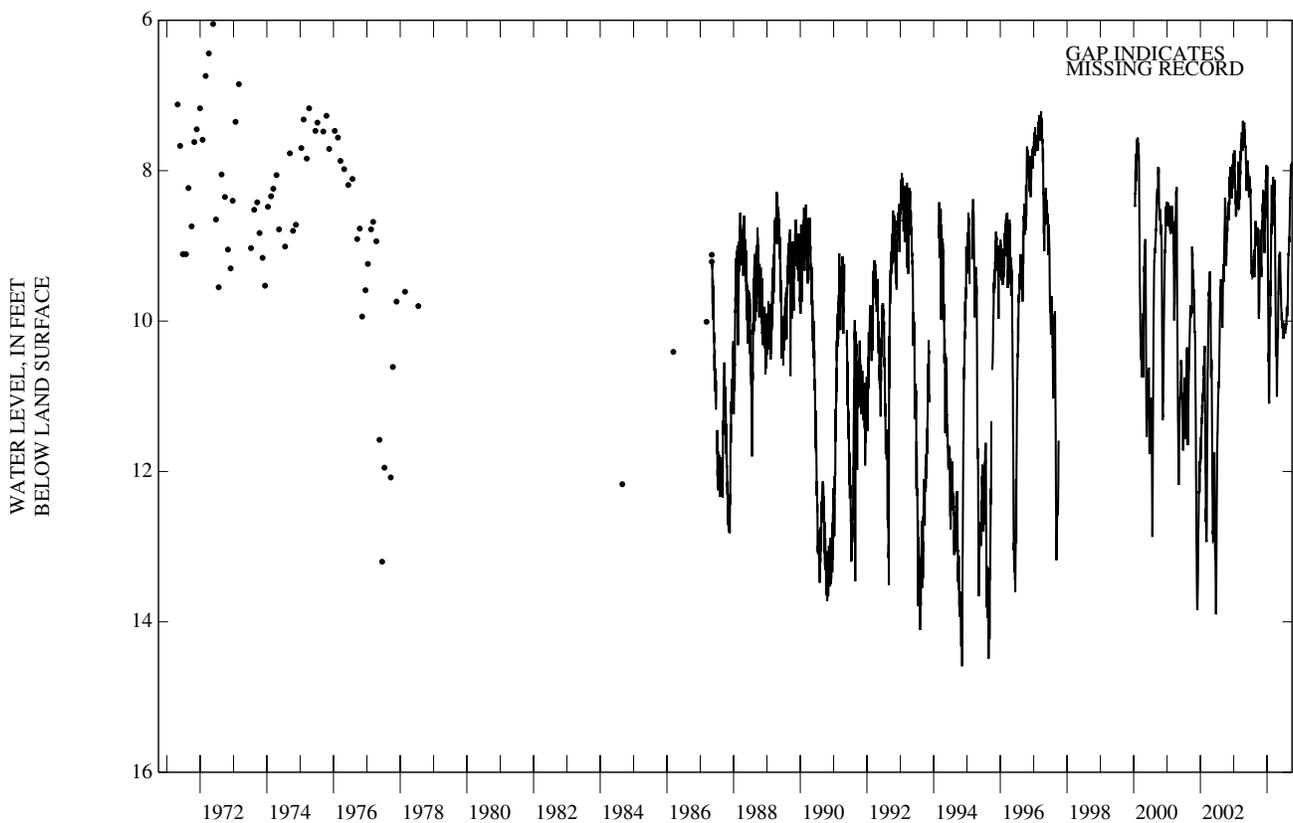
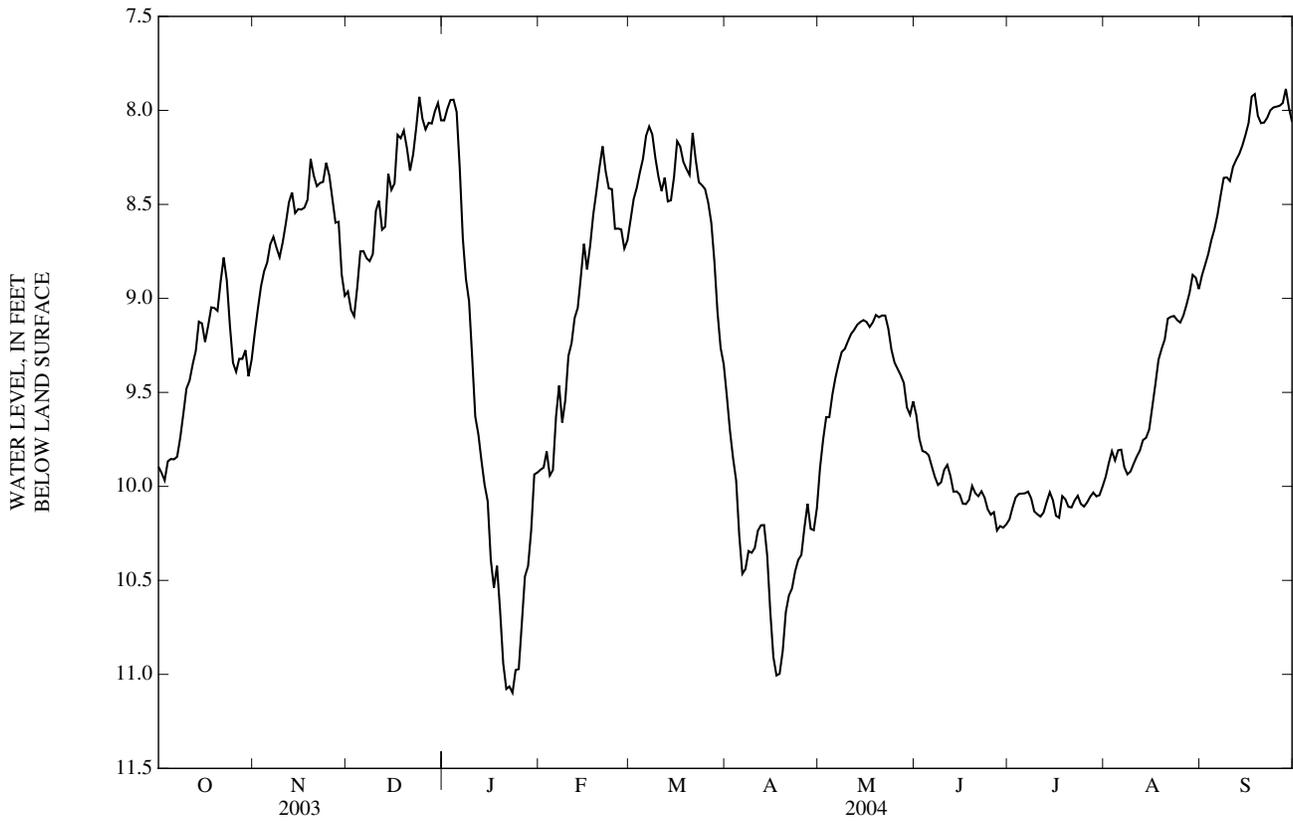
335334078352106. Local number, BR-123; DENR Calabash Research Station well HH39j7.





GROUND-WATER LEVELS  
BRUNSWICK COUNTY—Continued

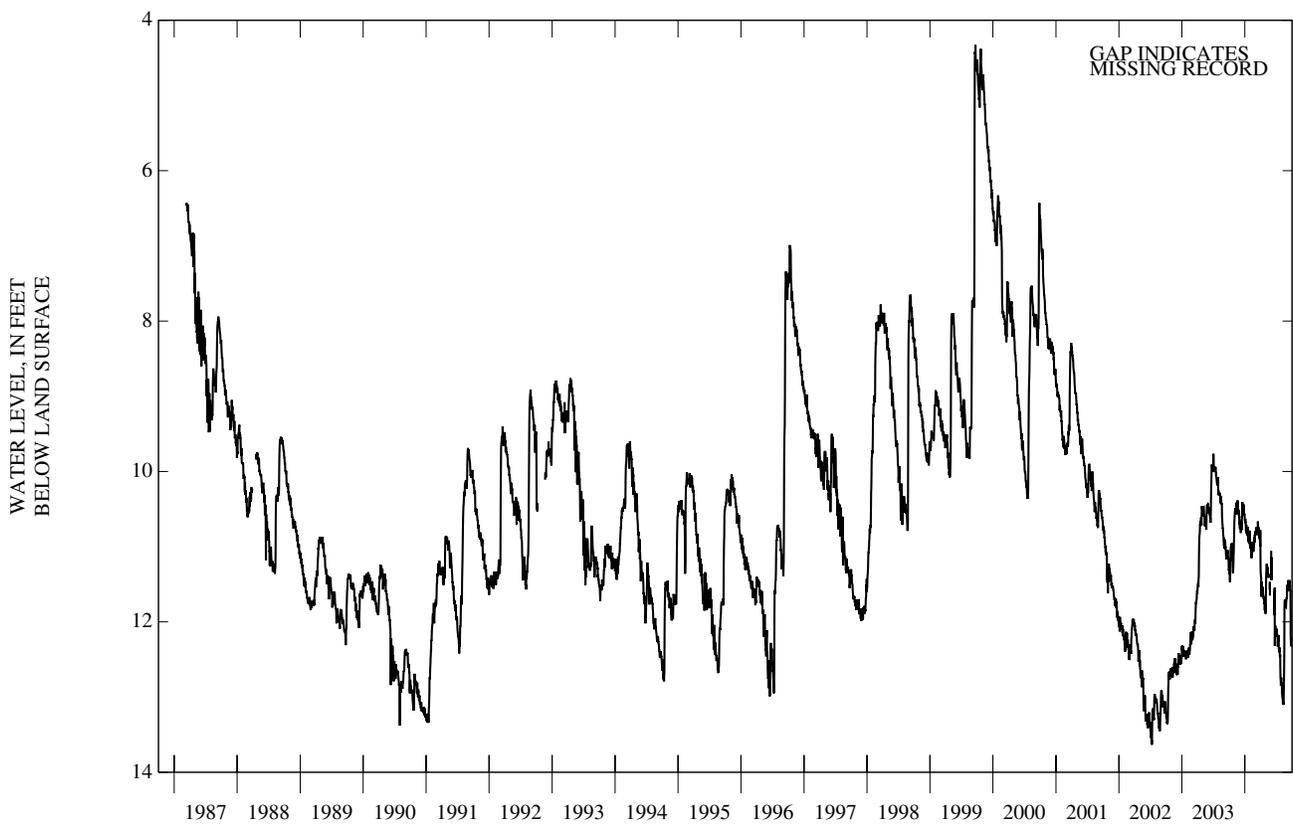
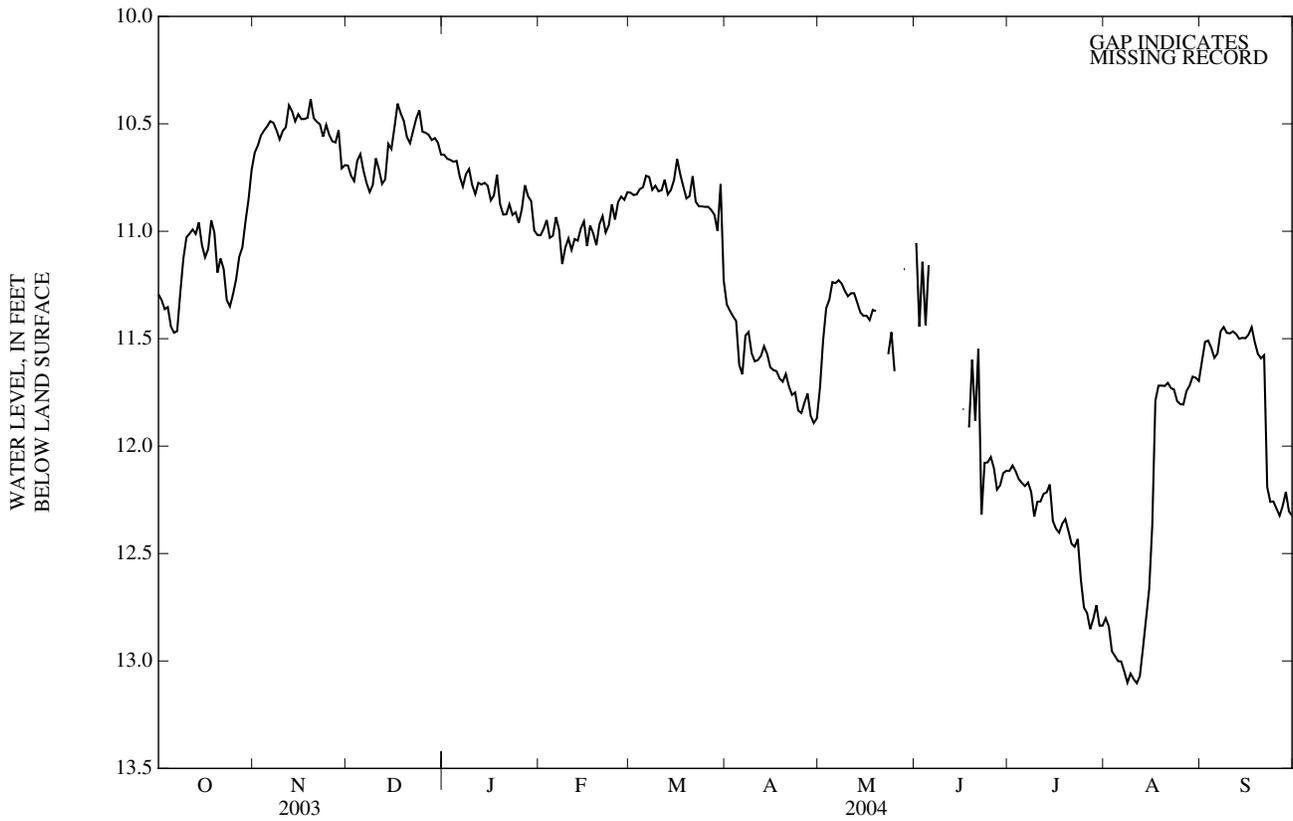
340416078084202. Local number, NC-180; DENR Bolivia Research Station well FF33d2; County number, BR-078.





GROUND-WATER LEVELS  
BRUNSWICK COUNTY—Continued

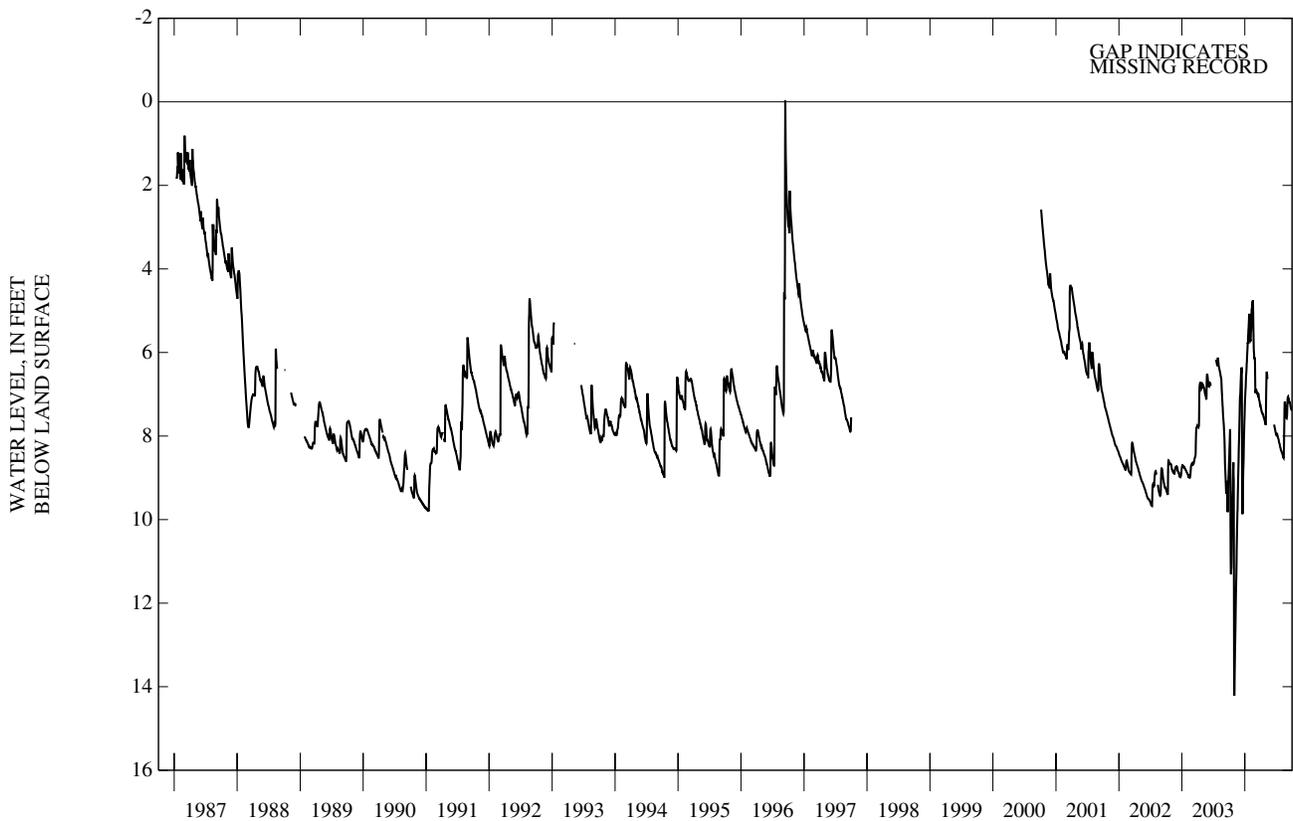
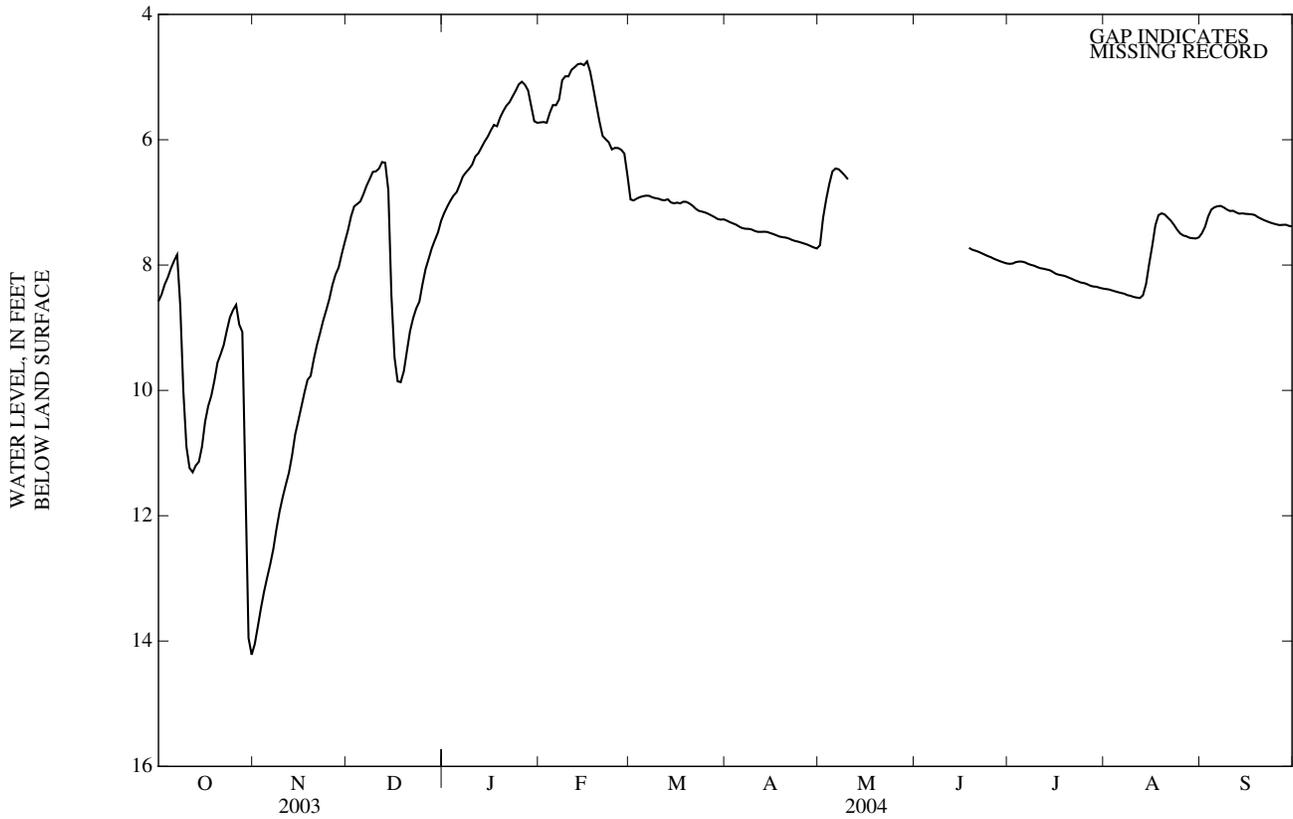
335629078115406. Local number, NC-181; DENR Sunset Harbor Research Station well GG34s6; County number, BR-079.





GROUND-WATER LEVELS  
BRUNSWICK COUNTY—Continued

335629078115407. Local number, NC-182; DENR Sunset Harbor Research Station well GG34s7; County number, BR-080.

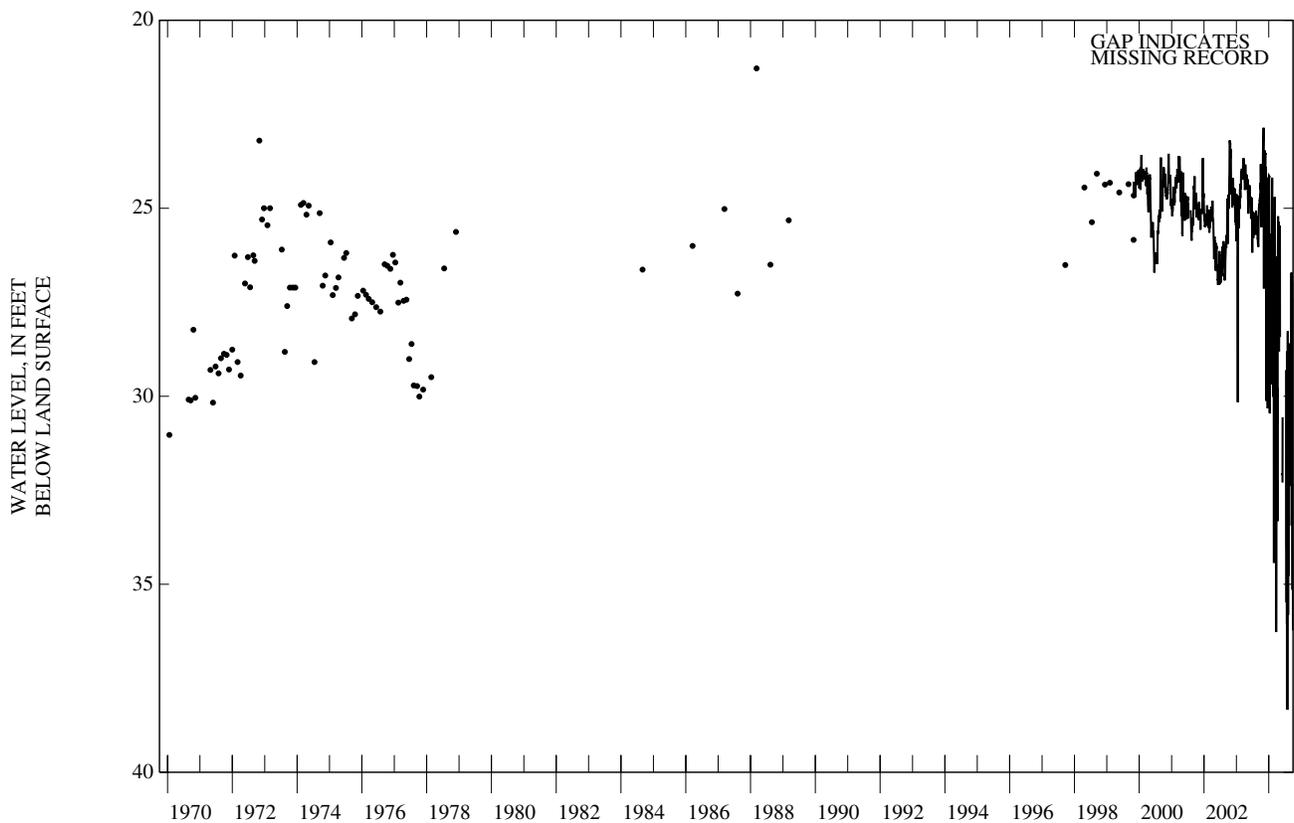
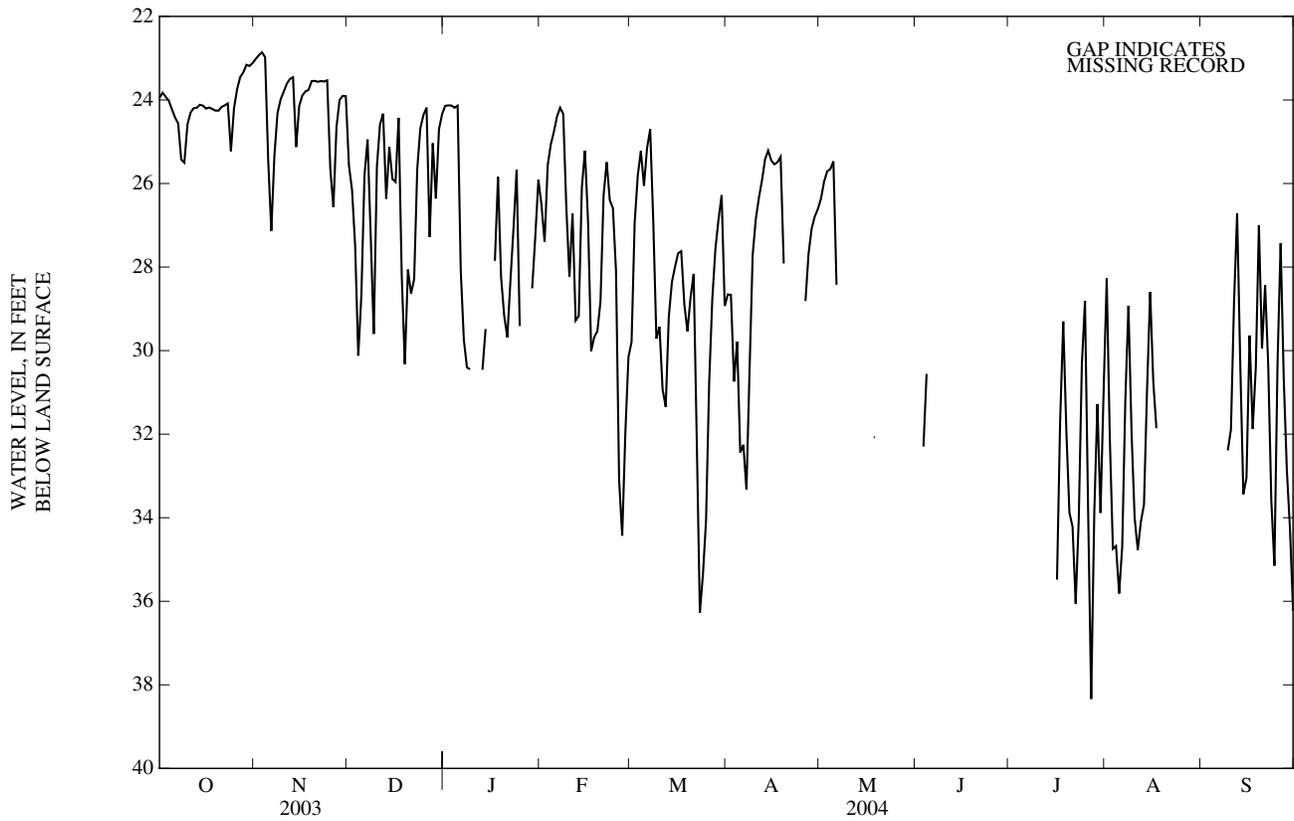






BRUNSWICK COUNTY—Continued

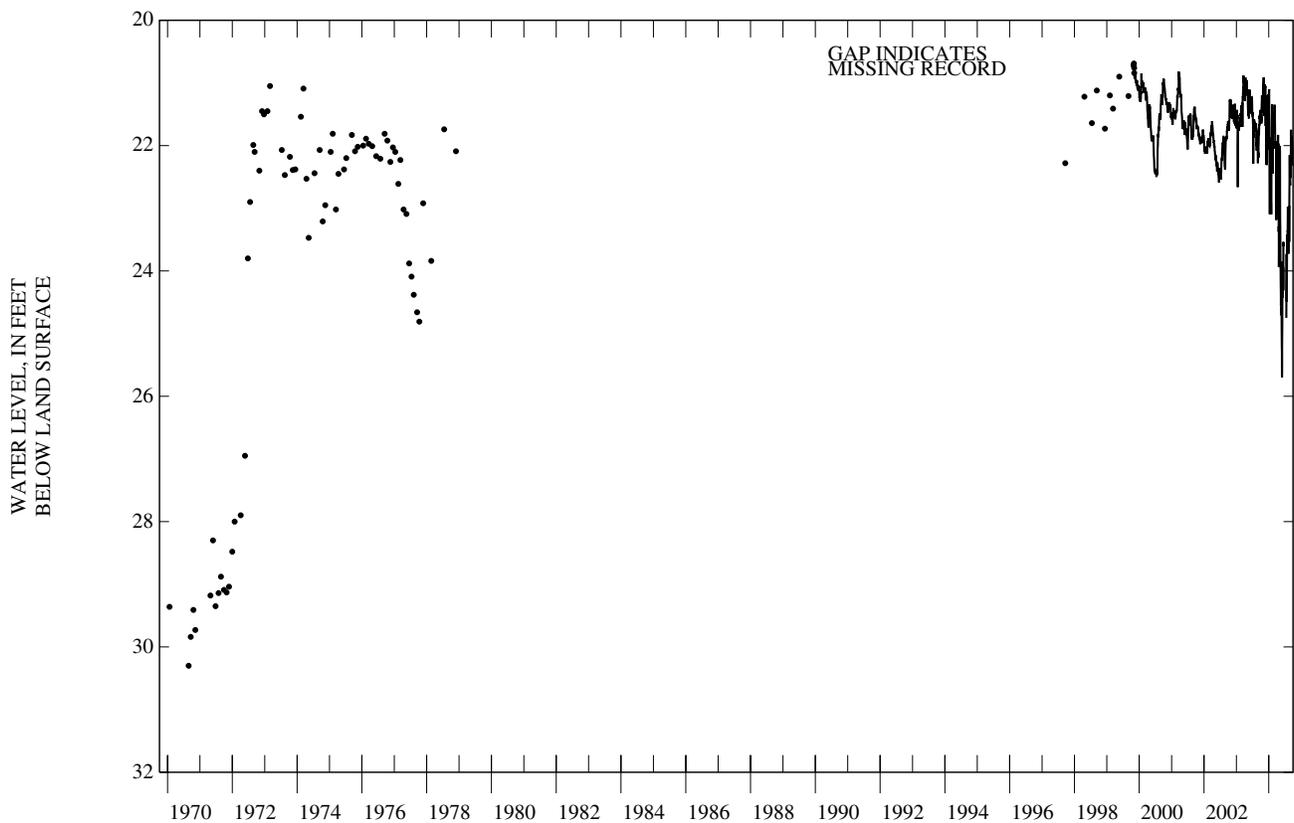
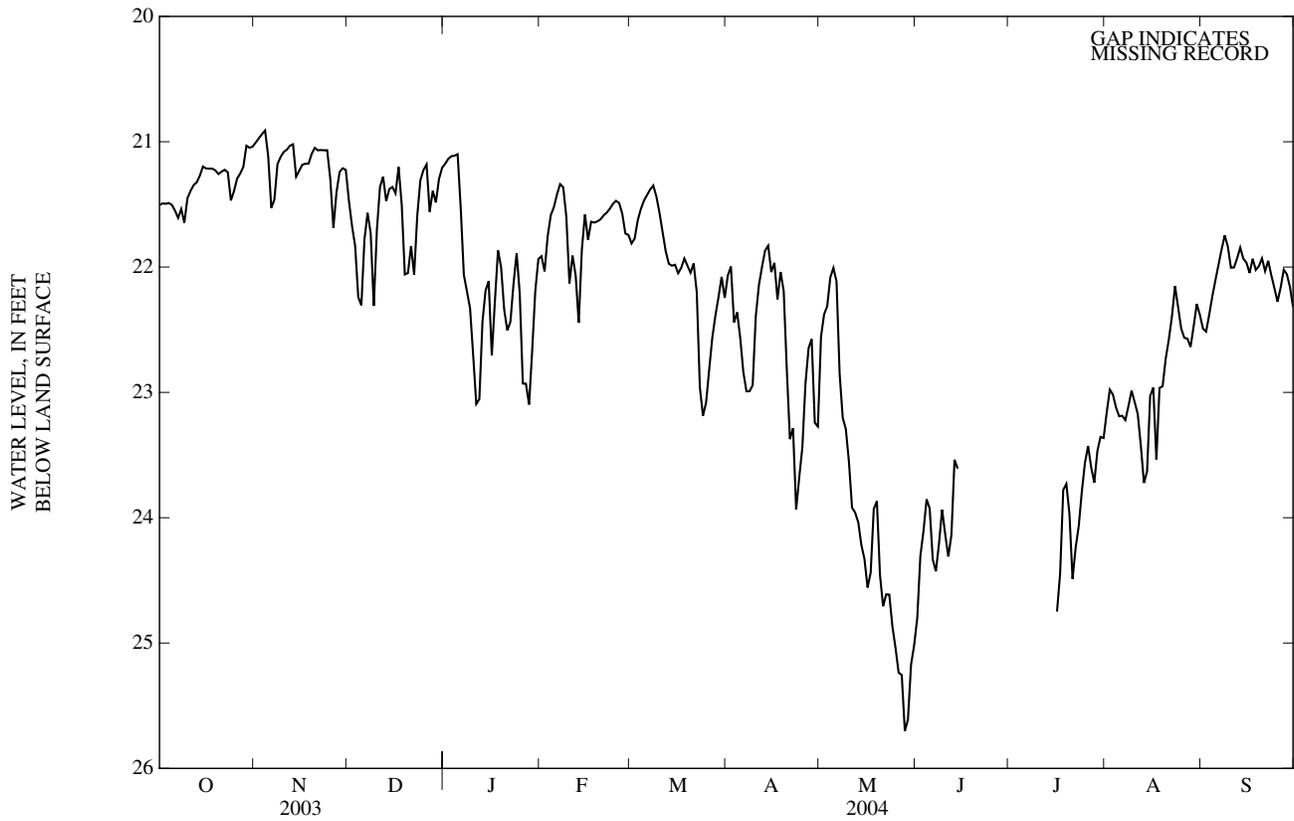
335631078003604. Local number, NC-197; DENR Southport Research Station well GG32t4; County number, BR-081.





BRUNSWICK COUNTY—Continued

335631078003605. Local number, NC-198; DENR Southport Research Station well GG32t5; County number, BR-082.



GROUND-WATER LEVELS  
BRUNSWICK COUNTY—Continued

335631078003606. Local number, NC-199; DENR Southport Research Station well GG32t6; County number, BR-083.

LOCATION.--Lat 33°56'31.42", long 78°00'35.08", Hydrologic Unit 03030005, north of Southport, 0.45 mi northeast of Secondary Road 1526 on Secondary Road 1527. Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Surficial aquifer.

WELL CHARACTERISTICS.--Drilled observation well, depth 21 ft, diameter 4 in., cased to 11 ft, screened from 11 to 21 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 28.00 ft above NGVD of 1929. Measuring point: Top of instrument shelf, 1.27 ft above land-surface datum; revised from 0.00 ft above land-surface datum, Oct. 16, 1997.

REMARKS.-- Well is part of local-effects network.

PERIOD OF RECORD.--January 1970 to current year. Continuous record began October 1997.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 0.13 ft below land-surface datum, Sept. 16, 1999; lowest water level measured, 11.36 ft below land-surface datum, Oct. 10, 1977.

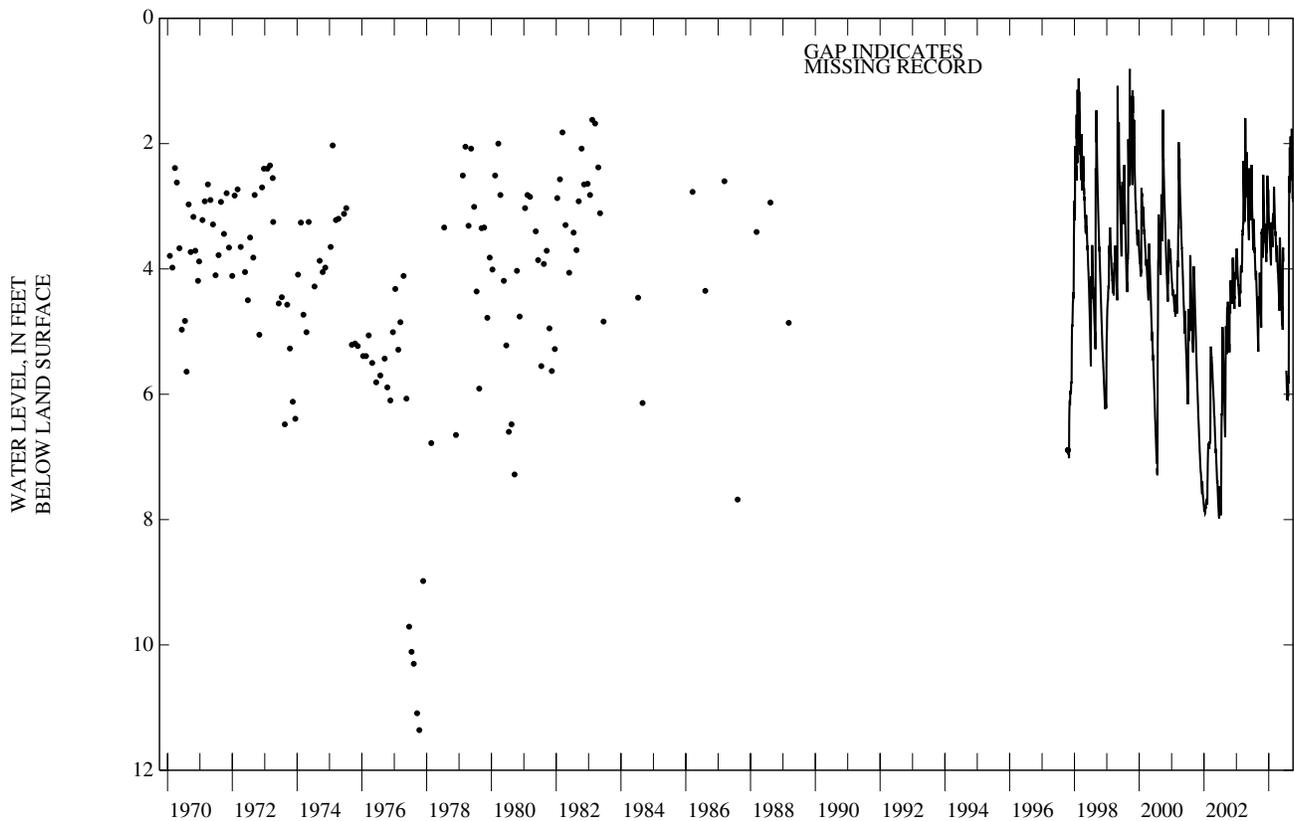
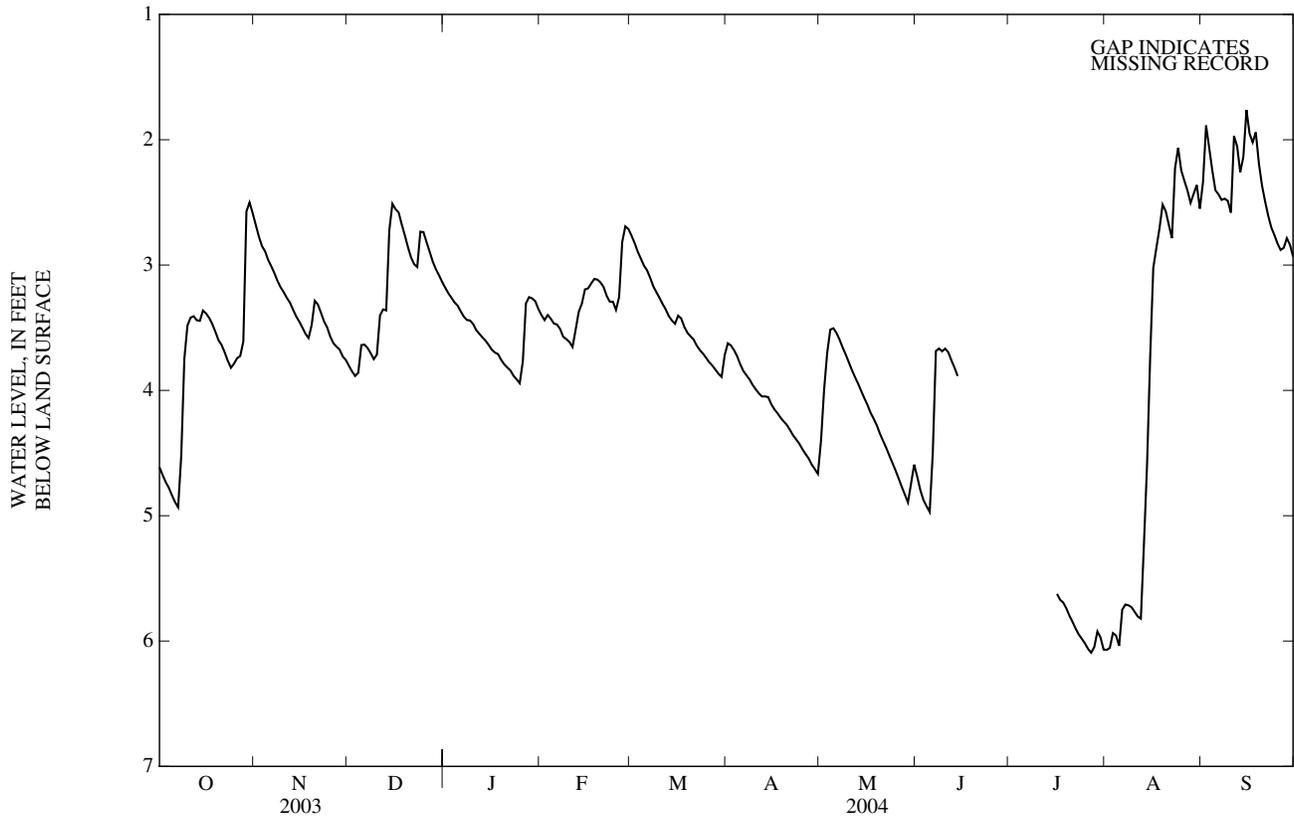
DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.61	2.68	3.80	3.18	3.40	2.77	3.62	4.40	4.69	---	6.07	2.34
2	4.67	2.77	3.85	3.22	3.44	2.83	3.64	3.99	4.80	---	6.05	1.89
3	4.73	2.85	3.88	3.26	3.40	2.89	3.68	3.70	4.88	---	5.94	2.06
4	4.78	2.89	3.86	3.30	3.43	2.95	3.73	3.52	4.92	---	5.96	2.24
5	4.84	2.96	3.64	3.32	3.47	3.00	3.79	3.50	4.97	---	6.04	2.40
6	4.89	3.01	3.63	3.37	3.47	3.04	3.85	3.54	4.50	---	5.75	2.44
7	4.93	3.06	3.66	3.41	3.51	3.10	3.88	3.60	3.69	---	5.71	2.48
8	4.52	3.13	3.70	3.44	3.57	3.17	3.91	3.66	3.67	---	5.71	2.47
9	3.75	3.18	3.75	3.44	3.59	3.22	3.96	3.72	3.69	---	5.73	2.49
10	3.48	3.22	3.71	3.47	3.61	3.26	3.99	3.78	3.67	---	5.77	2.58
11	3.42	3.26	3.40	3.52	3.65	3.31	4.02	3.84	3.70	---	5.80	1.97
12	3.41	3.30	3.35	3.55	3.52	3.35	4.05	3.90	3.76	---	5.82	2.05
13	3.44	3.36	3.36	3.58	3.37	3.41	4.05	3.95	3.82	---	5.22	2.26
14	3.44	3.41	2.72	3.60	3.31	3.44	4.05	4.01	3.89	---	4.59	2.14
15	3.36	3.45	2.51	3.64	3.19	3.47	4.11	4.06	---	---	3.73	1.76
16	3.39	3.50	2.55	3.68	3.19	3.40	4.15	4.12	---	5.62	3.02	1.95
17	3.42	3.55	2.58	3.70	3.15	3.43	4.18	4.18	---	5.67	2.86	2.02
18	3.47	3.58	2.68	3.71	3.11	3.49	4.22	4.23	---	5.69	2.71	1.94
19	3.53	3.48	2.76	3.76	3.12	3.54	4.25	4.28	---	5.74	2.52	2.19
20	3.60	3.28	2.86	3.79	3.14	3.57	4.28	4.35	---	5.80	2.57	2.37
21	3.64	3.31	2.94	3.82	3.17	3.60	4.31	4.40	---	5.85	2.68	2.49
22	3.70	3.38	2.99	3.84	3.25	3.64	4.36	4.46	---	5.90	2.78	2.61
23	3.76	3.45	3.02	3.88	3.29	3.68	4.39	4.52	---	5.95	2.23	2.70
24	3.82	3.50	2.73	3.91	3.29	3.71	4.42	4.58	---	5.98	2.06	2.76
25	3.79	3.57	2.74	3.94	3.36	3.74	4.47	4.64	---	6.02	2.24	2.83
26	3.74	3.62	2.82	3.77	3.25	3.77	4.51	4.70	---	6.06	2.33	2.88
27	3.73	3.65	2.89	3.31	2.82	3.80	4.54	4.77	---	6.09	2.40	2.86
28	3.61	3.67	2.97	3.26	2.69	3.83	4.59	4.83	---	6.05	2.50	2.79
29	2.57	3.73	3.03	3.27	2.71	3.87	4.63	4.89	---	5.92	2.43	2.84
30	2.50	3.76	3.08	3.29	---	3.89	4.67	4.74	---	5.97	2.36	2.93
31	2.58	---	3.13	3.35	---	3.72	---	4.59	---	6.07	2.55	---

WTR YR 2004 MEAN 3.67 HIGH 1.76 LOW 6.09

BRUNSWICK COUNTY—Continued

35631078003606. Local number, NC-199; DENR Southport Research Station well GG32t6; County number, BR-083.



GROUND-WATER LEVELS

BUNCOMBE COUNTY

352840082381001. County number, BU-068; DENR Bent Creek Research Station MW-1S (Regolith well).

LOCATION.--Lat 35°28'39", long 82°38'10", Hydrologic Unit 06010105, 1.2 mi north of Blue Ridge Parkway, 3.1 mi west of Brevard Road in Bent Creek Research Forest. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 22 ft, diameter 4 in., cased to 8 ft, screened interval from 8 ft to 22 ft, sand filter packed from 6 ft to 22 ft.

INSTRUMENTATION.--Measured periodically with steel tape.

DATUM.--Land-surface datum is 2,200.99 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.95 ft above land-surface datum.

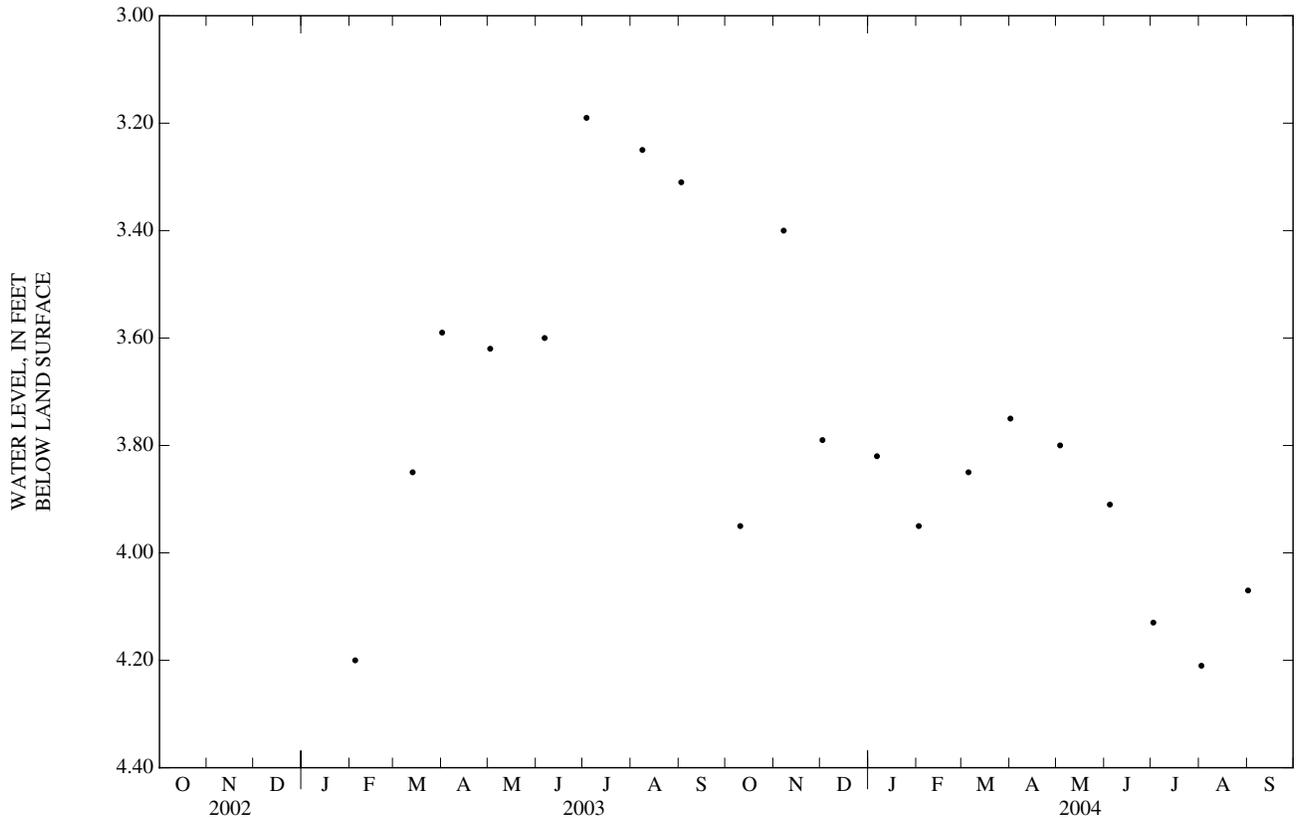
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.19 ft below land-surface datum, July 3, 2003; lowest water level measured 4.21 ft below land-surface datum, Aug. 2, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 10	3.95	DEC 02	3.79	FEB 02	3.95	APR 01	3.75	JUN 04	3.91	AUG 02	4.21
NOV 07	3.40	JAN 06	3.82	MAR 05	3.85	MAY 03	3.80	JUL 02	4.13	SEP 01	4.07



BUNCOMBE COUNTY—Continued

352840082381002. County number, BU-069; DENR Bent Creek Research Station MW-11 (Transition Zone well).

LOCATION.--Lat 35°28'40", long 82°38'10", Hydrologic Unit 06010105, 1.2 mi north of Blue Ridge Parkway, 3.1 mi west of Brevard Road in Bent Creek Research Forest. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 53 ft, diameter 4 in., cased to 38 ft, screened interval from 38 ft to 53 ft, sand filter packed from 32 ft to 53 ft.

INSTRUMENTATION.--Measured periodically with steel tape.

DATUM.--Land-surface datum is 2,202.52 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.77 ft above land-surface datum.

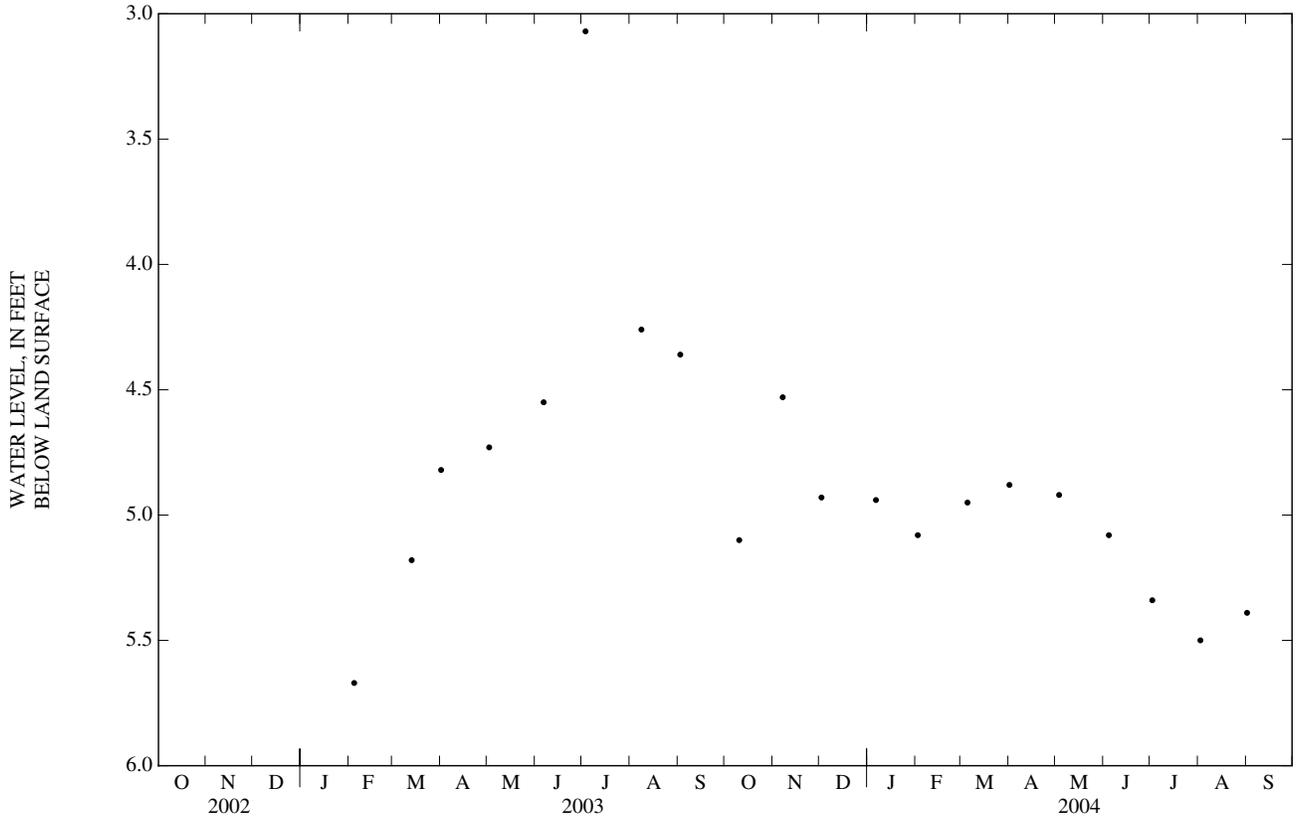
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.07 ft below land-surface datum, July 3, 2003; lowest water level measured 5.67 ft below land-surface datum, Feb. 4, 2003.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 10	5.10	DEC 02	4.93	FEB 02	5.08	APR 01	4.88	JUN 04	5.08	AUG 02	5.50
NOV 07	4.53	JAN 06	4.94	MAR 05	4.95	MAY 03	4.92	JUL 02	5.34	SEP 01	5.39



GROUND-WATER LEVELS  
BUNCOMBE COUNTY—Continued

352840082381003. County number, BU-070; DENR Bent Creek Research Station MW-1D (Bedrock well).

LOCATION.--Lat 35°28'41", long 82°38'12", Hydrologic Unit 06010105, 1.2 mi north of Blue Ridge Parkway, 3.1 mi west of Brevard Road in Bent Creek Research Forest. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Biotite Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 221 ft, diameter 6 in., cased to 55 ft, open hole from 55 ft to 221 ft.

INSTRUMENTATION.--Measured periodically with steel tape.

DATUM.--Land-surface datum is 2,201.77 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.50 ft above land-surface datum.

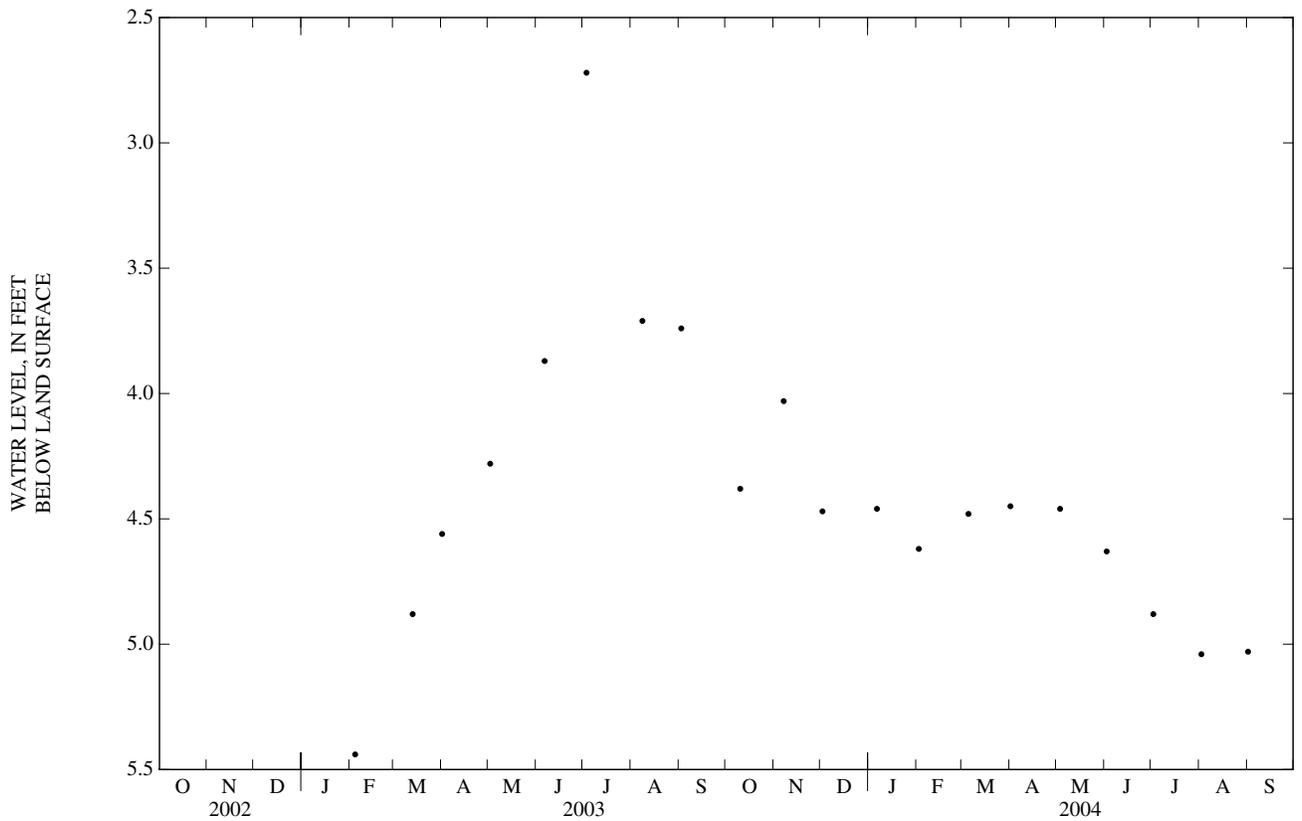
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.72 ft below land-surface datum, July 3, 2003; lowest water level measured 5.44 ft below land-surface datum, Feb. 4, 2003.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 10	4.38	DEC 02	4.47	FEB 02	4.62	APR 01	4.45	JUN 02	4.63	AUG 02	5.04
NOV 07	4.03	JAN 06	4.46	MAR 05	4.48	MAY 03	4.46	JUL 02	4.88	SEP 01	5.03



BUNCOMBE COUNTY—Continued

352854082380501. County number, BU-071; DENR Bent Creek Research Station MW-2S (Regolith well).

LOCATION.--Lat 35°28'54", long 82°38'06", Hydrologic Unit 06010105, 1.2 mi north of Blue Ridge Parkway, 3.1 mi west of Brevard Road in Bent Creek Research Forest. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 20 ft, diameter 4 in., cased to 5 ft, screened interval from 5 ft to 20 ft, sand filter packed from 3 ft to 20 ft.

INSTRUMENTATION.--Measured periodically with steel tape.

DATUM.--Land-surface datum is 2,190.69 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.96 ft above land-surface datum.

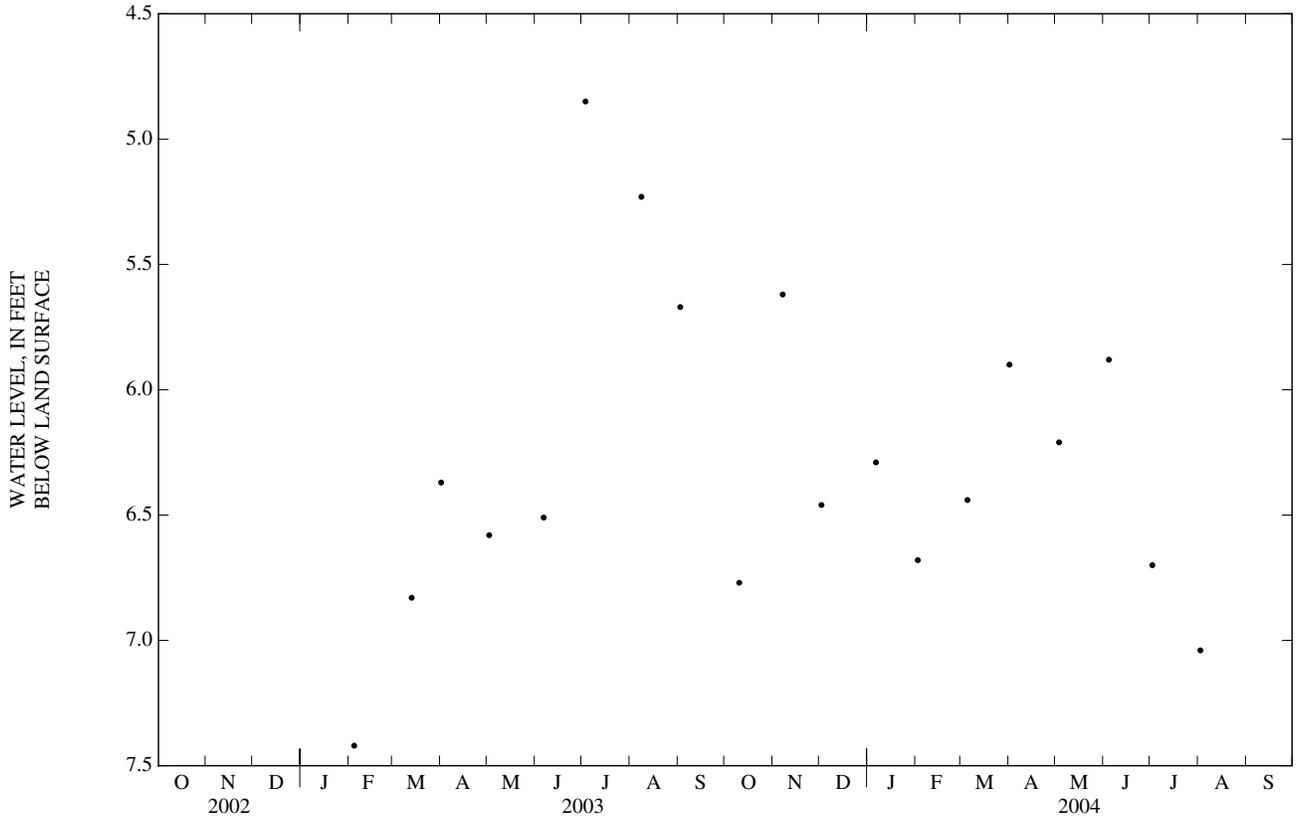
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.85 ft below land-surface datum, July 3, 2003; lowest water level measured 7.42 ft below land-surface datum, Feb. 4, 2003.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 10	6.77	DEC 02	6.46	FEB 02	6.68	APR 01	5.90	JUN 04	5.88	AUG 02	7.04
NOV 07	5.62	JAN 06	6.29	MAR 05	6.44	MAY 03	6.21	JUL 02	6.70		



GROUND-WATER LEVELS  
BUNCOMBE COUNTY—Continued

352854082380502. County number, BU-072; DENR Bent Creek Research Station MW-2I (Transition Zone well).

LOCATION.--Lat 35°28'54", long 82°38'06", Hydrologic Unit 06010105, 1.2 mi north of Blue Ridge Parkway, 3.1 mi west of Brevard Road in Bent Creek Research Forest. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 36 ft, diameter 4 in., cased to 21 ft, screened interval from 21 ft to 36 ft, sand filter packed from 18 ft to 36 ft.

INSTRUMENTATION.--Measured periodically with steel tape.

DATUM.--Land-surface datum is 2,191.72 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.89 ft above land-surface datum.

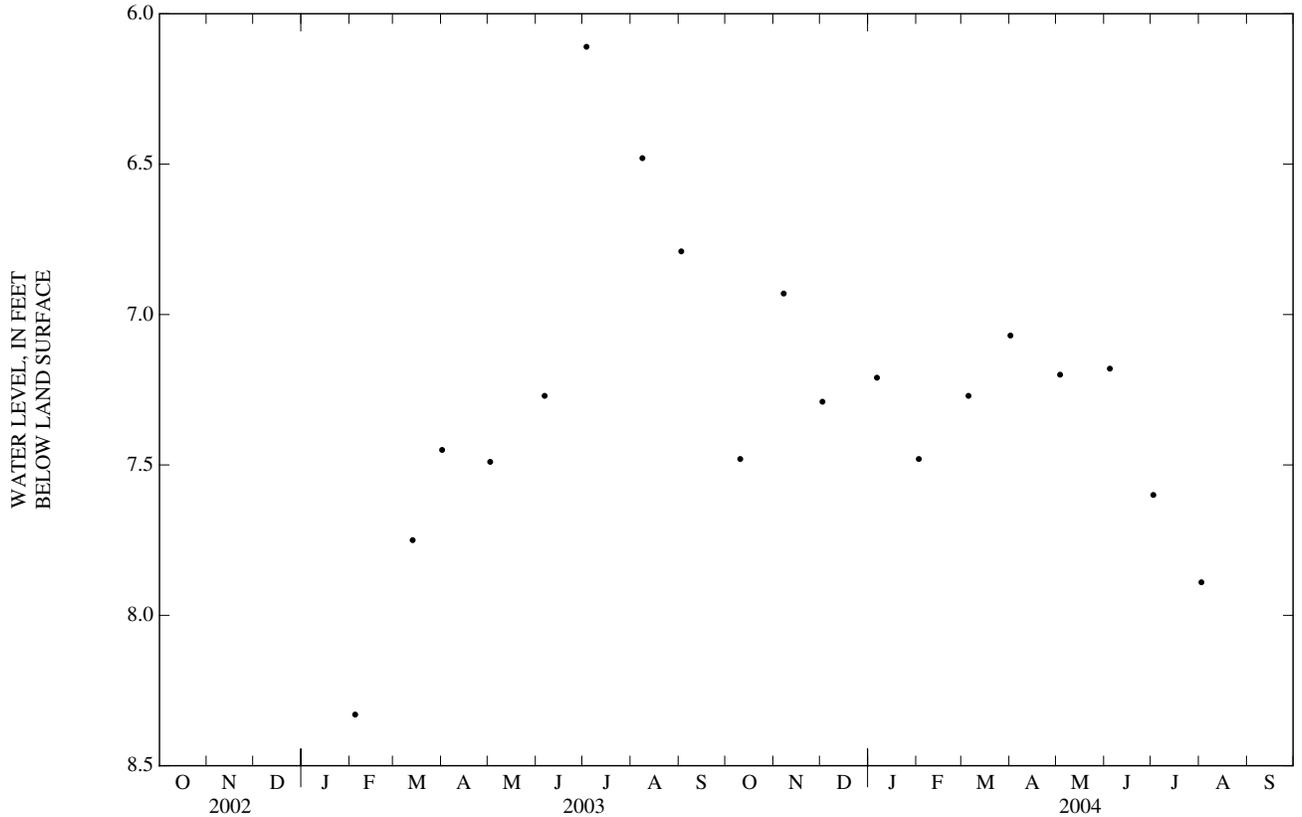
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.11 ft below land-surface datum, July 3, 2003; lowest water level measured 8.33 ft below land-surface datum, Feb. 4, 2003.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 10	7.48	DEC 02	7.29	FEB 02	7.48	APR 01	7.07	JUN 04	7.18	AUG 02	7.89
NOV 07	6.93	JAN 06	7.21	MAR 05	7.27	MAY 03	7.20	JUL 02	7.60		



BUNCOMBE COUNTY—Continued

352856082381201. County number, BU-074; DENR Bent Creek Research Station MW-3S (Regolith well).

LOCATION.--Lat 35°28'57", long 82°38'12", Hydrologic Unit 06010105, 1.2 mi north of Blue Ridge Parkway, 3.1 mi west of Brevard Road in Bent Creek Research Forest. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 30 ft, diameter 4 in., cased to 15 ft, screened interval from 15 ft to 30 ft, sand filter packed from 13 ft to 25 ft, natural fill from 25 ft to 30 ft.

INSTRUMENTATION.--Measured periodically with steel tape.

DATUM.--Land-surface datum is 2,210.12 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.82 ft above land-surface datum.

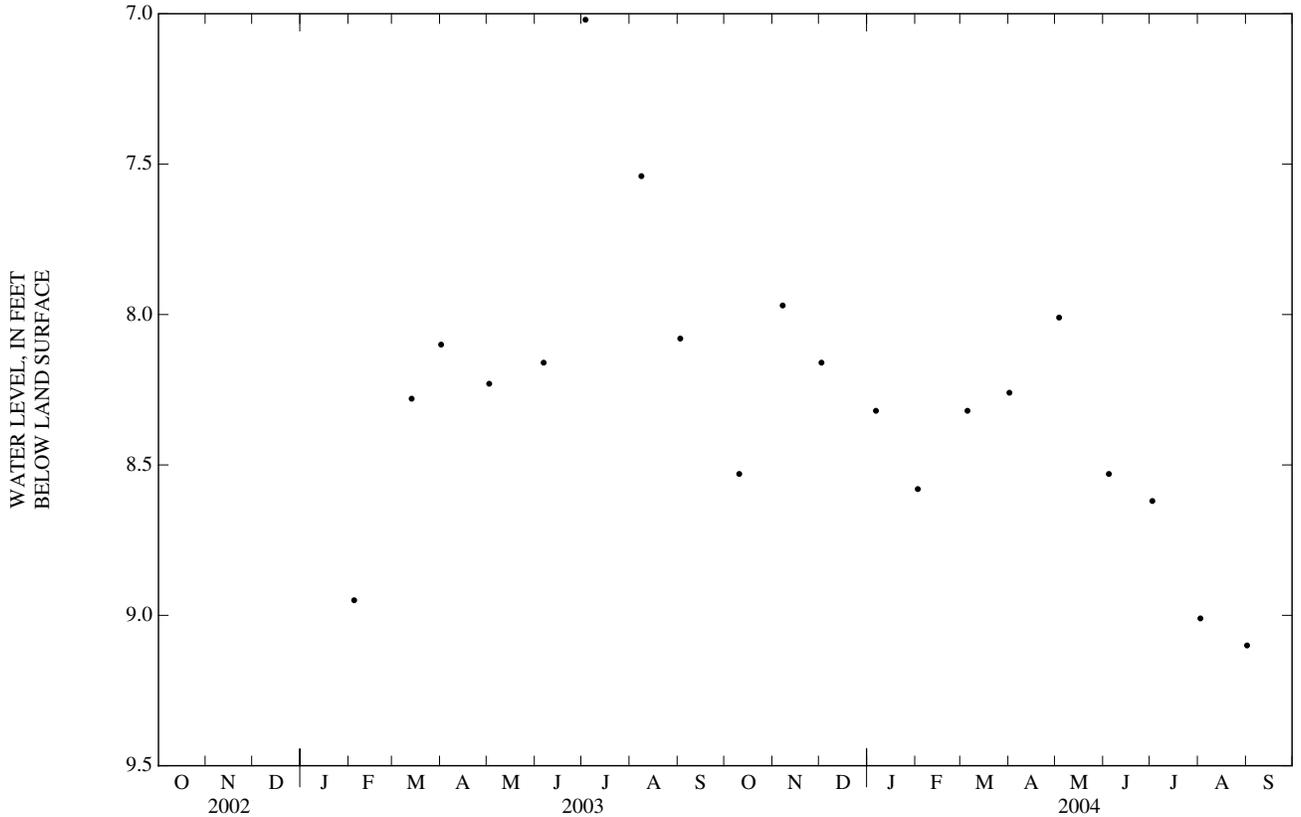
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.02 ft below land-surface datum, July 3, 2003; lowest water level measured 9.10 ft below land-surface datum, Sept. 1, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 10	8.53	DEC 02	8.16	FEB 02	8.58	APR 01	8.26	JUN 04	8.53	AUG 02	9.01
NOV 07	7.97	JAN 06	8.32	MAR 05	8.32	MAY 03	8.01	JUL 02	8.62	SEP 01	9.10



GROUND-WATER LEVELS

BUNCOMBE COUNTY—Continued

352856082381202. County number, BU-075; DENR Bent Creek Research Station MW-3I (Transition Zone well).

LOCATION.--Lat 35°28'57", long 82°38'12", Hydrologic Unit 06010105, 1.2 mi north of Blue Ridge Parkway, 3.1 mi west of Brevard Road in Bent Creek Research Forest. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 50 ft, diameter 4 in., cased to 35 ft, screened interval from 35 ft to 50 ft, sand filter packed from 33 ft to 50 ft.

INSTRUMENTATION.--Measured periodically with steel tape.

DATUM.--Land-surface datum is 2,209.45 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 3.06 ft above land-surface datum.

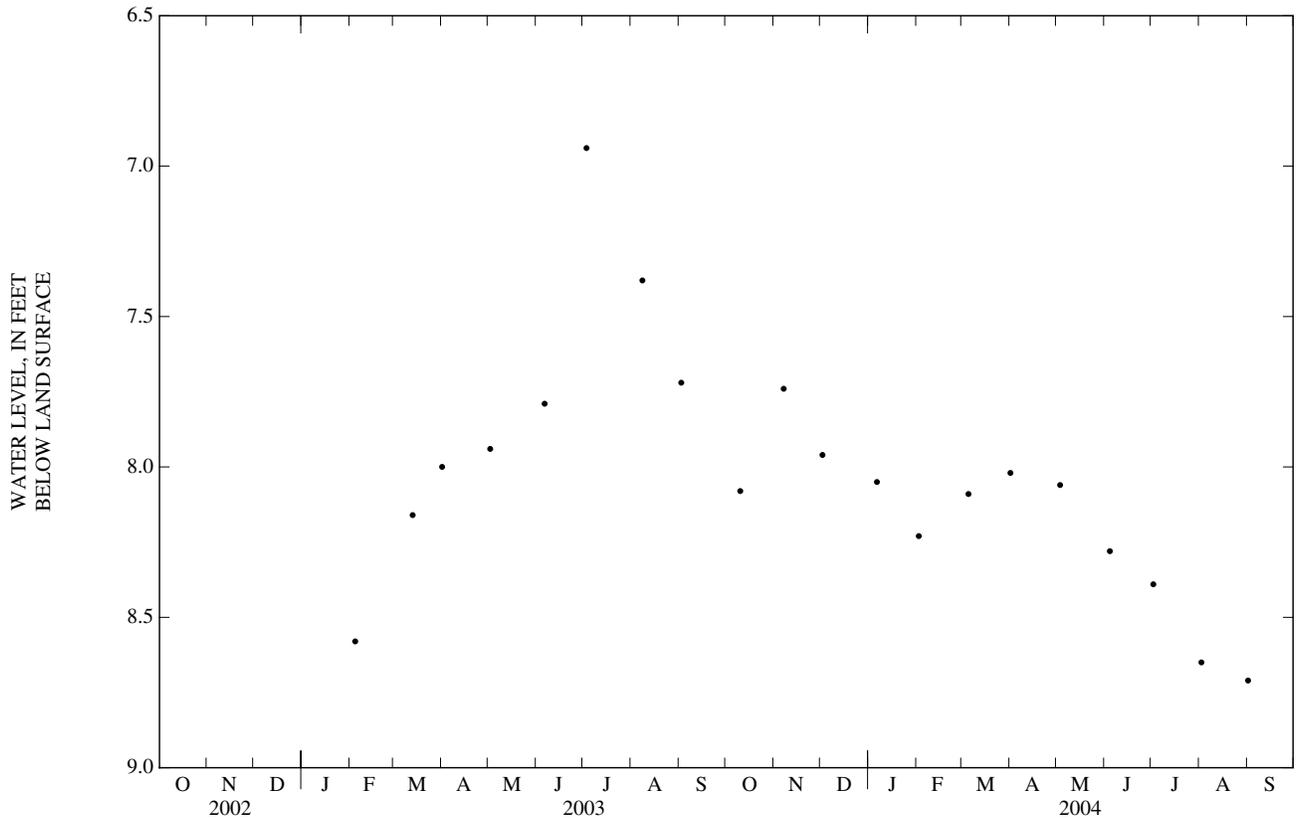
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.94 ft below land-surface datum, July 3, 2003; lowest water level measured 8.71 ft below land-surface datum, Sept. 1, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 10	8.08	DEC 02	7.96	FEB 02	8.23	APR 01	8.02	JUN 04	8.28	AUG 02	8.65
NOV 07	7.74	JAN 06	8.05	MAR 05	8.09	MAY 03	8.06	JUL 02	8.39	SEP 01	8.71



BUNCOMBE COUNTY—Continued

352856082381203. County number, BU-076; DENR Bent Creek Research Station MW-3D (Bedrock well).

LOCATION.--Lat 35°28'57", long 82°38'12", Hydrologic Unit 06010105, 1.2 mi north of Blue Ridge Parkway, 3.1 mi west of Brevard Road in Bent Creek Research Forest. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Biotite Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 300 ft, diameter 6 in., cased to 61 ft, open hole from 61 ft to 300 ft.

INSTRUMENTATION.--Measured periodically with steel tape.

DATUM.--Land-surface datum is 2,209.07 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.74 ft above land-surface datum.

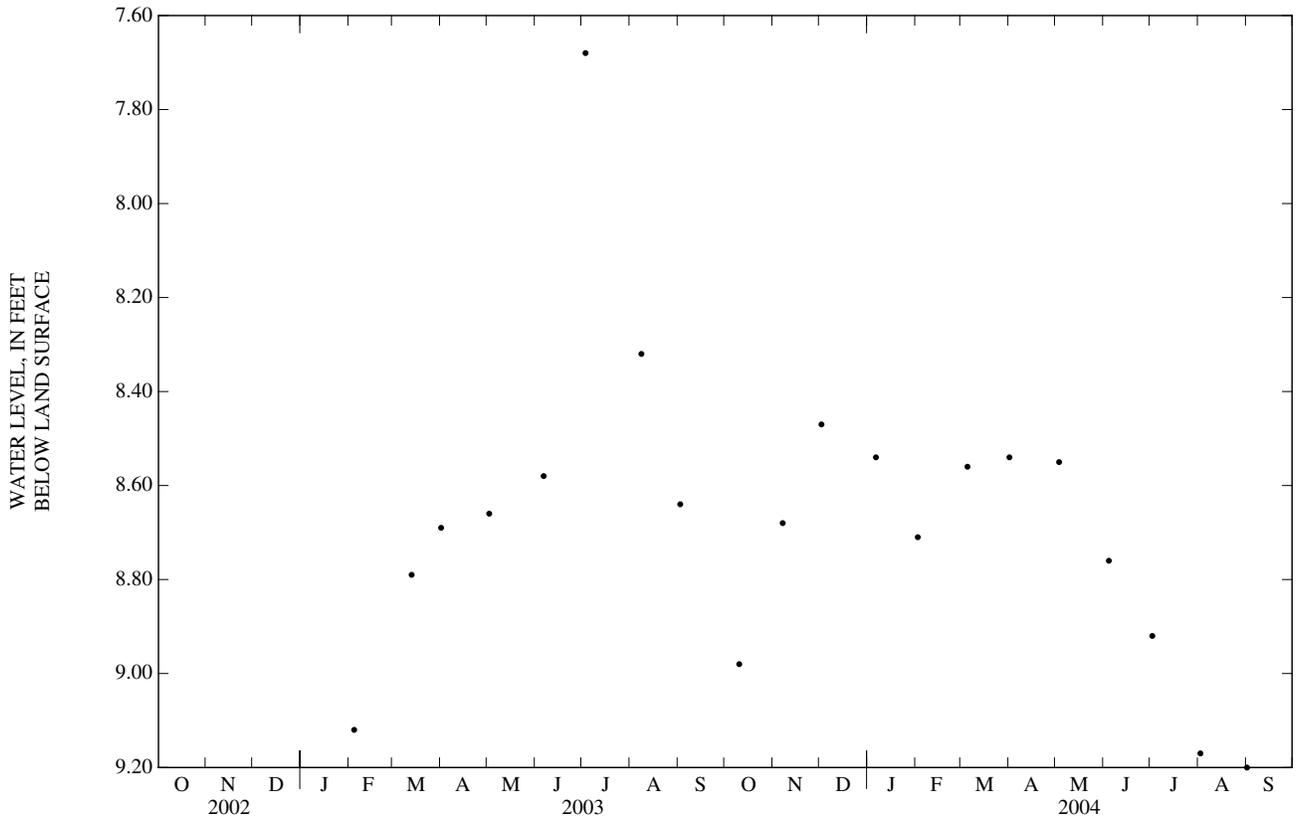
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.68 ft below land-surface datum, July 3, 2003; lowest water level measured 9.20 ft below land-surface datum, Sept. 1, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 10	8.98	DEC 02	8.47	FEB 02	8.71	APR 01	8.54	JUN 04	8.76	AUG 02	9.17
NOV 07	8.68	JAN 06	8.54	MAR 05	8.56	MAY 03	8.55	JUL 02	8.92	SEP 01	9.20



GROUND-WATER LEVELS  
BUNCOMBE COUNTY—Continued

352808082382601. County number, BU-077; DENR Bent Creek Research Station MW-4S (Regolith well).

LOCATION.--Lat 35°28'08", long 82°38'27", Hydrologic Unit 06010105, 1.2 mi north of Blue Ridge Parkway, 3.1 mi west of Brevard Road in Bent Creek Research Forest. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 22 ft, diameter 4 in., cased to 7 ft, screened interval from 7 ft to 22 ft, sand filter packed from 5 ft to 22 ft.

INSTRUMENTATION.--Measured periodically with steel tape.

DATUM.--Land-surface datum is 2,259.66 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 3.12 ft above land-surface datum.

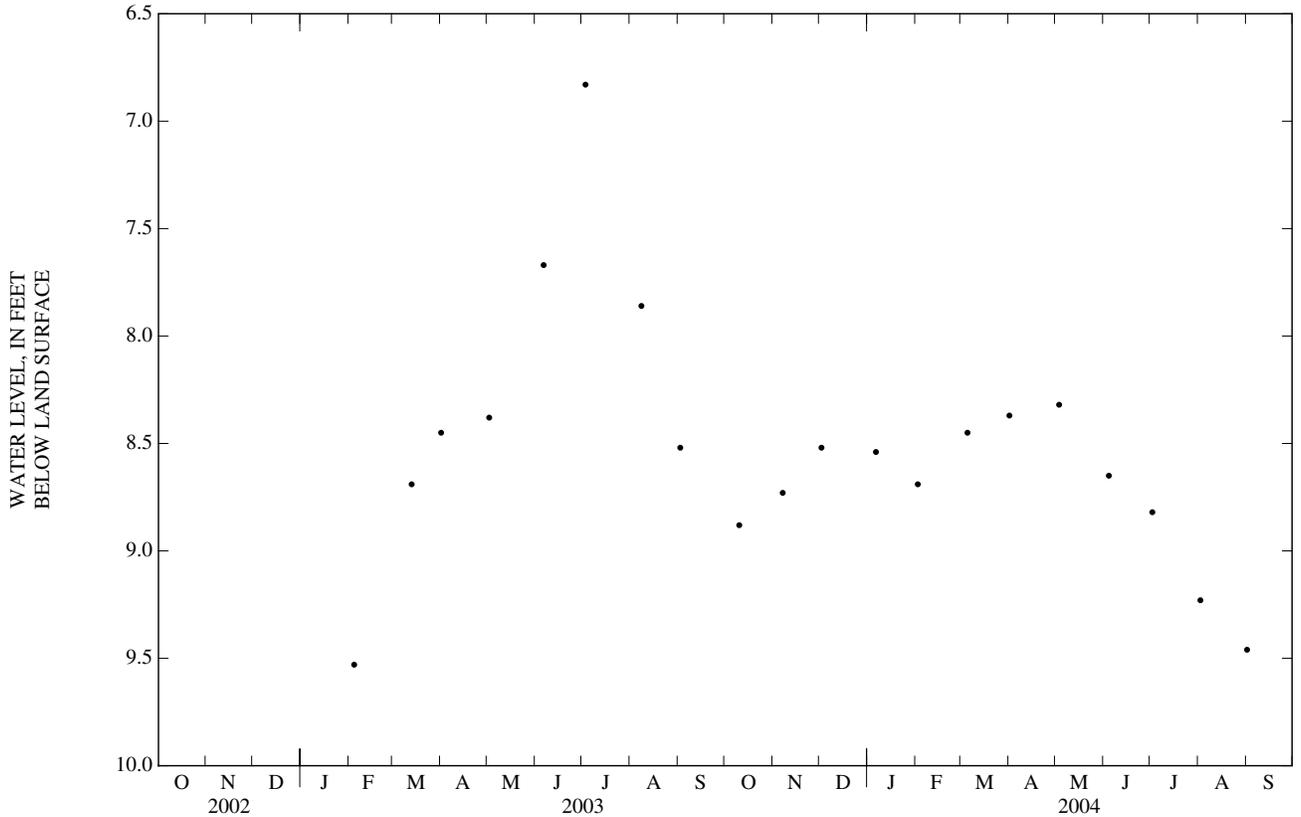
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.83 ft below land-surface datum, July 3, 2003; lowest water level measured 9.53 ft below land-surface datum, Feb. 4, 2003.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 10	8.88	DEC 02	8.52	FEB 02	8.69	APR 01	8.37	JUN 04	8.65	AUG 02	9.23
NOV 07	8.73	JAN 06	8.54	MAR 05	8.45	MAY 03	8.32	JUL 02	8.82	SEP 01	9.46



BUNCOMBE COUNTY—Continued

352808082382602. County number, BU-078; DENR Bent Creek Research Station MW-4I (Transition Zone well).

LOCATION.--Lat 35°28'08", long 82°38'26", Hydrologic Unit 06010105, 1.2 mi north of Blue Ridge Parkway, 3.1 mi west of Brevard Road in Bent Creek Research Forest. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 41 ft, diameter 4 in., cased to 26 ft, screened interval from 26 ft to 41 ft, sand filter packed from 24 ft to 41 ft.

INSTRUMENTATION.--Measured periodically with steel tape.

DATUM.--Land-surface datum is 2,258.80 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 3.02 ft above land-surface datum.

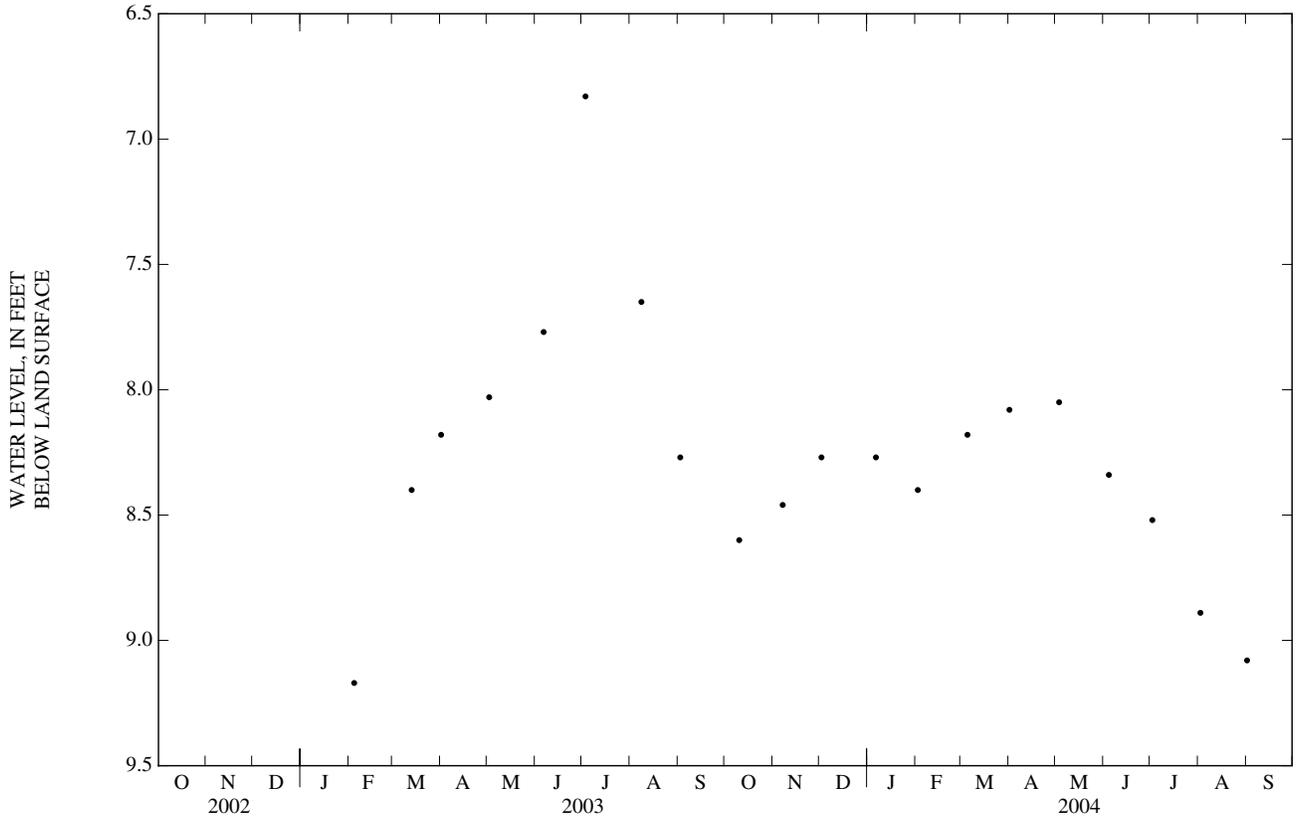
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.83 ft below land-surface datum, July 3, 2003; lowest water level measured 9.17 ft below land-surface datum, Feb. 4, 2003.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 10	8.60	DEC 02	8.27	FEB 02	8.40	APR 01	8.08	JUN 04	8.34	AUG 02	8.89
NOV 07	8.46	JAN 06	8.27	MAR 05	8.18	MAY 03	8.05	JUL 02	8.52	SEP 01	9.08



GROUND-WATER LEVELS  
BUNCOMBE COUNTY—Continued

352808082382603. County number, BU-079; DENR Bent Creek Research Station MW-4D (Bedrock well).

LOCATION.--Lat 35°28'08", long 82°38'26", Hydrologic Unit 06010105, 1.2 mi north of Blue Ridge Parkway, 3.1 mi west of Brevard Road in Bent Creek Research Forest. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Biotite Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 501 ft, diameter 6 in., cased to 61 ft, open hole from 61 ft to 501 ft.

INSTRUMENTATION.--Measured periodically with steel tape.

DATUM.--Land-surface datum is 2,258.53 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 3.02 ft above land-surface datum.

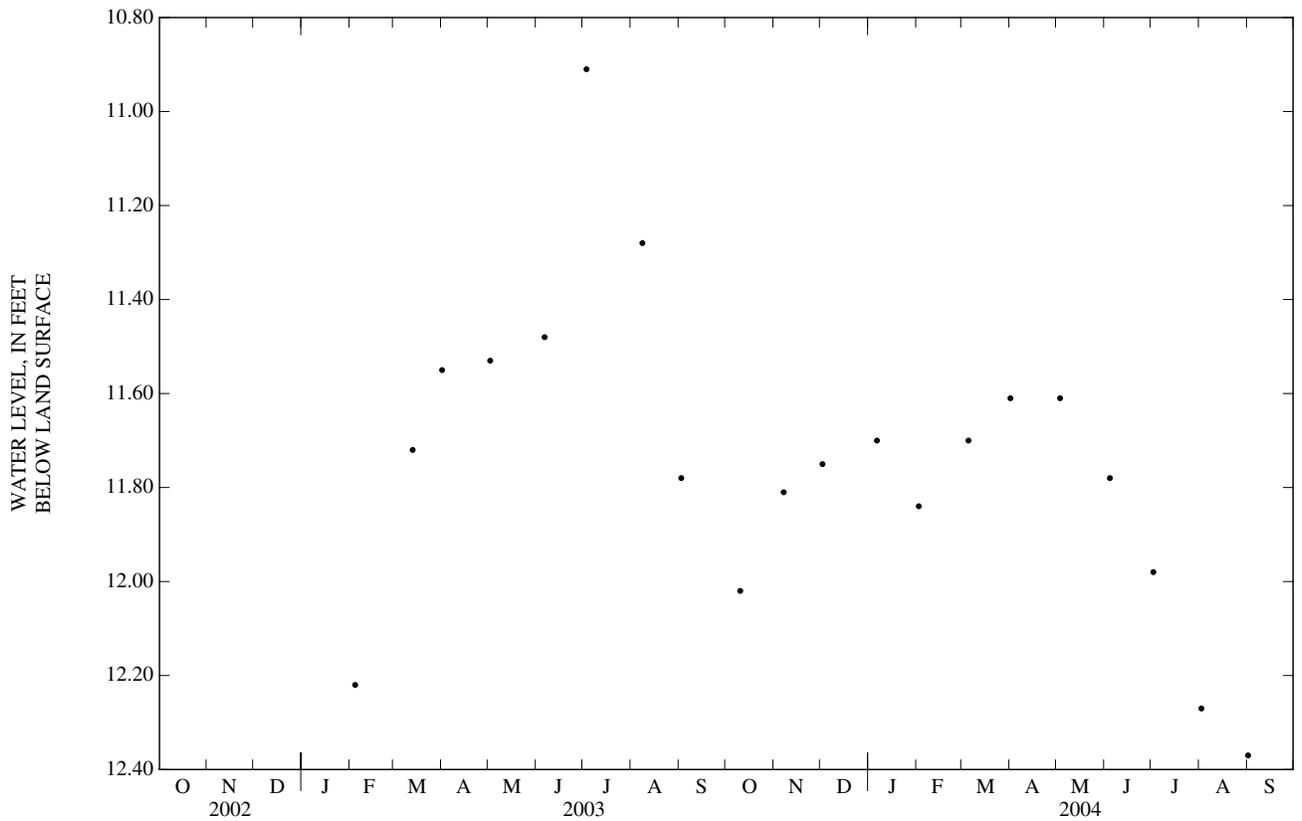
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.91 ft below land-surface datum, July 3, 2003; lowest water level measured 12.37 ft below land-surface datum, Sept. 1, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 10	12.02	DEC 02	11.75	FEB 02	11.84	APR 01	11.61	JUN 04	11.78	AUG 02	12.27
NOV 07	11.81	JAN 06	11.70	MAR 05	11.70	MAY 03	11.61	JUL 02	11.98	SEP 01	12.37



BUNCOMBE COUNTY—Continued

352810082383501. County number, BU-080; DENR Bent Creek Research Station MW-5S (Regolith well).

LOCATION.--Lat 35°28'10", long 82°38'35", Hydrologic Unit 06010105, 1.2 mi north of Blue Ridge Parkway, 3.1 mi west of Brevard Road in Bent Creek Research Forest. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 24 ft, diameter 4 in., cased to 9 ft, screened interval from 9 ft to 24 ft, sand filter packed from 7 ft to 9 ft, natural fill from 9 ft to 24 ft.

INSTRUMENTATION.--Measured periodically with steel tape.

DATUM.--Land-surface datum is 2,299.99 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 3.01 ft above land-surface datum.

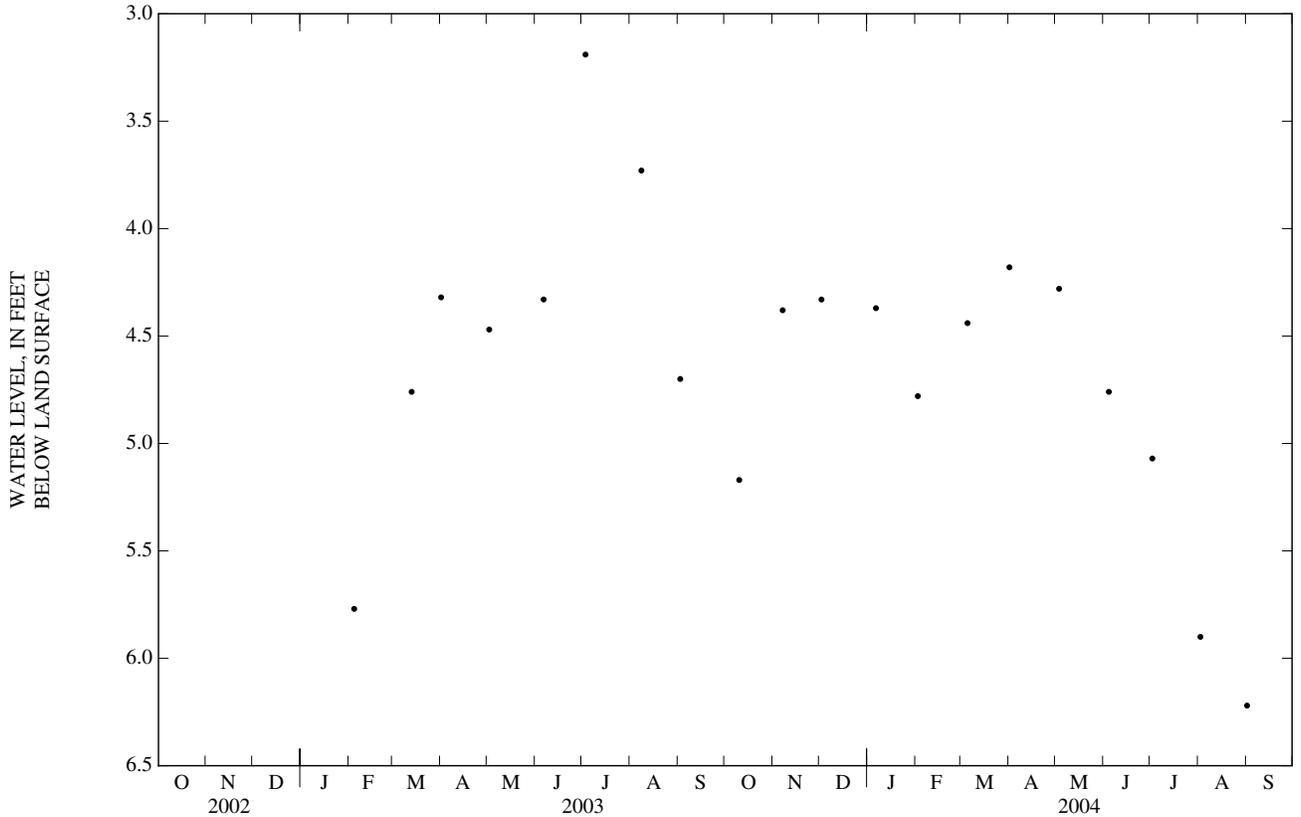
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.19 ft below land-surface datum, July 3, 2003; lowest water level measured 6.22 ft below land-surface datum, Sept. 1, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 10	5.17	DEC 02	4.33	FEB 02	4.78	APR 01	4.18	JUN 04	4.76	AUG 02	5.90
NOV 07	4.38	JAN 06	4.37	MAR 05	4.44	MAY 03	4.28	JUL 02	5.07	SEP 01	6.22



GROUND-WATER LEVELS

BUNCOMBE COUNTY—Continued

352810082383502. County number, BU-081; DENR Bent Creek Research Station MW-5I (Transition Zone well).

LOCATION.--Lat 35°28'11", long 82°38'35", Hydrologic Unit 06010105, 1.2 mi north of Blue Ridge Parkway, 3.1 mi west of Brevard Road in Bent Creek Research Forest. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 47 ft, diameter 4 in., cased to 32 ft, screened interval from 32 ft to 47 ft, sand filter packed from 28 ft to 47 ft.

INSTRUMENTATION.--Measured periodically with steel tape.

DATUM.--Land-surface datum is 2,302.19 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.70 ft above land-surface datum.

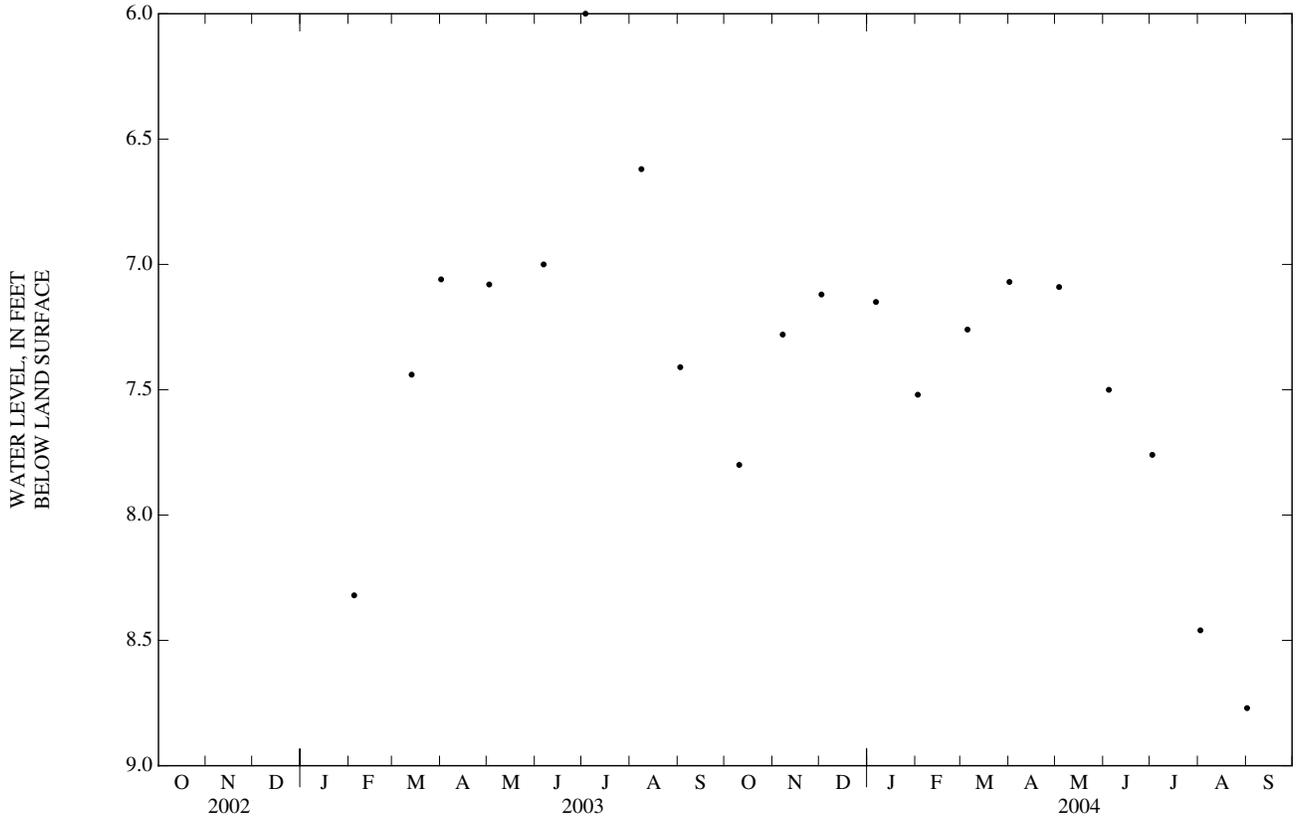
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.00 ft below land-surface datum, July 3, 2003; lowest water level measured 8.77 ft below land-surface datum, Sept. 1, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 10	7.80	DEC 02	7.12	FEB 02	7.52	APR 01	7.07	JUN 04	7.50	AUG 02	8.46
NOV 07	7.28	JAN 06	7.15	MAR 05	7.26	MAY 03	7.09	JUL 02	7.76	SEP 01	8.77



BUNCOMBE COUNTY—Continued

352810082383503. County number, BU-082; DENR Bent Creek Research Station MW-5D (Bedrock well).

LOCATION.--Lat 35°28'10", long 82°38'35", Hydrologic Unit 06010105, 1.2 mi north of Blue Ridge Parkway, 3.1 mi west of Brevard Road in Bent Creek Research Forest. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Biotite Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 300 ft, diameter 6 in., cased to 62 ft, open hole from 62 ft to 300 ft.

INSTRUMENTATION.--Measured periodically with steel tape.

DATUM.--Land-surface datum is 2,304.84 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.58 ft above land-surface datum.

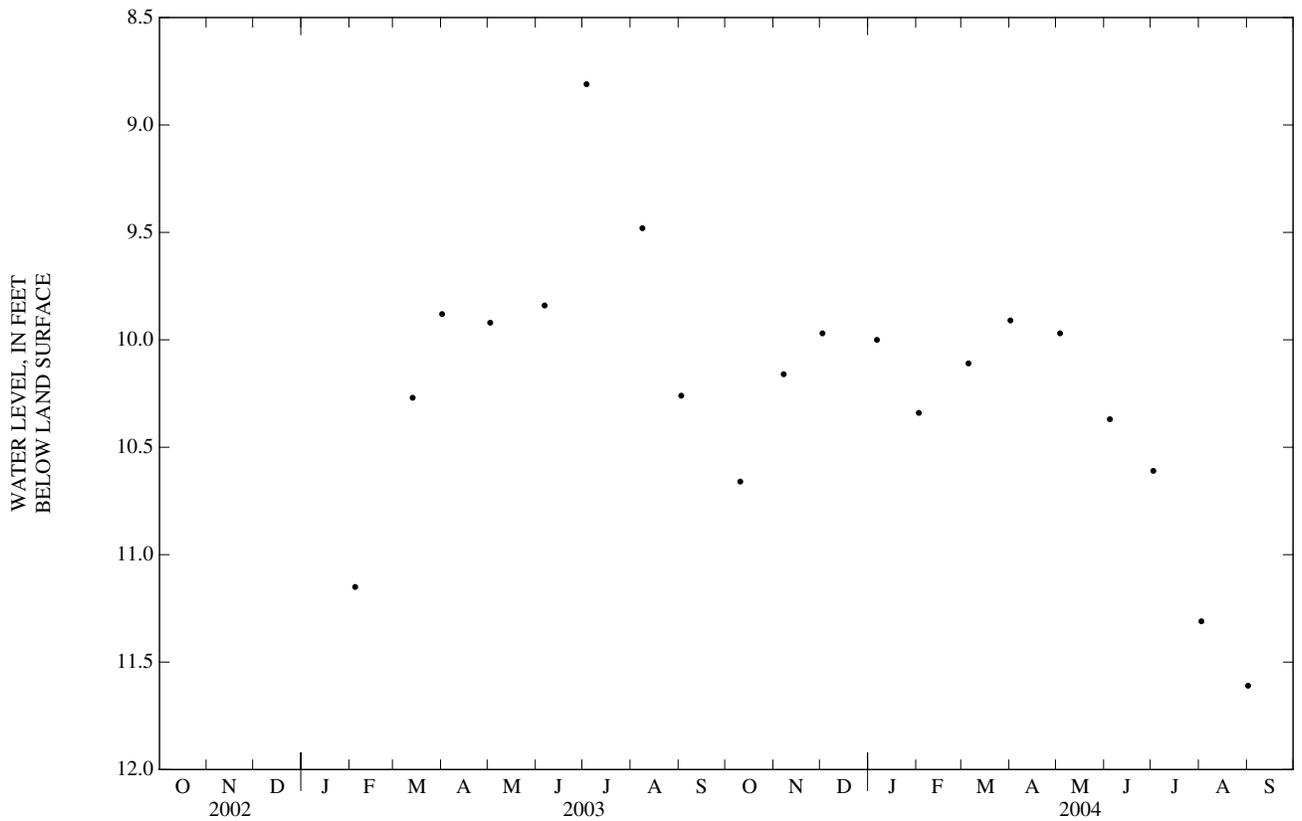
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.81 ft below land-surface datum, July 3, 2003; lowest water level measured 11.61 ft below land-surface datum, Sept. 1, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 10	10.66	DEC 02	9.97	FEB 02	10.34	APR 01	9.91	JUN 04	10.37	AUG 02	11.31
NOV 07	10.16	JAN 06	10.00	MAR 05	10.11	MAY 03	9.97	JUL 02	10.61	SEP 01	11.61



GROUND-WATER LEVELS  
BUNCOMBE COUNTY—Continued

352827082383901. County number, BU-083; DENR Bent Creek Research Station MW-7S (Regolith well).

LOCATION.--Lat 35°28'27", long 82°38'39", Hydrologic Unit 06010105, 1.2 mi north of Blue Ridge Parkway, 3.1 mi west of Brevard Road in Bent Creek Research Forest. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 25 ft, diameter 4 in., cased to 10 ft, screened interval from 10 ft to 25 ft, sand filter packed from 8 ft to 25 ft.

INSTRUMENTATION.--Measured periodically with steel tape.

DATUM.--Land-surface datum is 2,368.23 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.96 ft above land-surface datum.

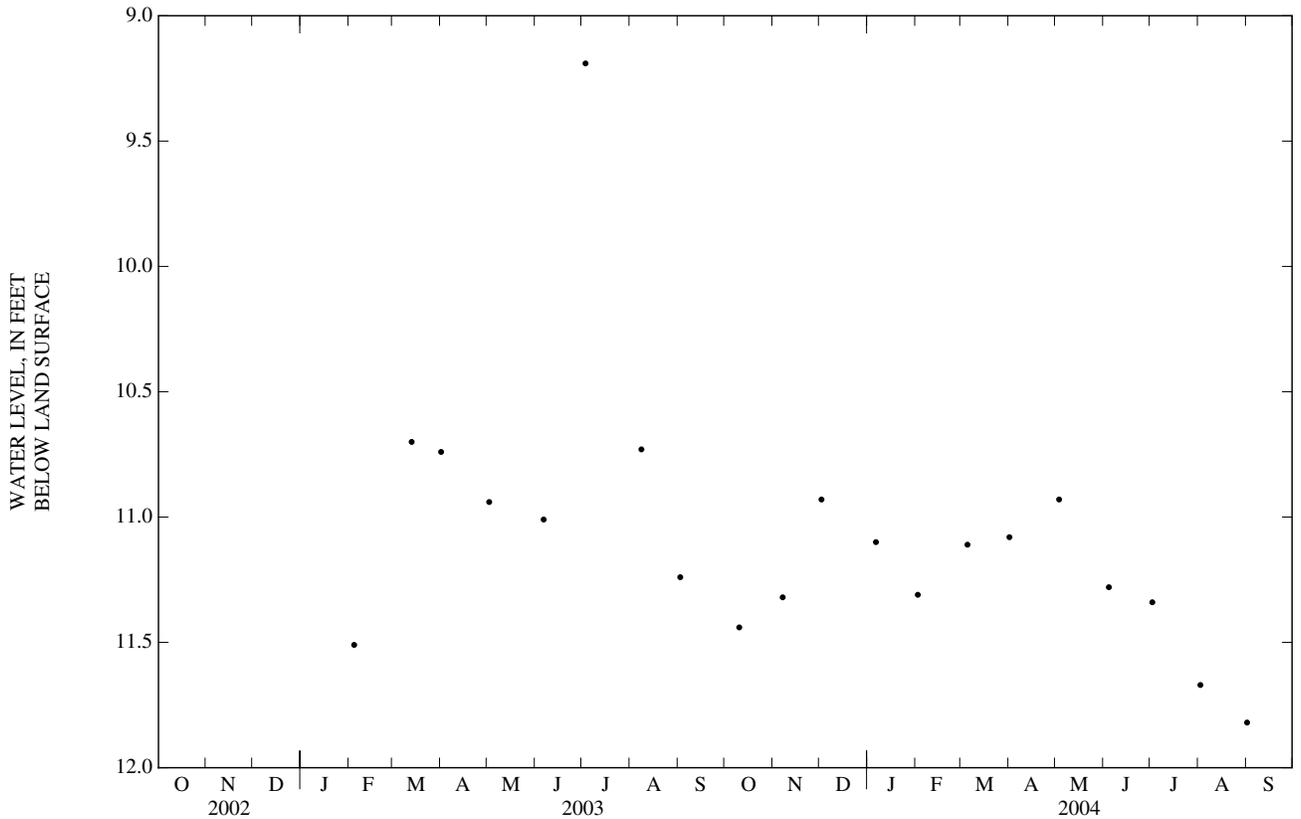
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.19 ft below land-surface datum, July 3, 2003; lowest water level measured 11.82 ft below land-surface datum, Sept. 1, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 10	11.44	DEC 02	10.93	FEB 02	11.31	APR 01	11.08	JUN 04	11.28	AUG 02	11.67
NOV 07	11.32	JAN 06	11.10	MAR 05	11.11	MAY 03	10.93	JUL 02	11.34	SEP 01	11.82



BUNCOMBE COUNTY—Continued

352827082383902. County number, BU-084; DENR Bent Creek Research Station MW-7I (Transition Zone well).

LOCATION.--Lat 35°28'27", long 82°38'39", Hydrologic Unit 06010105, 1.2 mi north of Blue Ridge Parkway, 3.1 mi west of Brevard Road in Bent Creek Research Forest. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 50 ft, diameter 4 in., cased to 30 ft, screened interval from 30 ft to 50 ft, sand filter packed from 27 ft to 45 ft, natural fill from 45 ft to 50 ft.

INSTRUMENTATION.--Measured periodically with steel tape.

DATUM.--Land-surface datum is 2,369.04 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.91 ft above land-surface datum.

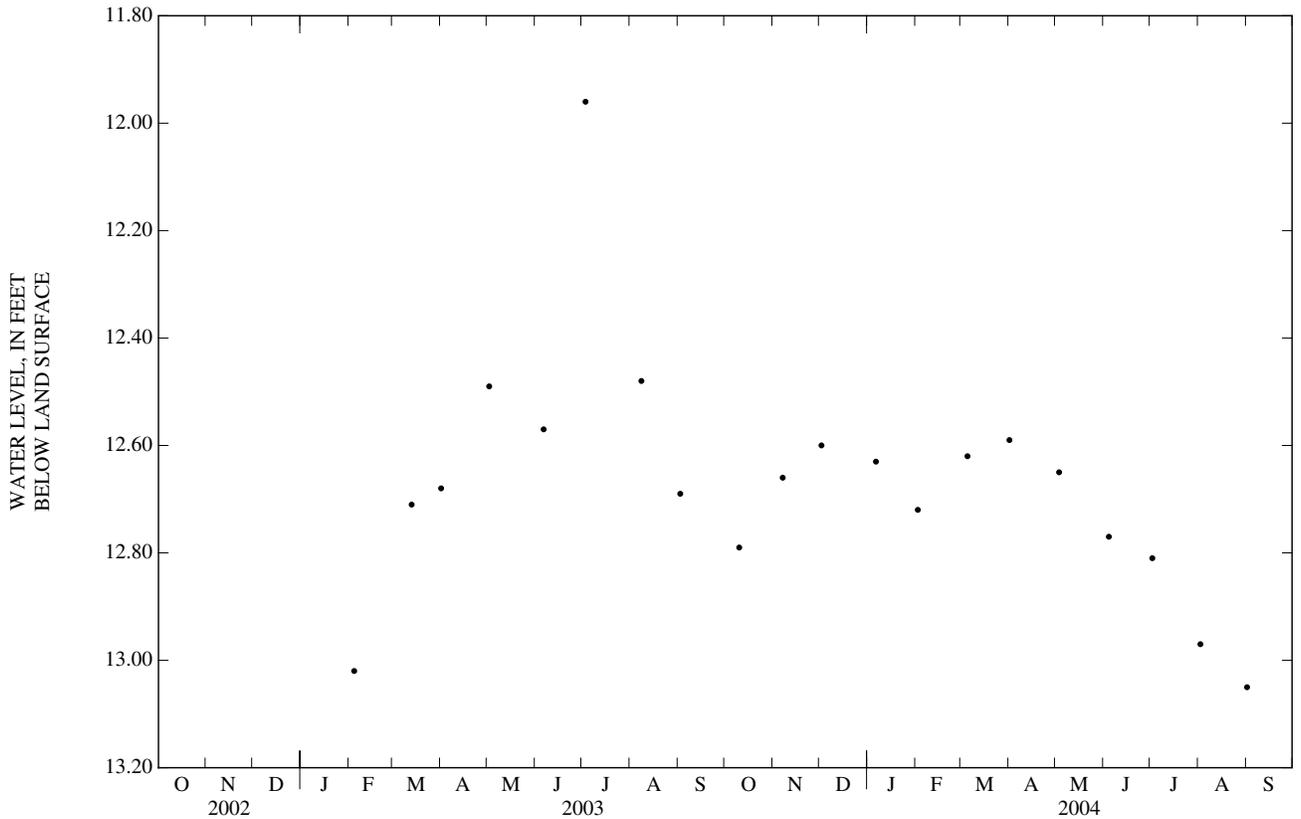
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.96 ft below land-surface datum, July 3, 2003; lowest water level measured 13.05 ft below land-surface datum, Sept. 1, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 10	12.79	DEC 02	12.60	FEB 02	12.72	APR 01	12.59	JUN 04	12.77	AUG 02	12.97
NOV 07	12.66	JAN 06	12.63	MAR 05	12.62	MAY 03	12.65	JUL 02	12.81	SEP 01	13.05



GROUND-WATER LEVELS  
BUNCOMBE COUNTY—Continued

352827082383903. County number, BU-085; DENR Bent Creek Research Station MW-7D (Bedrock well).

LOCATION.--Lat 35°28'27", long 82°38'39", Hydrologic Unit 06010105, 1.2 mi north of Blue Ridge Parkway, 3.1 mi west of Brevard Road in Bent Creek Research Forest. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Biotite Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 285 ft, diameter 6 in., cased to 62 ft, open hole from 62 ft to 285 ft.

INSTRUMENTATION.--Measured periodically with steel tape.

DATUM.--Land-surface datum is 2,369.88 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.93 ft above land-surface datum.

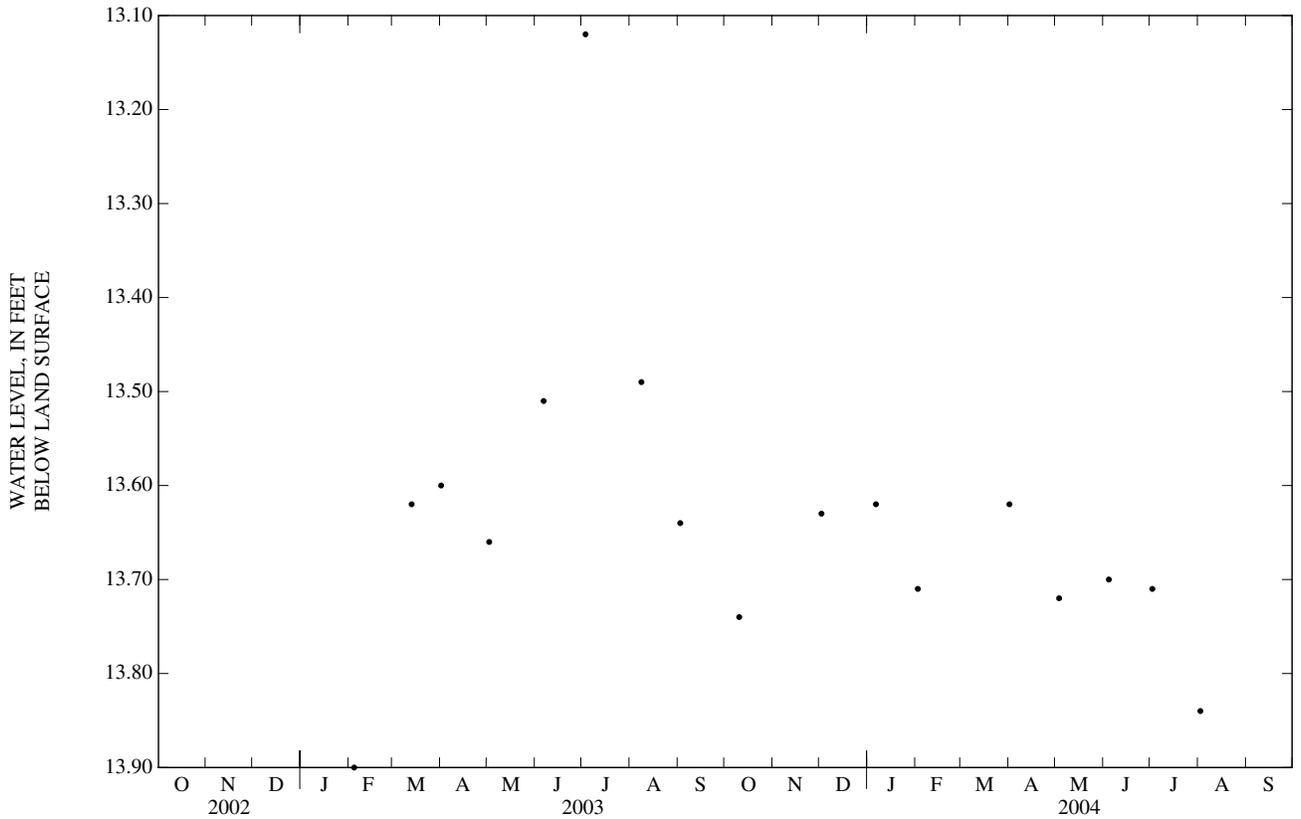
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.12 ft below land-surface datum, July 3, 2003; lowest water level measured 13.90 ft below land-surface datum, Feb. 4, 2003.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

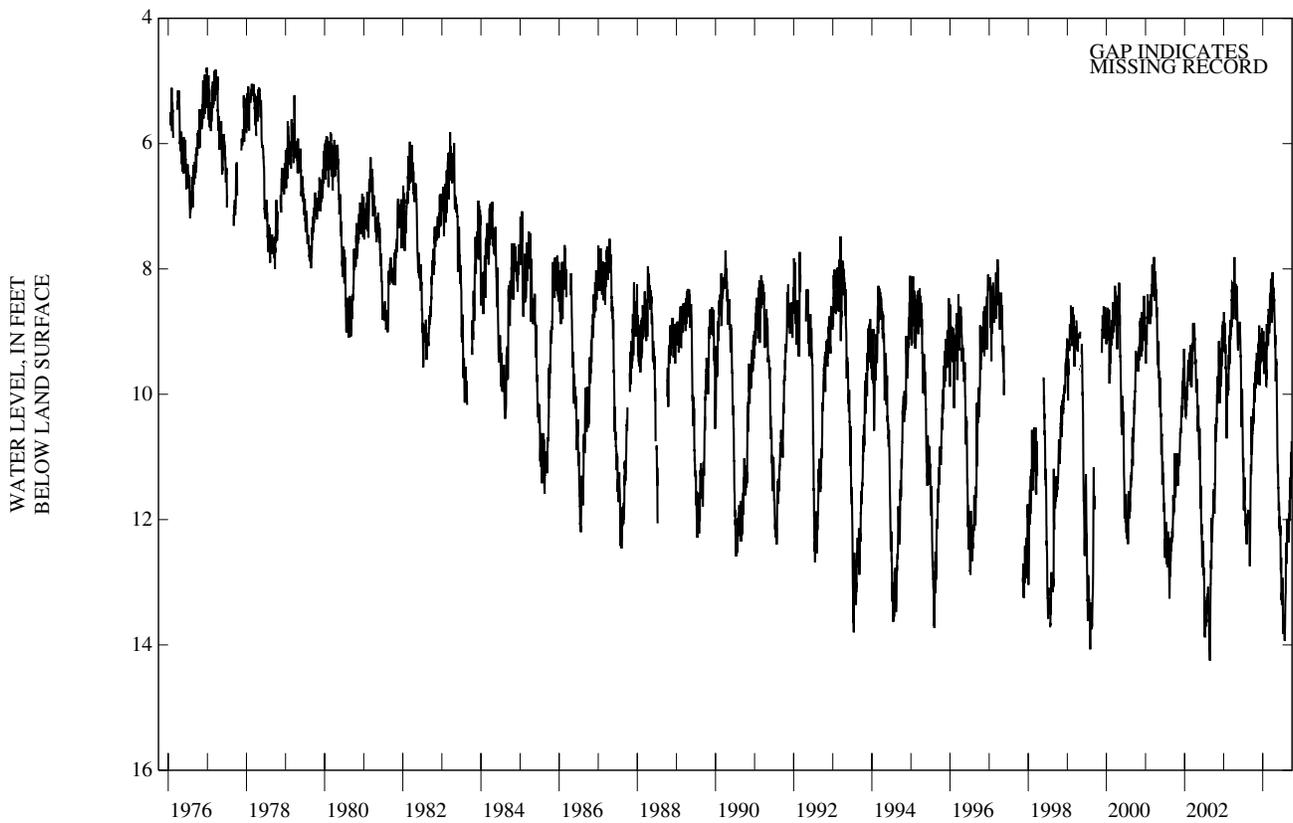
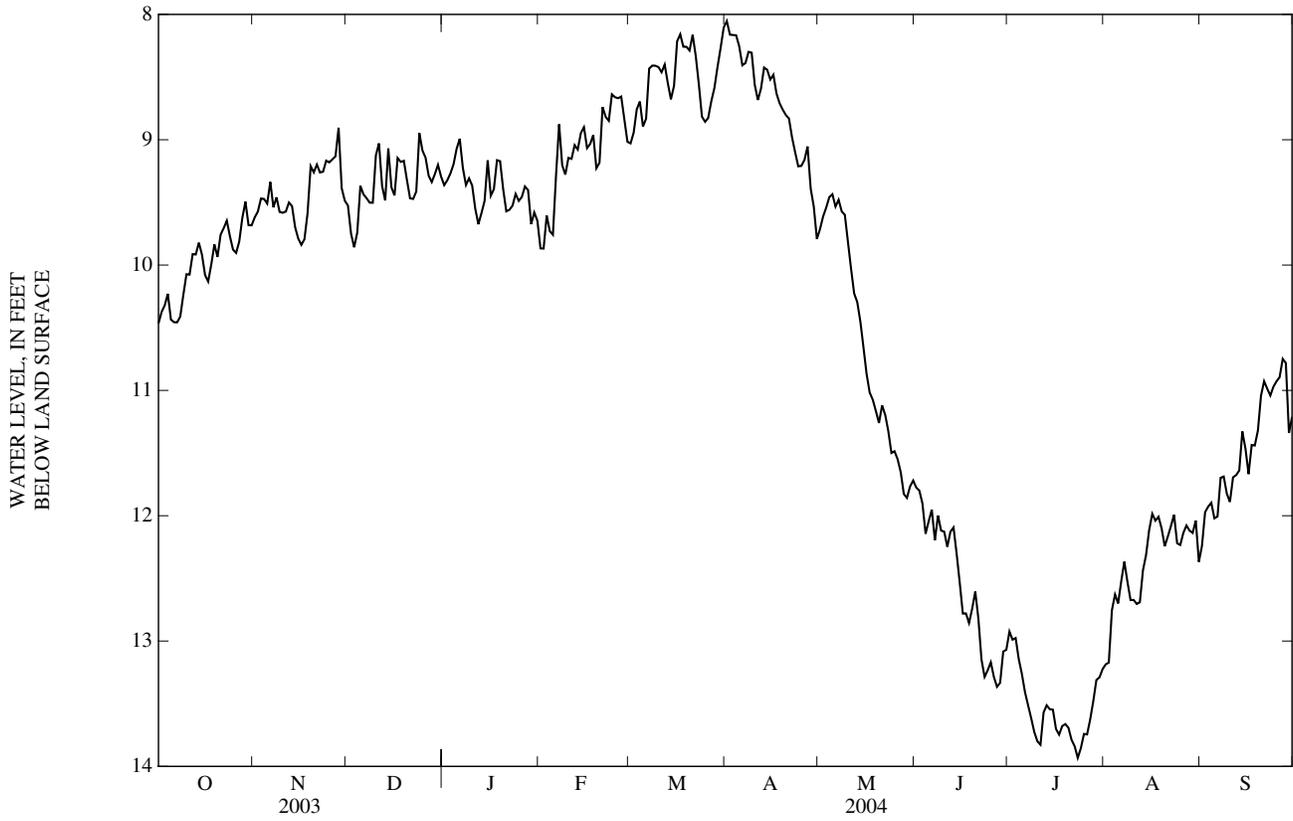
DATE	WATER LEVEL	DATE	WATER LEVEL								
OCT 10	13.74	JAN 06	13.62	APR 01	13.62	JUN 04	13.70	AUG 02	13.84		
DEC 02	13.63	FEB 02	13.71	MAY 03	13.72	JUL 02	13.71				





GROUND-WATER LEVELS  
CARTERET COUNTY—Continued

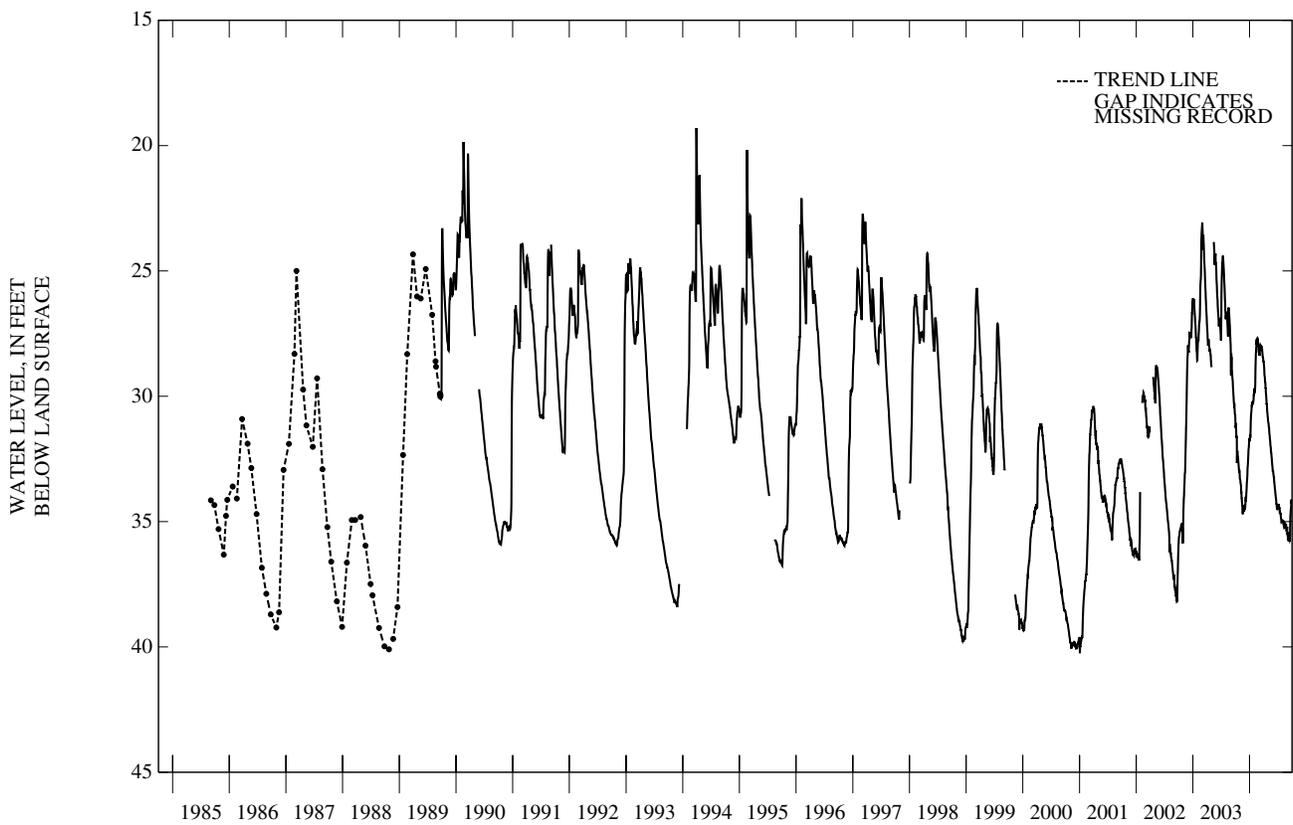
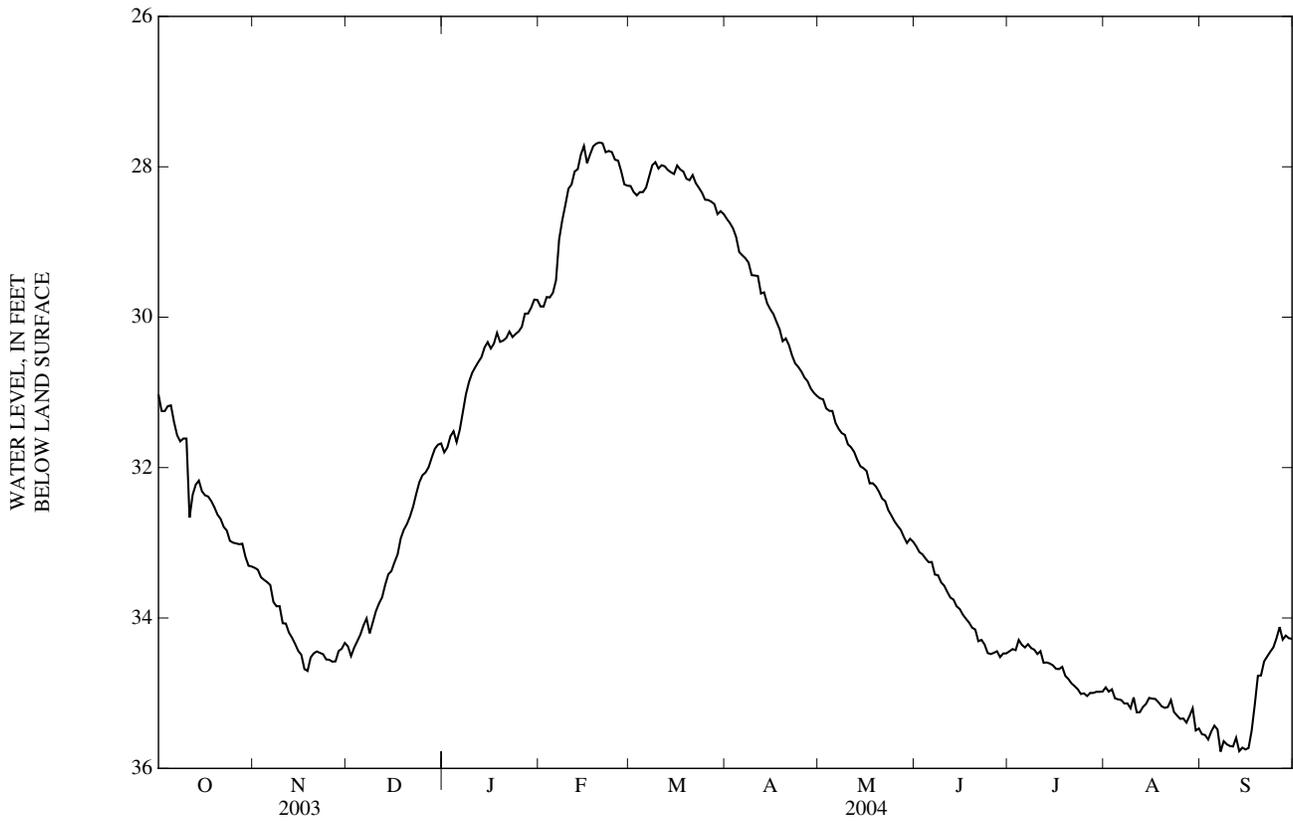
344323076451301. Local number, NC-139; DENR Camp Glenn Research Station well X17j5; County name, CT-153.





GROUND-WATER LEVELS  
CHEROKEE COUNTY—Continued

351117083545001. Local number, NC-191; County number, CE-028.



## GROUND-WATER LEVELS

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## CHEROKEE COUNTY—Continued

351121083545002. Local number, NC-192; County name, CE-029.

LOCATION.--Lat 35°11'21", long 83°54'50", Hydrologic Unit 06020002, 0.7 mi north of Marble, 75 ft west of Secondary Road 1377. Owner: Coats American Company.

AQUIFER.--Saprolite derived from schist of Precambrian age.

WELL CHARACTERISTICS.--Drilled observation well, drilled to 24 ft, diameter 4 in., cased to 14 ft, screened interval from 14 to 24 ft, sand filter pack from 6 to 24 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 1,710 ft above NGVD of 1929 (from topographic map). Measuring point: Three saw cuts in top of casing, 3.35 ft above land-surface datum.

REMARKS.--Well is part of climatic-effects network.

PERIOD OF RECORD.--October 1989 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 0.26 ft above land-surface datum, Feb. 26, 2001; lowest water level recorded, 14.44 ft below land-surface datum, Nov. 4, 5, 6, 1993.

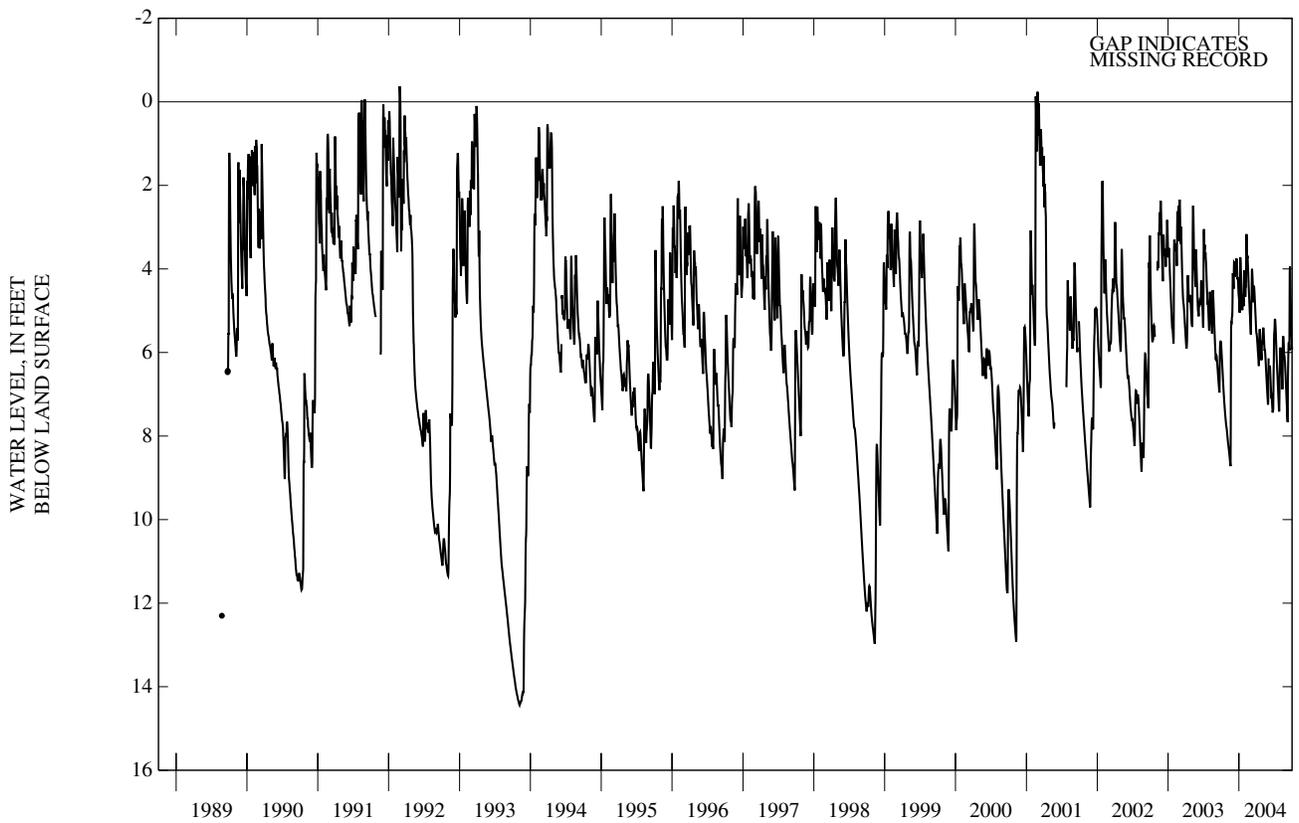
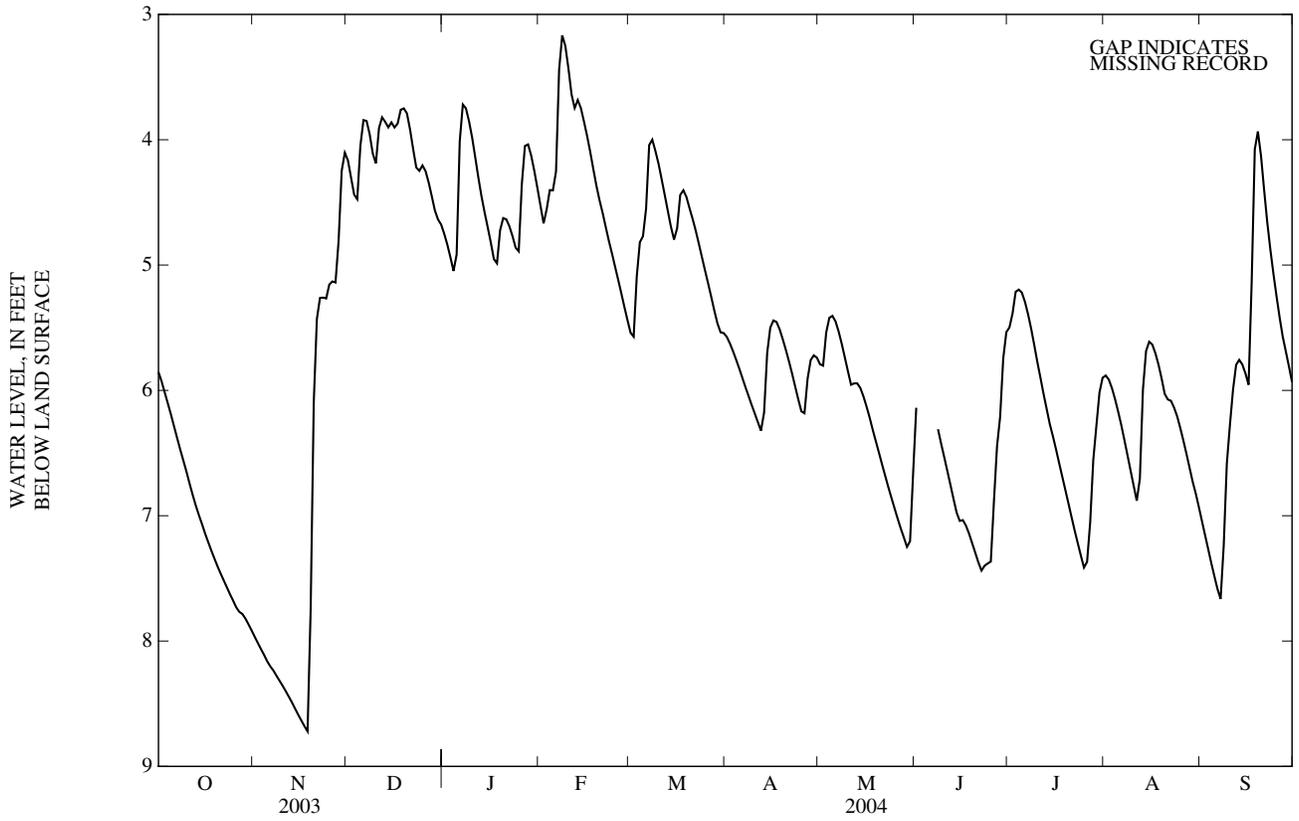
DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.85	7.97	4.16	4.75	4.53	5.54	5.57	5.79	6.14	5.50	5.88	7.04
2	5.93	8.02	4.30	4.84	4.67	5.57	5.63	5.80	---	5.39	5.91	7.16
3	6.02	8.06	4.44	4.94	4.55	5.09	5.69	5.54	---	5.21	5.98	7.27
4	6.10	8.11	4.47	5.05	4.40	4.82	5.76	5.42	---	5.20	6.07	7.38
5	6.19	8.16	4.05	4.92	4.40	4.77	5.83	5.41	---	5.22	6.17	7.48
6	6.29	8.20	3.84	4.01	4.25	4.55	5.90	5.45	---	5.29	6.27	7.59
7	6.38	8.24	3.85	3.72	3.44	4.04	5.97	5.53	---	5.39	6.39	7.66
8	6.47	8.28	3.96	3.75	3.17	4.00	6.04	5.63	6.31	5.51	6.52	7.24
9	6.56	8.32	4.11	3.85	3.25	4.09	6.12	5.74	6.42	5.64	6.64	6.58
10	6.65	8.36	4.19	3.98	3.43	4.19	6.18	5.85	6.53	5.78	6.76	6.28
11	6.74	8.40	3.91	4.14	3.64	4.31	6.25	5.96	6.64	5.90	6.88	5.99
12	6.83	8.45	3.82	4.30	3.75	4.44	6.32	5.94	6.75	6.03	6.71	5.80
13	6.92	8.49	3.86	4.45	3.68	4.57	6.18	5.94	6.87	6.15	5.99	5.76
14	6.99	8.54	3.90	4.58	3.75	4.69	5.70	5.98	6.97	6.27	5.69	5.79
15	7.07	8.59	3.86	4.70	3.85	4.80	5.50	6.05	7.04	6.37	5.61	5.87
16	7.14	8.63	3.90	4.82	3.97	4.71	5.44	6.13	7.04	6.47	5.63	5.95
17	7.21	8.68	3.87	4.95	4.09	4.44	5.45	6.22	7.08	6.58	5.70	5.13
18	7.28	8.72	3.76	4.99	4.23	4.40	5.51	6.32	7.14	6.69	5.79	4.08
19	7.34	7.75	3.75	4.72	4.37	4.46	5.59	6.41	7.22	6.79	5.91	3.93
20	7.40	6.10	3.79	4.62	4.48	4.55	5.68	6.50	7.30	6.90	6.03	4.13
21	7.46	5.43	3.92	4.64	4.58	4.63	5.77	6.59	7.37	7.01	6.07	4.40
22	7.52	5.26	4.07	4.69	4.70	4.73	5.86	6.68	7.44	7.12	6.08	4.66
23	7.57	5.26	4.22	4.77	4.80	4.83	5.97	6.77	7.40	7.22	6.14	4.87
24	7.63	5.27	4.25	4.86	4.91	4.94	6.07	6.86	7.38	7.32	6.21	5.07
25	7.68	5.16	4.21	4.89	5.01	5.04	6.17	6.94	7.37	7.41	6.30	5.25
26	7.73	5.13	4.25	4.35	5.12	5.15	6.18	7.02	6.89	7.37	6.40	5.42
27	7.77	5.14	4.34	4.05	5.22	5.26	5.91	7.10	6.45	7.05	6.51	5.57
28	7.78	4.81	4.45	4.04	5.33	5.37	5.76	7.17	6.21	6.55	6.62	5.69
29	7.82	4.25	4.56	4.13	5.44	5.47	5.72	7.25	5.75	6.28	6.73	5.81
30	7.87	4.10	4.64	4.25	---	5.54	5.74	7.20	5.54	6.02	6.82	5.93
31	7.92	---	4.68	4.38	---	5.54	---	6.66	---	5.90	6.93	---

WTR YR 2004 MEAN 5.75 HIGH 3.17 LOW 8.72

GROUND-WATER LEVELS  
CHEROKEE COUNTY—Continued

351121083545002. Local number, NC-192; County name, CE-029.



## COLUMBUS COUNTY

342508078360802. Local number, NC-179; DENR Carver Moore Research Station well AA39v2; County number, CO-089.

LOCATION.--Lat 34°25'08", long 78°36'09", Hydrologic Unit 03040206, 6.7 mi north of Hallsboro, east of Secondary Road 1001 at abandoned school on Secondary Road 1724. Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Upper Cape Fear aquifer of Late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation well, depth 506 ft, diameter 4 in., screened interval from 496 to 506 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals.

DATUM.--Land-surface datum is 105.53 ft above NGVD of 1929 (levels by DENR). Measuring point: Top of instrument shelf, 2.10 ft above land-surface datum.

REMARKS.--Well is part of areal-effects network.

PERIOD OF RECORD.--September 1975 to current year. Periodic water-level measurements November 1990 to June 2000. Continuous record January 1987 to November 1990, June 2000 to current year. Records from September 1975 to April 1986 are unpublished and available in the files of the Division of Water Quality, DENR.

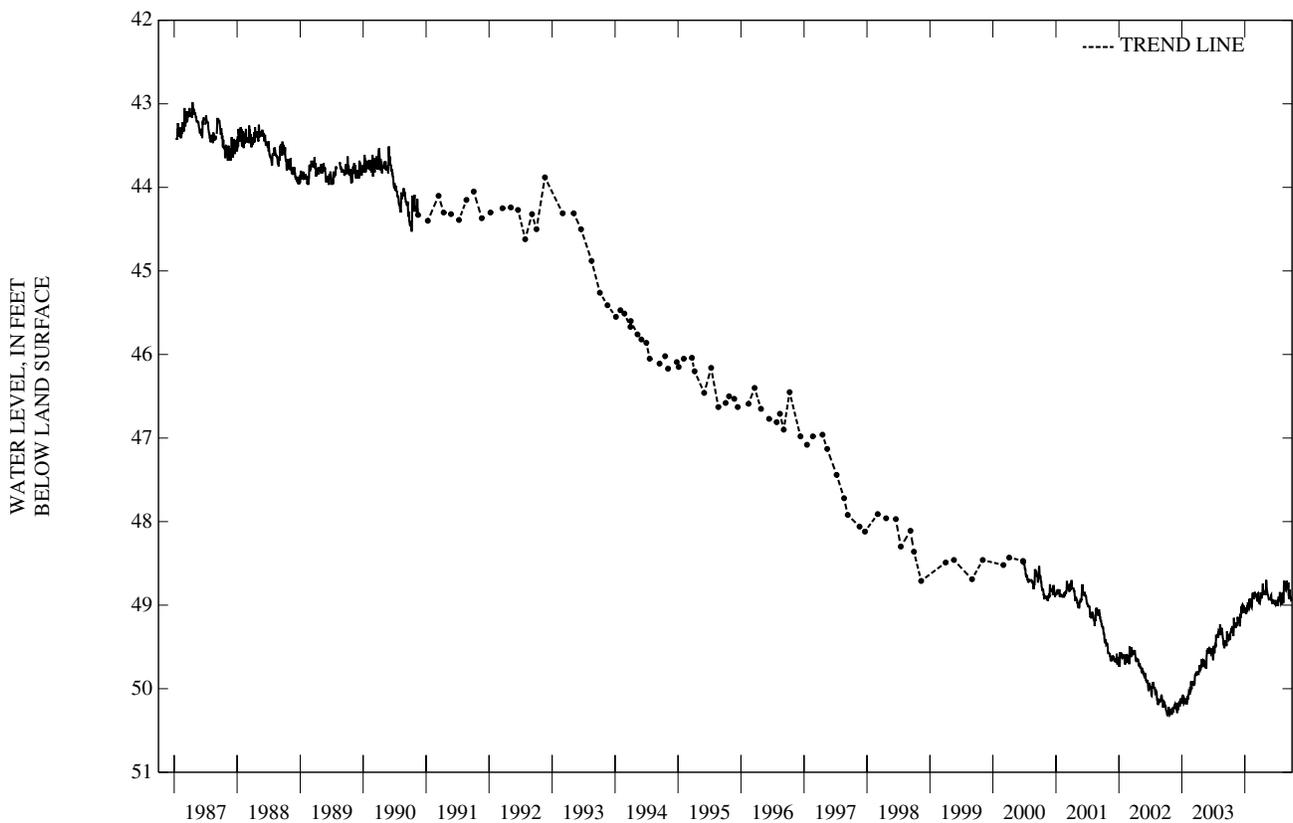
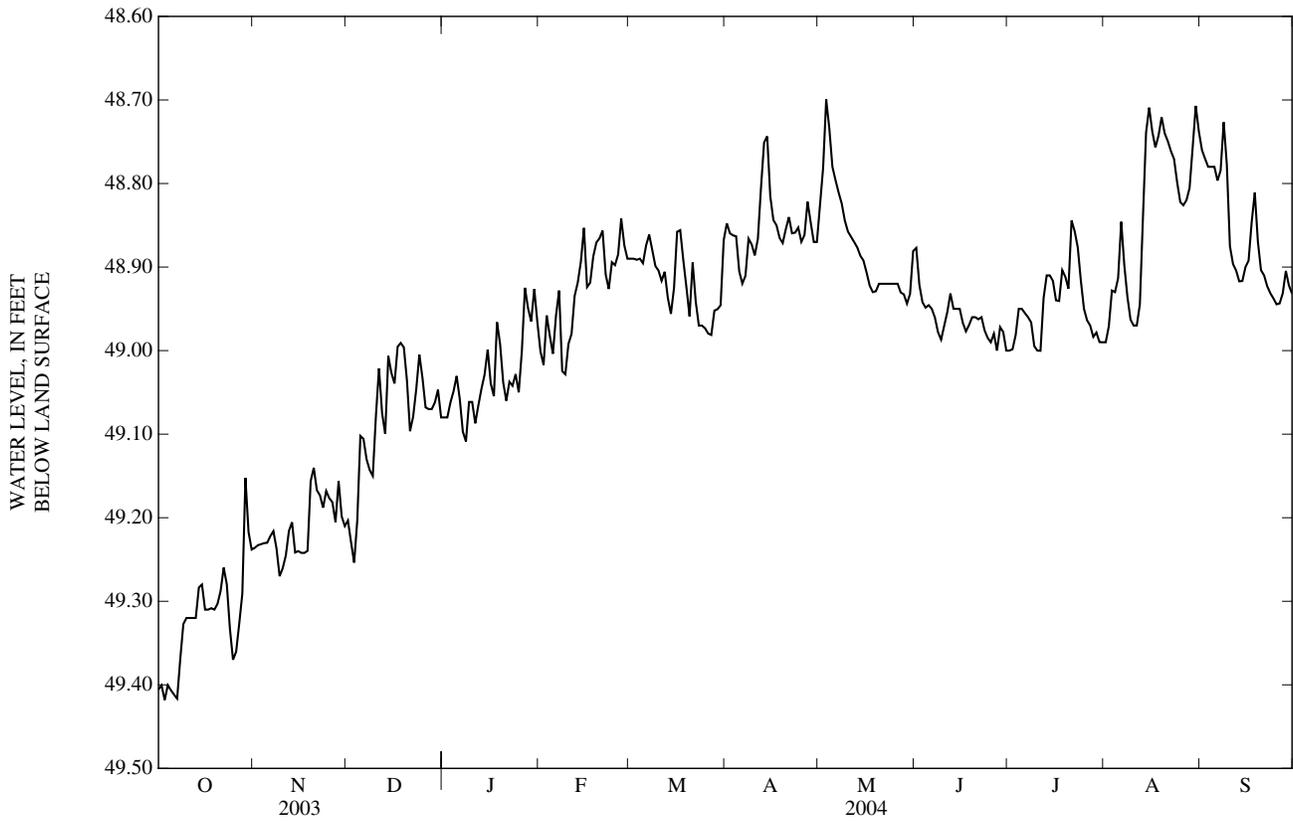
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 39.11 ft below land-surface datum, July 20, 1976; lowest water level recorded, 50.32 ft below land-surface datum, Oct. 8-11, 2002.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	
1	49.41	49.24	49.20	49.08	49.00	48.89	48.85	48.83	48.88	49.00	48.99	48.76	
2	49.40	49.23	49.23	49.08	49.02	48.89	48.86	48.78	48.92	49.00	48.97	48.77	
3	49.42	49.23	49.25	49.06	48.96	48.89	48.86	48.70	48.94	48.98	48.93	48.78	
4	49.40	49.23	49.20	49.05	48.98	48.89	48.86	48.73	48.95	48.95	48.93	48.78	
5	49.41	49.23	49.10	49.03	49.00	48.90	48.91	48.78	48.95	48.95	48.91	48.78	
6	49.41	49.22	49.11	49.06	48.96	48.87	48.92	48.80	48.95	48.96	48.85	48.80	
7	49.42	49.22	49.13	49.10	48.93	48.86	48.91	48.81	48.96	48.96	48.90	48.78	
8	49.37	49.24	49.14	49.11	49.02	48.88	48.87	48.82	48.98	48.97	48.94	48.73	
9	49.33	49.27	49.15	49.06	49.03	48.90	48.87	48.84	48.99	48.99	48.96	48.78	
10	49.32	49.26	49.08	49.06	48.99	48.90	48.89	48.86	48.97	49.00	48.97	48.88	
11	49.32	49.25	49.02	49.09	48.98	48.92	48.87	48.86	48.95	49.00	48.97	48.90	
12	49.32	49.22	49.08	49.07	48.93	48.91	48.81	48.87	48.93	48.94	48.94	48.90	
13	49.32	49.21	49.10	49.05	48.92	48.94	48.75	48.88	48.95	48.91	48.84	48.92	
14	49.28	49.24	49.01	49.03	48.89	48.96	48.74	48.89	48.95	48.91	48.74	48.92	
15	49.28	49.24	49.03	49.00	48.85	48.92	48.82	48.89	48.95	48.92	48.71	48.90	
16	49.31	49.24	49.04	49.04	48.92	48.86	48.84	48.91	48.97	48.94	48.74	48.89	
17	49.31	49.24	49.00	49.05	48.92	48.86	48.85	48.92	48.98	48.94	48.76	48.85	
18	49.31	49.24	48.99	48.97	48.89	48.89	48.87	48.93	48.97	48.90	48.74	48.81	
19	49.31	49.16	49.00	48.99	48.87	48.92	48.87	48.93	48.96	48.91	48.72	48.87	
20	49.30	49.14	49.04	49.04	48.87	48.96	48.85	48.92	48.96	48.93	48.74	48.90	
21	49.29	49.17	49.10	49.06	48.86	48.89	48.84	48.92	48.96	48.84	48.75	48.91	
22	49.26	49.17	49.08	49.04	48.91	48.94	48.86	48.92	48.96	48.86	48.76	48.92	
23	49.28	49.19	49.05	49.04	48.93	48.97	48.86	48.92	48.98	48.88	48.77	48.93	
24	49.33	49.17	49.00	49.03	48.89	48.97	48.85	48.92	48.98	48.92	48.80	48.94	
25	49.37	49.18	49.03	49.05	48.90	48.97	48.87	48.92	48.99	48.95	48.82	48.94	
26	49.36	49.18	49.07	49.00	48.88	48.98	48.86	48.92	48.98	48.96	48.83	48.94	
27	49.33	49.21	49.07	48.92	48.84	48.98	48.82	48.93	49.00	48.97	48.82	48.93	
28	49.29	49.16	49.07	48.95	48.87	48.95	48.85	48.93	48.97	48.98	48.81	48.90	
29	49.15	49.20	49.06	48.97	48.89	48.95	48.87	48.94	48.98	48.98	48.76	48.92	
30	49.22	49.21	49.05	48.93	---	48.95	48.87	48.93	49.00	48.99	48.71	48.93	
31	49.24	---	49.08	48.97	---	48.87	---	48.88	---	48.99	48.74	---	
WTR YR	2004	MEAN	48.99	HIGH	48.70	LOW	49.42						

GROUND-WATER LEVELS  
COLUMBUS COUNTY—Continued

342508078360802. Local number, NC-179; DENR Carver Moore Research Station well AA39v2; County number, CO-089.

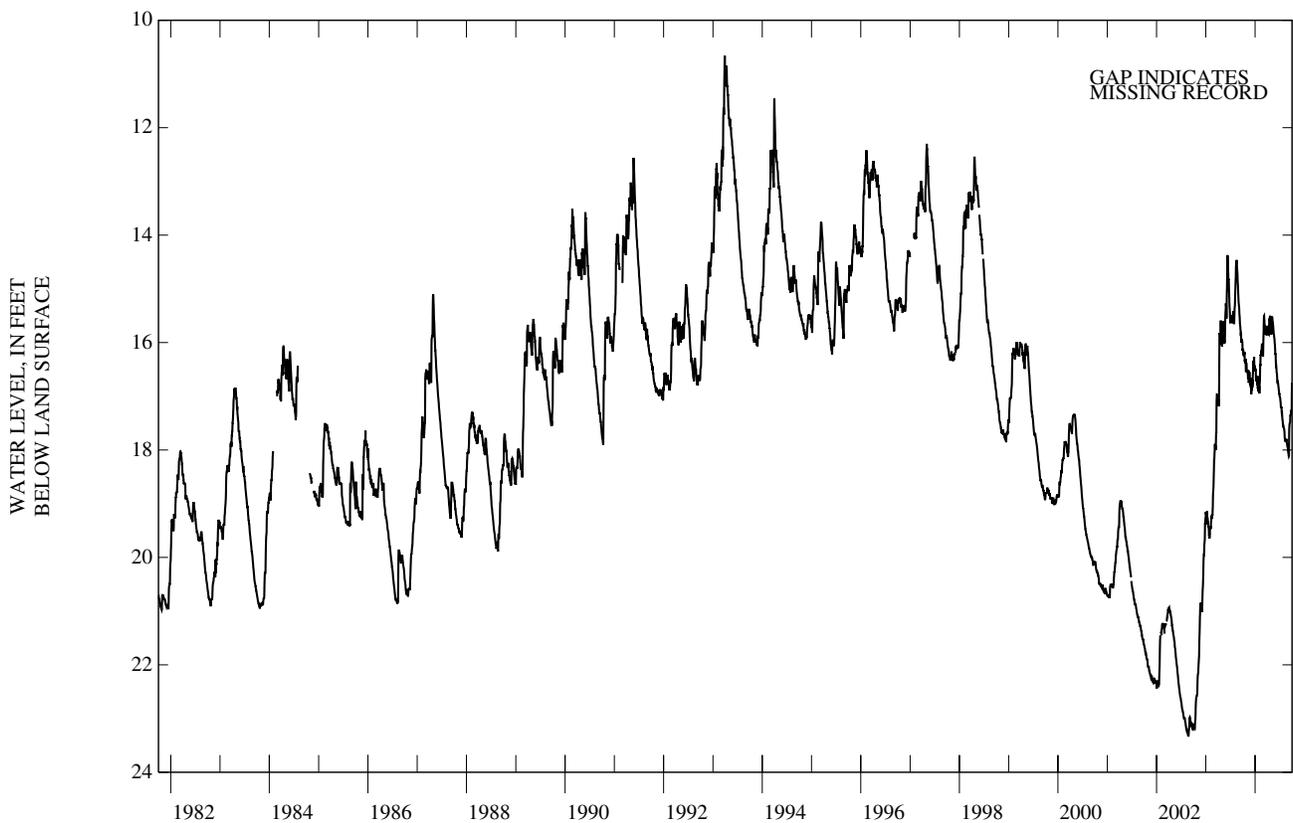
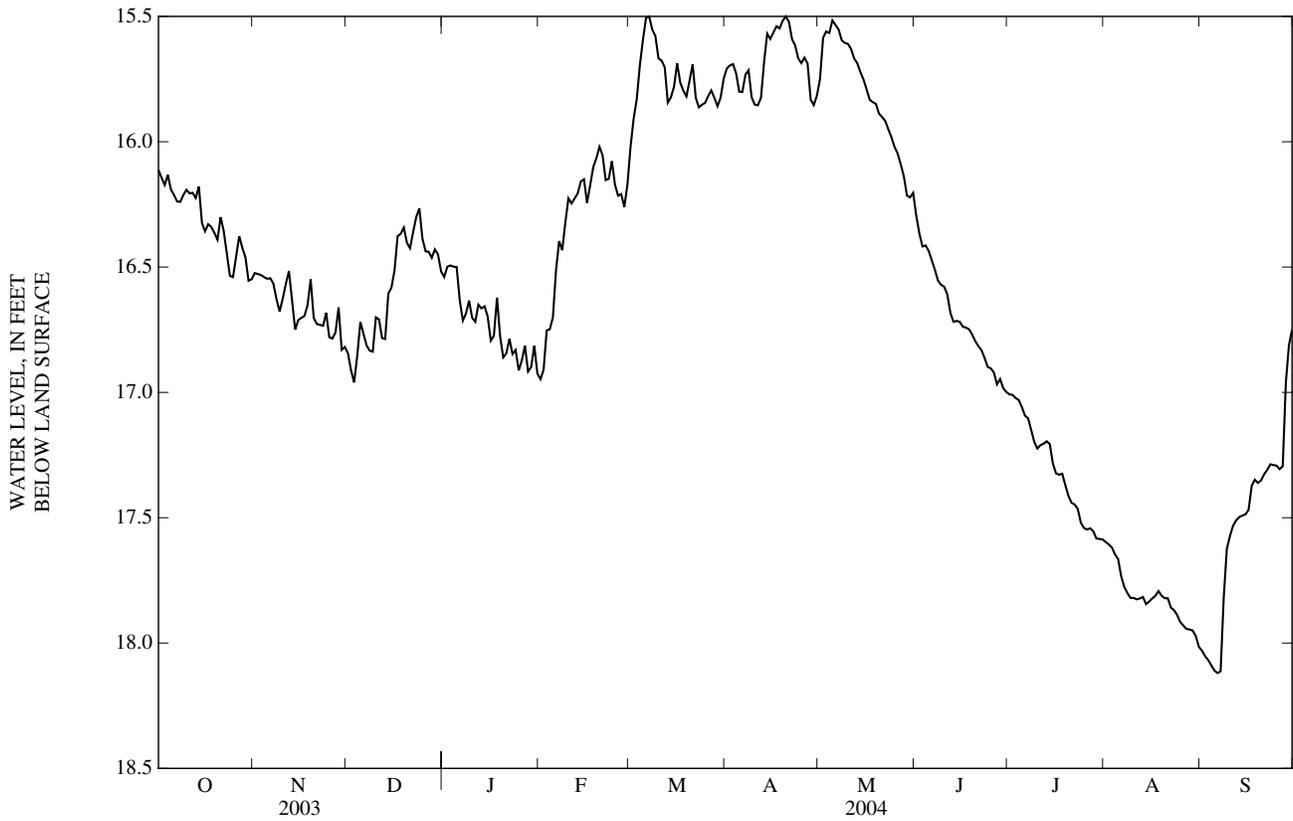




GROUND-WATER LEVELS

DAVIE COUNTY—Continued

355359080331701. Local number, NC-142; County number, DV-025.



345051078012109 DENR Rose Hill Research Station well V32v9; County number, DU-157

PRECIPITATION RECORDS

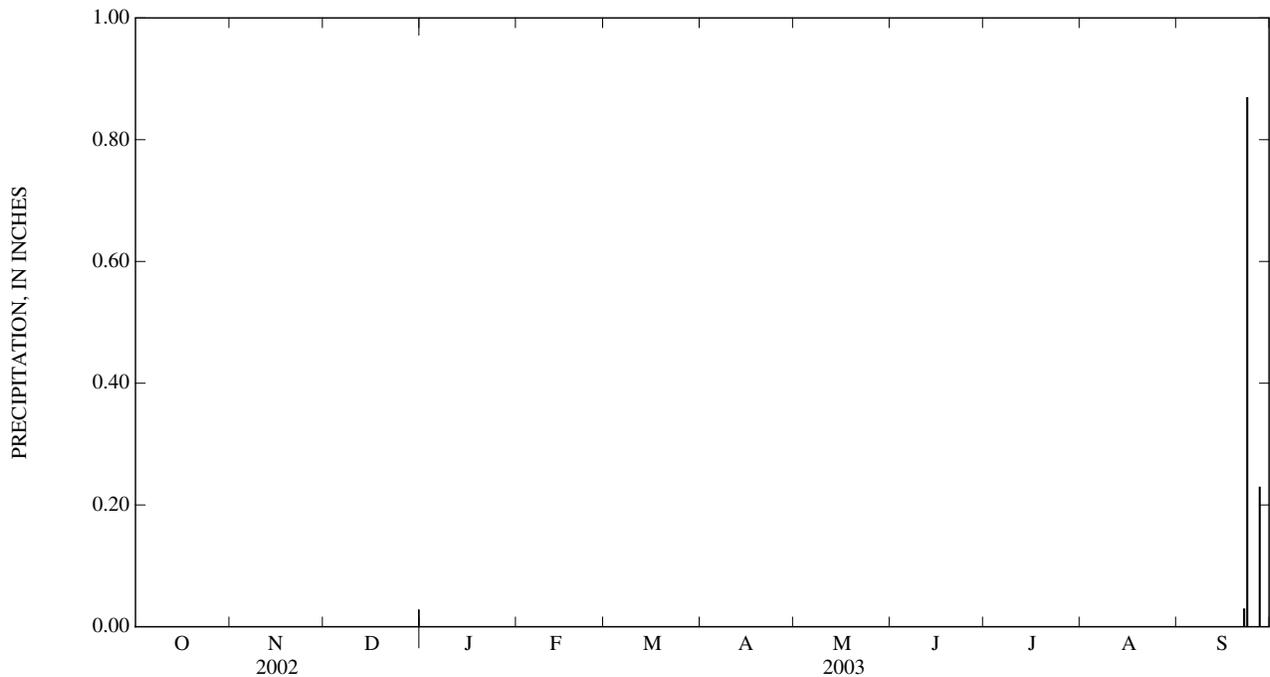
PERIOD OF RECORD.--September 2003 to September 2004.

GAGE.--Tipping-bucket raingage and electronic datalogger.

REMARKS.--Gage is operated as part of a U.S. Geological Survey Ground-water Resources Program recharge study. Precipitation data collected during freezing periods may not be accurately reflected in daily record; consequently, winter record is poor.

PRECIPITATION, TOTAL, INCHES  
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003  
DAILY SUM VALUES

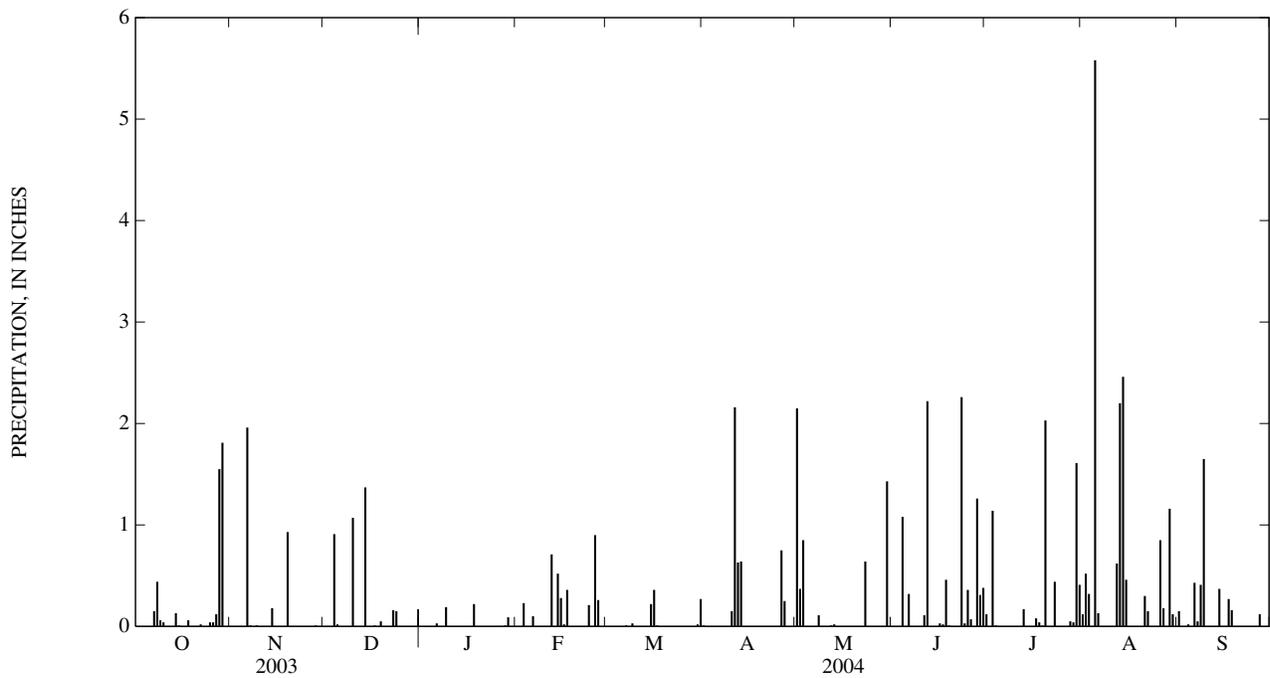
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	0.00
21	---	---	---	---	---	---	---	---	---	---	---	0.00
22	---	---	---	---	---	---	---	---	---	---	---	0.03
23	---	---	---	---	---	---	---	---	---	---	---	0.87
24	---	---	---	---	---	---	---	---	---	---	---	0.00
25	---	---	---	---	---	---	---	---	---	---	---	0.00
26	---	---	---	---	---	---	---	---	---	---	---	0.00
27	---	---	---	---	---	---	---	---	---	---	---	0.23
28	---	---	---	---	---	---	---	---	---	---	---	0.00
29	---	---	---	---	---	---	---	---	---	---	---	0.00
30	---	---	---	---	---	---	---	---	---	---	---	0.00
31	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---



3450510078012109 DENR Rose Hill Research Station well V32v9; County number, DU-157—Continued

PRECIPITATION, TOTAL, INCHES  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	0.00	0.00	0.00	0.00	0.01	2.15	0.00	0.12	0.12	0.15
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.52	0.00
3	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.85	0.00	1.14	0.32	0.00
4	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	1.08	0.01	0.00	0.02
5	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.58	0.00
6	0.00	1.96	0.00	0.03	0.10	0.00	0.00	0.00	0.32	0.00	0.13	0.43
7	0.15	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.05
8	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.41
9	0.06	0.01	0.00	0.19	0.00	0.03	0.00	0.00	0.00	0.00	0.00	1.65
10	0.04	0.00	1.07	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	2.16	0.00	0.11	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.71	0.00	0.63	0.01	2.22	0.00	0.62	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.02	0.00	0.17	2.20	0.00
14	0.13	0.18	1.37	0.00	0.52	0.00	0.00	0.00	0.00	0.00	2.46	0.37
15	0.01	0.00	0.00	0.00	0.28	0.22	0.00	0.00	0.00	0.00	0.46	0.00
16	0.00	0.00	0.00	0.00	0.02	0.36	0.00	0.00	0.03	0.00	0.00	0.00
17	0.00	0.00	0.01	0.00	0.36	0.01	0.00	0.00	0.02	0.08	0.00	0.27
18	0.06	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.46	0.04	0.00	0.16
19	0.00	0.93	0.05	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.03	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00
22	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00
23	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.64	2.26	0.44	0.00	0.00
24	0.00	0.00	0.15	0.00	0.21	0.00	0.00	0.00	0.03	0.00	0.00	0.00
25	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00
26	0.04	0.00	0.00	0.00	0.90	0.00	0.75	0.00	0.07	0.00	0.85	0.00
27	0.12	0.00	0.00	0.00	0.26	0.00	0.25	0.00	0.00	0.00	0.18	0.12
28	1.55	0.01	0.00	0.01	0.00	0.00	0.00	0.00	1.26	0.05	0.00	---
29	1.81	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.31	0.04	1.16	---
30	0.00	0.00	0.00	0.00	---	0.02	0.00	1.43	0.38	1.61	0.12	---
31	0.00	---	0.00	0.00	---	0.27	---	0.00	---	0.41	0.00	---
TOTAL	4.47	3.10	3.74	0.54	3.59	0.92	4.59	5.58	8.92	6.15	15.17	---



## GROUND-WATER LEVELS

115

## DUPLIN COUNTY--Continued

345051078012101. Local number, NC-174; DENR Rose Hill Research Station well V32v1; County number, DU-126.

LOCATION.--Lat 34°50'53.1", long 78°01'15.1", Hydrologic Unit 03030007, 1.5 mi north of Rose Hill at Rose Hill-Magnolia Elementary School, east of U.S. Highway 117 on Secondary Road 1911. Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Peedee aquifer of Late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation well, depth 98 ft, diameter 4 in., screened interval from 83 to 98 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 85.89 ft above NGVD of 1929 (levels by DENR). Measuring point: Top of instrument shelf, 1.75 ft above land-surface datum.

REMARKS.--Well is part of areal-effects network.

PERIOD OF RECORD.--March 1982 to current year. Continuous record began January 1987.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 14.00 ft below land-surface datum, Oct. 8, 1996; lowest water level recorded, 20.22 ft below land-surface datum, Aug. 30, 2002.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

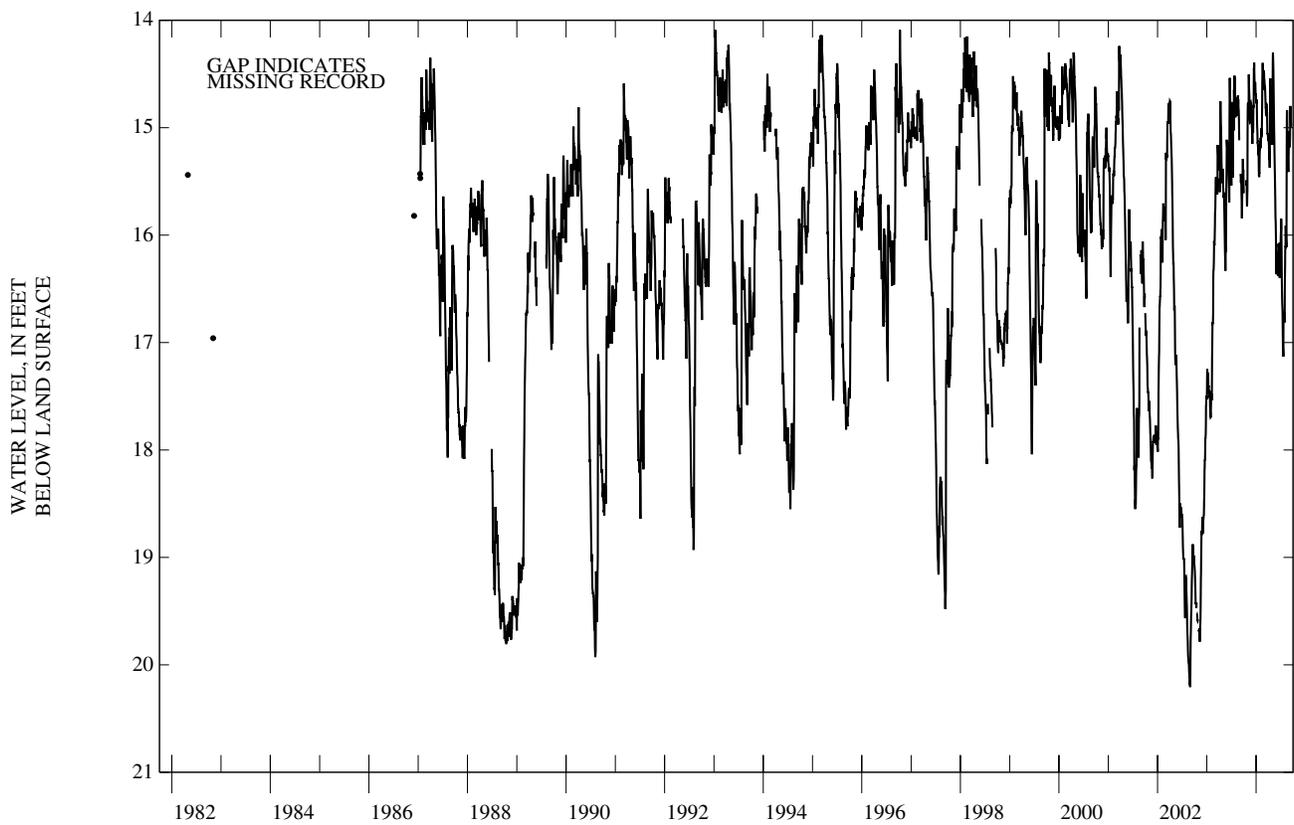
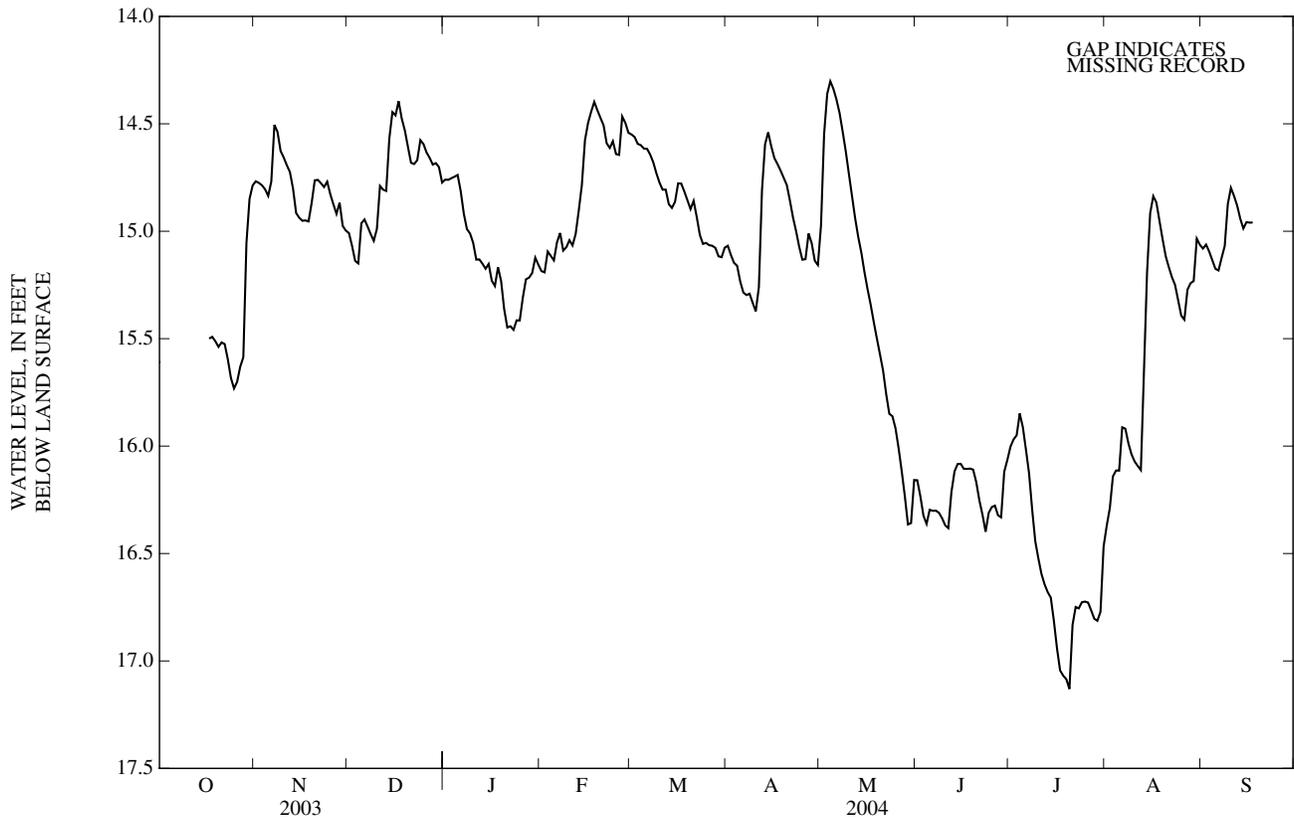
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.61	14.77	15.01	14.76	15.19	14.55	15.07	14.97	16.16	16.00	16.37	15.08
2	---	14.77	15.07	14.76	15.19	14.56	15.11	14.55	16.23	15.97	16.29	15.06
3	---	14.79	15.14	14.75	15.09	14.59	15.15	14.36	16.32	15.95	16.14	15.09
4	---	14.80	15.15	14.75	15.11	14.60	15.16	14.30	16.36	15.85	16.11	15.13
5	---	14.84	14.96	14.74	15.14	14.62	15.23	14.34	16.30	15.91	16.11	15.17
6	---	14.77	14.95	14.81	15.05	14.62	15.29	14.39	16.30	16.02	15.91	15.18
7	---	14.51	14.98	14.92	15.01	14.64	15.30	14.45	16.30	16.13	15.92	15.12
8	---	14.54	15.01	14.99	15.09	14.68	15.29	14.54	16.31	16.30	15.99	15.07
9	---	14.63	15.04	15.01	15.07	14.73	15.33	14.63	16.34	16.44	16.04	14.87
10	---	14.66	14.99	15.05	15.04	14.77	15.37	14.73	16.37	16.52	16.07	14.80
11	---	14.69	14.79	15.13	15.07	14.81	15.26	14.84	16.38	16.60	16.09	14.84
12	---	14.72	14.81	15.13	15.01	14.81	14.81	14.94	16.21	16.64	16.11	14.88
13	---	14.80	14.81	15.15	14.90	14.87	14.59	15.03	16.12	16.68	15.65	14.94
14	---	14.92	14.57	15.17	14.79	14.89	14.54	15.10	16.08	16.71	15.19	14.99
15	---	14.94	14.45	15.15	14.58	14.86	14.61	15.19	16.08	16.81	14.92	14.96
16	---	14.95	14.46	15.23	14.50	14.78	14.66	15.27	16.11	16.94	14.84	14.96
17	15.50	14.95	14.39	15.25	14.44	14.78	14.69	15.34	16.11	17.04	14.87	14.96
18	15.49	14.95	14.48	15.17	14.40	14.82	14.72	15.42	16.10	17.07	14.95	---
19	15.51	14.87	14.53	15.23	14.44	14.86	14.75	15.50	16.11	17.09	15.04	---
20	15.54	14.76	14.61	15.36	14.47	14.90	14.79	15.57	16.17	17.13	15.12	---
21	15.52	14.76	14.68	15.45	14.51	14.86	14.86	15.65	16.25	16.83	15.17	---
22	15.53	14.78	14.69	15.44	14.59	14.93	14.94	15.76	16.32	16.75	15.21	---
23	15.60	14.79	14.67	15.46	14.61	15.02	15.00	15.85	16.40	16.76	15.25	---
24	15.68	14.77	14.58	15.41	14.58	15.06	15.07	15.86	16.31	16.73	15.32	---
25	15.73	14.83	14.59	15.42	14.64	15.05	15.13	15.92	16.28	16.72	15.39	---
26	15.70	14.87	14.63	15.31	14.64	15.06	15.13	16.01	16.28	16.73	15.41	---
27	15.63	14.92	14.66	15.22	14.47	15.07	15.01	16.12	16.32	16.76	15.27	---
28	15.59	14.87	14.69	15.22	14.50	15.08	15.06	16.23	16.33	16.80	15.24	---
29	15.06	14.98	14.68	15.19	14.54	15.12	15.14	16.36	16.12	16.81	15.23	---
30	14.85	15.00	14.70	15.12	---	15.12	15.16	16.36	16.06	16.77	15.03	---
31	14.79	---	14.77	15.16	---	15.08	---	16.16	---	16.47	15.06	---

WTR YR 2004 MEAN 15.29 HIGH 14.30 LOW 17.13

GROUND-WATER LEVELS

DUPLIN COUNTY—Continued

345051078012101. Local number, NC-174; DENR Rose Hill Research Station well V32v1; County number, DU-126.

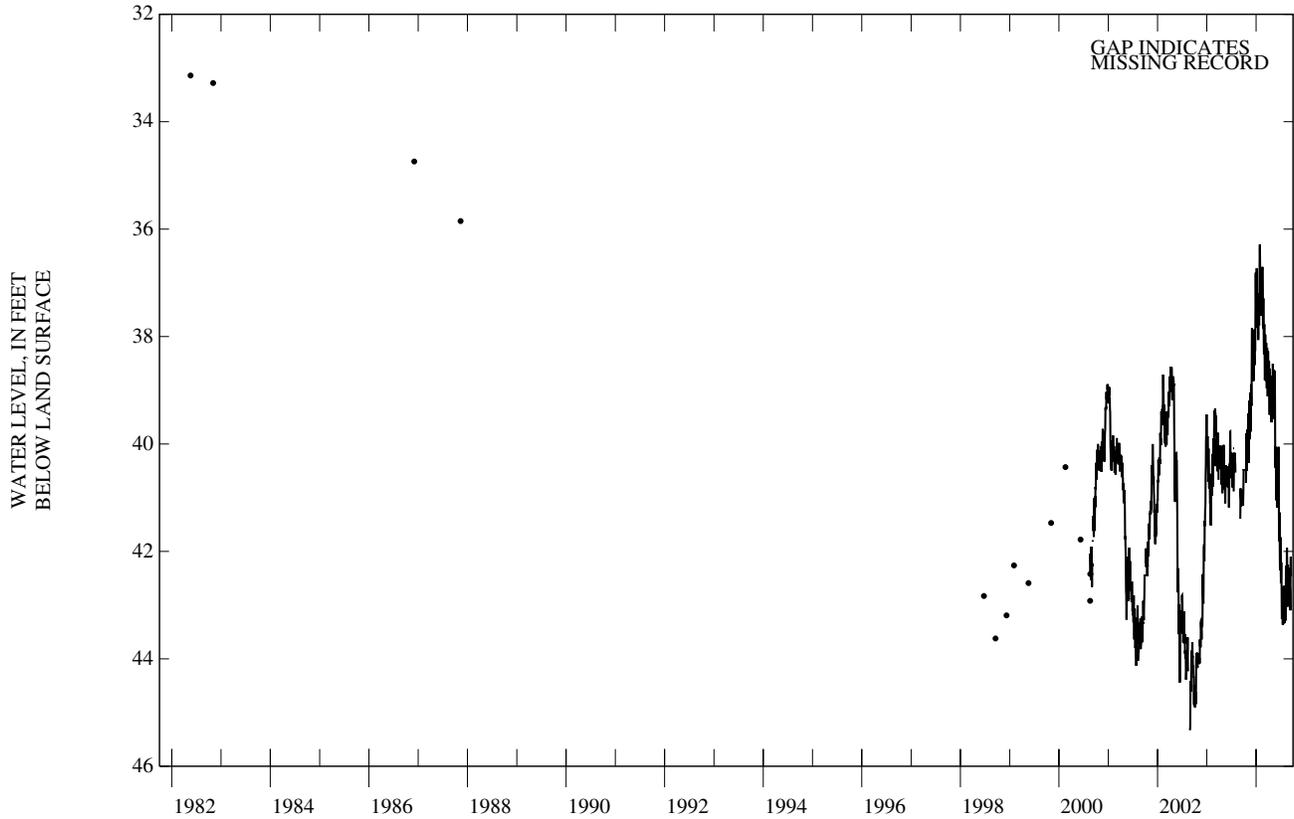
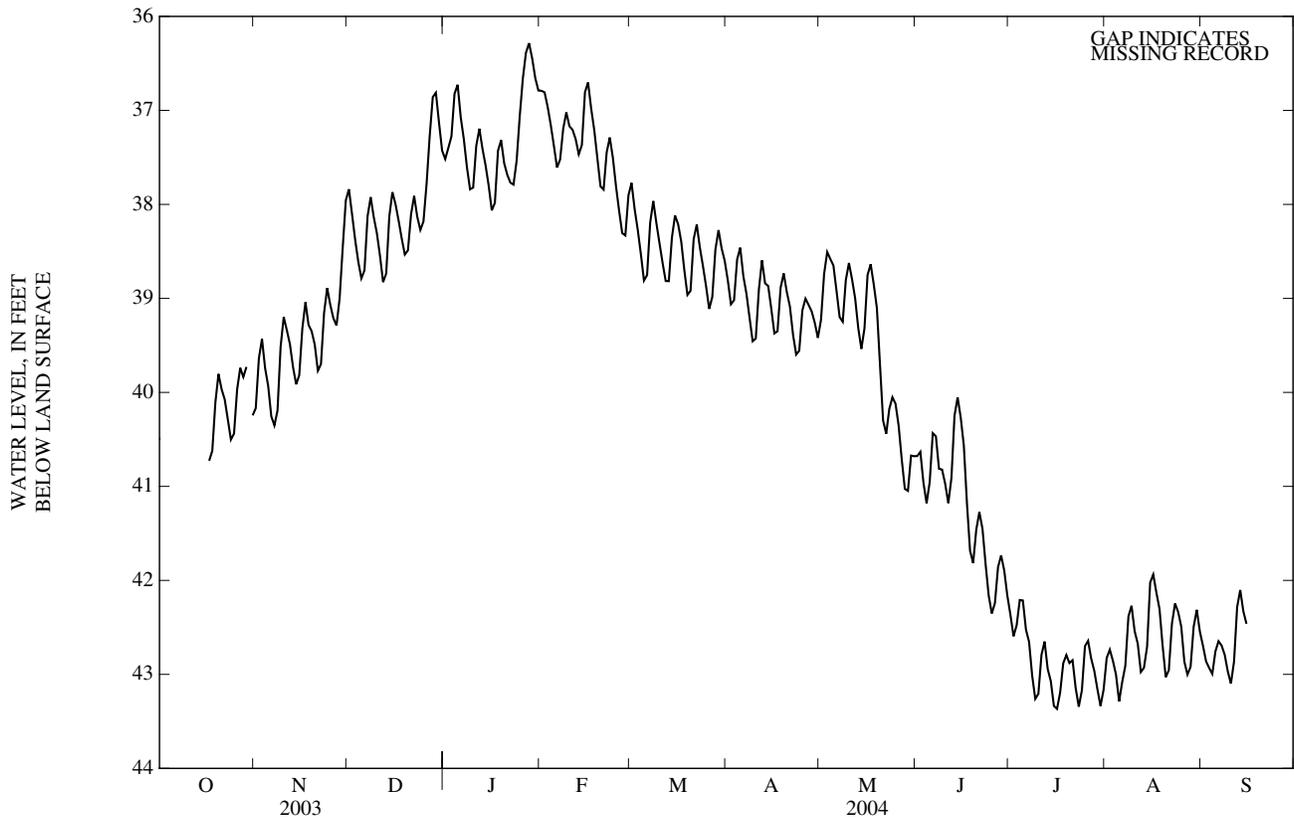




GROUND-WATER LEVELS

DUPLIN COUNTY—Continued

345051078012106. Local number, NC-218; DENR Rose Hill Research Station well V32v6; County number, DU-135.

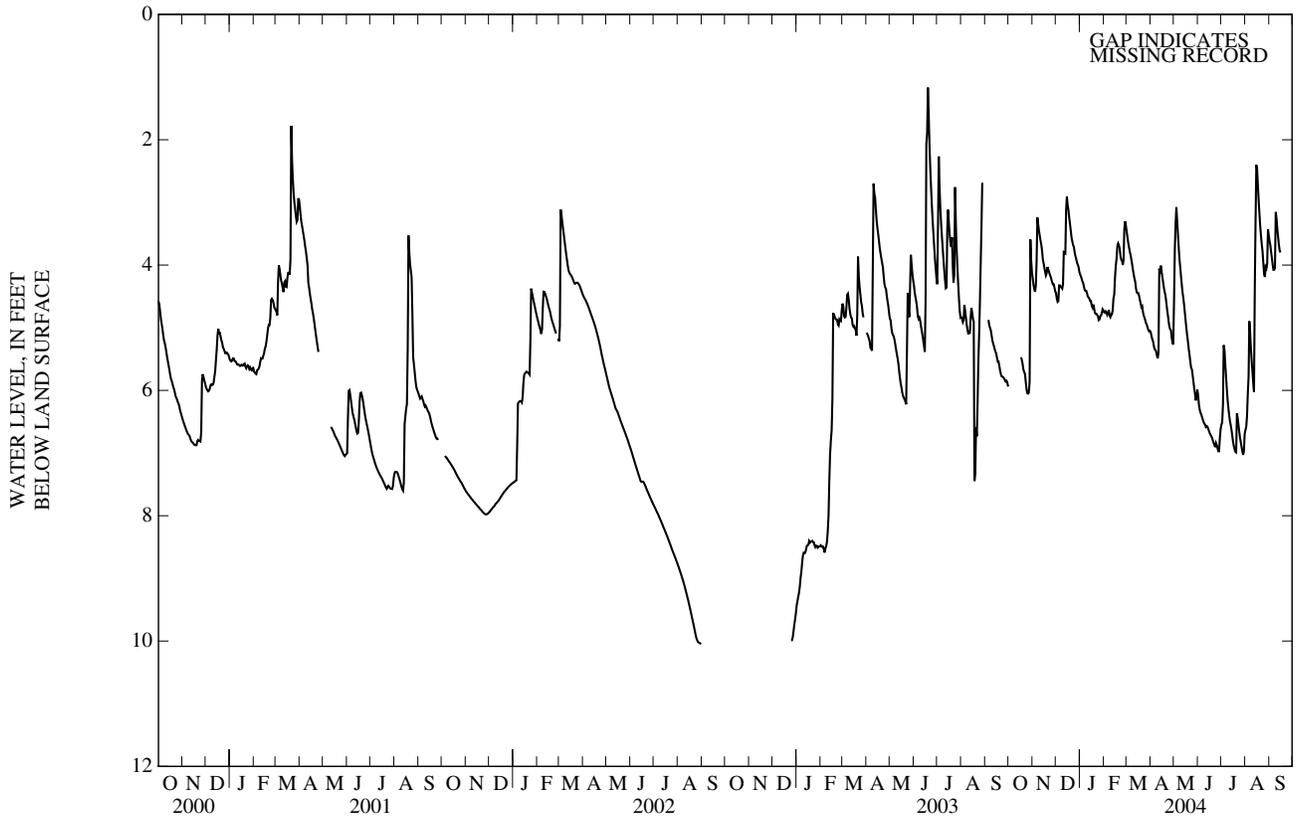




GROUND-WATER LEVELS

DUPLIN COUNTY—Continued

345051078012108. Local number, NC-222; DENR Rose Hill Research Station well V32v8; County number, DU-136.



## GROUND-WATER LEVELS

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## DUPLIN COUNTY—Continued

345051078012103. Local number, NC-224; DENR Rose Hill Research Station well V32v3; County number, DU-134.

LOCATION.--Lat 34°50'52", long 78°01'20", Hydrologic Unit 03030007, 1.5 mi north of Rose Hill at Rose Hill-Magnolia Elementary School, east of U.S. Highway 117 on Secondary Road 1911. Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Castle Hayne aquifer of Late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation well, depth 46 ft, diameter 4 in., screened interval from 36 to 46 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 84.42 ft above NGVD of 1929 (from topographic map). Measuring point: Top of cut casing, 1.22 ft above land-surface datum.

REMARKS.--Well is part of areal-effects network.

PERIOD OF RECORD.--October 2000 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 4.03 ft below land-surface datum, March 22, 2001; lowest water level recorded, 16.04 ft below land-surface datum, Aug. 24, 2002.

REVISIONS.--Revised figures of water-levels for water year 2001, superseding those published in the report for 2001 are given below.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

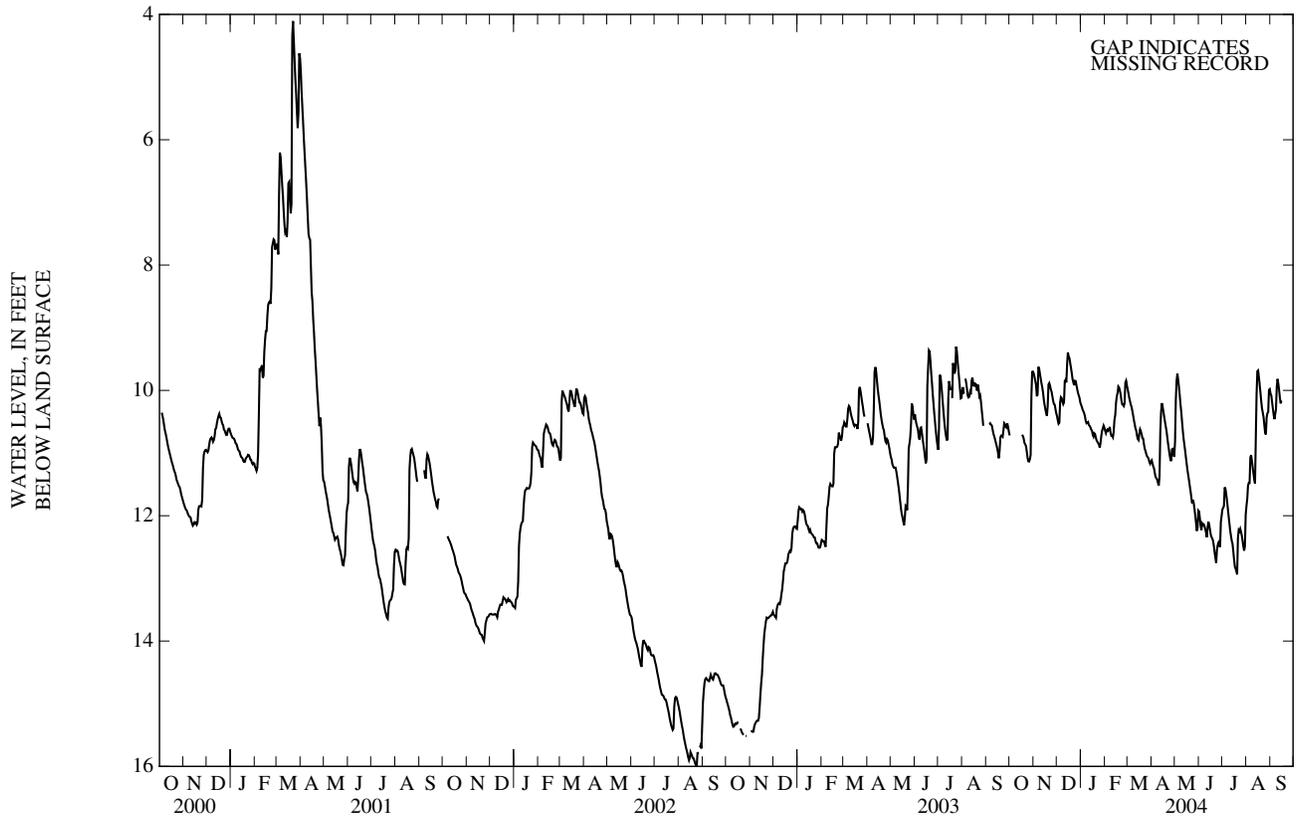
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.72	9.73	10.41	10.23	10.64	9.98	11.12	10.82	11.93	11.90	11.84	10.05
2	---	9.79	10.48	10.27	10.68	10.04	11.17	10.15	12.04	11.87	11.73	10.08
3	---	9.85	10.53	10.31	10.64	10.12	11.21	9.85	12.16	11.84	11.52	10.18
4	---	9.92	10.52	10.34	10.62	10.17	11.25	9.73	12.23	11.55	11.47	10.29
5	---	10.09	10.19	10.36	10.64	10.23	11.32	9.83	12.12	11.57	11.48	10.39
6	---	10.07	10.11	10.42	10.62	10.26	11.38	9.94	12.14	11.66	11.07	10.46
7	---	9.62	10.12	10.49	10.58	10.32	11.40	10.07	12.14	11.77	11.03	10.38
8	---	9.65	10.18	10.53	10.68	10.40	11.42	10.22	12.17	11.88	11.12	10.30
9	---	9.74	10.22	10.52	10.72	10.47	11.47	10.34	12.22	12.00	11.23	9.95
10	---	9.81	10.19	10.51	10.72	10.53	11.52	10.49	12.27	12.12	11.33	9.82
11	---	9.89	9.85	10.55	10.75	10.60	11.38	10.64	12.34	12.23	11.42	9.89
12	---	9.95	9.83	10.57	10.66	10.64	10.67	10.77	12.18	12.32	11.49	9.99
13	---	10.03	9.87	10.59	10.47	10.72	10.35	10.87	12.10	12.40	10.76	10.12
14	---	10.15	9.58	10.63	10.39	10.78	10.20	10.96	12.14	12.45	10.07	10.21
15	---	10.23	9.39	10.64	10.20	10.79	10.26	11.07	12.22	12.56	9.70	10.17
16	---	10.30	9.46	10.71	10.10	10.69	10.34	11.17	12.30	12.69	9.68	---
17	10.71	10.36	9.48	10.74	10.04	10.62	10.42	11.27	12.34	12.81	9.79	---
18	10.73	10.41	9.57	10.68	9.94	10.65	10.50	11.35	12.36	12.84	9.91	---
19	10.76	10.25	9.64	10.70	9.96	10.70	10.57	11.43	12.40	12.89	10.04	---
20	10.83	9.91	9.72	10.76	10.01	10.76	10.65	11.53	12.48	12.94	10.17	---
21	10.86	9.88	9.82	10.80	10.07	10.77	10.74	11.61	12.59	12.35	10.29	---
22	10.89	9.92	9.87	10.82	10.16	10.86	10.85	11.70	12.68	12.23	10.36	---
23	10.97	9.98	9.92	10.84	10.22	10.93	10.93	11.80	12.75	12.25	10.43	---
24	11.07	10.02	9.85	10.86	10.23	10.97	11.03	11.75	12.54	12.21	10.55	---
25	11.13	10.09	9.85	10.91	10.25	11.02	11.10	11.79	12.47	12.26	10.68	---
26	11.14	10.16	9.92	10.85	10.21	11.05	11.13	11.89	12.43	12.32	10.70	---
27	11.10	10.22	9.98	10.73	9.88	11.07	10.94	11.99	12.47	12.40	10.43	---
28	11.03	10.23	10.04	10.65	9.85	11.10	10.93	12.11	12.50	12.49	10.36	---
29	10.08	10.30	10.08	10.60	9.92	11.14	11.01	12.24	12.10	12.56	10.34	---
30	9.70	10.37	10.12	10.56	---	11.17	11.06	12.20	12.00	12.49	9.99	---
31	9.70	---	10.19	10.59	---	11.13	---	11.92	---	11.99	9.98	---

WTR YR 2004 MEAN 10.85 HIGH 9.39 LOW 12.94

GROUND-WATER LEVELS

DUPLIN COUNTY—Continued

345051078012103. Local number, NC-224; DENR Rose Hill Research Station well V32v3; County number, DU-134.



GREENE COUNTY

353103077333401. County number, GR-082; L2 Lizzie N26q2.

LOCATION.--Lat 35°31'04", long 77°33'33", Hydrologic Unit 03020203, near Lizzie, 20 ft north of Secondary Road 1335. Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Surficial.

WELL CHARACTERISTICS.--Drilled observation well, depth 18 ft, diameter 2 in., cased to 6 ft, screened interval from 6 to 16 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 15-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 76.96 ft above NGVD of 1929 (levels by North Carolina Geodetic Survey). Measuring point: Top of metal casing, 2.71 ft above land surface datum.

REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

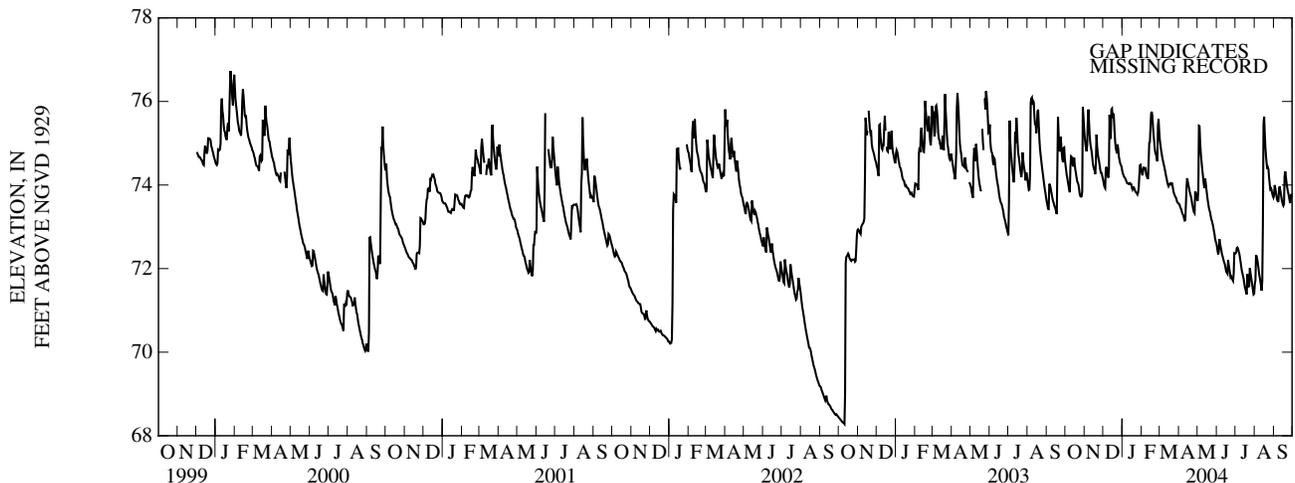
PERIOD OF RECORD.--December 1999 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded 76.98 ft, above NGVD of 1929, Jan. 25, 2000; lowest water level recorded, 68.26 ft, above NGVD of 1929, Oct. 11, 2002.

ELEVATION ABOVE NGVD 1929, FEET  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	74.49	75.16	74.10	74.30	74.28	75.08	73.55	73.62	72.53	72.36	71.63	73.77
2	74.37	75.00	74.01	74.25	74.23	74.96	73.52	73.87	72.43	72.38	71.73	74.00
3	74.24	74.89	73.95	74.21	74.32	74.84	73.46	75.42	72.34	72.49	72.32	73.93
4	74.17	74.81	73.92	74.18	74.43	74.75	73.44	75.41	72.40	72.51	72.29	73.82
5	74.06	74.96	74.38	74.17	74.39	74.66	73.39	75.01	72.71	72.48	72.22	73.72
6	73.98	75.53	74.43	74.14	74.39	74.59	73.33	74.77	72.60	72.42	72.11	73.65
7	73.89	75.81	74.35	74.10	74.40	74.51	73.30	74.60	72.52	72.36	72.00	73.61
8	73.83	75.50	74.25	74.05	74.26	74.45	73.27	74.43	72.44	72.27	71.87	73.61
9	74.42	75.19	74.17	74.04	74.20	74.38	73.20	74.29	72.36	72.17	71.79	73.90
10	74.69	75.01	74.38	74.04	74.18	74.30	73.15	74.14	72.30	72.06	71.69	73.97
11	74.67	74.90	75.68	74.02	74.15	74.22	73.16	74.00	72.25	71.96	71.58	73.88
12	74.58	74.82	75.32	74.03	74.56	74.16	73.54	73.93	72.18	71.89	71.47	73.78
13	74.46	74.69	75.11	74.04	75.01	74.06	73.92	74.16	72.13	71.83	71.70	73.68
14	74.46	74.53	75.81	74.03	75.03	74.01	74.16	74.05	72.09	71.75	73.06	73.60
15	74.66	74.44	75.83	74.02	75.39	73.97	74.09	73.90	72.00	71.65	75.45	73.54
16	74.47	74.38	75.61	73.94	75.71	74.00	74.01	73.78	71.93	71.56	75.64	73.51
17	74.36	74.34	75.71	73.90	75.75	74.03	73.93	73.65	71.90	71.50	75.24	73.54
18	74.27	74.26	75.62	73.94	75.65	74.03	73.84	73.56	71.88	71.43	74.91	74.21
19	74.17	74.52	75.32	73.95	75.38	74.04	73.79	73.46	72.21	71.38	74.70	74.33
20	74.08	75.21	75.05	73.91	75.18	74.01	73.74	73.39	72.10	71.87	74.52	74.21
21	74.05	74.92	74.89	73.86	75.03	74.02	73.66	73.34	72.00	71.72	74.39	74.07
22	74.01	74.77	74.82	73.84	74.85	73.94	73.56	73.26	71.89	71.57	74.42	73.96
23	73.90	74.65	74.75	73.81	74.75	73.84	73.48	73.17	71.79	71.58	74.38	73.87
24	73.79	74.58	74.97	73.80	74.73	73.79	73.41	73.14	71.81	72.01	74.18	73.80
25	73.73	74.48	74.86	73.77	74.64	73.75	73.35	73.07	71.78	71.91	74.02	73.72
26	73.72	74.37	74.69	73.82	74.56	73.72	73.33	73.00	71.74	71.80	73.90	73.63
27	73.73	74.29	74.60	73.93	75.43	73.70	73.85	72.91	71.71	71.71	73.92	73.57
28	73.84	74.29	74.53	74.22	75.57	73.65	73.82	72.83	71.88	71.59	73.88	73.71
29	75.86	74.23	74.48	74.47	75.29	73.59	73.71	72.72	72.37	71.48	73.80	73.78
30	75.64	74.16	74.46	74.48	---	73.58	73.66	72.65	72.36	71.38	73.74	73.70
31	75.36	---	74.38	74.38	---	73.55	---	72.62	---	71.40	73.70	---

WTR YR 2004 MEAN 73.78 MAX 75.86 MIN 71.38



GROUND-WATER LEVELS  
 GREENE COUNTY—Continued

353111077334402. County number, GR-085; L6 Lizzie N26q6.

LOCATION.--Lat 35°31'12", long 77°33'43", Hydrologic Unit 03020203, near Lizzie, north of Secondary Road 1335 and west of Secondary Road 1345.  
 Owner: DENR (North Carolina Department of Environment and Natural Resources).

WATER-LEVEL RECORDS

AQUIFER.--Surficial.

WELL CHARACTERISTICS.--Drilled observation well, depth 8 ft, diameter 2 in., screened interval from 4 to 7 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape.

DATUM.--Land-surface datum is 73.38 ft above NGVD of 1929 (levels by North Carolina Geodetic Survey). Measuring point: Top of metal casing, 3.38 ft above land surface datum.

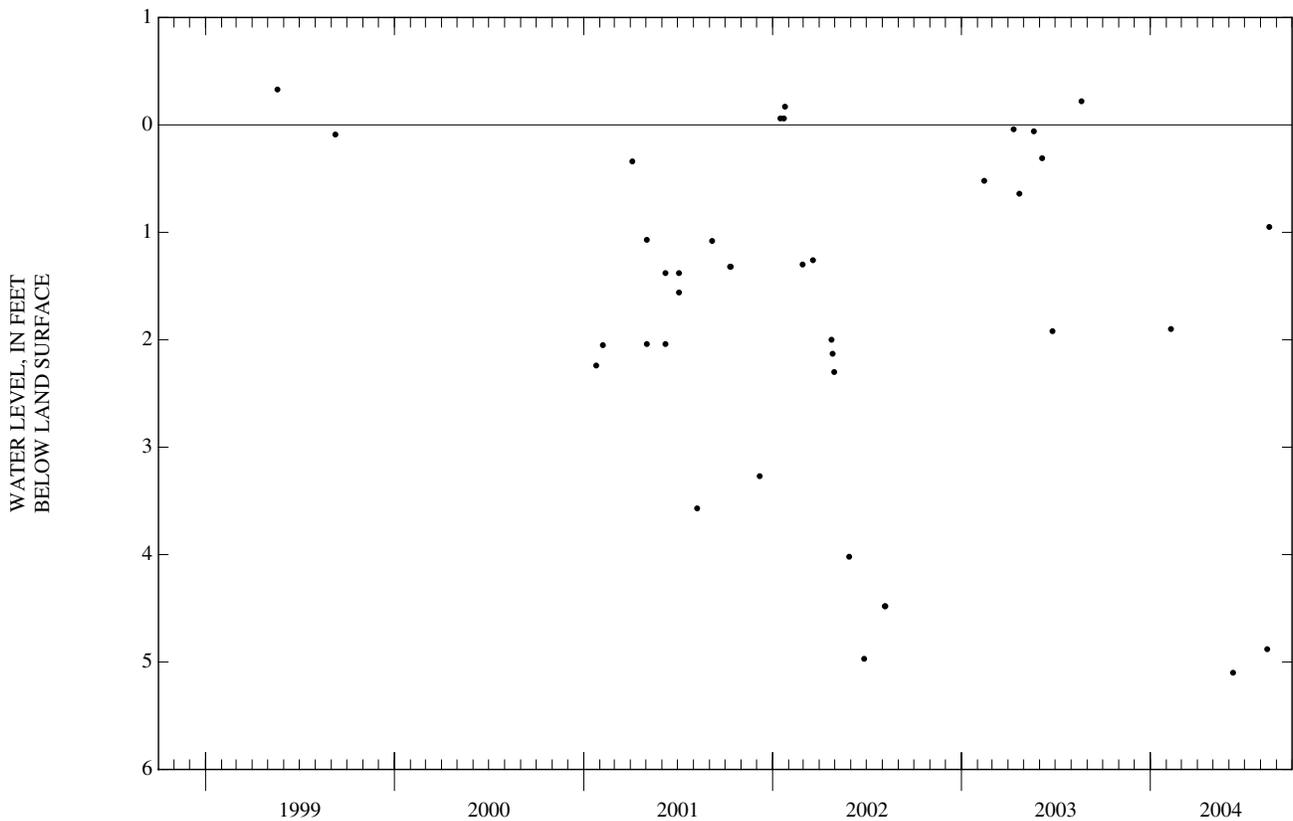
REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

PERIOD OF RECORD.--May 1999 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.33 ft above land-surface datum, May 19, 1999; lowest water level measured, 5.10 ft below land-surface datum, June 2, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL						
FEB 09	1.90	JUN 08	5.10	AUG 13	4.88	AUG 17	.95



353111077334402. County number, GR-085; L6 Lizzie N26q6—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1995 to current year.

REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Depth to water level, feet below LSD (72019)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unfiltered/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, mg/L as CaCO3 (00900)	Calcium, water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)
FEB 09...	1810	1.90	773	1.0	9	4.5	674	9.5	9.9	140	33.9	12.8	9.43
JUN 08...	1725	5.10	766	.8	9	3.9	673	29.0	20.1	--	--	--	--

Date	Sodium, water, fltrd, mg/L (00930)	Chloride, water, fltrd, mg/L (00940)	Sulfate, water, fltrd, mg/L (00945)	Ammonia, water, fltrd, mg/L as N (00608)	Nitrite + nitrate, water, fltrd, mg/L as N (00631)	Nitrite, water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, fltrd, mg/L (00666)	Organic carbon, water, fltrd, mg/L (00681)	Iron, water, fltrd, ug/L (01046)
FEB 09...	44.3	101	30.8	.06	29.8	<.008	.016	.021	1.9	13
JUN 08...	--	--	--	<.04	34.0	E.006	.016	.028	--	--

GROUND-WATER LEVELS  
 GREENE COUNTY—Continued

353103077333404. County number, GR-087; L2S.

LOCATION.--Lat 35°31'04", long 77°33'33", Hydrologic Unit 03020203, near Lizzie, 20 ft north of Secondary Road 1335. Owner: DENR (North Carolina Department of Environment and Natural Resources).

WATER-LEVEL RECORDS

AQUIFER.--Surficial.

WELL CHARACTERISTICS.--Drilled observation well, depth 5 ft, diameter 2 in., screened interval from 2 to 5 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape.

DATUM.--Land-surface datum is 77.42 ft above NGVD of 1929 (levels by North Carolina Geodetic Survey). Measuring point: Top of metal casing, 1.58 ft above land surface datum.

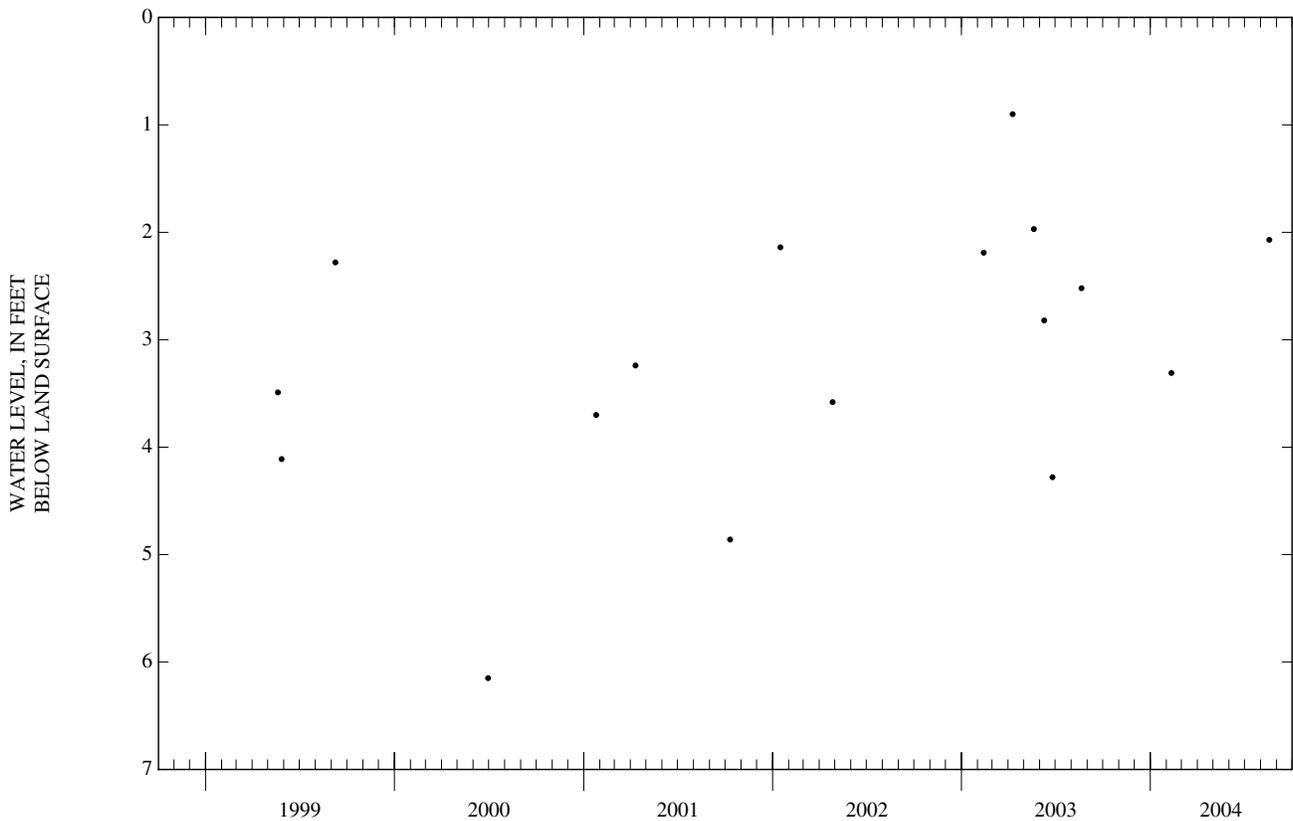
REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

PERIOD OF RECORD.--May 1999 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.90 ft below land-surface datum, Feb. 12, 2003; lowest water level measured, 6.15 ft below land-surface datum, June 29, 2000.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL						
FEB 10	3.31	JUN 09		AUG 13		AUG 17	2.07





GROUND-WATER LEVELS  
GREENE COUNTY—Continued

353103077333402. County number, GR-088; L2D.

LOCATION.--Lat 35°31'04", long 77°33'33", Hydrologic Unit 03020203, near Lizzie, 20 ft north of Secondary Road 1335. Owner: DENR (North Carolina Department of Environment and Natural Resources).

WATER-LEVEL RECORDS

AQUIFER.--Surficial.

WELL CHARACTERISTICS.--Drilled observation well, depth 20 ft, diameter 2 in., screened interval from 18 to 20 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape.

DATUM.--Land-surface datum is 77.42 ft above NGVD of 1929 (levels by North Carolina Geodetic Survey). Measuring point: Top of metal casing, 1.58 ft above land surface datum.

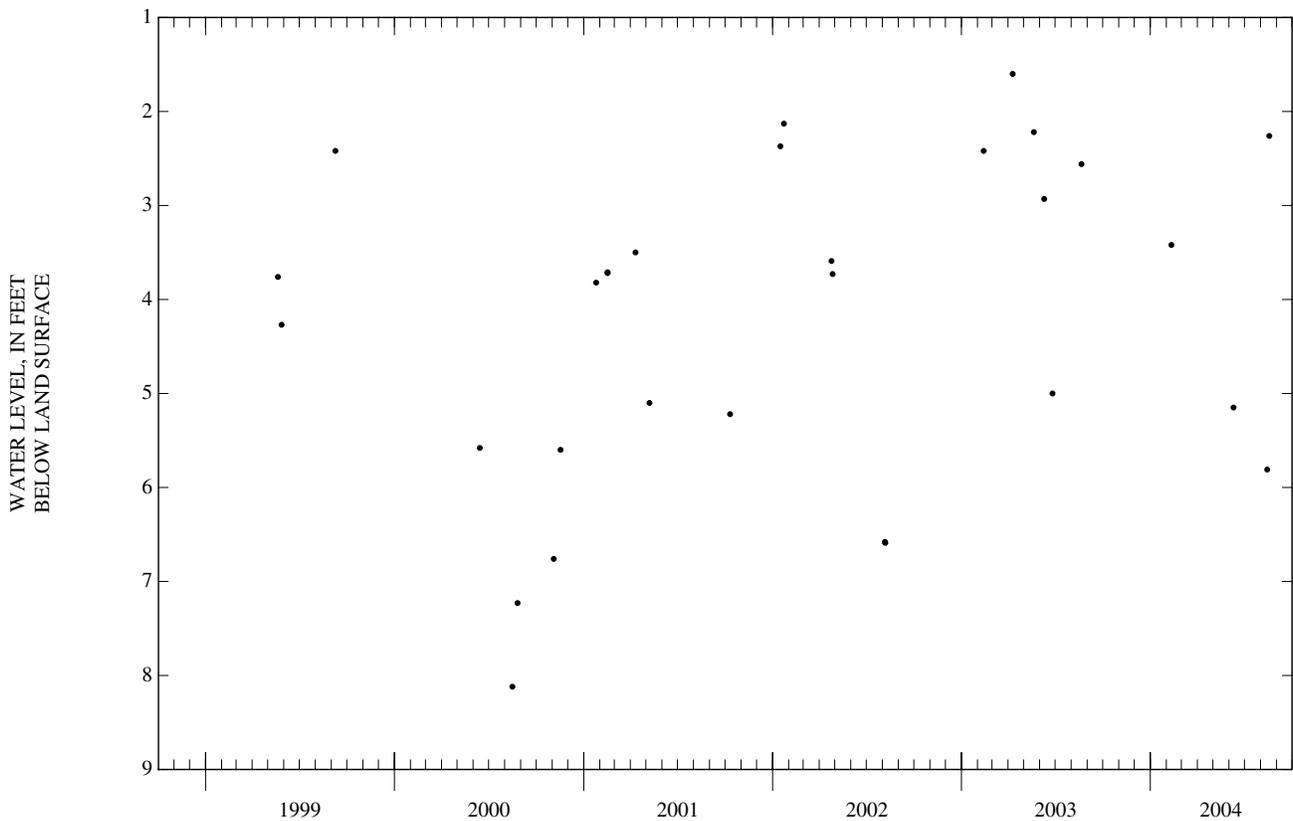
REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

PERIOD OF RECORD.--May 1999 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.60 ft below land-surface datum, Apr. 9, 2003; lowest water level measured, 8.12 ft below land-surface datum, Aug. 15, 2000.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL						
FEB 10	3.42	JUN 09	5.15	AUG 13	5.81	AUG 17	2.26



353103077333402. County number, GR-088; L2D—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--February 1999 to current year.

REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Depth to water level, feet below LSD (72019)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unf uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)
FEB 10...	1200	3.42	769	.5	6	5.5	144	10.0	16.3	14	3.62	1.19	3.64
JUN 09...	1400	5.15	765	.6	6	4.8	139	31.0	17.4	--	--	--	--

Date	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Residue water, fltrd, sum of constituents mg/L (70301)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, fltrd, mg/L (00666)	Organic carbon, water, fltrd, mg/L (00681)	Iron, water, fltrd, ug/L (01046)
FEB 10...	18.9	5	28.9	9.4	74	<.04	1.21	E.005	.007	.013	.5	155
JUN 09...	--	--	--	--	--	<.04	1.20	E.005	E.004	.010	--	--

GROUND-WATER LEVELS  
 GREENE COUNTY—Continued

353122077334903. County number, GR-092; L4D.

LOCATION.--Lat 35°31'22", long 77°33'48", Hydrologic Unit 03020203, near Lizzie, north of Secondary Road 1335 and west of Secondary Road 1345.  
 Owner: DENR (North Carolina Department of Environment and Natural Resources).

WATER-LEVEL RECORDS

AQUIFER.--Surficial.

WELL CHARACTERISTICS.--Drilled observation well, depth 12 ft, diameter 2 in., screened interval from 10 to 12 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape.

DATUM.--Land-surface datum is 64.47 ft above NGVD of 1929 (levels by North Carolina Geodetic Survey). Measuring point: Top of metal casing, 1.50 ft above land surface datum.

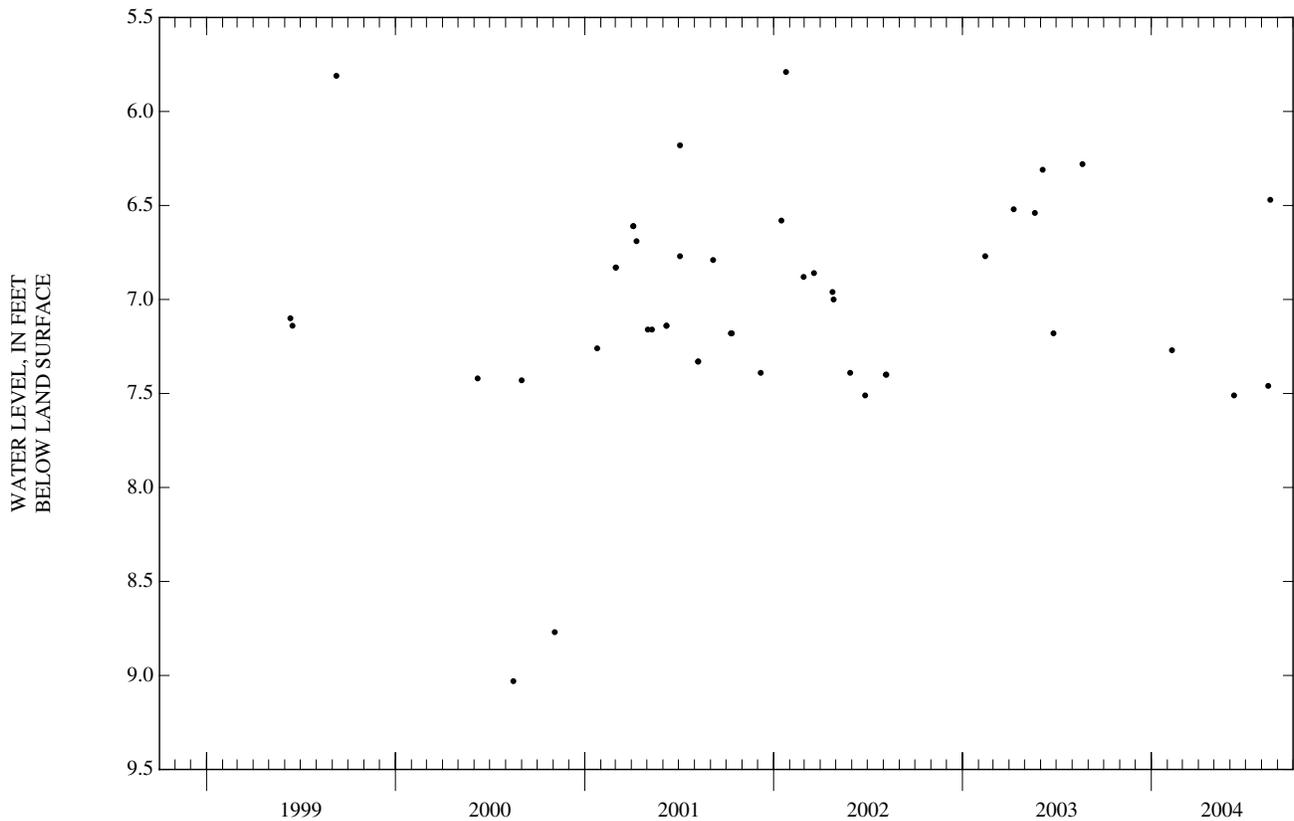
REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

PERIOD OF RECORD.--June 1999 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.79 ft below land-surface datum, June 24, 2003; lowest water level measured, 9.03 ft below land-surface datum, Aug. 15, 2000.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL						
FEB 09	7.27	JUN 08	7.51	AUG 13	7.46	AUG 17	6.47



353122077334903. County number, GR-092; L4D—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--February 1999 to current year.

REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Depth to water level, feet below LSD (72019)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unfiltered uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)
Date		Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, fltrd, mg/L (00666)	Organic carbon, water, fltrd, mg/L (00681)	Iron, water, fltrd, ug/L (01046)	
FEB 09...	1700												
JUN 08...	1800												
FEB 09...		13.4	<2	48.1	56.2	<.04	19.7	.016	.018	.028	.8	57	
JUN 08...		--	--	--	--	<.04	22.1	.014	.029	.055	--	--	

GROUND-WATER LEVELS  
 GREENE COUNTY—Continued

353127077333704. County number, GR-109; L15D.

LOCATION.--Lat 35°31'27", long 77°33'36", Hydrologic Unit 03020203, near Lizzie, north of Secondary Road 1335 and west of Secondary Road 1345.  
 Owner: DENR (North Carolina Department of Environment and Natural Resources).

WATER-LEVEL RECORDS

AQUIFER.--Surficial.

WELL CHARACTERISTICS.--Drilled observation well, depth 23 ft, diameter 2 in., screened interval from 21 to 23 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape.

DATUM.--Land-surface datum is 73.59 ft above NGVD of 1929 (levels by North Carolina Geodetic Survey). Measuring point: Top of metal casing, 1.38 ft above land surface datum.

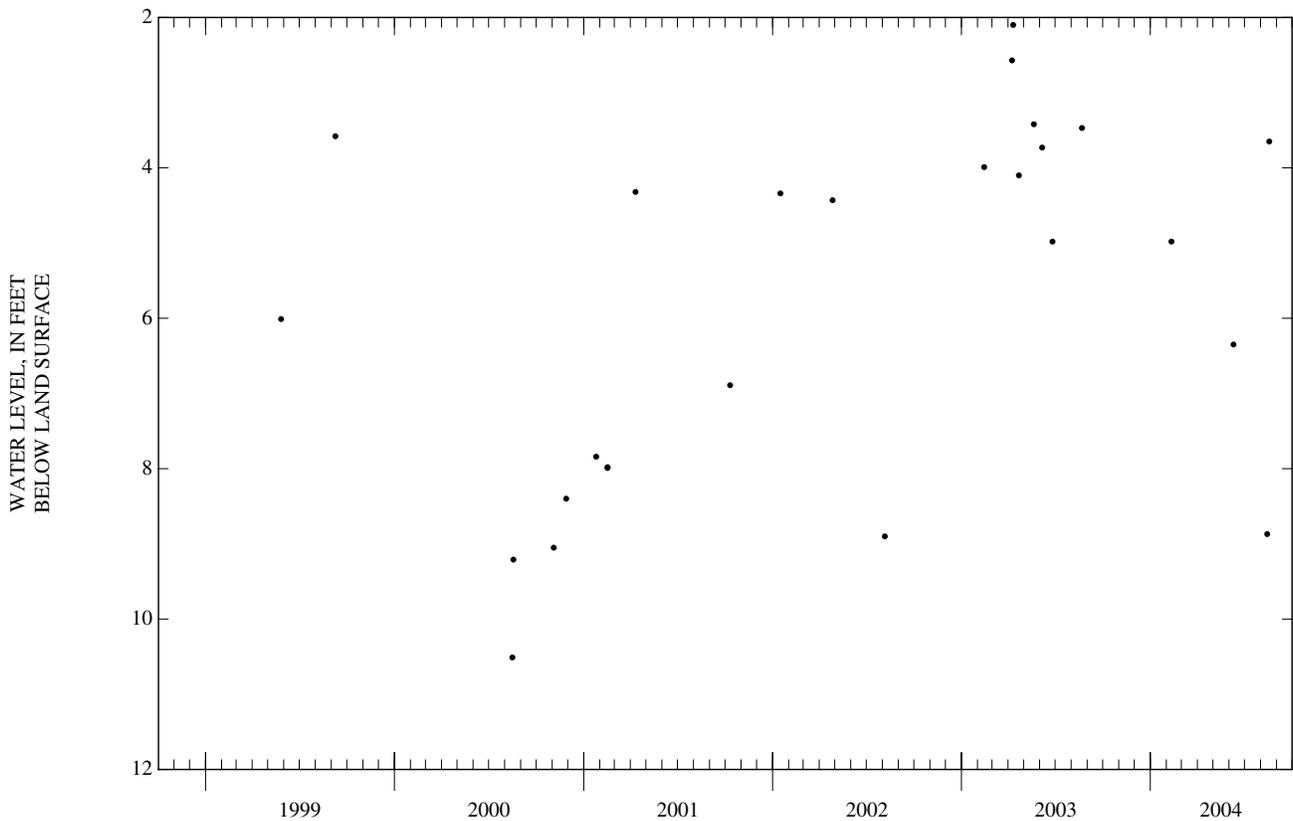
REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

PERIOD OF RECORD.--May 1999 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.10 ft below land-surface datum, Apr. 10, 2003; lowest water level measured, 10.51 ft below land-surface datum, Aug. 15, 2000.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL						
FEB 10	4.98	JUN 09	6.35	AUG 13	8.87	AUG 17	3.65



353127077333704. County number, GR-109; L15D—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--May 1999 to current year.

REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Depth to water level, feet below LSD (72019)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unfltrd uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)
Date		Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, fltrd, mg/L (00666)	Organic carbon, water, fltrd, mg/L (00681)	Iron, water, fltrd, ug/L (01046)	
FEB 10...	1620												
JUN 09...	1200												
FEB 10...		5.72	<2	30.2	45.7	<.04	6.56	E.007	.008	.013	.5	18	
JUN 09...		--	--	--	--	<.04	15.3	.013	.008	.013	--	--	

GROUND-WATER LEVELS  
GREENE COUNTY—Continued

353135077332701. County number, GR-110; L17.

LOCATION.--Lat 35°31'36", long 77°33'26", Hydrologic Unit 03020203, near Lizzie, 200 ft west of Secondary Road 1345. Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Yorktown.

WELL CHARACTERISTICS.--Drilled observation well, depth 68 ft, diameter 2 in., screened interval from 41 to 61 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 15-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 72.50 ft above NGVD of 1929 (levels by North Carolina Geodetic Survey). Measuring point: Top of metal casing, 2.74 ft above land surface datum.

REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

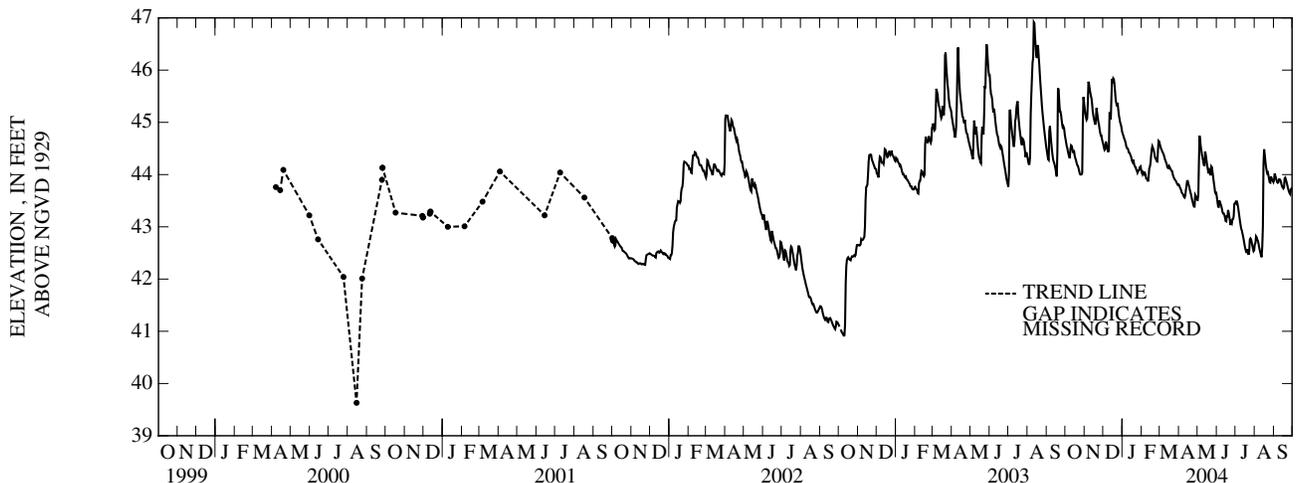
PERIOD OF RECORD.--April 2000 to current year. Continuous record began December 2000.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded 46.97 ft above NGVD of 1929, Aug. 11, 12, 2003; lowest water level recorded 40.91 ft above NGVD of 1929, Oct. 9, 2002.

ELEVATION ABOVE NGVD 1929, FEET  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44.69	45.26	44.58	44.79	44.04	44.58	43.80	43.51	43.56	43.47	42.67	43.90
2	44.62	45.17	44.51	44.75	44.01	44.54	43.76	43.61	43.47	43.45	42.69	44.02
3	44.55	45.10	44.47	44.71	44.05	44.50	43.74	44.25	43.38	43.50	42.82	43.98
4	44.50	45.05	44.48	44.68	44.04	44.47	43.71	44.74	43.38	43.45	42.80	43.94
5	44.44	45.07	44.63	44.65	44.01	44.44	43.67	44.65	43.50	43.38	42.76	43.89
6	44.39	45.35	44.60	44.60	44.03	44.42	43.64	44.54	43.47	43.30	42.73	43.85
7	44.34	45.78	44.54	44.54	44.00	44.39	43.63	44.46	43.43	43.20	42.68	43.84
8	44.31	45.74	44.47	44.51	43.93	44.35	43.61	44.37	43.40	43.12	42.61	43.85
9	44.49	45.64	44.43	44.50	43.91	44.31	43.57	44.31	43.35	43.04	42.55	43.91
10	44.56	45.57	44.49	44.48	43.91	44.27	43.56	44.24	43.28	42.97	42.50	43.91
11	44.55	45.51	45.17	44.43	43.87	44.24	43.60	44.18	43.26	42.94	42.45	43.90
12	44.50	45.46	45.16	44.42	43.96	44.21	43.70	44.18	43.26	42.88	42.42	43.86
13	44.43	45.35	45.05	44.39	44.12	44.15	43.79	44.44	43.23	42.82	42.62	43.81
14	44.42	45.20	45.45	44.36	44.15	44.13	43.88	44.38	43.18	42.76	43.00	43.77
15	44.44	45.13	45.83	44.33	44.22	44.12	43.88	44.29	43.11	42.69	44.20	43.75
16	44.35	45.06	45.75	44.27	44.37	44.16	43.83	44.20	43.10	42.62	44.48	43.73
17	44.31	45.00	45.84	44.24	44.49	44.14	43.78	44.12	43.22	42.57	44.38	43.75
18	44.27	44.96	45.82	44.29	44.54	44.11	43.72	44.06	43.18	42.53	44.26	43.92
19	44.22	45.04	45.73	44.23	44.51	44.10	43.68	44.02	43.32	42.50	44.16	43.94
20	44.18	45.27	45.57	44.18	44.47	44.07	43.63	44.08	43.27	42.57	44.08	43.90
21	44.17	45.19	45.43	44.15	44.42	44.06	43.57	44.05	43.19	42.53	44.03	43.86
22	44.13	45.09	45.37	44.14	44.34	44.00	43.51	43.98	43.11	42.47	44.04	43.81
23	44.07	45.01	45.31	44.10	44.31	43.96	43.47	44.16	43.03	42.53	43.98	43.76
24	44.02	44.96	45.37	44.08	44.30	43.93	43.42	44.14	43.09	42.76	43.91	43.71
25	44.00	44.86	45.25	44.04	44.26	43.91	43.39	44.04	43.07	42.78	43.85	43.68
26	44.00	44.80	45.14	44.06	44.25	43.89	43.39	43.94	43.14	42.76	43.84	43.64
27	44.00	44.74	45.08	44.08	44.46	43.87	43.61	43.85	43.15	42.71	43.96	43.62
28	44.03	44.75	45.00	44.11	44.64	43.85	43.59	43.76	43.20	42.64	43.93	43.71
29	45.01	44.67	44.96	44.14	44.63	43.82	43.56	43.66	43.44	42.59	43.89	43.73
30	45.48	44.62	44.92	44.16	---	43.80	43.52	43.64	43.45	42.53	43.88	43.72
31	45.38	---	44.84	44.09	---	43.81	---	43.65	---	42.55	43.86	---

WTR YR 2004 MEAN 44.04 MAX 45.84 MIN 42.42



GREENE COUNTY—Continued

353135077332702. County number, GR-111; L18 Lizzie.

LOCATION.--Lat 35°31'36", long 77°33'26", Hydrologic Unit 03020203, near Lizzie, 200 ft west of Secondary Road 1345. Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Surficial.

WELL CHARACTERISTICS.--Drilled observation well, depth 20 ft, diameter 2 in., screened interval from 10 to 20 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 15-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 72.83 ft above NGVD of 1929 (levels by North Carolina Geodetic Survey). Measuring point: Top of metal casing, 3.26 ft above land-surface datum.

REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

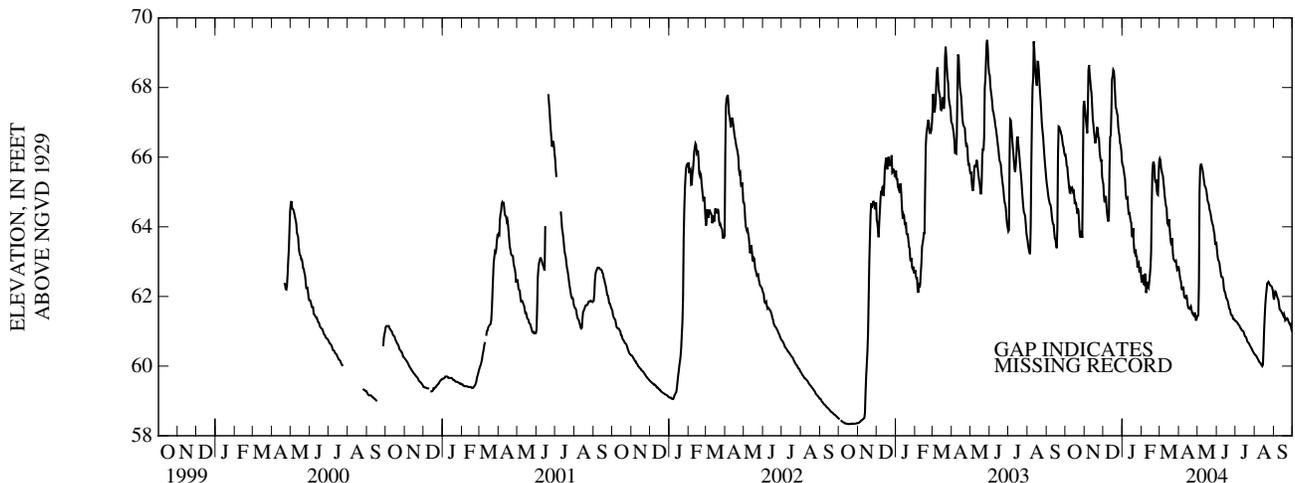
PERIOD OF RECORD.--April 2000 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 69.41 ft above NGVD of 1929, Aug. 11, 2003; lowest water level recorded, 58.33 ft above NGVD of 1929, Oct. 17, 2002.

ELEVATION ABOVE NGVD 1929, FEET  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	66.07	67.49	65.23	65.77	62.42	65.96	62.77	61.45	63.35	61.29	60.34	61.91
2	65.95	67.26	64.89	65.73	62.43	65.91	62.61	61.46	63.16	61.29	60.31	62.05
3	65.75	67.07	64.70	65.61	62.62	65.70	62.49	62.37	63.05	61.27	60.30	62.15
4	65.72	66.88	64.76	65.47	62.35	65.62	62.44	65.02	63.02	61.24	60.27	62.13
5	65.48	66.69	64.88	65.37	62.34	65.51	62.25	65.69	62.96	61.21	60.24	62.06
6	65.30	67.27	64.62	65.00	62.66	65.47	62.18	65.79	62.81	61.19	60.20	61.99
7	65.12	68.49	64.40	64.81	62.57	65.27	62.26	65.79	62.69	61.17	60.17	61.94
8	64.98	68.65	64.23	64.80	62.10	65.08	62.26	65.69	62.57	61.13	60.12	61.90
9	64.97	68.38	64.15	64.82	62.24	64.87	62.03	65.62	62.56	61.09	60.11	61.77
10	65.11	68.19	64.33	64.55	62.43	64.71	61.97	65.48	62.56	61.08	60.09	61.63
11	65.08	67.98	65.71	64.34	62.29	64.59	61.96	65.35	62.48	61.03	60.05	61.61
12	65.11	67.83	66.58	64.42	62.25	64.54	61.95	65.20	62.26	61.02	60.03	61.59
13	65.03	67.48	66.63	64.29	62.41	64.14	62.04	65.16	62.16	61.01	60.00	61.55
14	65.07	67.10	67.30	64.16	62.61	64.08	61.92	65.12	62.13	60.99	60.03	61.52
15	64.90	66.93	68.24	64.12	62.85	64.14	61.74	65.04	62.05	60.92	60.46	61.48
16	64.65	66.73	68.33	63.75	63.28	64.21	61.67	64.90	61.96	60.87	61.01	61.44
17	64.71	66.56	68.51	63.70	64.64	63.92	61.68	64.75	61.93	60.84	61.44	61.50
18	64.68	66.40	68.47	63.97	65.54	63.68	61.65	64.70	61.89	60.83	61.78	61.44
19	64.55	66.49	68.25	63.54	65.82	63.54	61.68	64.64	61.84	60.77	62.02	61.31
20	64.38	66.62	67.80	63.28	65.87	63.47	61.71	64.50	61.72	60.71	62.20	61.33
21	64.53	66.86	67.43	63.24	65.76	63.67	61.62	64.44	61.65	60.68	62.37	61.37
22	64.45	66.79	67.38	63.35	65.36	63.25	61.53	64.36	61.63	60.67	62.39	61.38
23	64.11	66.59	67.27	63.15	65.27	63.07	61.53	64.23	61.53	60.64	62.42	61.35
24	63.77	66.54	67.20	63.14	65.36	63.05	61.47	64.14	61.47	60.59	62.39	61.29
25	63.70	66.16	66.88	62.83	65.07	63.01	61.45	64.08	61.46	60.56	62.34	61.25
26	63.78	66.01	66.72	62.94	64.94	63.00	61.52	64.02	61.45	60.53	62.32	61.21
27	63.88	65.87	66.61	62.97	64.92	63.02	61.51	63.88	61.36	60.50	62.30	61.18
28	63.68	65.93	66.40	62.72	65.44	62.88	61.33	63.80	61.35	60.46	62.29	61.20
29	65.28	65.45	66.34	62.72	65.88	62.77	61.33	63.55	61.35	60.42	62.25	61.05
30	67.43	65.31	66.18	62.84	---	62.79	61.41	63.48	61.31	60.39	62.17	60.99
31	67.62	---	65.88	62.55	---	62.87	---	63.57	---	60.36	61.98	---

WTR YR 2004 MEAN 63.52 MAX 68.65 MIN 60.00



GROUND-WATER LEVELS  
GREENE COUNTY—Continued

353103077333406. County number, GR-147; L55.

LOCATION.--Lat 35°31'04", long 77°33'33", Hydrologic Unit 03020203, near Lizzie, 20 ft north of Secondary Road 1335. Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Yorktown.

WELL CHARACTERISTICS.--Drilled observation well, depth 70 ft, diameter 2 in., screened interval from 50 to 70 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 15-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 77.46 ft above NGVD of 1929 (levels by North Carolina Geodetic Survey). Measuring point: Top of metal casing, 1.41 ft above land-surface datum.

REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project. Minimum for period of record affected by pumping.

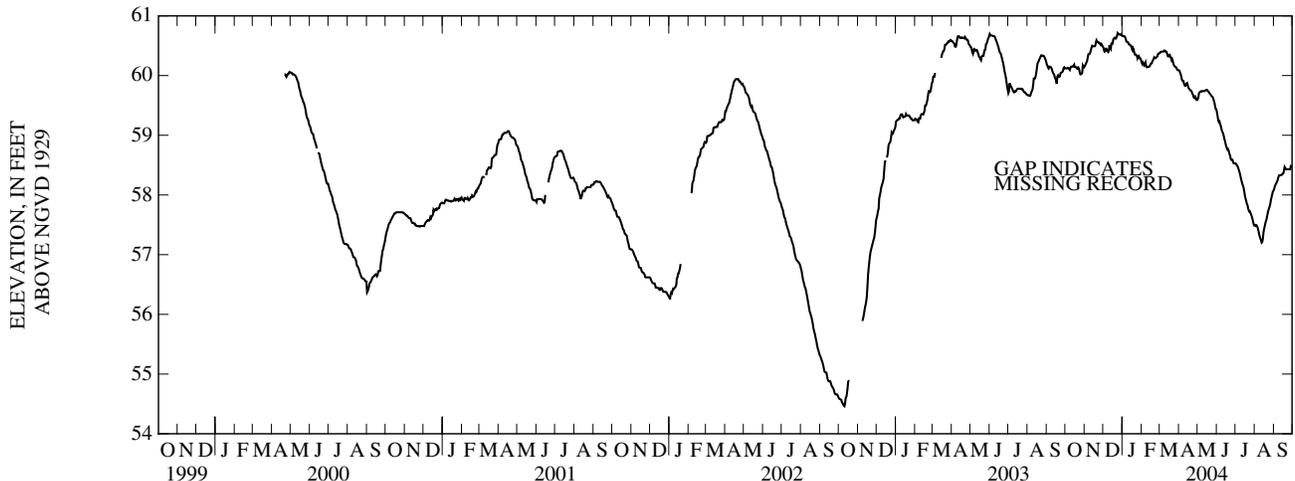
PERIOD OF RECORD.--April 2000 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded 60.72 ft, above NGVD of 1929, Dec. 24, 25, 2003; lowest water level recorded 54.46 ft, above NGVD of 1929, Oct. 10, 2002.

ELEVATION ABOVE NGVD 1929, FEET  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	60.12	60.16	60.48	60.66	60.21	60.37	60.09	59.60	59.39	58.53	57.49	58.09
2	60.12	60.18	60.43	60.66	60.19	60.39	60.07	59.63	59.32	58.51	57.48	58.14
3	60.12	60.20	60.40	60.66	60.22	60.40	60.04	59.70	59.26	58.50	57.50	58.16
4	60.12	60.22	60.41	60.66	60.20	60.40	60.01	59.72	59.23	58.49	57.49	58.19
5	60.13	60.25	60.45	60.64	60.17	60.40	59.96	59.73	59.24	58.46	57.47	58.20
6	60.12	60.31	60.45	60.62	60.20	60.40	59.92	59.73	59.20	58.43	57.44	58.23
7	60.11	60.36	60.43	60.57	60.22	60.40	59.91	59.73	59.16	58.40	57.39	58.26
8	60.09	60.36	60.40	60.56	60.15	60.42	59.91	59.74	59.12	58.36	57.34	58.30
9	60.13	60.36	60.39	60.56	60.14	60.42	59.87	59.74	59.08	58.31	57.30	58.33
10	60.15	60.39	60.43	60.55	60.15	60.41	59.83	59.74	59.05	58.26	57.27	58.33
11	60.15	60.43	60.51	60.52	60.15	60.39	59.83	59.74	59.03	58.22	57.24	58.33
12	60.15	60.47	60.46	60.52	60.15	60.39	59.84	59.74	58.99	58.19	57.20	58.33
13	60.15	60.50	60.45	60.51	60.15	60.36	59.87	59.75	58.94	58.15	57.21	58.34
14	60.17	60.49	60.53	60.50	60.16	60.32	59.88	59.75	58.90	58.12	57.27	58.34
15	60.18	60.49	60.55	60.50	60.19	60.32	59.84	59.76	58.85	58.06	57.38	58.36
16	60.14	60.49	60.54	60.45	60.20	60.34	59.80	59.76	58.81	57.99	57.43	58.36
17	60.14	60.49	60.61	60.42	60.20	60.35	59.78	59.75	58.79	57.94	57.48	58.41
18	60.14	60.50	60.62	60.46	60.24	60.32	59.77	59.73	58.76	57.91	57.53	58.47
19	60.14	60.55	60.63	60.43	60.26	60.29	59.75	59.72	58.77	57.86	57.56	58.45
20	60.11	60.59	60.64	60.38	60.28	60.26	59.75	59.70	58.73	57.84	57.60	58.43
21	60.11	60.57	60.62	60.35	60.31	60.28	59.74	59.69	58.69	57.79	57.65	58.43
22	60.13	60.56	60.63	60.35	60.29	60.24	59.71	59.68	58.66	57.75	57.71	58.43
23	60.11	60.55	60.66	60.34	60.29	60.19	59.69	59.66	58.61	57.72	57.74	58.43
24	60.05	60.55	60.72	60.33	60.30	60.17	59.66	59.65	58.59	57.73	57.78	58.43
25	60.02	60.54	60.71	60.29	60.31	60.15	59.63	59.64	58.59	57.70	57.81	58.43
26	60.02	60.52	60.69	60.31	60.32	60.14	59.62	59.62	58.59	57.67	57.85	58.43
27	60.03	60.51	60.69	60.33	60.36	60.14	59.67	59.58	58.55	57.64	57.92	58.43
28	60.05	60.53	60.68	60.31	60.37	60.12	59.62	59.55	58.53	57.61	57.96	58.48
29	60.17	60.51	60.68	60.28	60.37	60.10	59.59	59.49	58.53	57.56	58.00	58.48
30	60.15	60.49	60.69	60.28	---	60.09	59.59	59.44	58.53	57.52	58.06	58.46
31	60.14	---	60.67	60.25	---	60.09	---	59.43	---	57.49	58.07	---

WTR YR 2004 MEAN 59.53 MAX 60.72 MIN 57.20



GREENE COUNTY—Continued

353103077333407. County number, GR-166; LWQ2M.

LOCATION.--Lat 35°31'03", long 77°33'34", Hydrologic Unit 03020203, near Lizzie, 30 ft north of Secondary Road 1335. Owner: DENR (North Carolina Department of Environment and Natural Resources).

WATER-LEVEL RECORDS

AQUIFER.--Surficial.

WELL CHARACTERISTICS.--Drilled observation well, depth 11.4 ft, diameter 2 in., screened interval from 7.2 to 11.2 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape.

DATUM.--Land-surface datum is 77.49 ft above NGVD of 1929 (levels by North Carolina Geodetic Survey). Measuring point: Top of metal casing, 2.26 ft above land surface datum.

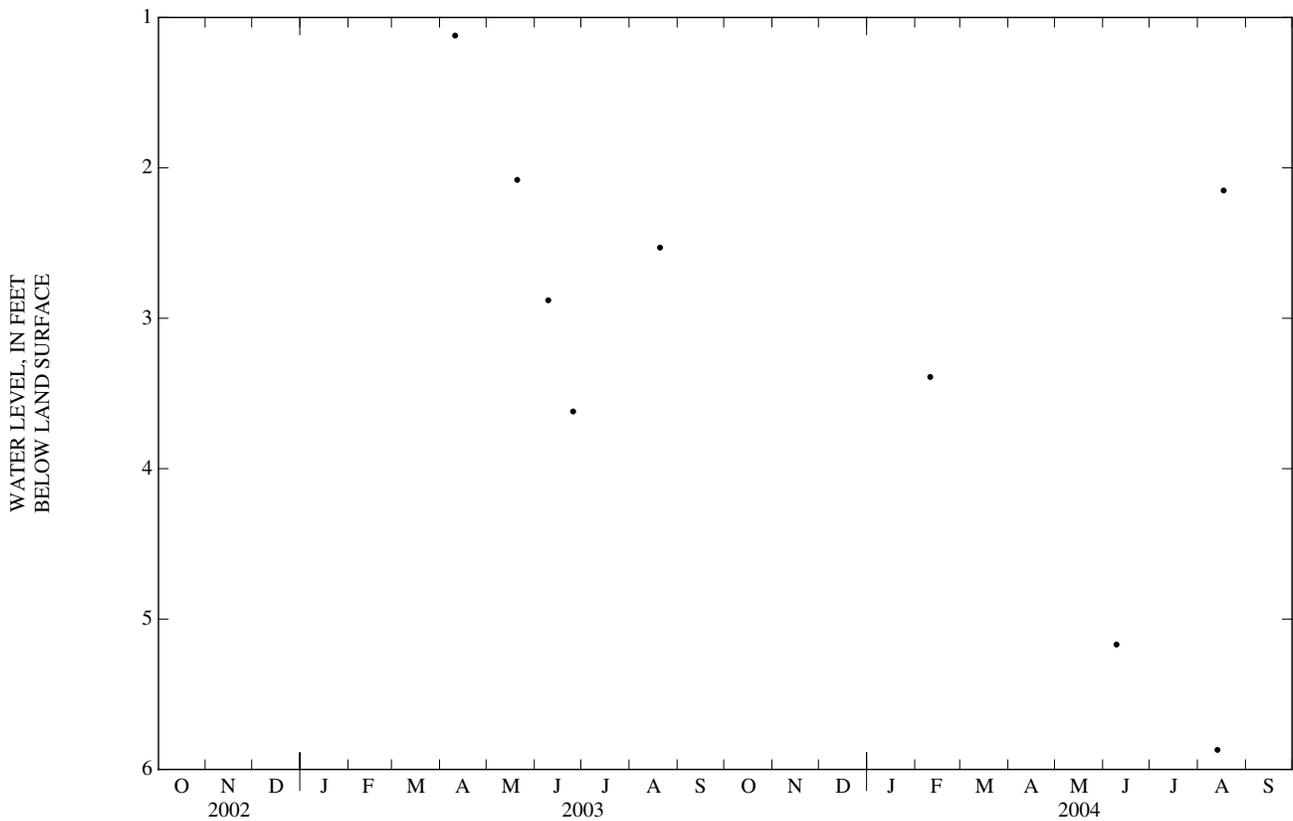
REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

PERIOD OF RECORD.--April 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.12 ft below land-surface datum, Apr. 10, 2003; lowest water level measured, 5.87 ft below land-surface datum, Aug. 13, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL						
FEB 10	3.39	JUN 09	5.17	AUG 13	5.87	AUG 17	2.15



WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 2003 to current year.

REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Depth to water level, feet below LSD (72019)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unfltrd uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)
FEB 10...	1035	3.39	769	5.9	54	4.9	155	8.5	12.2	16	2.50	2.34	.78
JUN 09...	1435	5.17	765	3.9	42	4.3	171	31.0	19.4	--	--	--	--

Date	Sodium, water, fltrd, mg/L (00930)	Alkalinity, wat flt fxd end lab, mg/L as CaCO3 (29801)	Chloride, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, fltrd, mg/L (00666)	Organic carbon, water, fltrd, mg/L (00681)	Iron, water, fltrd, ug/L (01046)
FEB 10...	19.2	<2	25.0	4.4	<.04	6.62	<.008	<.006	<.004	.9	E3
JUN 09...	--	--	--	--	<.04	7.46	<.008	<.006	E.002	--	--

GREENE COUNTY—Continued

353127077333705. County number, GR-167; LWQ15M.

LOCATION.--Lat 35°31'27", long 77°33'37", Hydrologic Unit 03020203, near Lizzie, north of Secondary Road 1335 and west of Secondary Road 1345.  
 Owner: DENR (North Carolina Department of Environment and Natural Resources).

WATER-LEVEL RECORDS

AQUIFER.--Surficial.

WELL CHARACTERISTICS.--Drilled observation well, depth 11.6 ft, diameter 2 in., screened interval from 7.4 to 11.4 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape.

DATUM.--Land-surface datum is 73.72 ft above NGVD of 1929 (levels by North Carolina Geodetic Survey). Measuring point: Top of metal casing, 2.05 ft above land surface datum.

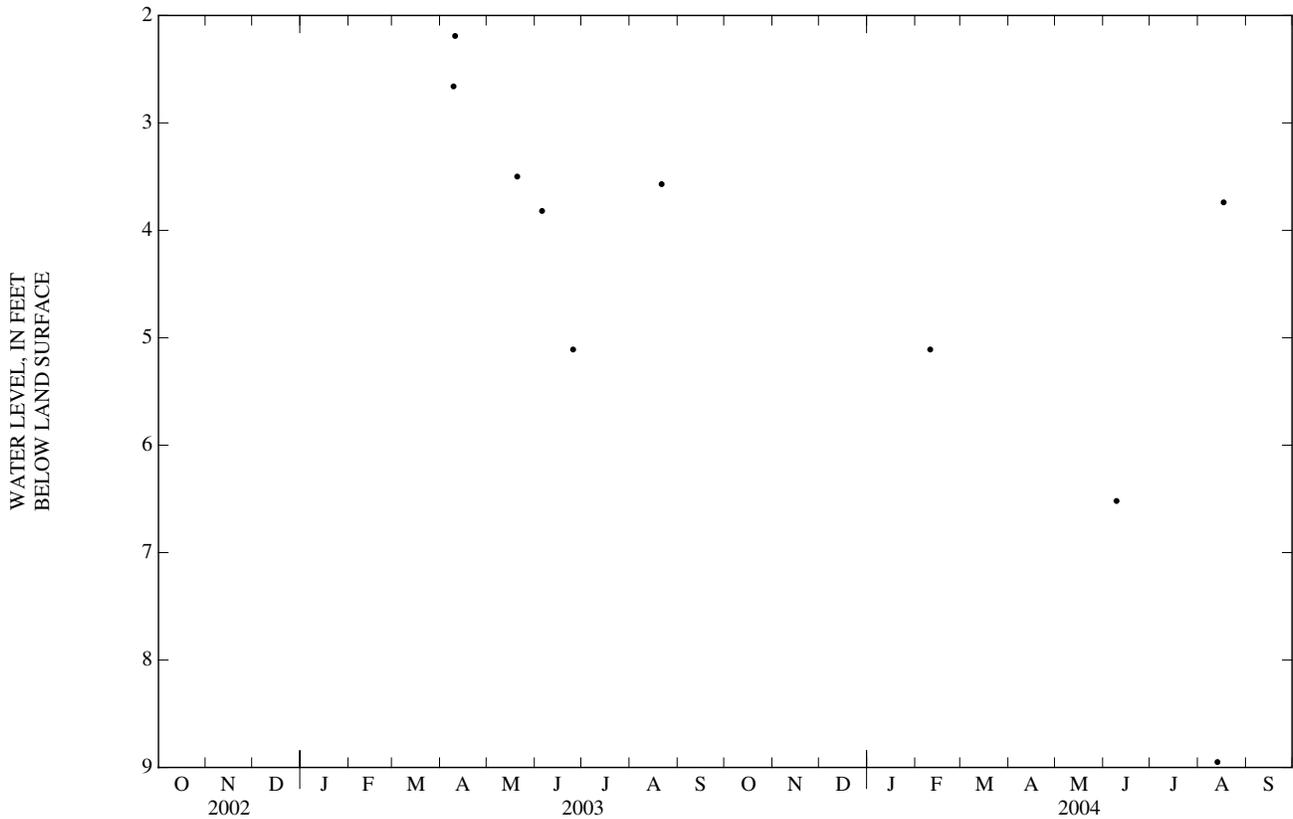
REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

PERIOD OF RECORD.--April 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.19 ft below land-surface datum, Apr. 10, 2003; lowest water level measured, 8.95 ft below land-surface datum, Aug. 13, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL						
FEB 10	5.11	JUN 09	6.52	AUG 13	8.95	AUG 17	3.74



WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 2003 to current year.

REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Depth to water level, feet below LSD (72019)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unfiltered uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)
FEB 10...	1430	5.11	767	.8	8	4.8	297	12.0	14.1	79	19.4	7.37	5.41
JUN 09...	1240	6.52	766	.4	4	4.1	338	30.0	18.0	--	--	--	--

Date	Sodium, water, fltrd, mg/L (00930)	Chloride, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, fltrd, mg/L (00666)	Organic carbon, water, fltrd, mg/L (00681)	Iron, water, fltrd, ug/L (01046)
FEB 10...	4.80	32.9	10.9	E.04	18.1	<.008	<.006	E.002	1.3	7
JUN 09...	--	--	--	E.02	24.6	<.008	<.006	E.004	--	--

GREENE COUNTY—Continued

353114077333101. County number, GR-168; LWQ70S.

LOCATION.--Lat 35°31'14", long 77°33'31", Hydrologic Unit 03020203, near Lizzie, north of Secondary Road 1335 and west of Secondary Road 1345.  
 Owner: DENR (North Carolina Department of Environment and Natural Resources).

WATER-LEVEL RECORDS

AQUIFER.--Surficial.

WELL CHARACTERISTICS.--Drilled observation well, depth 7.8 ft, diameter 2 in., screened interval from 3.6 to 7.6 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape.

DATUM.--Land-surface datum is 79.00 ft above NGVD of 1929 (levels by North Carolina Geodetic Survey). Measuring point: Top of metal casing, 1.87 ft above land surface datum.

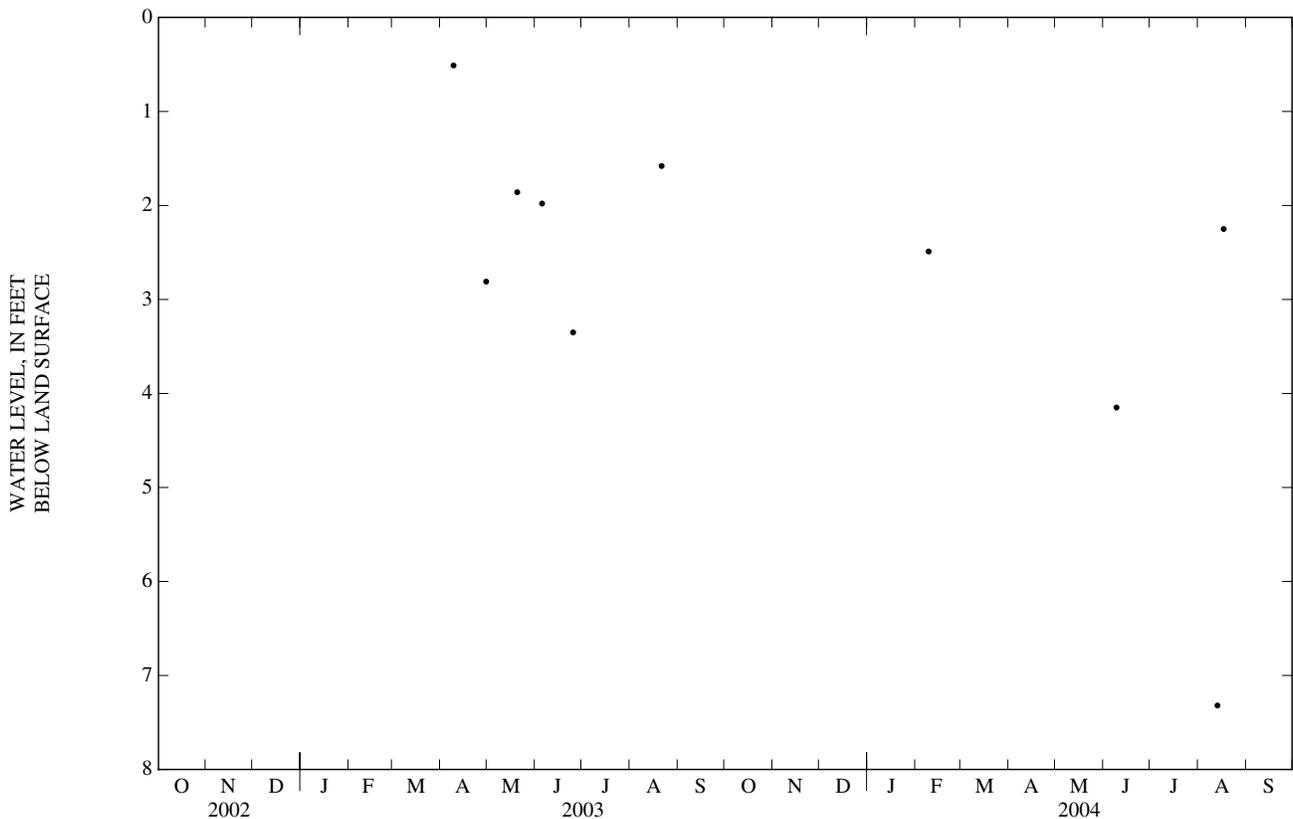
REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

PERIOD OF RECORD.--April 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.51 ft below land-surface datum, Apr. 9, 2003; lowest water level measured, 7.32 ft below land-surface datum, Aug. 13, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL						
FEB 09	2.49	JUN 09	4.15	AUG 13	7.32	AUG 17	2.25



353114077333101. County number, GR-168; LWQ70S—Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 2003 to current year.

REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Depth to water level, feet below LSD (72019)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unfiltered/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)
FEB 09...	1535	2.49	774	8.1	68	4.4	1,200	13.0	8.9	310	84.8	22.8	13.7
JUN 09...	0915	4.15	768	3.5	39	3.9	1,080	27.0	21.1	--	--	--	--

Date	Sodium, water, fltrd, mg/L (00930)	Chloride, water, fltrd, mg/L (00940)	Sulfate water, fltrd, mg/L (00945)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, fltrd, mg/L (00666)	Organic carbon, water, fltrd, mg/L (00681)	Iron, water, fltrd, ug/L (01046)
FEB 09...	42.5	121	78.1	<.04	76.3	<.008	<.006	E.003	2.4	17
JUN 09...	--	--	--	<.04	66.0	<.008	E.004	.007	--	--

GREENE COUNTY—Continued

353114077333102. County number, GR-169; LWQ70D.

LOCATION.--Lat 35°31'14", long 77°33'31", Hydrologic Unit 03020203, near Lizzie, north of Secondary Road 1335 and west of Secondary Road 1345.  
 Owner: DENR (North Carolina Department of Environment and Natural Resources).

WATER-LEVEL RECORDS

AQUIFER.--Surficial.

WELL CHARACTERISTICS.--Drilled observation well, depth 14.6 ft, diameter 2 in., screened interval from 10.4 to 14.4 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape.

DATUM.--Land-surface datum is 78.97 ft above NGVD of 1929 (levels by North Carolina Geodetic Survey). Measuring point: Top of metal casing, 2.07 ft above land surface datum.

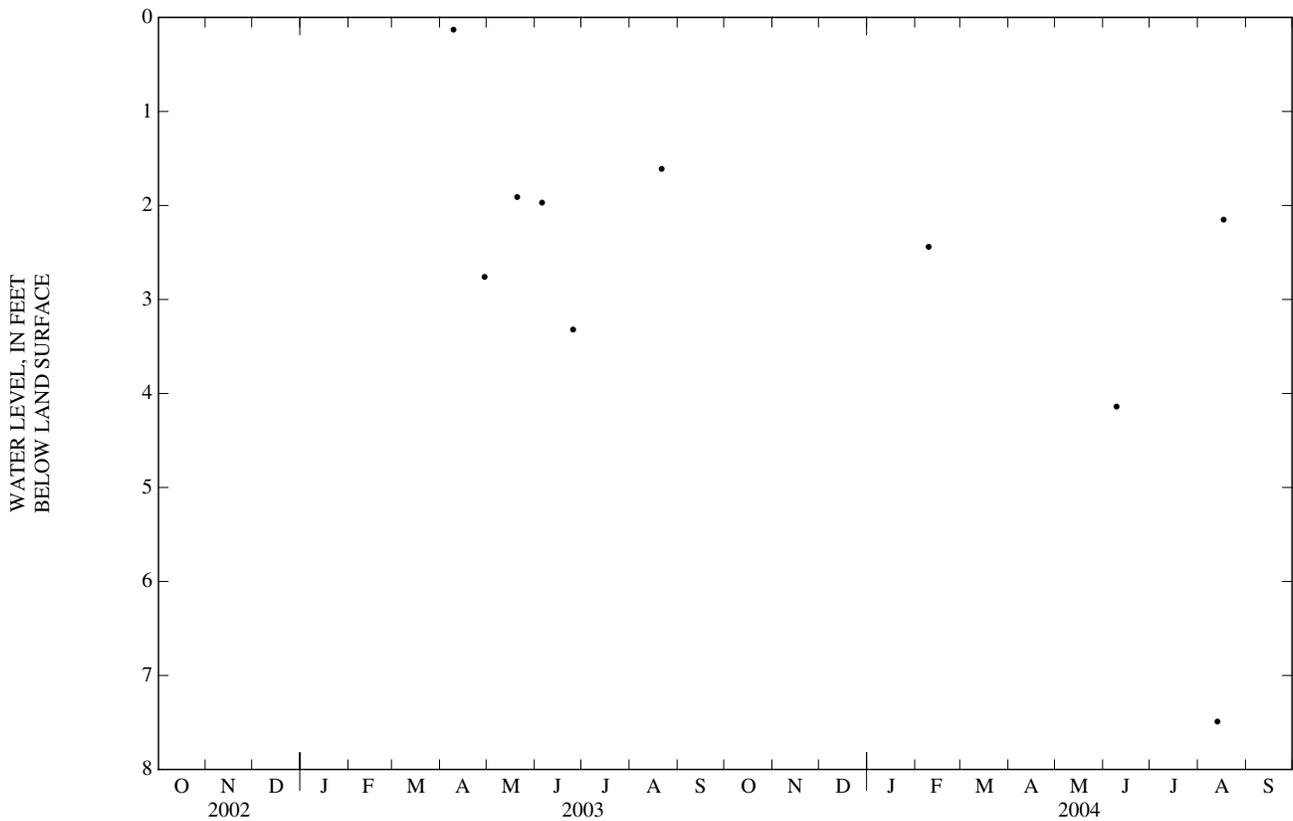
REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

PERIOD OF RECORD.--April 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.13 ft below land-surface datum, Apr. 9, 2003; lowest water level measured, 7.49 ft below land-surface datum, Aug. 13, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL						
FEB 09	2.44	JUN 09	4.14	AUG 13	7.49	AUG 17	2.15



WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 2003 to current year.

REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Depth to water level, feet below LSD (72019)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unfiltered uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, mg/L as CaCO3 (00900)	Calcium, water, fltrd, mg/L (00915)	Magnesium, water, fltrd, mg/L (00925)	Potassium, water, fltrd, mg/L (00935)
FEB 09...	1630	2.44	773	1.0	9	4.6	464	11.0	12.7	120	34.2	8.53	2.83
JUN 09...	1005	4.14	768	1.2	13	4.0	499	29.0	17.6	--	--	--	--

Date	Sodium, water, fltrd, mg/L (00930)	Chloride, water, fltrd, mg/L (00940)	Sulfate, water, fltrd, mg/L (00945)	Ammonia, water, fltrd, mg/L as N (00608)	Nitrite + nitrate, water, fltrd, mg/L as N (00631)	Nitrite, water, fltrd, mg/L as N (00613)	Orthophosphate, water, fltrd, mg/L as P (00671)	Phosphorus, water, fltrd, mg/L (00666)	Organic carbon, water, fltrd, mg/L (00681)	Iron, water, fltrd, ug/L (01046)
FEB 09...	19.0	62.4	21.4	E.03	22.3	E.004	<.006	<.004	.8	136
JUN 09...	--	--	--	<.04	25.9	<.008	<.006	<.004	--	--

GREENE COUNTY—Continued

353126077332102. County number, GR-171; LWQ71D.

LOCATION.--Lat 35°31'26", long 77°33'21", Hydrologic Unit 03020203, near Lizzie, north of Secondary Road 1335 and west of Secondary Road 1345.  
 Owner: DENR (North Carolina Department of Environment and Natural Resources).

WATER-LEVEL RECORDS

AQUIFER.--Surficial.

WELL CHARACTERISTICS.--Drilled observation well, depth 14.2 ft, diameter 2 in., screened interval from 10.0 to 14.0 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape.

DATUM.--Land-surface datum is 73.31 ft above NGVD of 1929 (levels by North Carolina Geodetic Survey). Measuring point: Top of metal casing, 2.47 ft above land surface datum.

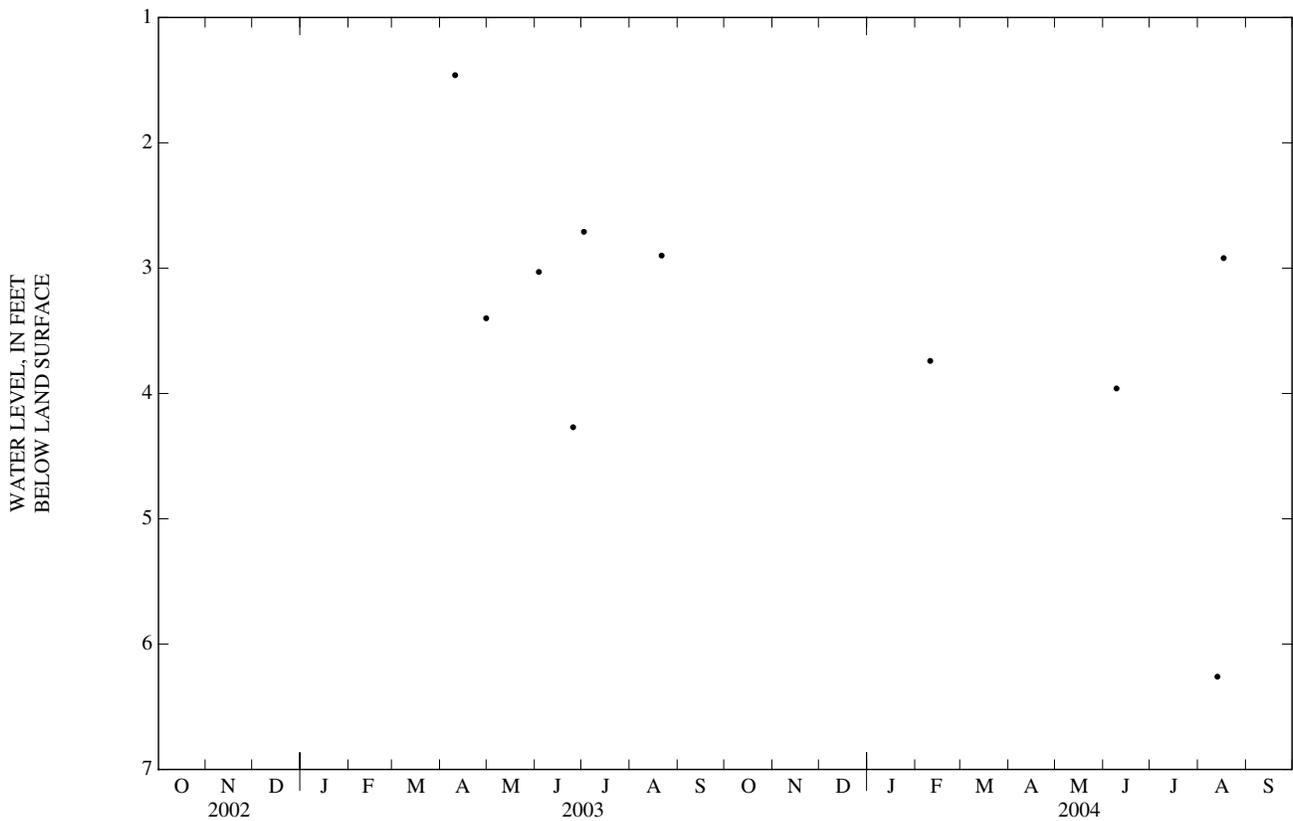
REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

PERIOD OF RECORD.--April 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.46 ft below land-surface datum, Apr. 10, 2003; lowest water level measured, 6.26 ft below land-surface datum, Aug. 13, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL						
FEB 10	3.74	JUN 09	3.96	AUG 13	6.26	AUG 17	2.92



WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 2003 to current year.

REMARKS.--Station operated in cooperation with the North Carolina Department of Environment and Natural Resources and the U.S. Environmental Protection Agency as part of the Lizzie research site water-quality monitoring project.

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

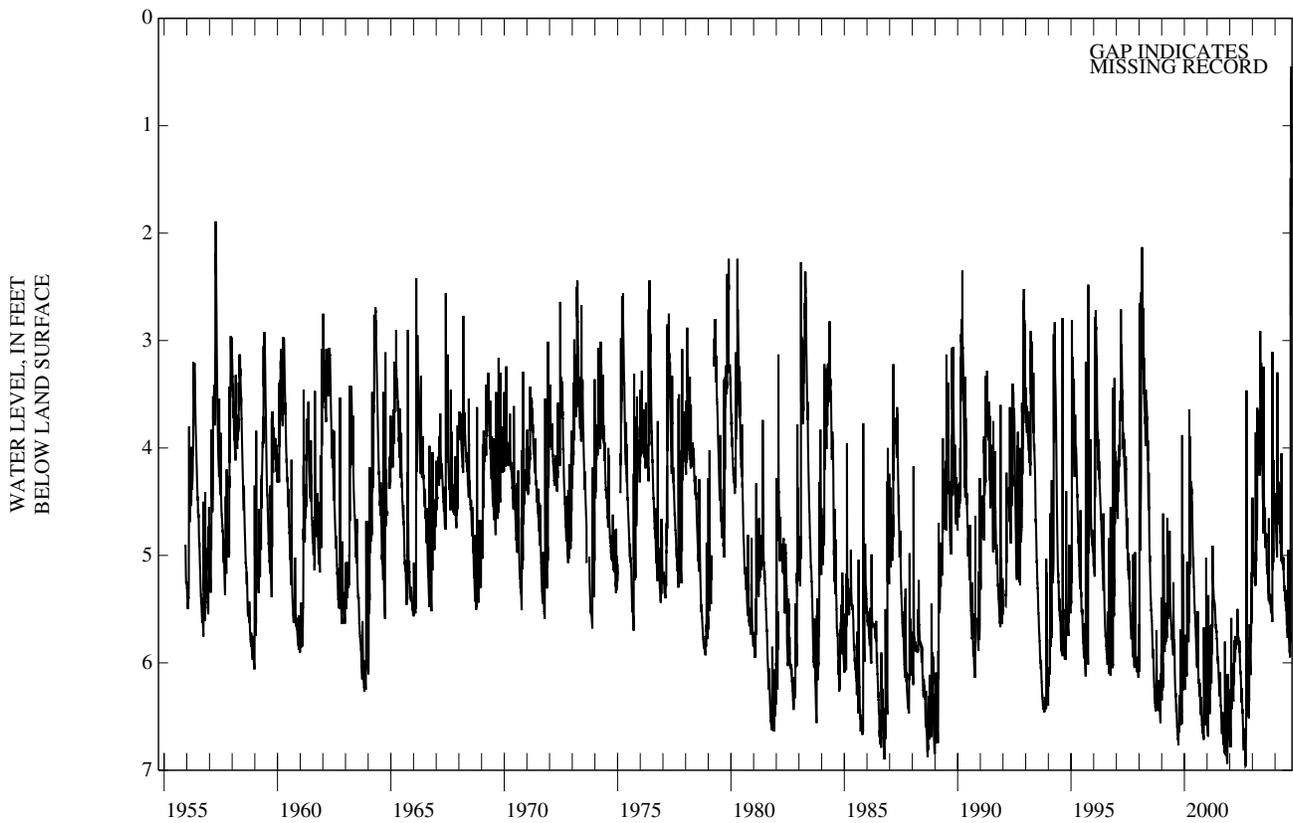
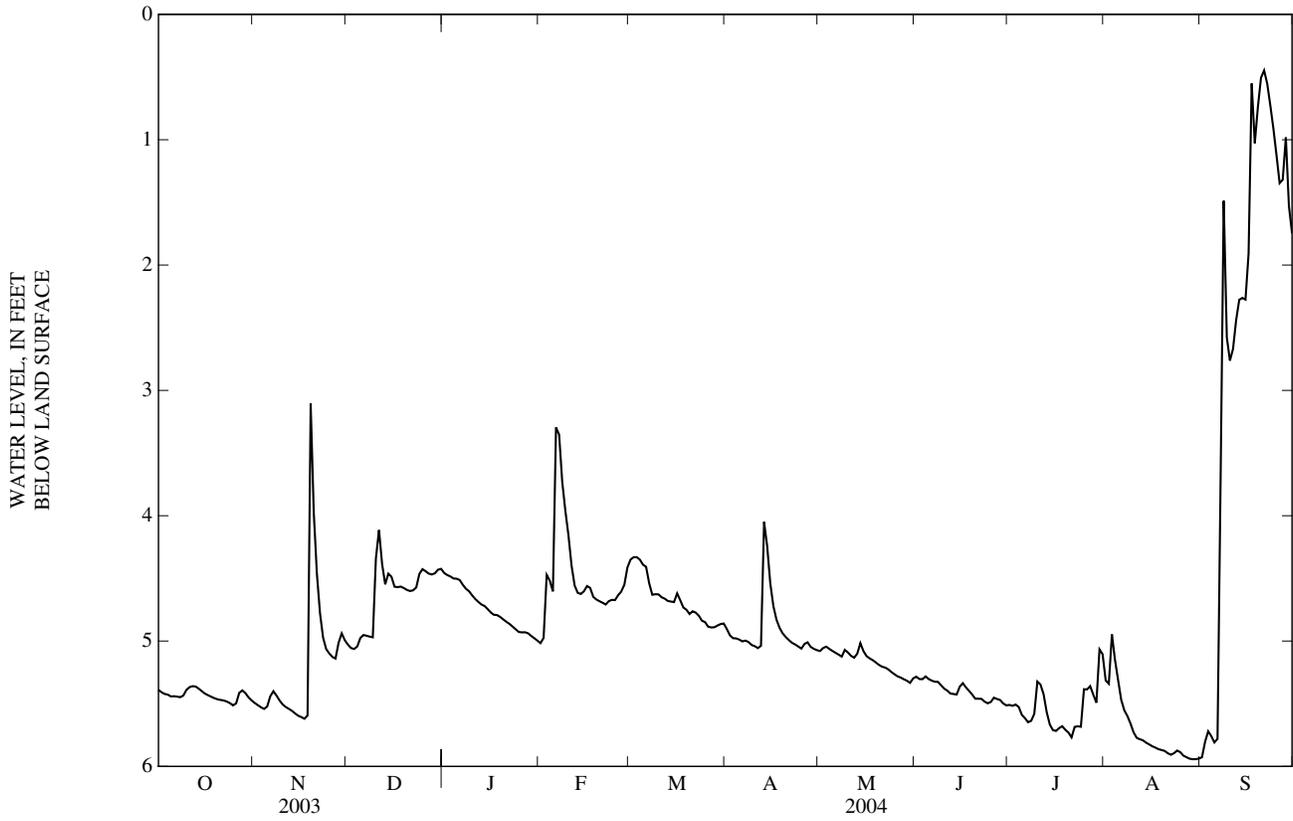
Date	Time	Depth to water level, feet below LSD (72019)	Barometric pressure, mm Hg (00025)	Dissolved oxygen, mg/L (00300)	Dissolved oxygen, percent of saturation (00301)	pH, water, unfltrd field, std units (00400)	Specif. conductance, wat unfiltered uS/cm 25 degC (00095)	Temperature, air, deg C (00020)	Temperature, water, deg C (00010)	Hardness, water, mg/L as CaCO3 (00900)	Calcium water, filtered, mg/L (00915)	Magnesium, water, filtered, mg/L (00925)	Potassium, water, filtered, mg/L (00935)
FEB 10...	1740	3.74	765	1.0	9	4.7	148	10.5	13.6	27	6.23	2.88	2.24
JUN 09...	1535	3.96	763	.9	9	4.2	146	30.0	18.2	--	--	--	--

Date	Sodium, water, filtered, mg/L (00930)	Chloride, water, filtered, mg/L (00940)	Sulfate water, filtered, mg/L (00945)	Ammonia water, filtered, mg/L as N (00608)	Nitrite + nitrate water filtered, mg/L as N (00631)	Nitrite water, filtered, mg/L as N (00613)	Orthophosphate, water, filtered, mg/L as P (00671)	Phosphorus, water, filtered, mg/L (00666)	Organic carbon, water, filtered, mg/L (00681)	Iron, water, filtered, ug/L (01046)
FEB 10...	7.70	22.6	16.2	<.04	3.55	<.008	<.006	<.004	.4	45
JUN 09...	--	--	--	<.04	4.02	<.008	<.006	<.004	--	--



GROUND-WATER LEVELS  
HAYWOOD COUNTY—Continued

352315082484401. Local number, NC-40; County name, HW-047.



## HERTFORD COUNTY

363026077001906. Local number, NC-155; DENR Como Research Station well B20u6; County number, HF-085.

LOCATION.--Lat 36°30'27", long 77°00'20", Hydrologic Unit 03010203, 0.5 mi northeast of Como, and northwest of U.S. Highway 258 on Secondary Road 1316. Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Lower Cape Fear aquifer of Late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation well, depth 570 ft, diameter 4 in. to 211 ft, diameter 2.5 in. from 211 to 570 ft, screened interval from 560 to 570 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals.

DATUM.--Land-surface datum is 68.83 ft above NGVD of 1929 (levels by DENR). Measuring point: Top of instrument shelf, 3.00 ft above land-surface datum.

REMARKS.--Well is part of areal-effects network.

PERIOD OF RECORD.--September 1981 to current year. Continuous record began June 2000. Records from September 1981 to October 1986 are from the files of the Division of Water Quality, DENR.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 143.04 ft below land-surface datum, Feb. 9, 1983; lowest water level recorded, 162.53 ft below land-surface datum, Sept. 24, 25, 2004.

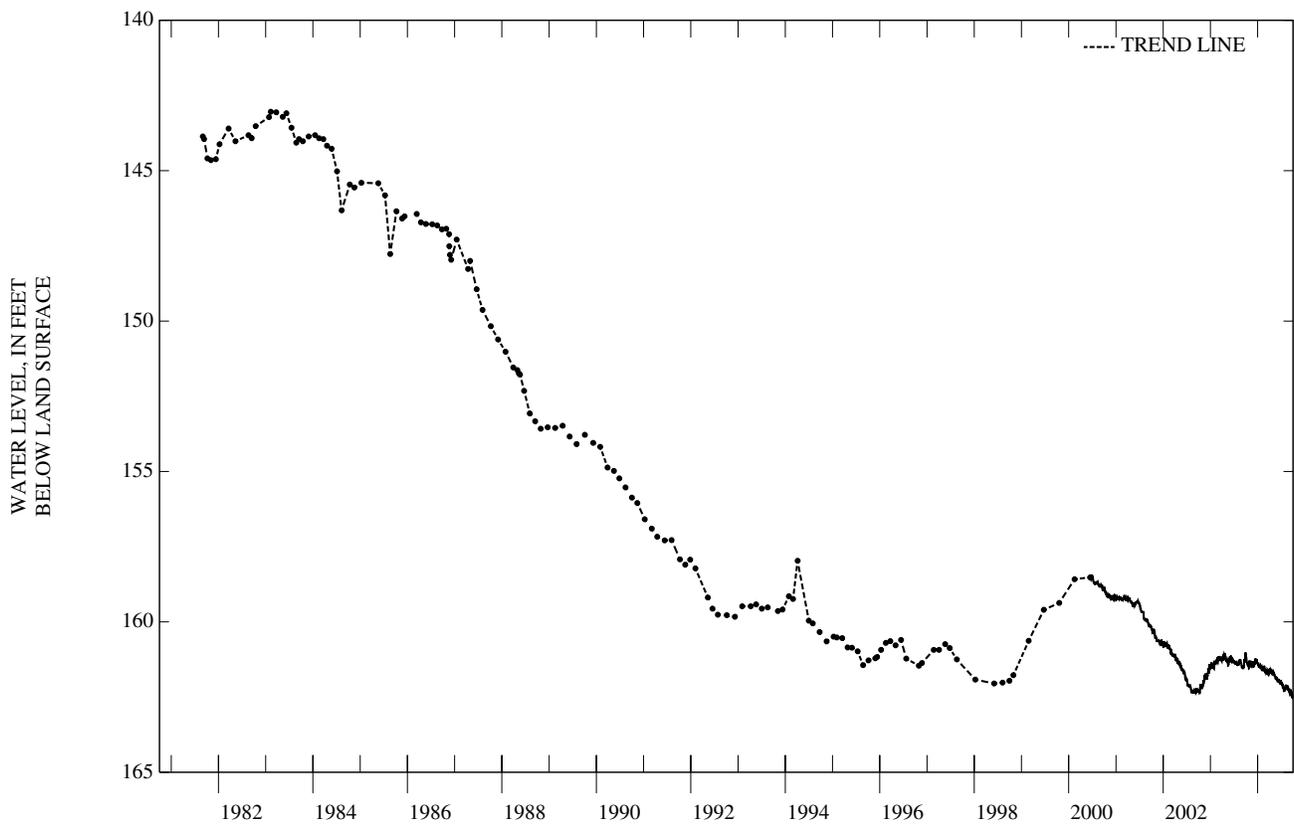
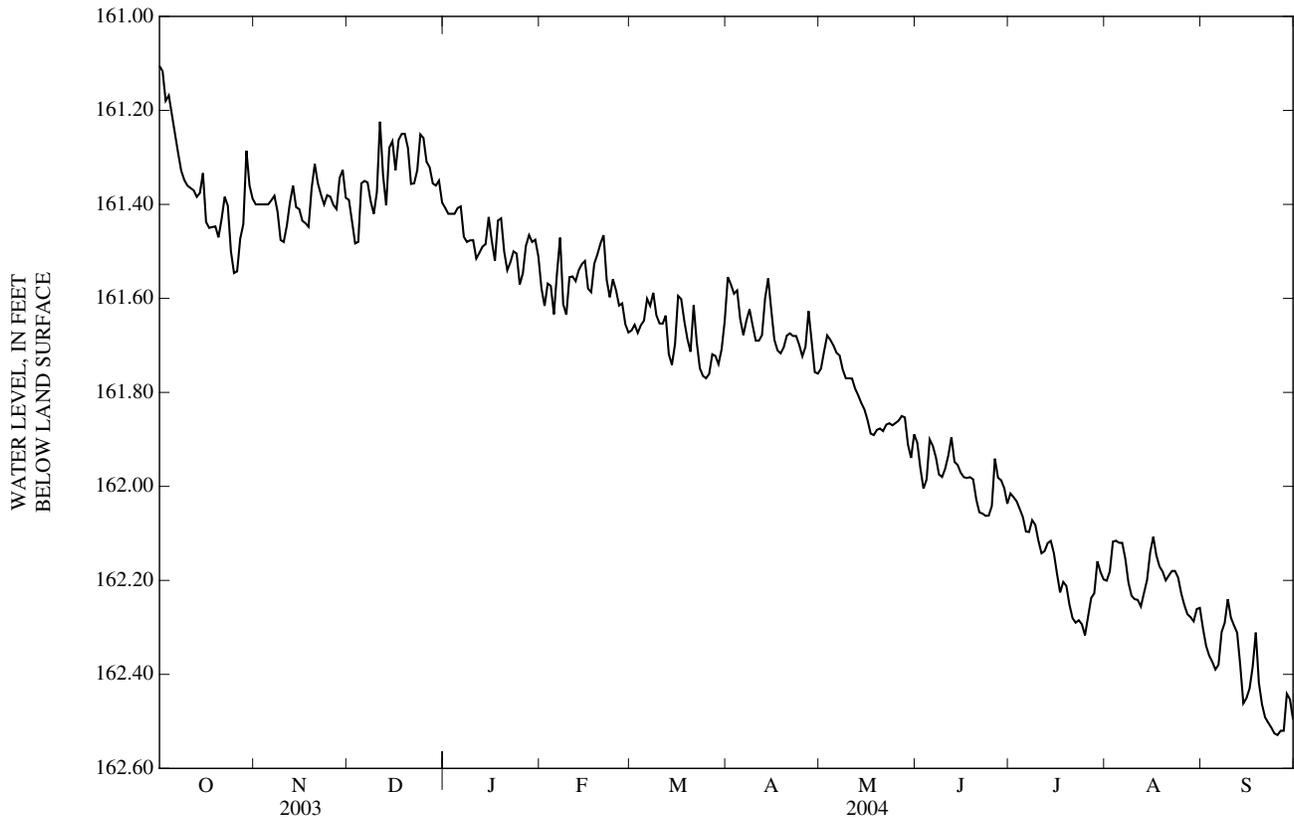
DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	161.11	161.40	161.39	161.41	161.58	161.67	161.55	161.75	161.91	162.01	162.20	162.30
2	161.12	161.40	161.44	161.42	161.62	161.66	161.57	161.71	161.96	162.02	162.18	162.34
3	161.18	161.40	161.48	161.42	161.57	161.67	161.59	161.68	162.00	162.03	162.12	162.36
4	161.17	161.40	161.48	161.42	161.57	161.66	161.58	161.69	161.99	162.05	162.12	162.37
5	161.21	161.40	161.36	161.41	161.63	161.65	161.64	161.70	161.90	162.07	162.12	162.39
6	161.25	161.39	161.35	161.40	161.55	161.60	161.68	161.72	161.91	162.10	162.12	162.38
7	161.29	161.38	161.35	161.47	161.47	161.62	161.65	161.72	161.94	162.10	162.15	162.31
8	161.33	161.41	161.39	161.48	161.61	161.59	161.62	161.75	161.97	162.07	162.20	162.29
9	161.35	161.48	161.42	161.48	161.63	161.64	161.66	161.77	161.98	162.08	162.23	162.24
10	161.36	161.48	161.37	161.48	161.55	161.65	161.69	161.77	161.96	162.12	162.24	162.28
11	161.37	161.45	161.22	161.52	161.55	161.65	161.69	161.77	161.93	162.14	162.24	162.30
12	161.37	161.40	161.34	161.50	161.56	161.64	161.68	161.79	161.90	162.14	162.26	162.31
13	161.38	161.36	161.40	161.49	161.54	161.72	161.60	161.81	161.95	162.12	162.23	162.38
14	161.38	161.41	161.28	161.48	161.53	161.74	161.56	161.82	161.95	162.12	162.20	162.46
15	161.33	161.41	161.27	161.43	161.52	161.70	161.63	161.84	161.97	162.14	162.14	162.45
16	161.44	161.43	161.33	161.48	161.58	161.59	161.69	161.86	161.98	162.19	162.11	162.43
17	161.45	161.44	161.26	161.52	161.59	161.60	161.71	161.89	161.98	162.23	162.15	162.38
18	161.45	161.45	161.25	161.43	161.53	161.65	161.72	161.89	161.98	162.20	162.17	162.31
19	161.45	161.37	161.25	161.43	161.51	161.69	161.70	161.88	161.99	162.21	162.18	162.42
20	161.47	161.31	161.28	161.50	161.48	161.71	161.68	161.88	162.03	162.25	162.20	162.46
21	161.43	161.36	161.36	161.54	161.47	161.61	161.67	161.88	162.06	162.28	162.19	162.49
22	161.38	161.38	161.36	161.52	161.56	161.69	161.68	161.87	162.06	162.29	162.18	162.50
23	161.40	161.40	161.33	161.50	161.60	161.75	161.68	161.87	162.06	162.28	162.18	162.51
24	161.50	161.38	161.25	161.50	161.56	161.76	161.70	161.87	162.06	162.29	162.19	162.53
25	161.55	161.38	161.26	161.57	161.58	161.77	161.72	161.87	162.04	162.32	162.23	162.53
26	161.54	161.40	161.31	161.55	161.62	161.76	161.70	161.86	161.94	162.28	162.25	162.52
27	161.47	161.41	161.32	161.49	161.61	161.72	161.63	161.85	161.98	162.24	162.27	162.52
28	161.44	161.34	161.36	161.47	161.66	161.72	161.69	161.85	161.99	162.23	162.28	162.44
29	161.29	161.33	161.36	161.48	161.67	161.74	161.76	161.91	162.00	162.16	162.29	162.45
30	161.36	161.39	161.35	161.48	---	161.71	161.76	161.94	162.04	162.18	162.26	162.50
31	161.39	---	161.40	161.51	---	161.65	---	161.89	---	162.20	162.26	---

WTR YR 2004 MEAN 161.75 HIGH 161.11 LOW 162.53

GROUND-WATER LEVELS  
HERTFORD COUNTY—Continued

363026077001906. Local number, NC-155; DENR Como Research Station well B20u6; County number, HF-085.



IREDELL COUNTY

353135080524201. County number, IR-130; DENR Langtree Research Station MW-2 (Regolith well).

LOCATION.--Lat 35°31'35", long 80°52'42", Hydrologic Unit 03050101, 2.5 mi northwest of Davidson, .1 mi north of Langtree Road at Davidson College Lake Campus. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic quartz diorite).

WELL CHARACTERISTICS.--Drilled observation well, depth 28 ft, diameter 4 in., cased to 13 ft, screened interval from 13 ft to 28 ft, sand filter packed from 10 ft to 28 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 802.48 ft above NGVD of 1929 (levels by DENR). Measuring point: Top of instrument shelter floor, 1.34 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

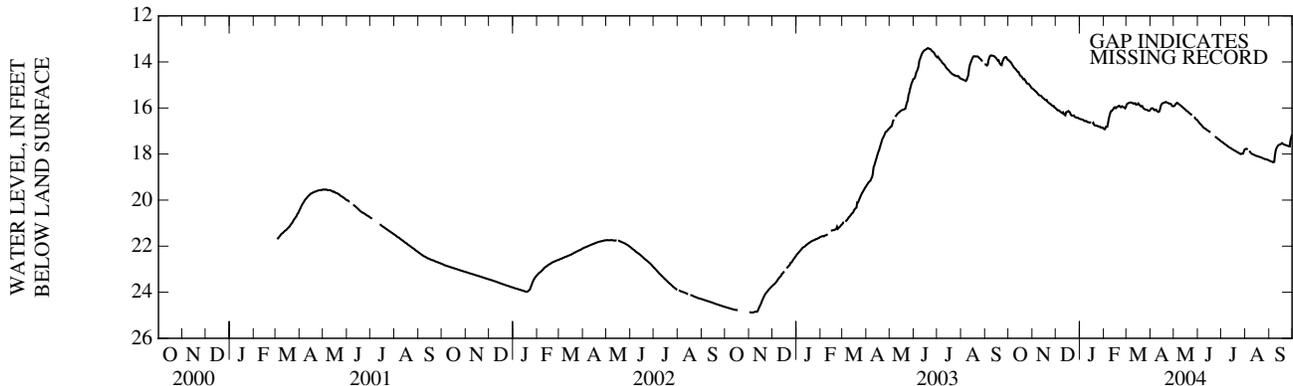
PERIOD OF RECORD.--March 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 13.39 ft below land-surface datum, June 19, 2003; lowest water level recorded 24.91 ft below land-surface datum, Nov. 5, 2002.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.92	15.17	16.02	16.48	16.92	15.85	16.04	15.92	16.58	17.45	17.78	18.29
2	13.96	15.19	16.06	16.48	16.92	15.81	16.02	15.89	16.62	17.48	17.77	18.31
3	14.00	15.22	16.10	16.50	16.82	15.80	16.01	15.83	16.67	17.50	17.78	18.32
4	14.02	15.26	16.10	16.50	16.82	15.78	16.02	15.80	16.70	17.53	17.80	18.33
5	14.09	15.29	16.10	16.51	16.82	15.77	16.08	15.77	16.73	17.56	---	18.35
6	14.14	15.31	16.15	16.55	16.66	15.76	16.10	15.80	16.77	17.58	17.86	18.36
7	14.20	15.36	16.17	16.57	16.46	15.77	16.08	15.82	16.81	17.60	17.91	18.35
8	14.24	15.40	16.20	16.57	16.33	15.78	16.08	15.85	16.85	17.63	17.95	18.04
9	14.28	15.44	16.22	16.56	16.20	15.79	16.13	15.88	16.88	17.66	17.99	17.84
10	14.31	15.45	16.19	16.60	16.13	15.81	16.16	15.90	16.89	17.68	18.00	17.74
11	14.36	15.46	16.25	16.62	16.12	15.80	16.17	15.93	16.91	17.70	18.02	17.68
12	14.40	15.48	16.30	16.62	16.09	15.80	16.15	15.97	16.95	17.73	18.03	17.63
13	14.44	15.53	16.32	16.64	16.03	15.85	16.05	15.99	16.97	17.74	18.05	17.61
14	14.45	15.56	16.18	16.63	15.98	15.85	15.91	16.02	16.99	17.76	18.07	17.59
15	14.54	15.58	16.17	16.65	15.97	15.84	15.83	16.05	17.02	17.79	18.08	17.57
16	14.60	15.61	16.17	---	16.01	15.80	15.80	16.08	17.04	17.81	18.09	17.56
17	14.62	15.65	16.13	16.70	15.97	15.85	15.78	16.12	17.05	17.83	18.10	17.52
18	14.66	15.66	16.16	16.65	15.95	15.89	15.78	16.14	---	17.84	18.11	17.55
19	14.70	15.65	16.20	16.73	15.93	15.93	15.76	16.16	---	17.87	18.12	17.58
20	14.75	15.73	16.29	16.75	15.91	15.93	15.74	16.20	---	17.89	18.13	17.59
21	14.74	15.76	16.33	16.76	15.92	15.91	15.74	16.23	---	17.91	18.14	17.60
22	14.78	15.79	16.33	16.76	15.96	15.98	15.77	16.25	---	17.92	18.16	17.61
23	14.84	15.82	16.33	16.78	15.97	16.03	15.78	16.28	17.23	17.94	18.17	17.62
24	14.90	15.83	16.32	16.78	15.93	16.05	15.80	16.31	17.27	17.97	18.19	17.64
25	14.94	15.87	16.38	16.81	15.95	16.07	15.81	---	17.29	17.99	18.21	17.65
26	14.95	15.90	16.40	16.82	15.96	16.07	15.81	---	17.32	18.00	18.22	17.66
27	14.95	15.92	16.41	16.81	15.98	16.07	15.82	16.39	17.35	17.98	18.23	17.67
28	15.00	15.91	16.42	16.85	16.01	16.10	15.89	16.43	17.37	17.98	18.24	17.40
29	15.05	15.98	16.42	16.85	15.95	16.12	15.92	16.48	17.41	17.98	18.24	17.27
30	15.11	15.99	16.44	16.85	---	16.12	15.93	16.51	17.43	17.88	18.25	17.15
31	15.14	---	16.46	16.90	---	16.10	---	16.53	---	17.80	18.27	---

WTR YR 2004 MEAN 16.47 HIGH 13.92 LOW 18.36



GROUND-WATER LEVELS

IREDELL COUNTY—Continued

353135080524202. County number, IR-131; DENR Langtree Research Station MW-2I (Transition zone well).

LOCATION.--Lat 35°31'36", long 80°52'42", Hydrologic Unit 03050101, 2.5 mi northwest of Davidson, .1 mi north of Langtree Road at Davidson College Lake Campus. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Transition zone (weathered and competent quartz diorite).

WELL CHARACTERISTICS.--Drilled observation well, depth 48 ft, diameter 4 in., cased to 33 ft, screened interval from 33 ft to 48 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 802.67 ft above NGVD of 1929 (levels by DENR). Measuring point: Top of instrument shelter floor, 0.67 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

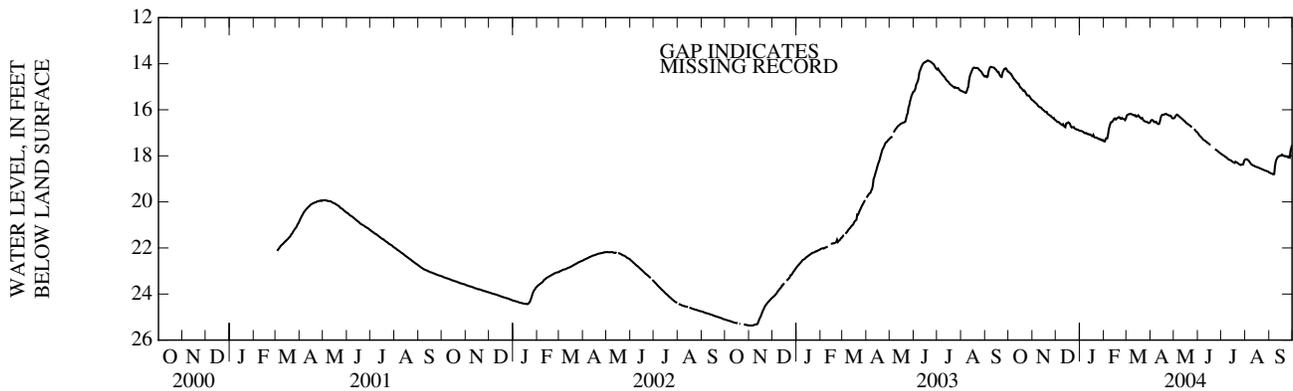
PERIOD OF RECORD.--March 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 13.85 ft below land-surface datum, June 19, 2003; lowest water level recorded 25.38 ft below land-surface datum, Nov. 3, 5, 6, 2002.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.34	15.59	16.47	16.92	17.37	16.26	16.48	16.37	17.03	17.92	18.16	18.73
2	14.38	15.61	16.50	16.92	17.37	16.22	16.45	16.34	17.08	17.95	18.15	18.75
3	14.42	15.65	16.53	16.93	17.26	16.21	16.44	16.27	17.12	17.97	18.15	18.76
4	14.44	15.68	16.53	16.94	17.24	16.19	16.47	16.23	17.15	17.99	18.18	18.77
5	14.51	15.71	16.54	16.95	17.24	16.18	16.52	16.21	17.19	18.01	18.20	18.79
6	14.56	15.74	16.59	17.00	17.08	16.17	16.54	16.24	17.23	18.04	18.25	18.81
7	14.62	15.78	16.61	17.02	16.85	16.19	16.53	16.27	17.27	18.06	18.30	18.79
8	14.67	15.83	16.64	17.01	16.72	16.20	16.52	16.30	17.31	18.08	18.35	18.45
9	14.70	15.87	16.66	17.01	16.60	16.21	16.58	16.33	17.33	18.12	18.38	18.25
10	14.74	15.88	16.63	17.05	16.54	16.24	16.61	16.36	17.35	18.15	18.40	18.15
11	14.79	15.90	16.69	17.06	16.53	16.24	16.62	16.38	17.37	18.17	18.42	18.09
12	14.82	15.91	16.74	17.05	16.50	16.23	16.60	16.42	17.40	18.18	18.43	18.04
13	14.86	15.96	16.76	17.08	16.44	16.29	16.48	16.45	17.43	18.20	18.45	18.02
14	14.87	16.00	16.60	17.07	16.38	16.29	16.33	16.48	17.45	18.22	18.47	18.00
15	14.96	16.02	16.58	17.09	16.37	16.28	16.24	16.51	17.48	18.25	18.48	18.00
16	15.03	16.05	16.58	17.14	16.42	16.24	16.22	16.54	17.51	18.27	18.49	17.98
17	15.05	16.09	16.55	17.15	16.39	16.29	16.21	16.58	17.53	18.29	18.50	17.95
18	15.09	16.10	16.57	17.09	16.36	16.33	16.21	16.60	---	18.31	18.51	17.97
19	15.13	16.09	16.61	17.18	16.34	16.37	16.20	16.62	---	18.25	18.54	18.00
20	15.18	16.17	16.71	17.20	16.32	16.38	16.18	16.65	---	18.28	18.55	18.01
21	15.16	16.20	16.76	17.21	16.34	16.36	16.18	16.68	---	18.29	18.56	18.02
22	15.21	16.22	16.76	17.21	16.39	16.43	16.21	16.70	---	18.31	18.58	18.02
23	15.26	16.25	16.75	17.23	16.39	16.47	16.22	16.73	17.70	18.34	18.59	18.03
24	15.34	16.25	16.75	17.24	16.36	16.49	16.24	16.76	17.74	18.37	18.61	18.05
25	15.38	16.30	16.81	17.27	16.39	16.51	16.26	---	17.76	18.38	18.62	18.06
26	15.38	16.33	16.83	17.28	16.40	16.52	16.25	---	17.78	18.40	18.64	18.07
27	15.38	16.36	16.84	17.27	16.41	16.52	16.27	16.84	17.82	18.38	18.65	18.08
28	15.43	16.35	16.86	17.31	16.45	16.55	16.34	16.87	17.84	18.38	18.66	17.79
29	15.47	16.42	16.86	17.31	16.38	16.57	16.37	16.93	17.87	18.37	18.67	17.65
30	15.54	16.44	16.88	17.31	---	16.57	16.37	16.96	17.90	18.25	18.68	17.53
31	15.57	---	16.91	17.36	---	16.55	---	16.98	---	18.18	18.71	---

WTR YR 2004 MEAN 16.91 HIGH 14.34 LOW 18.81



IREDELL COUNTY—Continued

353135080524203. County number, IR-132; DENR Langtree Research Station MW-2D (Bedrock well).

LOCATION.--Lat 35°31'36", long 80°52'42", Hydrologic Unit 03050101, 2.5 mi northwest of Davidson, .1 mi north of Langtree Road at Davidson College Lake Campus. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

WATER-LEVEL RECORDS

AQUIFER.--Quartz diorite bedrock.

WELL CHARACTERISTICS.--Drilled observation well, depth 400 ft, diameter 6 in., cased to 53 ft, open hole from 53 ft to 400 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 802.27 ft above NGVD of 1929 (levels by DENR). Measuring point: Top of instrument shelter floor, 1.39 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

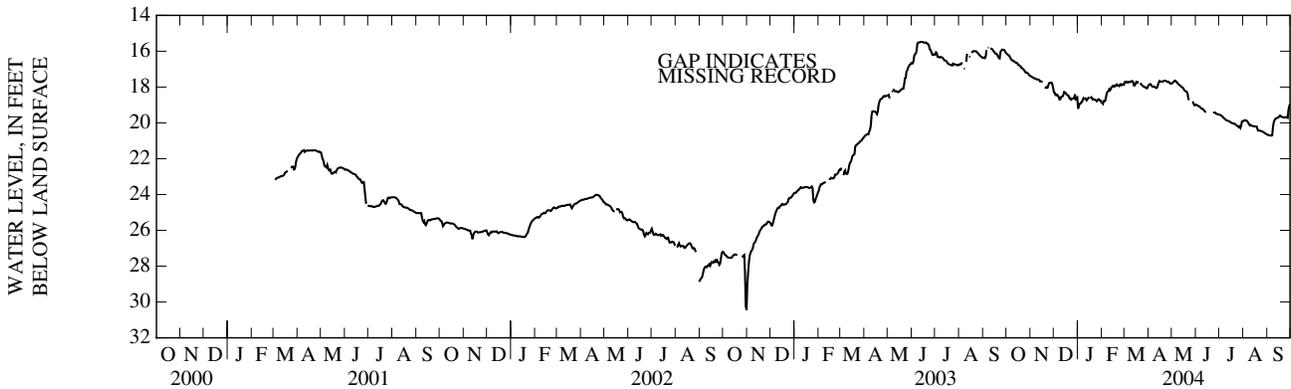
PERIOD OF RECORD.--March 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 15.46 ft below land-surface datum, June 12, 13, 14, 2003; lowest water level recorded 31.72 ft below land-surface datum, Oct. 30, 2002.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.13	17.39	18.30	19.21	18.86	17.73	17.89	17.79	18.98	19.55	19.90	20.67
2	16.18	17.42	18.33	19.04	18.93	17.73	17.85	17.76	19.01	19.56	19.88	20.67
3	16.22	17.45	18.45	18.94	18.78	17.70	17.83	17.71	19.04	19.57	19.84	20.70
4	16.23	17.48	18.45	18.93	18.80	17.74	17.88	17.66	19.06	19.61	19.87	20.69
5	16.31	17.51	18.43	18.86	18.77	17.75	17.95	17.64	19.07	19.64	19.87	20.71
6	16.39	17.51	18.49	18.84	18.55	17.71	17.98	17.68	19.11	19.70	19.92	20.72
7	16.47	17.54	18.55	18.72	18.33	17.71	17.99	17.71	19.16	19.74	19.98	20.69
8	16.51	17.55	18.69	18.62	18.27	17.73	17.97	17.78	19.21	19.77	20.06	20.24
9	16.52	17.58	18.69	18.65	18.23	17.70	18.00	17.83	19.22	19.82	20.14	19.96
10	16.55	17.57	18.56	18.63	18.12	17.67	18.04	17.87	19.23	19.85	20.11	19.86
11	16.58	17.58	18.54	18.68	18.18	17.67	18.06	17.90	19.30	19.87	20.15	19.77
12	16.61	17.62	18.53	18.74	18.12	17.75	18.01	17.94	19.34	19.88	20.16	19.76
13	16.65	17.69	18.45	18.66	18.01	17.91	17.86	17.98	19.38	19.90	20.18	19.74
14	16.64	17.68	18.28	18.65	17.99	17.91	17.72	18.01	19.39	19.92	20.19	19.71
15	16.69	17.69	18.29	18.55	17.93	17.80	17.66	18.04	---	19.95	20.19	19.69
16	16.76	17.74	18.33	---	17.95	17.72	17.69	18.11	---	19.98	20.20	19.66
17	16.78	---	18.40	18.63	17.97	17.76	17.71	18.18	---	20.01	20.20	19.59
18	16.81	---	18.44	18.57	17.90	17.72	17.70	18.22	---	20.03	20.21	19.61
19	16.85	18.02	18.49	18.63	17.92	17.74	17.70	18.25	---	20.02	20.34	19.65
20	16.93	18.04	18.50	18.71	17.86	---	17.66	18.27	---	20.04	20.44	19.68
21	16.95	18.00	18.64	18.68	17.91	17.78	17.65	18.36	---	20.07	20.43	19.68
22	16.99	18.05	18.63	18.70	17.91	17.83	17.65	18.65	---	20.09	20.44	19.71
23	17.03	18.02	18.71	18.71	17.95	17.89	17.66	18.73	19.42	20.13	20.45	19.71
24	17.09	17.84	18.66	18.74	17.86	17.92	17.68	---	19.43	20.17	20.46	19.68
25	17.16	17.77	18.65	18.80	17.84	17.96	17.72	---	19.43	20.21	20.48	19.68
26	17.21	17.75	18.63	18.75	17.90	17.99	17.72	---	19.44	20.24	20.50	19.70
27	17.19	17.77	18.63	18.68	17.86	18.00	17.71	18.84	19.50	20.20	20.53	19.72
28	17.23	17.76	18.41	18.68	17.86	18.03	17.76	18.85	19.51	20.28	20.55	19.26
29	17.26	17.88	18.68	18.75	17.87	18.07	17.81	18.95	19.52	20.16	20.59	19.05
30	17.34	18.08	18.65	18.75	---	18.07	17.82	19.02	19.54	19.93	20.61	18.95
31	17.38	---	18.60	18.86	---	17.96	---	18.99	---	19.90	20.64	---

WTR YR 2004 MEAN 18.58 HIGH 16.13 LOW 20.72



353135080524203 IR-132 DENR Langtree Research Station MW-2D (Bedrock Well)—Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 2002 to March 2004 (discontinued).

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: August 2002 to March 2004.

pH: August 2002 to March 2004.

WATER TEMPERATURE: August 2002 to March 2004.

DISSOLVED OXYGEN: August 2002 to March 2004.

DISSOLVED OXYGEN, PERCENT SATURATION: August 2002 to March 2004.

INSTRUMENTATION.-- Water-quality monitor with satellite telemetry from August 2002 to March 2004.

REMARKS.--Station operated in cooperation with North Carolina Department of Environment and Natural Resources, Water Resources Division as part of the Piedmont/Mountains ground-water study. Dissolved oxygen, percent saturation, is computed using a barometric pressure of 760 mm Hg.

EXTREMES FOR PERIOD OF DAILY RECORD.--

CONSTITUENT	MAXIMUM RECORDED	MINIMUM RECORDED
SPECIFIC CONDUCTANCE, microsiemens	97, December 17, 20, 2002, January 17, 19, 2004	83, August 23, 31, 2002, September 1, 2, 2002
pH, standard units	7.5, December 15, 16, 17, 2002	6.4, March 14, 2004
WATER TEMPERATURE, °C	16.2, June 23, 2003	16.0, on many days during the period
DISSOLVED OXYGEN, mg/L	7.5, August 28, 2002	4.8, on several days during the period
DISSOLVED OXYGEN, PERCENT SATURATION, %	78, August 28, 2002	50, on several days during the period

EXTREMES FOR CURRENT YEAR.--

CONSTITUENT	MAXIMUM RECORDED	MINIMUM RECORDED
SPECIFIC CONDUCTANCE, microsiemens	97, January 17, 19	89, March 14-18
pH, standard units	6.9, on several days during the year	6.4, March 14
WATER TEMPERATURE, °C	16.1, on many days during the year	16.1, on many days during the year
DISSOLVED OXYGEN, mg/L	5.6, on many days during the year	4.9, on several days during the year
DISSOLVED OXYGEN, PERCENT SATURATION, %	59, on many days during the year	51, on several days during the year

353135080524203 IR-132 DENR Langtree Research Station MW-2D (Bedrock Well)—Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	90	91	93	96	95	91	---	---	---	---	---	---
2	90	91	93	96	95	91	---	---	---	---	---	---
3	90	91	93	96	95	92	---	---	---	---	---	---
4	90	91	93	96	95	91	---	---	---	---	---	---
5	90	91	93	96	94	92	---	---	---	---	---	---
6	90	91	93	96	94	91	---	---	---	---	---	---
7	90	91	93	96	94	90	---	---	---	---	---	---
8	90	91	93	96	94	90	---	---	---	---	---	---
9	90	91	93	96	94	90	---	---	---	---	---	---
10	90	91	94	96	94	90	---	---	---	---	---	---
11	90	91	94	96	94	90	---	---	---	---	---	---
12	90	91	94	96	94	90	---	---	---	---	---	---
13	90	91	94	96	93	91	---	---	---	---	---	---
14	90	91	94	96	93	90	---	---	---	---	---	---
15	90	91	94	96	93	89	---	---	---	---	---	---
16	90	91	94	---	93	89	---	---	---	---	---	---
17	90	---	94	96	93	89	---	---	---	---	---	---
18	90	92	94	96	93	---	---	---	---	---	---	---
19	90	92	94	96	93	---	---	---	---	---	---	---
20	90	92	94	96	92	---	---	---	---	---	---	---
21	90	92	94	96	92	---	---	---	---	---	---	---
22	90	92	94	96	92	---	---	---	---	---	---	---
23	90	92	95	96	92	---	---	---	---	---	---	---
24	90	93	95	96	92	---	---	---	---	---	---	---
25	90	92	95	96	92	---	---	---	---	---	---	---
26	90	93	95	96	92	---	---	---	---	---	---	---
27	90	93	95	96	92	---	---	---	---	---	---	---
28	90	93	94	95	91	---	---	---	---	---	---	---
29	90	93	95	95	91	---	---	---	---	---	---	---
30	90	93	95	95	---	---	---	---	---	---	---	---
31	91	---	95	95	---	---	---	---	---	---	---	---
MEAN	90	---	94	---	93	---	---	---	---	---	---	---
MAX	91	--	95	--	95	--	---	---	---	---	---	---
MIN	90	--	93	--	91	--	---	---	---	---	---	---

353135080524203 IR-132 DENR Langtree Research Station MW-2D (Bedrock Well)—Continued

 PH, WATER, UNFILTERED, FIELD, STANDARD UNITS  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.6	6.7	6.8	6.8	6.7	6.6	---	---	---	---	---	---
2	6.7	6.7	6.8	6.8	6.7	6.6	---	---	---	---	---	---
3	6.7	6.7	6.8	6.8	6.7	6.6	---	---	---	---	---	---
4	6.7	6.8	6.8	6.8	6.7	6.6	---	---	---	---	---	---
5	6.7	6.8	6.8	6.8	6.7	6.5	---	---	---	---	---	---
6	6.7	6.8	6.9	6.8	6.7	6.5	---	---	---	---	---	---
7	6.7	6.8	6.8	6.8	6.7	6.5	---	---	---	---	---	---
8	6.7	6.8	6.8	6.8	6.6	6.5	---	---	---	---	---	---
9	6.7	6.7	6.8	6.8	6.6	6.5	---	---	---	---	---	---
10	6.7	6.7	6.8	6.9	6.6	6.5	---	---	---	---	---	---
11	6.6	6.7	6.8	6.9	6.7	6.5	---	---	---	---	---	---
12	6.6	6.7	6.8	6.9	6.7	6.5	---	---	---	---	---	---
13	6.6	6.7	6.8	6.9	6.7	6.6	---	---	---	---	---	---
14	6.6	6.8	6.8	6.9	6.7	6.5	---	---	---	---	---	---
15	6.6	6.8	6.8	6.9	6.7	6.5	---	---	---	---	---	---
16	6.6	6.8	6.8	---	6.6	6.5	---	---	---	---	---	---
17	6.7	---	6.8	6.8	6.6	6.5	---	---	---	---	---	---
18	6.7	6.7	6.8	6.8	6.6	---	---	---	---	---	---	---
19	6.7	6.8	6.8	6.8	6.6	---	---	---	---	---	---	---
20	6.7	6.8	6.8	6.8	6.6	---	---	---	---	---	---	---
21	6.7	6.8	6.8	6.7	6.6	---	---	---	---	---	---	---
22	6.7	6.8	6.8	6.7	6.6	---	---	---	---	---	---	---
23	6.7	6.8	6.8	6.7	6.6	---	---	---	---	---	---	---
24	6.7	6.8	6.8	6.7	6.6	---	---	---	---	---	---	---
25	6.7	6.8	6.9	6.7	6.6	---	---	---	---	---	---	---
26	6.7	6.8	6.9	6.7	6.6	---	---	---	---	---	---	---
27	6.7	6.8	6.8	6.7	6.6	---	---	---	---	---	---	---
28	6.7	6.8	6.8	6.8	6.6	---	---	---	---	---	---	---
29	6.7	6.8	6.8	6.8	6.6	---	---	---	---	---	---	---
30	6.7	6.8	6.8	6.7	---	---	---	---	---	---	---	---
31	6.7	---	6.8	6.7	---	---	---	---	---	---	---	---
MEAN	6.7	---	6.8	---	6.6	---	---	---	---	---	---	---
MAX	6.7	---	6.9	---	6.7	---	---	---	---	---	---	---
MIN	6.6	---	6.8	---	6.6	---	---	---	---	---	---	---

353135080524203 IR-132 DENR Langtree Research Station MW-2D (Bedrock Well)—Continued

TEMPERATURE, WATER, DEGREES CELSIUS  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---
2	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---
3	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---
4	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---
5	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---
6	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---
7	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---
8	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---
9	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---
10	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---
11	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---
12	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---
13	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---
14	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---
15	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---
16	16.1	16.1	16.1	---	16.1	16.1	---	---	---	---	---	---
17	16.1	---	16.1	16.1	16.1	16.1	---	---	---	---	---	---
18	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---	---
19	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---	---
20	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---	---
21	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---	---
22	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---	---
23	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---	---
24	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---	---
25	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---	---
26	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---	---
27	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---	---
28	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---	---
29	16.1	16.1	16.1	16.1	16.1	---	---	---	---	---	---	---
30	16.1	16.1	16.1	16.1	---	---	---	---	---	---	---	---
31	16.1	---	16.1	16.1	---	---	---	---	---	---	---	---
MEAN	16.1	---	16.1	---	16.1	---	---	---	---	---	---	---
MAX	16.1	---	16.1	---	16.1	---	---	---	---	---	---	---
MIN	16.1	---	16.1	---	16.1	---	---	---	---	---	---	---

353135080524203 IR-132 DENR Langtree Research Station MW-2D (Bedrock Well)—Continued

DISSOLVED OXYGEN, WATER, UNFILTERED, MILLIGRAMS PER LITER  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.4	5.6	5.5	5.5	5.4	5.1	---	---	---	---	---	---
2	5.4	5.6	5.5	5.5	5.4	5.0	---	---	---	---	---	---
3	5.4	5.6	5.5	5.5	5.3	5.1	---	---	---	---	---	---
4	5.4	5.6	5.5	5.5	5.3	5.1	---	---	---	---	---	---
5	5.5	5.5	5.5	5.5	5.3	5.1	---	---	---	---	---	---
6	5.5	5.6	5.5	5.5	5.3	5.0	---	---	---	---	---	---
7	5.5	5.6	5.6	5.5	5.3	5.1	---	---	---	---	---	---
8	5.5	5.6	5.6	5.5	5.3	5.1	---	---	---	---	---	---
9	5.5	5.6	5.6	5.5	5.3	5.0	---	---	---	---	---	---
10	5.5	5.6	5.6	5.5	5.3	5.0	---	---	---	---	---	---
11	5.5	5.6	5.6	5.5	5.3	5.0	---	---	---	---	---	---
12	5.5	5.6	5.6	5.5	5.3	5.0	---	---	---	---	---	---
13	5.5	5.6	5.6	5.5	5.3	5.0	---	---	---	---	---	---
14	5.5	5.6	5.6	5.5	5.3	5.0	---	---	---	---	---	---
15	5.5	5.6	5.6	5.5	5.2	5.0	---	---	---	---	---	---
16	5.5	5.6	5.6	---	5.2	5.0	---	---	---	---	---	---
17	5.5	---	5.6	5.6	5.2	5.0	---	---	---	---	---	---
18	5.5	5.6	5.6	5.6	5.2	---	---	---	---	---	---	---
19	5.5	5.6	5.6	5.6	5.2	---	---	---	---	---	---	---
20	5.5	5.5	5.6	5.6	5.2	---	---	---	---	---	---	---
21	5.5	5.5	5.6	5.6	5.2	---	---	---	---	---	---	---
22	5.5	5.5	5.5	5.5	5.2	---	---	---	---	---	---	---
23	5.5	5.5	5.5	5.4	5.2	---	---	---	---	---	---	---
24	5.5	5.5	5.5	5.4	5.2	---	---	---	---	---	---	---
25	5.5	5.5	5.5	5.4	5.2	---	---	---	---	---	---	---
26	5.5	5.5	5.5	5.4	5.1	---	---	---	---	---	---	---
27	5.6	5.5	5.5	5.4	5.1	---	---	---	---	---	---	---
28	5.6	5.5	5.5	5.4	5.1	---	---	---	---	---	---	---
29	5.6	5.5	5.5	5.4	5.1	---	---	---	---	---	---	---
30	5.6	5.5	5.5	5.4	---	---	---	---	---	---	---	---
31	5.6	---	5.5	5.4	---	---	---	---	---	---	---	---
MEAN	5.5	---	5.5	---	5.2	---	---	---	---	---	---	---
MAX	5.6	---	5.6	---	5.4	---	---	---	---	---	---	---
MIN	5.4	---	5.5	---	5.1	---	---	---	---	---	---	---

353135080524203 IR-132 DENR Langtree Research Station MW-2D (Bedrock Well)—Continued

DISSOLVED OXYGEN, WATER, UNFILTERED, PERCENT OF SATURATION  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	56	59	57	57	56	53	---	---	---	---	---	---
2	56	58	57	57	56	52	---	---	---	---	---	---
3	56	58	57	57	55	53	---	---	---	---	---	---
4	56	58	57	57	55	53	---	---	---	---	---	---
5	57	58	57	57	55	53	---	---	---	---	---	---
6	57	58	58	57	55	52	---	---	---	---	---	---
7	57	58	59	57	55	53	---	---	---	---	---	---
8	57	59	59	57	55	53	---	---	---	---	---	---
9	57	59	59	57	55	52	---	---	---	---	---	---
10	57	59	59	57	55	52	---	---	---	---	---	---
11	57	59	59	57	55	52	---	---	---	---	---	---
12	57	59	59	57	55	52	---	---	---	---	---	---
13	57	59	59	57	55	52	---	---	---	---	---	---
14	57	59	59	57	55	52	---	---	---	---	---	---
15	57	58	59	57	54	52	---	---	---	---	---	---
16	57	59	59	---	54	52	---	---	---	---	---	---
17	57	---	59	59	54	52	---	---	---	---	---	---
18	57	59	59	59	54	---	---	---	---	---	---	---
19	57	58	59	58	54	---	---	---	---	---	---	---
20	57	57	59	59	54	---	---	---	---	---	---	---
21	57	57	59	58	54	---	---	---	---	---	---	---
22	57	57	58	57	54	---	---	---	---	---	---	---
23	57	57	58	56	54	---	---	---	---	---	---	---
24	57	57	58	56	54	---	---	---	---	---	---	---
25	57	57	58	56	54	---	---	---	---	---	---	---
26	57	57	57	56	53	---	---	---	---	---	---	---
27	58	57	58	56	53	---	---	---	---	---	---	---
28	59	57	58	56	53	---	---	---	---	---	---	---
29	59	57	57	56	53	---	---	---	---	---	---	---
30	59	57	57	56	---	---	---	---	---	---	---	---
31	59	---	57	56	---	---	---	---	---	---	---	---
MEAN	57	---	58	---	54	---	---	---	---	---	---	---
MAX	59	--	59	--	56	--	---	---	---	---	---	---
MIN	56	--	57	--	53	--	---	---	---	---	---	---

GROUND-WATER LEVELS

IREDELL COUNTY—Continued

353141080524701. County number, IR-145; DENR Langtree Research Station MW-1 (Regolith well).

LOCATION.--Lat 35°31'41", long 80°52'47", Hydrologic Unit 03050101, 2.5 mi northwest of Davidson, .2 mi north of Langtree Road at Davidson College Lake Campus. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic quartz diorite).

WELL CHARACTERISTICS.--Drilled observation well, depth 38 ft, diameter 4 in., cased to 28 ft, screened interval from 28 to 38 ft, sand filter packed from 26 to 38 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape. (by DENR and USGS)

DATUM.--Land surface datum is 812.17 ft above NGVD of 1929, (levels by DENR). Measuring point: Top of 4 in. PVC casing, 2.43 ft above land surface datum.

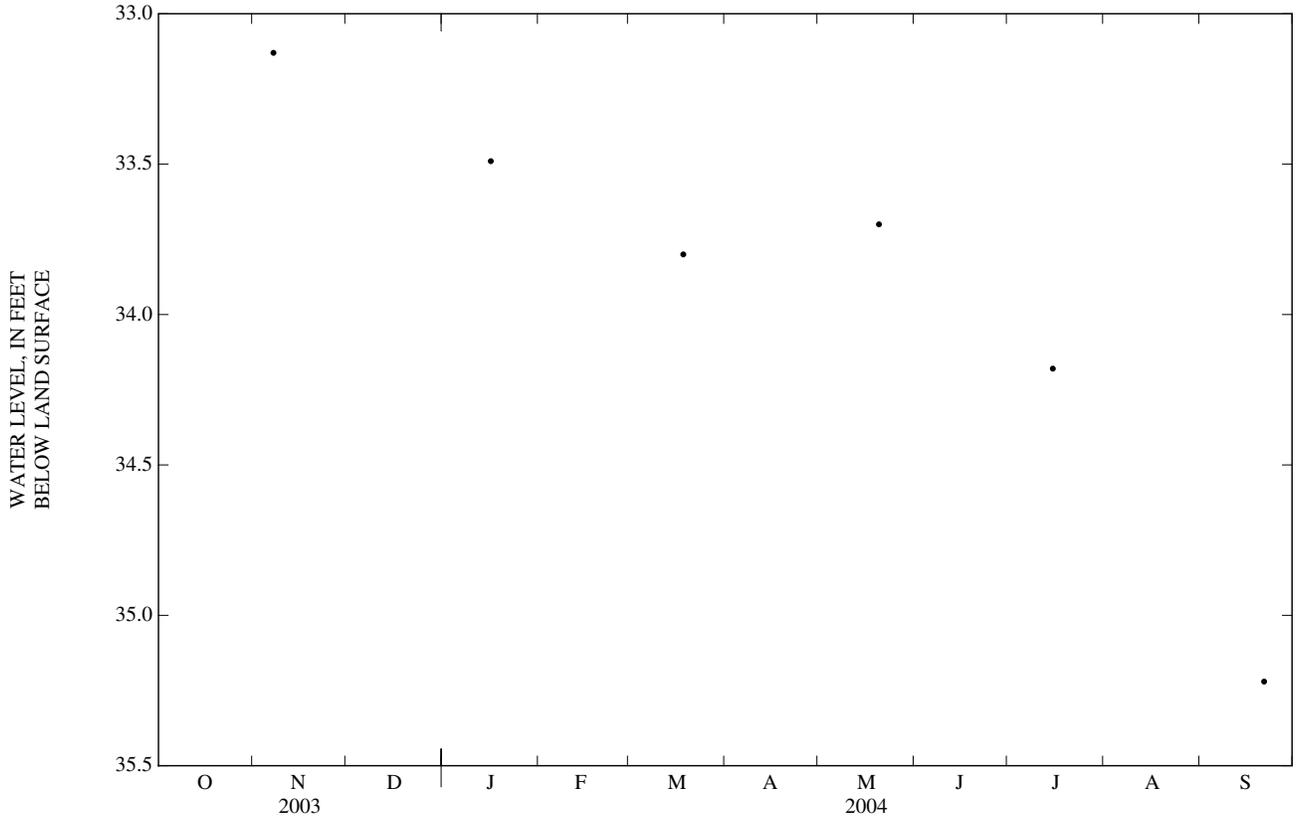
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--January 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Well dry during periodic water-level measurements January 2001 to June 2003. Highest water level measured, 35.22 ft below land-surface datum, Sept. 21, 2004; lowest water level measured, 36.43 ft below land-surface datum, June 23, 2003.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
NOV 07	33.13	JAN 16	33.49	MAR 18	33.8	MAY 20	33.7	JUL 15	34.18	SEP 21	35.22



IREDELL COUNTY—Continued

353141080524702. County number, IR-146; DENR Langtree Research Station MW-II (Transition zone well).

LOCATION.--Lat 35°31'41", long 80°52'47", Hydrologic Unit 03050101, 2.5 mi northwest of Davidson, .2 mi north of Langtree Road at Davidson College Lake Campus. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Transition zone (weathered and competent quartz diorite).

WELL CHARACTERISTICS.--Drilled observation well, depth 53 ft, diameter 4 in., cased to 38 ft, screened interval from 38 to 53 ft, sand filter packed from 34 to 53 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape. (by DENR and USGS)

DATUM.--Land surface datum is 812.18 ft above NGVD of 1929, (levels by DENR). Measuring point: Top of 4 in. PVC casing, 2.42 ft above land surface datum.

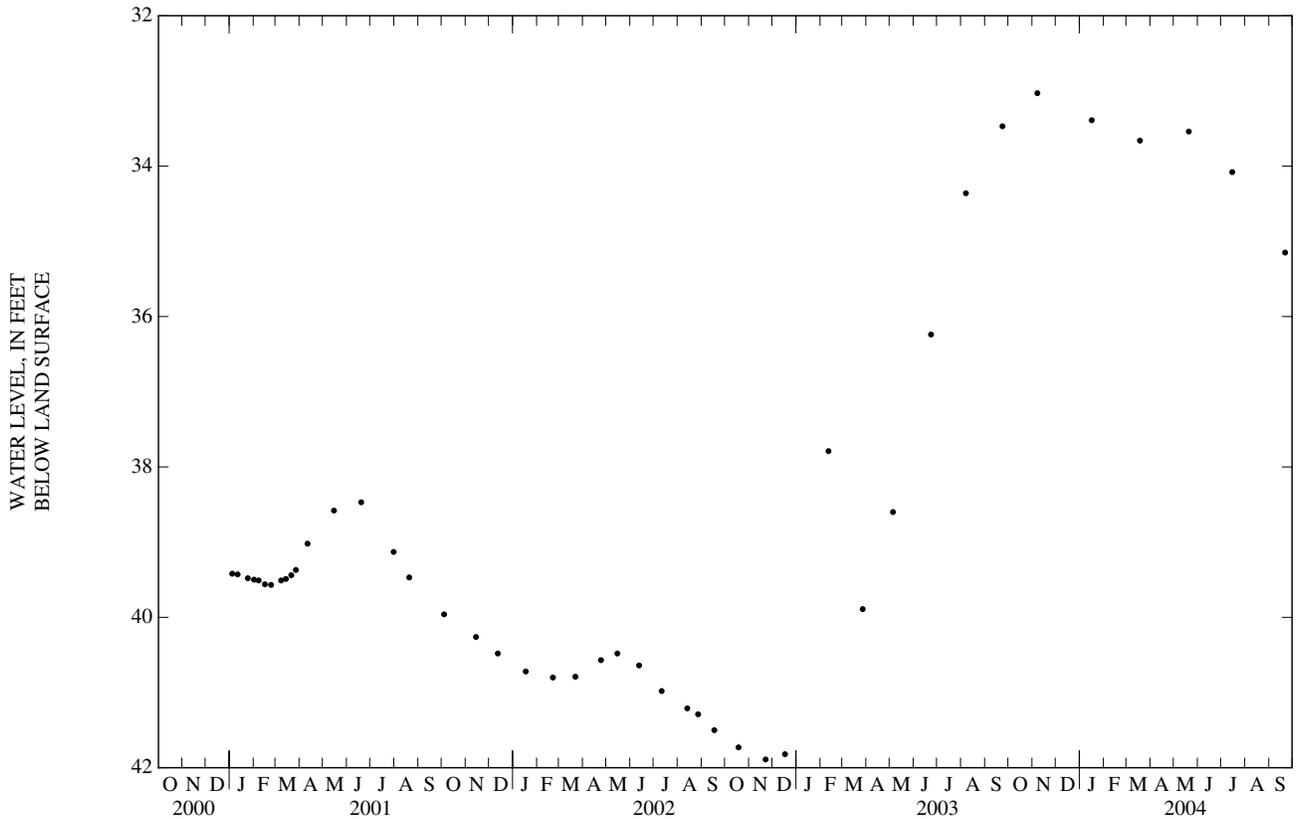
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--January 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 33.07 ft below land-surface datum, Nov. 7, 2003; lowest water level measured 41.89 ft below land surface datum, Nov. 22, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
NOV 07	33.03	JAN 16	33.39	MAR 18	33.66	MAY 20	33.54	JUL 15	34.08	SEP 21	35.15



GROUND-WATER LEVELS

IREDELL COUNTY—Continued

353141080524703. County number, IR-147; DENR Langtree Research Station MW-1D (Bedrock well).

LOCATION.--Lat 35°31'41", long 80°52'47", Hydrologic Unit 03050101, 2.5 mi northwest of Davidson, .2 mi north of Langtree Road at Davidson College Lake Campus. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Quartz diorite bedrock.

WELL CHARACTERISTICS.--Drilled observation well, depth 602 ft, diameter 6.25 in., steel cased to 55 ft, initially open hole from 55 to 602 ft. Well modified in December 2001, 4 in. PVC liner installed to 76 ft, open hole from 76 to 602 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape. (by DENR and USGS)

DATUM.--Land surface datum is 812.04 ft above NGVD of 1929 (levels by DENR). Measuring point: Top of steel protective casing, 2.15 ft above land surface datum (revised).

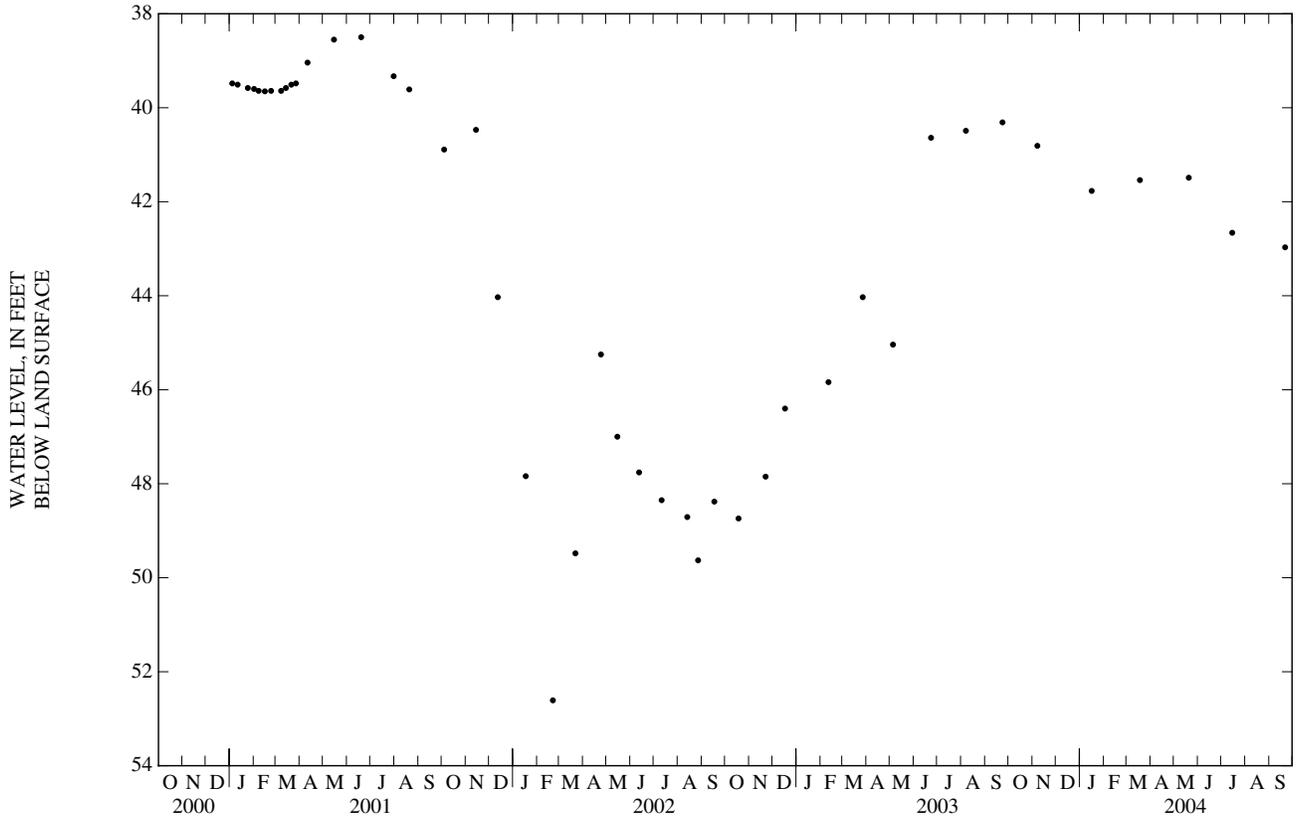
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--January 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 38.50 ft below land-surface datum, June 19, 2001; lowest water level measured 52.61 ft below land surface datum, Feb. 21, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
NOV 07	40.81	JAN 16	41.77	MAR 18	41.54	MAY 20	41.49	JUL 15	42.66	SEP 21	42.97



IREDELL COUNTY—Continued

353157080525301. County number, IR-148; DENR Langtree Research Station MW-3 (Regolith well).

LOCATION.--Lat 35°31'57", long 80°52'53", Hydrologic Unit 03050101, 2.5 mi northwest of Davidson, .5 mi north of Langtree Road at Davidson College Lake Campus. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic quartz diorite).

WELL CHARACTERISTICS.--Drilled observation well, depth 20 ft, diameter 4 in., cased to 5 ft, screened interval from 5 to 15 ft, sand filter packed from 4 to 20 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape. (by DENR and USGS)

DATUM.--Land surface datum is 761.42 ft above NGVD of 1929, (levels by DENR). Measuring point: Top of 4 in. PVC casing, 0.37 ft below land surface datum.

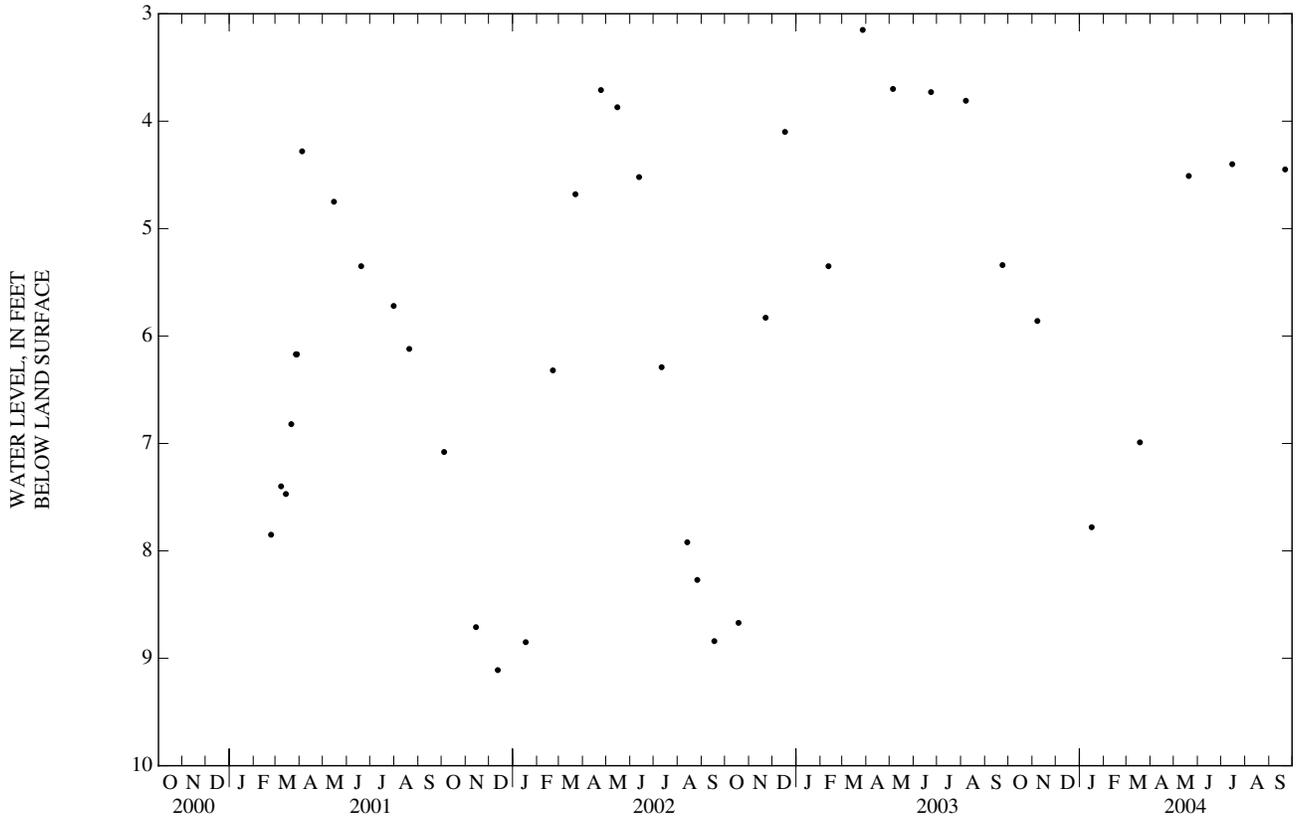
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--February 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.15 ft below land-surface datum, Mar. 27, 2003; lowest water level measured 9.11 ft below land surface datum, Dec. 12, 2001.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
NOV 07	5.86	JAN 16	7.78	MAR 18	6.99	MAY 20	4.51	JUL 15	4.40	SEP 21	4.45



GROUND-WATER LEVELS

IREDELL COUNTY—Continued

353157080525302. County number, IR-149; DENR Langtree Research Station MW-3I (Transition zone well).

LOCATION.--Lat 35°31'57", long 80°52'53", Hydrologic Unit 03050101, 2.5 mi northwest of Davidson, .5 mi north of Langtree Road at Davidson College Lake Campus. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Transition zone (weathered and competent quartz diorite).

WELL CHARACTERISTICS.--Drilled observation well, depth 73 ft, diameter 4 in., cased to 43 ft, screened interval from 43 to 73 ft, native fill from 10 to 73 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape. (by DENR and USGS)

DATUM.--Land surface datum is 762.45 ft above NGVD of 1929, (levels by DENR). Measuring point: Top of 4 in. PVC casing, 0.29 ft below land surface datum.

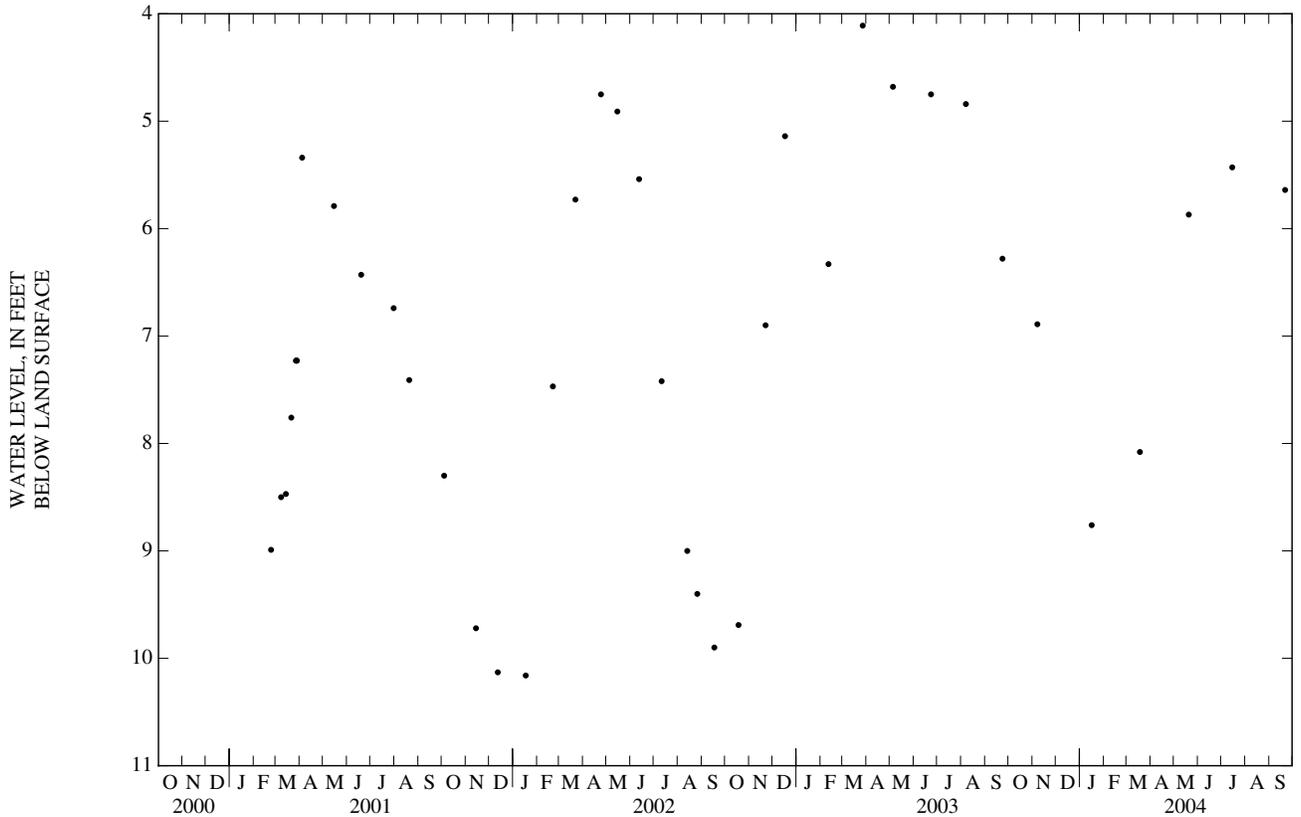
REMARKS.--Well is part of Piedmont/Mountains ground-water study. Possible well construction problems. Monitored zone may be connected to overlying regolith.

PERIOD OF RECORD.--February 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.11 ft below land-surface datum, Mar. 27, 2003; lowest water level measured 10.16 ft below land surface datum, Jan. 17, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
NOV 07	6.89	JAN 16	8.76	MAR 18	8.08	MAY 20	5.87	JUL 15	5.43	SEP 21	5.64



IREDELL COUNTY—Continued

353145080524701. County number, IR-151; DENR Langtree Research Station MW-4IB (Transition zone well).

LOCATION.--Lat 35°31'45", long 80°52'47", Hydrologic Unit 03050101, 2.5 mi northwest of Davidson, .3 mi north of Langtree Road at Davidson College Lake Campus. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Transition zone (bedrock quartz diorite).

WELL CHARACTERISTICS.--Drilled observation well, depth 53 ft, diameter 4 in., cased to 38 ft, screened interval from 38 to 53 ft, sand filter packed with native fill 35 to 53 ft (revised).

INSTRUMENTATION.--Measured periodically with steel and electric tape. (by DENR and USGS)

DATUM.--Land surface datum is 802.19 ft above NGVD of 1929, (levels by DENR). Measuring point: Top of 4 in. PVC casing, 0.00 ft below land surface datum.

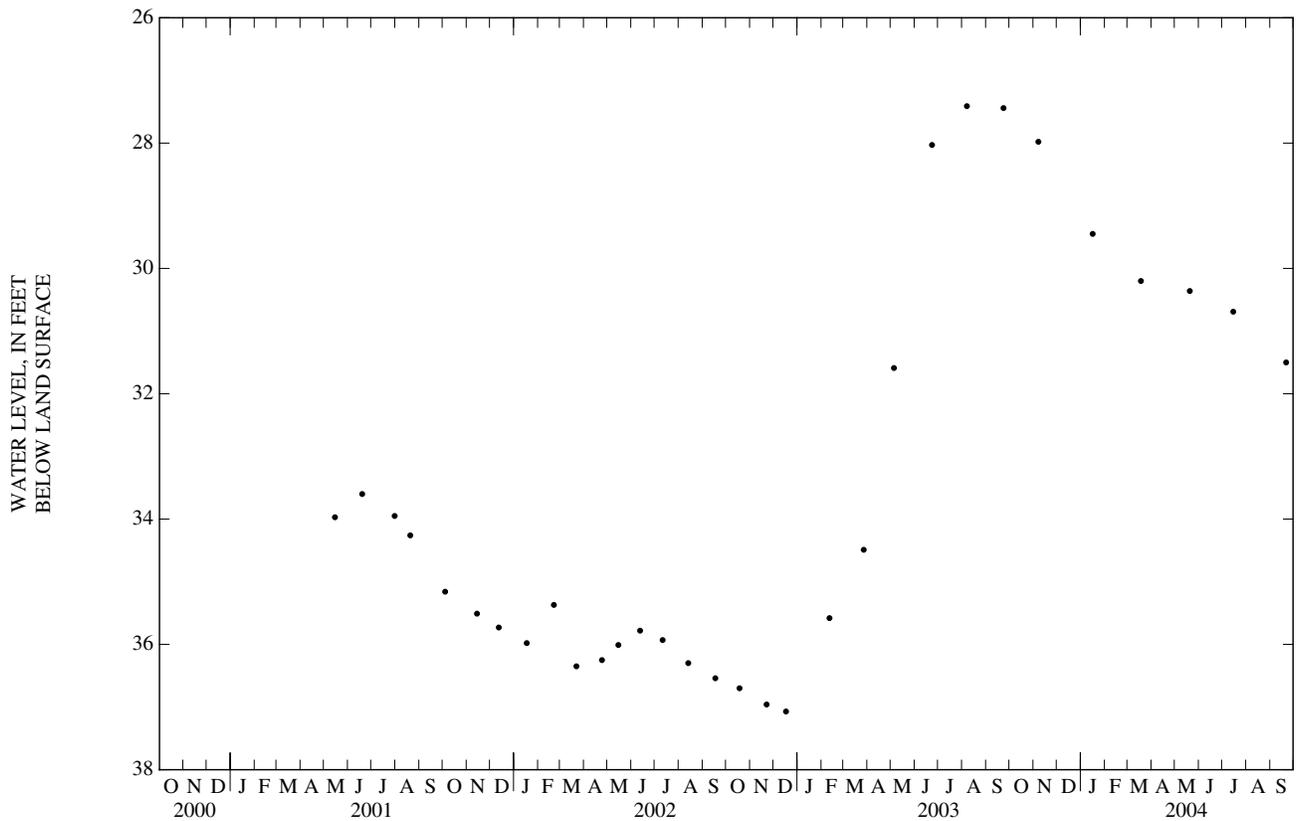
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--May 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 27.41 ft below land-surface datum, Aug. 7, 2003; lowest water level measured 37.07 ft below land surface datum, Dec. 17, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
NOV 07	27.98	JAN 16	29.45	MAR 18	30.20	MAY 20	30.36	JUL 15	30.69	SEP 21	31.50



GROUND-WATER LEVELS

IREDELL COUNTY—Continued

353145080524704. County number, IR-152A; DENR Langtree Research Station MW-4IA (Transition zone well).

LOCATION.--Lat 35°31'45", long 80°52'47", Hydrologic Unit 03050101, 2.5 mi northwest of Davidson, .3 mi north of Langtree Road at Davidson College Lake Campus. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Transition zone (weathered and competent quartz diorite).

WELL CHARACTERISTICS.--Drilled observation well, depth 55 ft, diameter 2 in., cased to 40 ft, screened interval from 40 to 55 ft, sand filter packed with native fill 35 ft to 55 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape. (by DENR and USGS)

DATUM.--Land surface datum is 801.69 ft above NGVD of 1929, (levels by DENR). Measuring point: Top of 2 in. PVC casing, 0.70 ft above land surface datum.

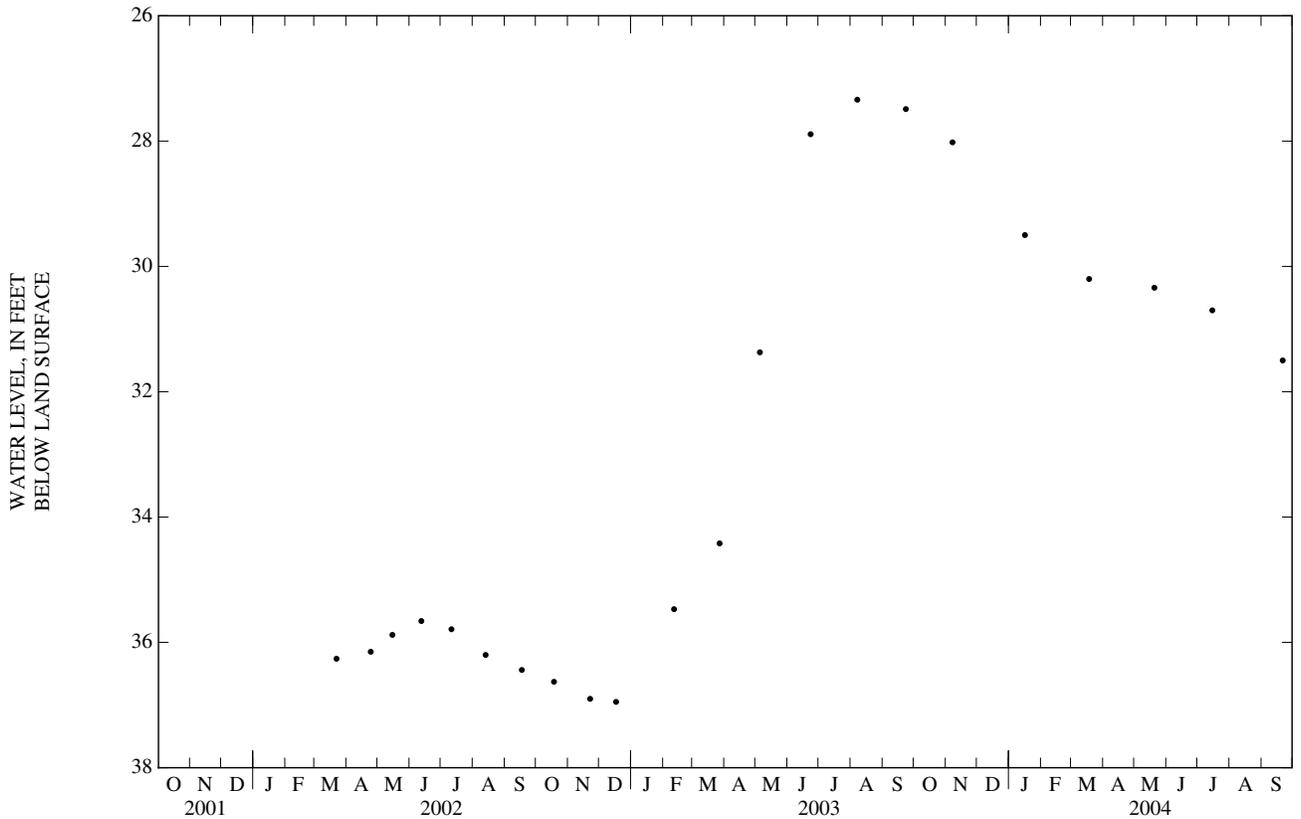
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--March 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 27.34 ft below land-surface datum, Aug. 7, 2003; lowest water level measured 36.95 ft below land surface datum, Dec. 17, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
NOV 07	28.02	JAN 16	29.50	MAR 18	30.20	MAY 20	30.34	JUL 15	30.70	SEP 21	31.50



IREDELL COUNTY—Continued

353145080524703. County number, IR-153; DENR Langtree Research Station MW-4D (Bedrock well).

LOCATION.--Lat 35°31'45", long 80°52'47", Hydrologic Unit 03050101, 2.5 mi northwest of Davidson, .3 mi north of Langtree Road at Davidson College Lake Campus. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Quartz diorite bedrock.

WELL CHARACTERISTICS.--Drilled observation well, depth 400 ft, diameter 6.25 in., steel cased to 61 ft, initially open hole from 61 to 400 ft. Well modified in December 2001, 4 in. PVC liner installed to 69 ft, open hole from 69 to 400 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape. (by DENR and USGS)

DATUM.--Land surface datum is 801.09 ft above NGVD of 1929, (levels by DENR). Measuring point: Top of 4 in. PVC casing, 1.32 ft above land surface datum (revised).

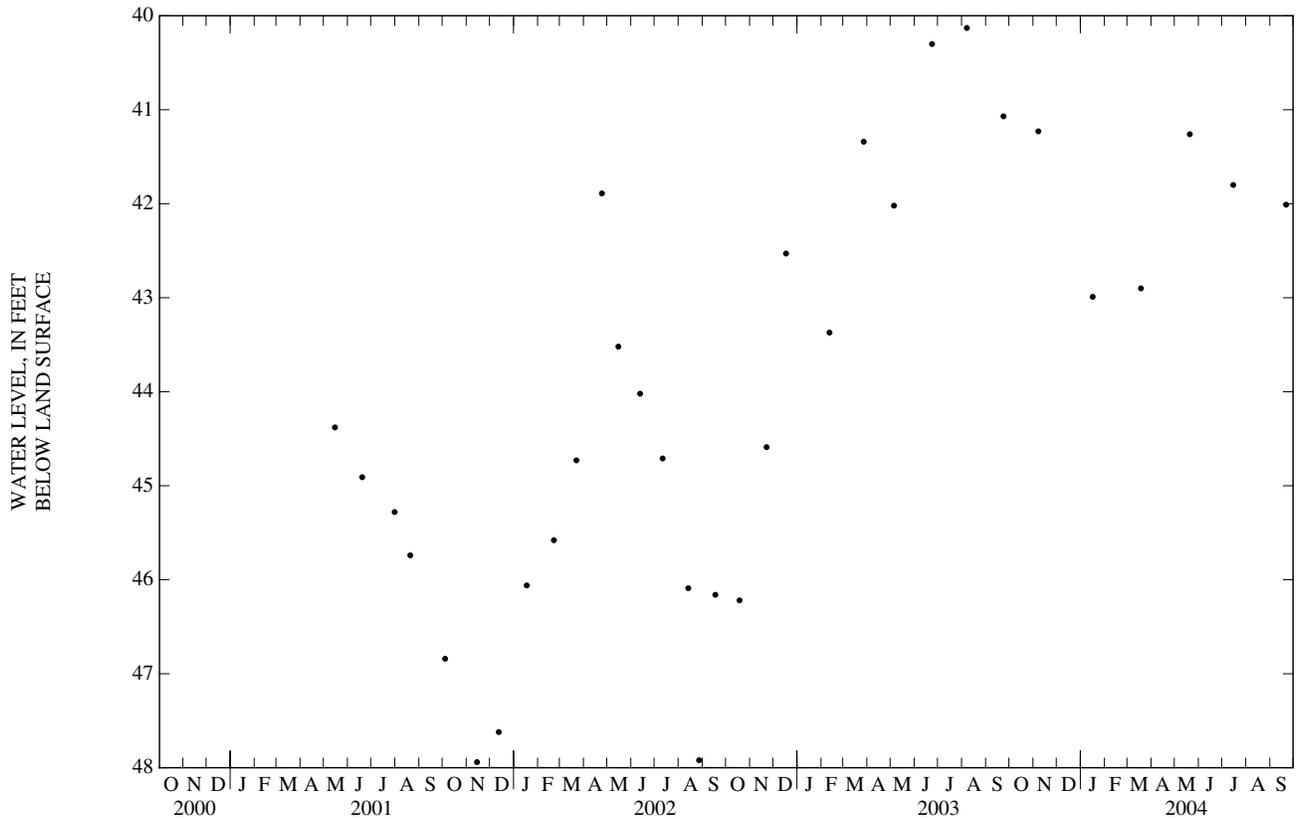
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--May 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 40.13 ft below land-surface datum, Aug. 7, 2003; lowest water level measured 47.94 ft below land surface datum, Nov. 14, 2001.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
NOV 07	41.23	JAN 16	42.99	MAR 18	42.90	MAY 20	41.26	JUL 15	41.80	SEP 21	42.01



GROUND-WATER LEVELS

IREDELL COUNTY—Continued

353148080524701. County number, IR-154; DENR Langtree Research Station MW-5S (Regolith well).

LOCATION.--Lat 35°31'48", long 80°52'47", Hydrologic Unit 03050101, 2.5 mi northwest of Davidson, .3 mi north of Langtree Road at Davidson College Lake Campus. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic quartz diorite).

WELL CHARACTERISTICS.--Drilled observation well, depth 20 ft, diameter 4 in., cased to 10 ft, screened interval from 10 to 20 ft, sand filter packed from 8 to 20 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape. (by DENR and USGS)

DATUM.--Land surface datum is 785.49 ft above NGVD of 1929, (levels by DENR). Measuring point: Top of 4 in. PVC casing, 0.00 ft above land surface datum.

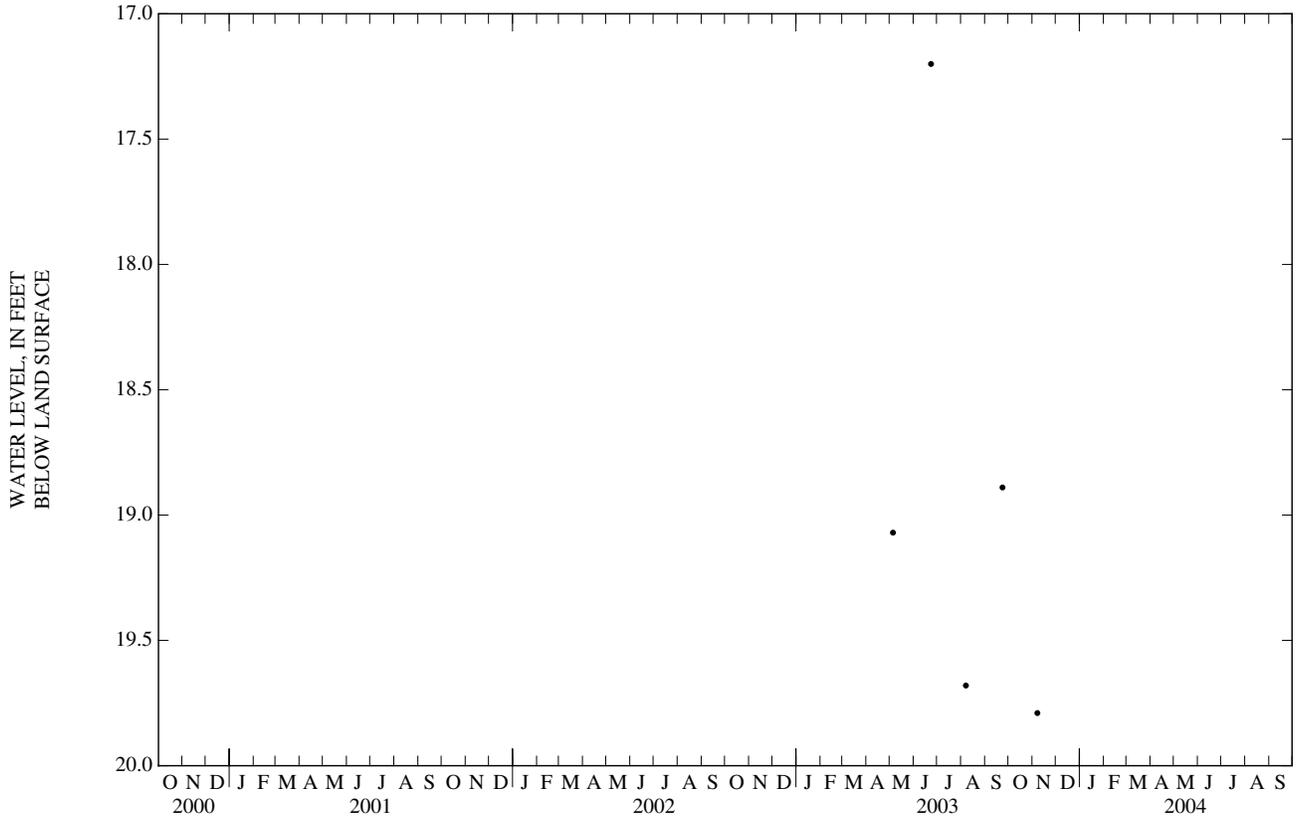
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--May 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Well dry during periodic water-level measurements May 2001 to May 2003. Highest water level measured, 17.20 ft below land-surface datum, June 23, 2003; lowest water level measured 19.79 ft below land-surface datum, Nov. 7, 2003.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
NOV 07	19.79	JAN 16		MAR 18		MAY 20		JUL 15		SEP 21	



IREDELL COUNTY—Continued

353148080524702. County number, IR-155; DENR Langtree Research Station MW-5I (Transition zone well).

LOCATION.--Lat 35°31'48", long 80°52'47", Hydrologic Unit 03050101, 2.5 mi northwest of Davidson, .3 mi north of Langtree Road at Davidson College Lake Campus. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Transition zone (weathered and competent quartz diorite bedrock).

WELL CHARACTERISTICS.--Drilled observation well, depth 35 ft, diameter 4 in., cased to 20 ft, screened interval from 20 to 35 ft, sand filter packed from 18 to 35 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape. (by DENR and USGS)

DATUM.--Land surface datum is 784.49 ft above NGVD of 1929, (levels by DENR). Measuring point: Top of 4 in. PVC casing, 0.20 ft above land surface datum.

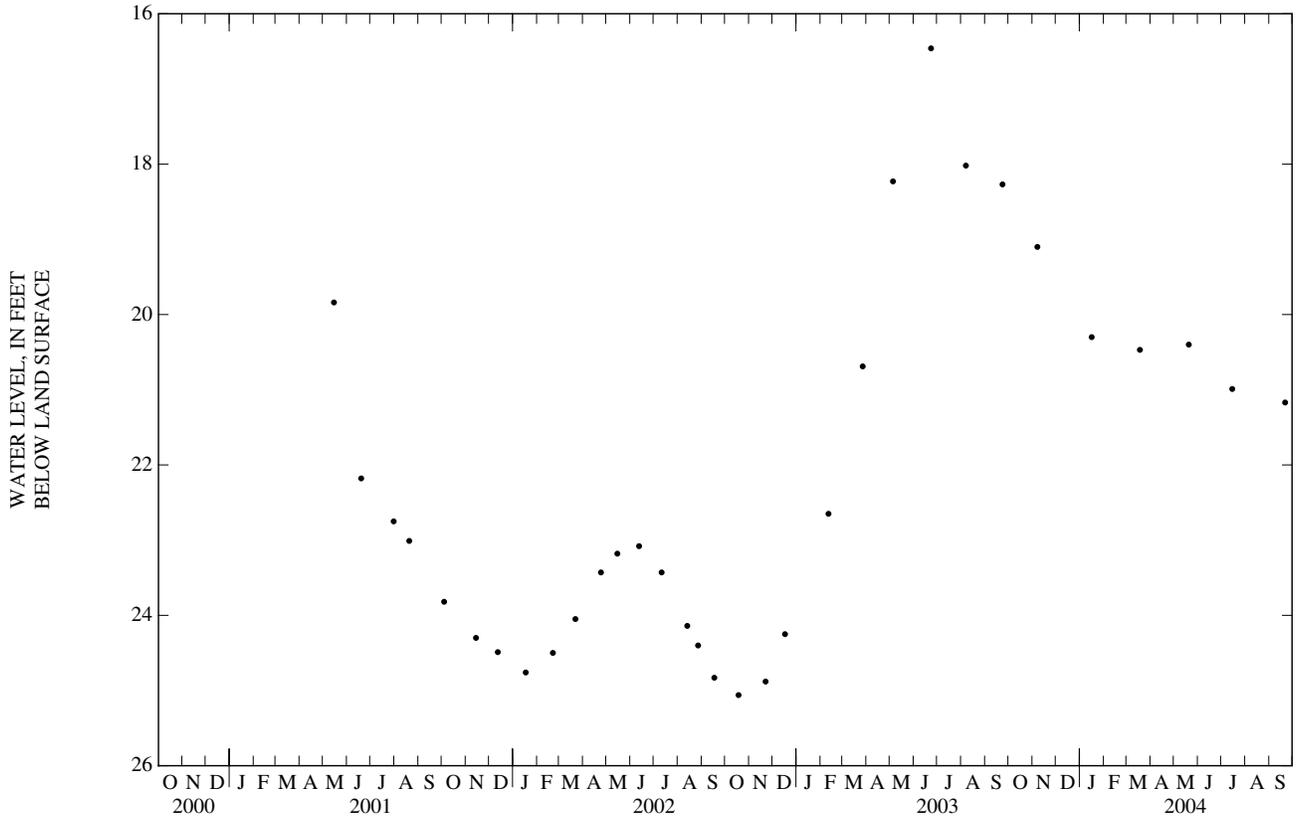
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--May 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 16.46 ft below land-surface datum, June 23, 2003; lowest water level measured 25.06 ft below land surface datum, Oct. 18, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
NOV 07	19.10	JAN 16	20.30	MAR 18	20.47	MAY 20	20.4	JUL 15	20.99	SEP 21	21.17



GROUND-WATER LEVELS

IREDELL COUNTY—Continued

353148080524703. County number, IR-156; DENR Langtree Research Station MW-5D (Bedrock well).

LOCATION.--Lat 35°31'48", long 80°52'47", Hydrologic Unit 03050101, 2.5 mi northwest of Davidson, .3 mi north of Langtree Road at Davidson College Lake Campus. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Quartz diorite bedrock.

WELL CHARACTERISTICS.--Drilled observation well, depth 400 ft, diameter 6.25 in., cased to 40 ft, open hole from 40 to 400 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape. (by DENR and USGS)

DATUM.--Land surface datum is 784.09 ft above NGVD of 1929, (levels by DENR). Measuring point: Top of steel protective casing, 1.40 ft above land surface datum.

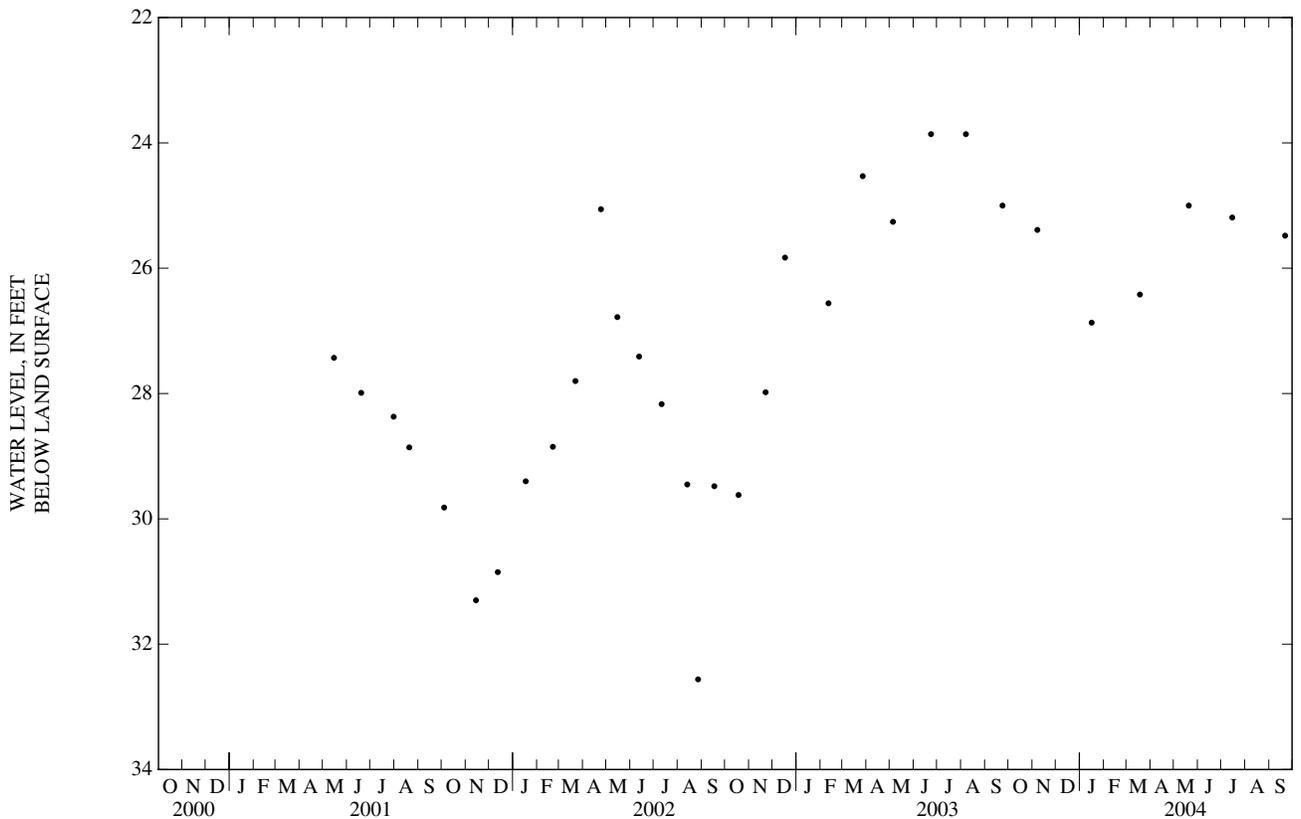
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--May 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 23.86 ft below land-surface datum, June 23, Aug. 7, 2003; lowest water level measured 32.56 ft below land surface datum, Aug. 27, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
NOV 07	25.39	JAN 16	26.87	MAR 18	26.42	MAY 20	25.00	JUL 15	25.19	SEP 21	25.48



IREDELL COUNTY—Continued

353151080524601. County number, IR-157; DENR Langtree Research Station MW-6S (Regolith well).

LOCATION.--Lat 35°31'51", long 80°52'46", Hydrologic Unit 03050101, 2.5 mi northwest of Davidson, .4 mi north of Langtree Road at Davidson College Lake Campus. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic quartz diorite).

WELL CHARACTERISTICS.--Drilled observation well, depth 18 ft, diameter 4 in., cased to 8 ft, screened interval from 8 to 18 ft, sand filter packed from 6 to 18 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape. (by DENR and USGS)

DATUM.--Land surface datum is 764.59 ft above NGVD of 1929, (levels by DENR). Measuring point: Top of 4 in. PVC casing, 0.16 ft below land surface datum.

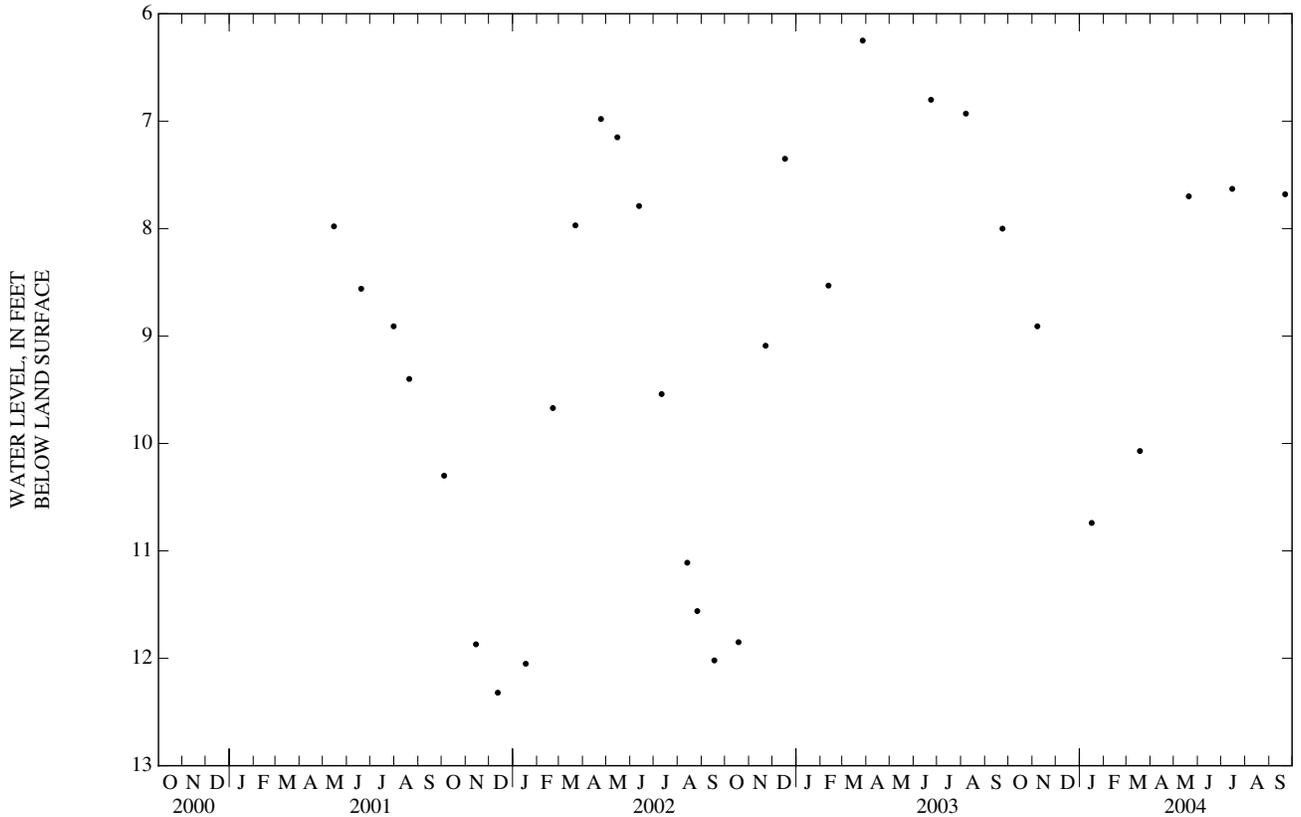
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--May 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.25 ft below land surface datum, Mar. 27, 2003; lowest water level measured, 12.32 ft below land surface datum, Dec. 12, 2001.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
NOV 07	8.91	JAN 16	10.74	MAR 18	10.07	MAY 20	7.70	JUL 15	7.63	SEP 21	7.68



GROUND-WATER LEVELS

IREDELL COUNTY—Continued

353151080524603. County number, IR-159; DENR Langtree Research Station MW-6D (Bedrock well).

LOCATION.--Lat 35°31'52", long 80°52'46", Hydrologic Unit 03050101, 2.5 mi northwest of Davidson, .4 mi north of Langtree Road at Davidson College Lake Campus. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Quartz diorite bedrock.

WELL CHARACTERISTICS.--Drilled observation well, depth 400 ft, diameter 6.25 in., steel cased to 43 ft, initially open hole from 43 to 400 ft. Well modified in December 2001, 4 in. PVC liner installed to 69 ft, open hole from 69 to 400 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape. (by DENR and USGS)

DATUM.--Land surface datum is 765.09 ft above NGVD of 1929, (levels by DENR). Measuring point: Top of 6.25 in. PVC casing, 0.10 ft below land surface datum (revised).

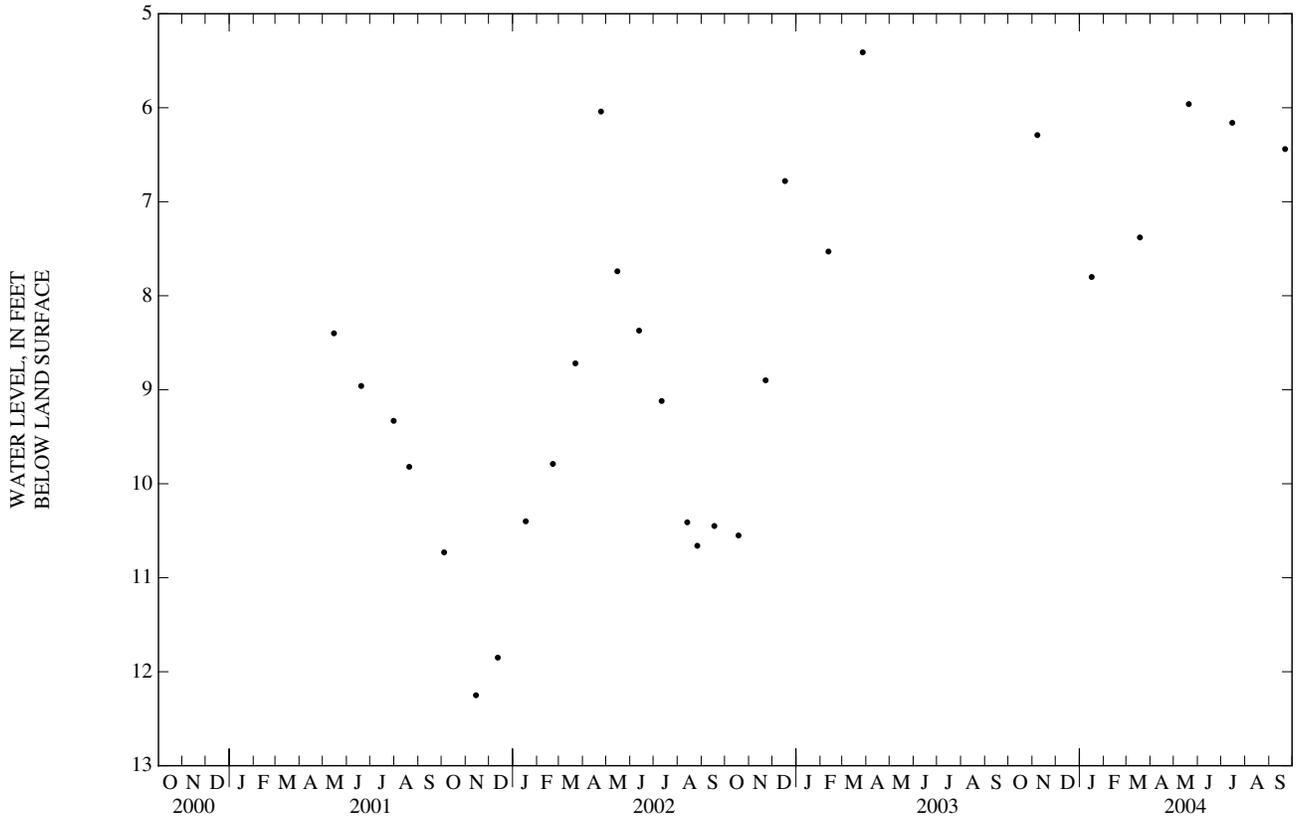
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--May 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.41 ft below land surface datum, Mar. 27, 2003; lowest water level measured, 12.25 ft below land surface datum, Nov. 14, 2001.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
NOV 07	6.29	JAN 16	7.80	MAR 18	7.38	MAY 20	5.96	JUL 15	6.16	SEP 21	6.44



IREDELL COUNTY—Continued

353151080524604. County number, IR-160; DENR Langtree Research Station MW-6IB (Transition zone well).

LOCATION.--Lat 35°31'52", long 80°52'46", Hydrologic Unit 03050101, 2.5 mi northwest of Davidson, .4 mi north of Langtree Road at Davidson College Lake Campus. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Transition zone (weathered and competent quartz diorite).

WELL CHARACTERISTICS.--Drilled observation well, depth 30 ft, diameter 4 in., cased to 15 ft, screened interval from 15 to 30 ft, sand filter packed from 12 to 30 ft.

INSTRUMENTATION.--Measured periodically with steel and electric tape. (by DENR and USGS)

DATUM.--Land surface datum is 765 ft above NGVD of 1929, (from topographic map). Measuring point: Top of 4 in. PVC casing, 0.24 ft below land surface datum.

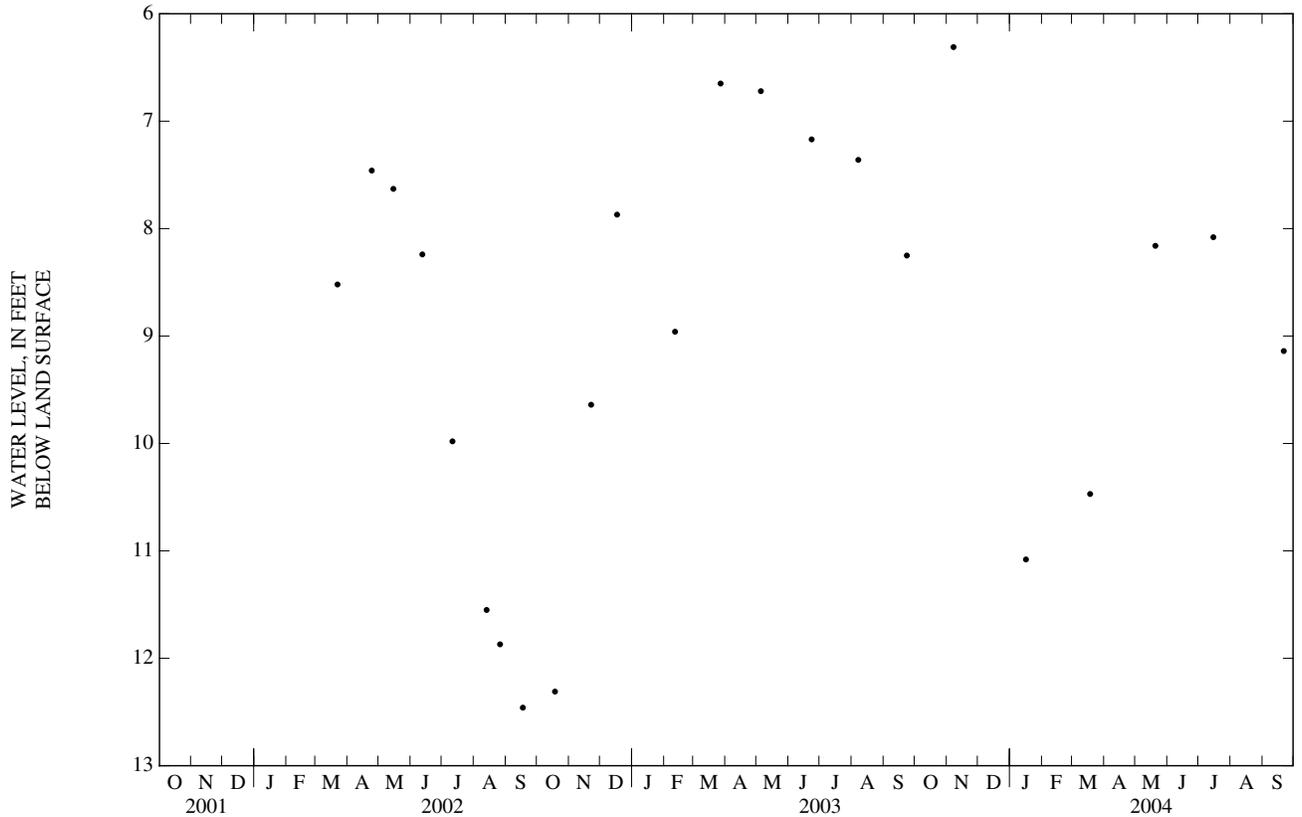
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--March 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.65 ft below land surface datum, Mar. 27, 2003; lowest water level measured, 12.46 ft below land surface datum, Sept. 17, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

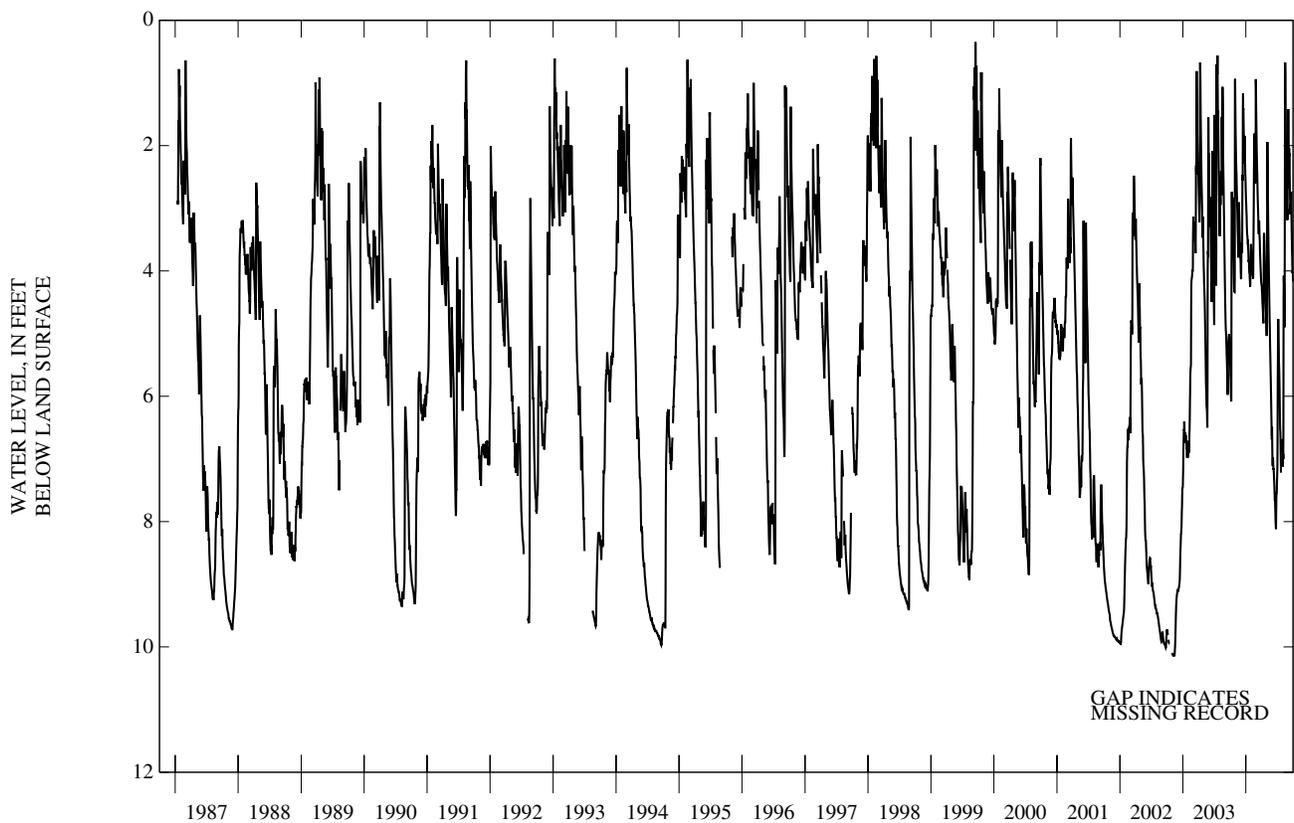
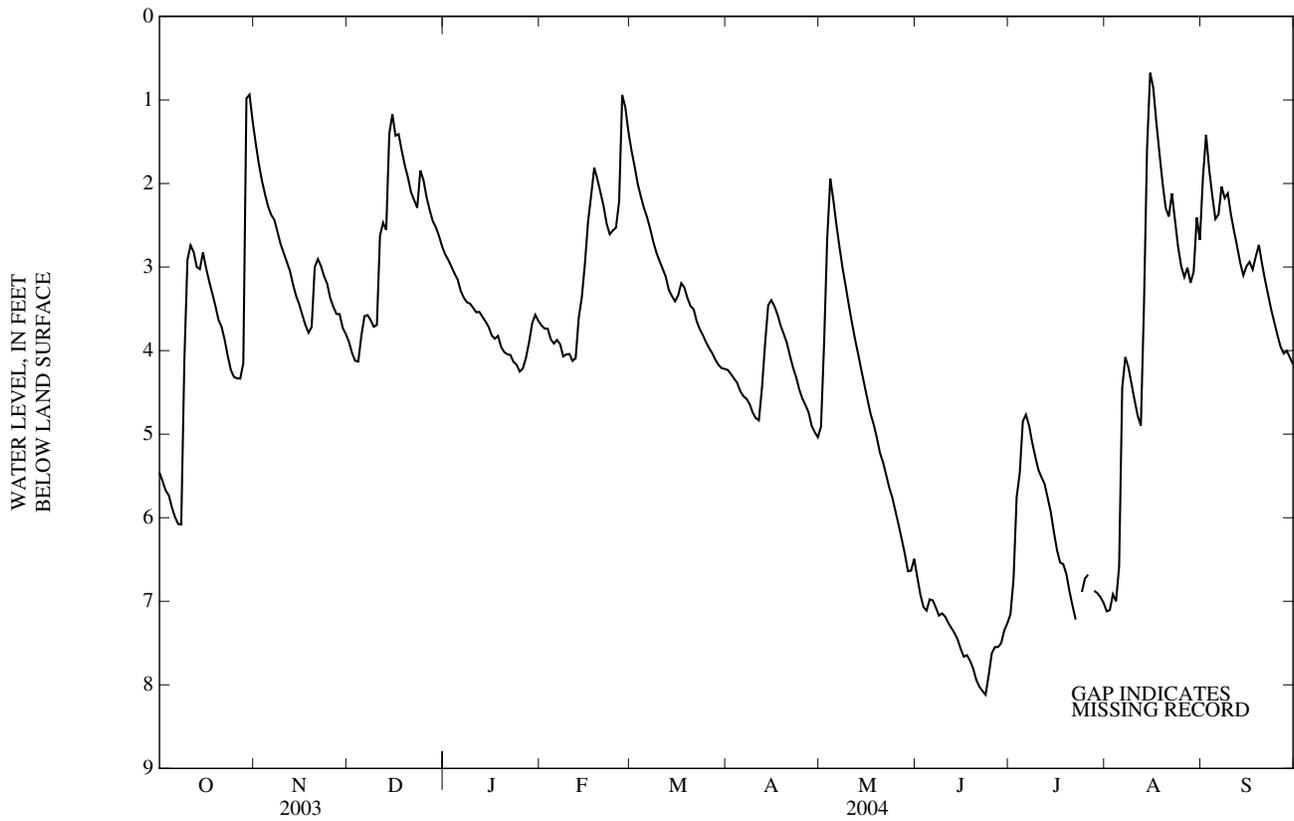
DATE	WATER LEVEL										
NOV 07	6.31	JAN 16	11.08	MAR 18	10.47	MAY 20	8.16	JUL 15	8.08	SEP 21	9.14





JONES COUNTY—Continued

345809077301408. Local number, NC-173; DENR Comfort Research Station well U26j8; County number, JO-035.



345809077301408 Local number, NC-173; DENR Comfort Research Station well U26j8; County number, JO-035--Continued

PRECIPITATION RECORDS

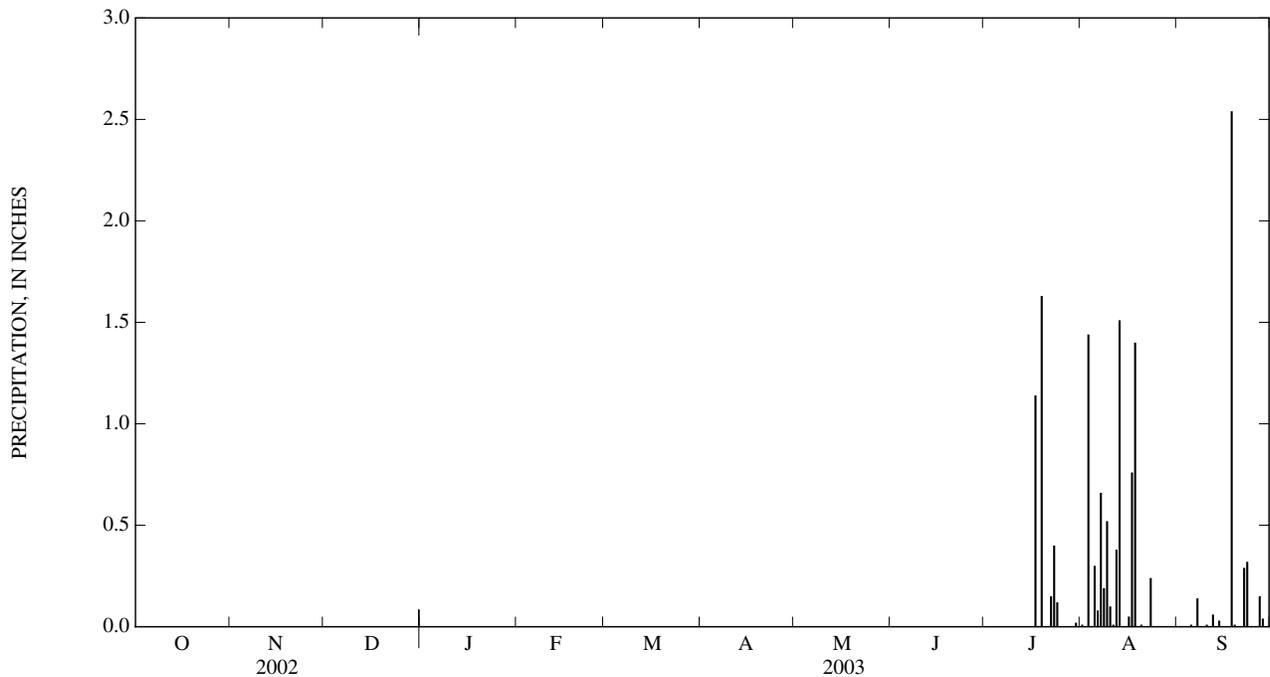
PERIOD OF RECORD.--July 2003 to September 2004.

GAGE.--Tipping-bucket raingage and electronic datalogger.

REMARKS.--Gage is operated as part of a U.S. Geological Survey Ground-water Resources Program recharge study. Precipitation data collected during freezing periods may not be accurately reflected in daily record; consequently, winter record is poor.

PRECIPITATION, TOTAL, INCHES  
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003  
DAILY SUM VALUES

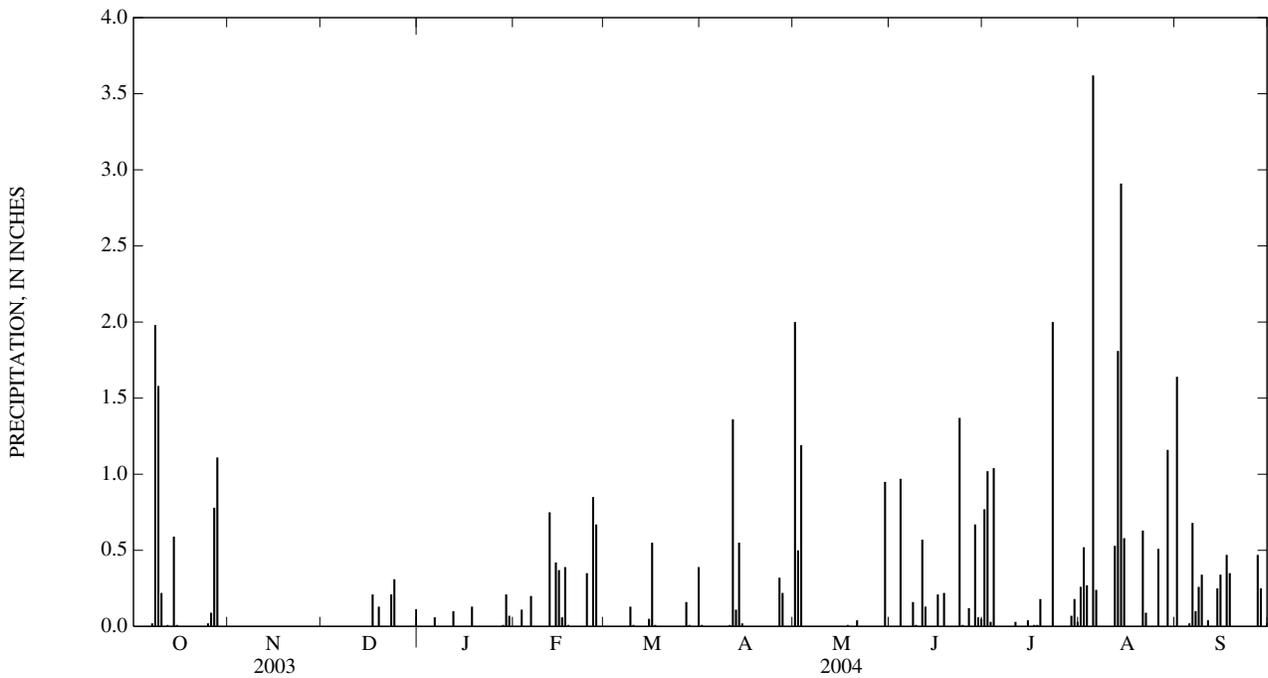
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	---	0.01	0.00
2	---	---	---	---	---	---	---	---	---	---	0.00	0.00
3	---	---	---	---	---	---	---	---	---	---	1.44	0.00
4	---	---	---	---	---	---	---	---	---	---	0.00	0.00
5	---	---	---	---	---	---	---	---	---	---	0.30	0.01
6	---	---	---	---	---	---	---	---	---	---	0.08	0.00
7	---	---	---	---	---	---	---	---	---	---	0.66	0.14
8	---	---	---	---	---	---	---	---	---	---	0.19	0.00
9	---	---	---	---	---	---	---	---	---	---	0.52	0.00
10	---	---	---	---	---	---	---	---	---	---	0.10	0.01
11	---	---	---	---	---	---	---	---	---	---	0.01	0.00
12	---	---	---	---	---	---	---	---	---	---	0.38	0.06
13	---	---	---	---	---	---	---	---	---	---	1.51	0.00
14	---	---	---	---	---	---	---	---	---	---	0.00	0.03
15	---	---	---	---	---	---	---	---	---	---	0.00	0.00
16	---	---	---	---	---	---	---	---	---	---	0.05	0.00
17	---	---	---	---	---	---	---	---	---	---	1.14	0.76
18	---	---	---	---	---	---	---	---	---	0.00	1.40	2.54
19	---	---	---	---	---	---	---	---	---	1.63	0.00	0.01
20	---	---	---	---	---	---	---	---	---	0.00	0.01	---
21	---	---	---	---	---	---	---	---	---	0.00	0.00	---
22	---	---	---	---	---	---	---	---	---	0.15	0.00	0.29
23	---	---	---	---	---	---	---	---	---	0.40	0.24	0.32
24	---	---	---	---	---	---	---	---	---	0.12	0.00	0.00
25	---	---	---	---	---	---	---	---	---	0.00	0.00	0.00
26	---	---	---	---	---	---	---	---	---	0.00	0.00	0.00
27	---	---	---	---	---	---	---	---	---	0.00	0.00	0.15
28	---	---	---	---	---	---	---	---	---	0.00	0.00	0.04
29	---	---	---	---	---	---	---	---	---	0.00	0.00	0.00
30	---	---	---	---	---	---	---	---	---	0.02	0.00	0.00
31	---	---	---	---	---	---	---	---	---	0.00	0.00	---
TOTAL	---	---	---	---	---	---	---	---	---	---	7.66	---



345809077301408 Local number, NC-173; DENR Comfort Research Station well U26j8; County number, JO-035—Continued

PRECIPITATION, TOTAL, INCHES  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	---	---	0.00	0.00	0.00	0.01	2.00	0.00	0.77	0.26	1.64
2	0.00	---	---	0.00	0.00	0.00	0.00	0.50	0.00	1.02	0.52	0.00
3	0.00	---	---	0.00	0.11	0.00	0.00	1.19	0.00	0.03	0.27	0.00
4	0.00	---	---	0.00	0.00	0.00	0.00	0.00	0.97	1.04	0.00	0.00
5	0.00	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.62	0.02
6	0.00	---	---	0.06	0.20	0.00	0.00	0.00	0.00	0.00	0.24	0.68
7	0.02	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10
8	1.98	---	---	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.26
9	1.58	---	---	0.00	0.00	0.13	0.00	0.00	0.01	0.00	0.00	0.34
10	0.22	---	---	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00
11	0.00	---	---	0.00	0.00	0.00	1.36	0.00	0.57	0.03	0.00	0.04
12	0.01	---	---	0.10	0.75	0.00	0.11	0.00	0.13	0.00	0.53	0.00
13	0.00	---	---	0.00	0.00	0.00	0.55	0.00	0.00	0.00	1.81	0.00
14	0.59	---	---	0.00	0.42	0.00	0.02	0.00	0.00	0.00	2.91	0.25
15	0.01	---	---	0.00	0.37	0.05	0.00	0.00	0.00	0.04	0.58	0.34
16	0.00	---	---	0.00	0.06	0.55	0.00	0.00	0.21	0.00	0.00	0.00
17	0.00	---	0.21	0.00	0.39	0.01	0.00	0.00	0.00	0.01	0.00	0.47
18	0.00	---	0.00	0.13	0.01	0.00	0.00	0.01	0.22	0.01	0.00	0.35
19	0.00	---	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00
20	0.00	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	---	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.63	0.00
22	0.00	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00
23	0.00	---	0.21	0.00	0.00	0.00	0.00	0.00	1.37	2.00	0.00	0.00
24	0.00	---	0.31	0.00	0.35	0.00	0.00	0.00	0.01	0.00	0.00	0.00
25	0.02	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.09	---	0.00	0.00	0.85	0.00	0.32	0.00	0.12	0.00	0.51	0.00
27	0.78	---	0.00	0.00	0.67	0.16	0.22	0.00	0.00	0.00	0.00	0.47
28	1.11	---	0.00	0.01	0.00	0.01	0.00	0.00	0.67	0.00	0.00	0.25
29	---	---	0.00	0.21	0.00	0.00	0.00	0.00	0.06	0.07	1.16	0.00
30	---	---	0.00	0.07	---	0.00	0.00	0.95	0.05	0.18	0.00	0.02
31	---	---	0.00	0.00	---	0.39	---	0.00	---	0.03	0.00	---
TOTAL	---	---	---	0.58	4.18	1.31	2.60	4.69	4.55	5.41	13.13	5.23



## GROUND-WATER LEVELS

## LENOIR COUNTY

351600077381001. Local number, NC-128; County number, LN-128.

LOCATION.--Lat 35°15'59", long 77°37'51", Hydrologic Unit 03020202, on west edge of Kinston at intersection of U.S. Highways 70 and 258 Bypass, and U.S. Highways 70 and 258 Business. Owner: City of Kinston.

AQUIFER.--Black Creek aquifer of Late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation well, depth 300 ft, diameter 10 in., cased to 160 ft, screened intervals unknown.

INSTRUMENTATION.--Water-level recorder collecting data at 30-minute intervals.

DATUM.--Land-surface datum is 33.5 ft above NGVD of 1929. Measuring point: Top of instrument shelf, 2.10 ft above land-surface datum.

REMARKS.--Well is part of local-effects network. Water levels affected by nearby pumping.

PERIOD OF RECORD.--December 1968 to current year. Continuous record began January 1974.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 34.83 ft below land-surface datum, Dec. 30, 1968; lowest water level recorded 125.96 ft below land-surface datum, Sept. 27, 1997.

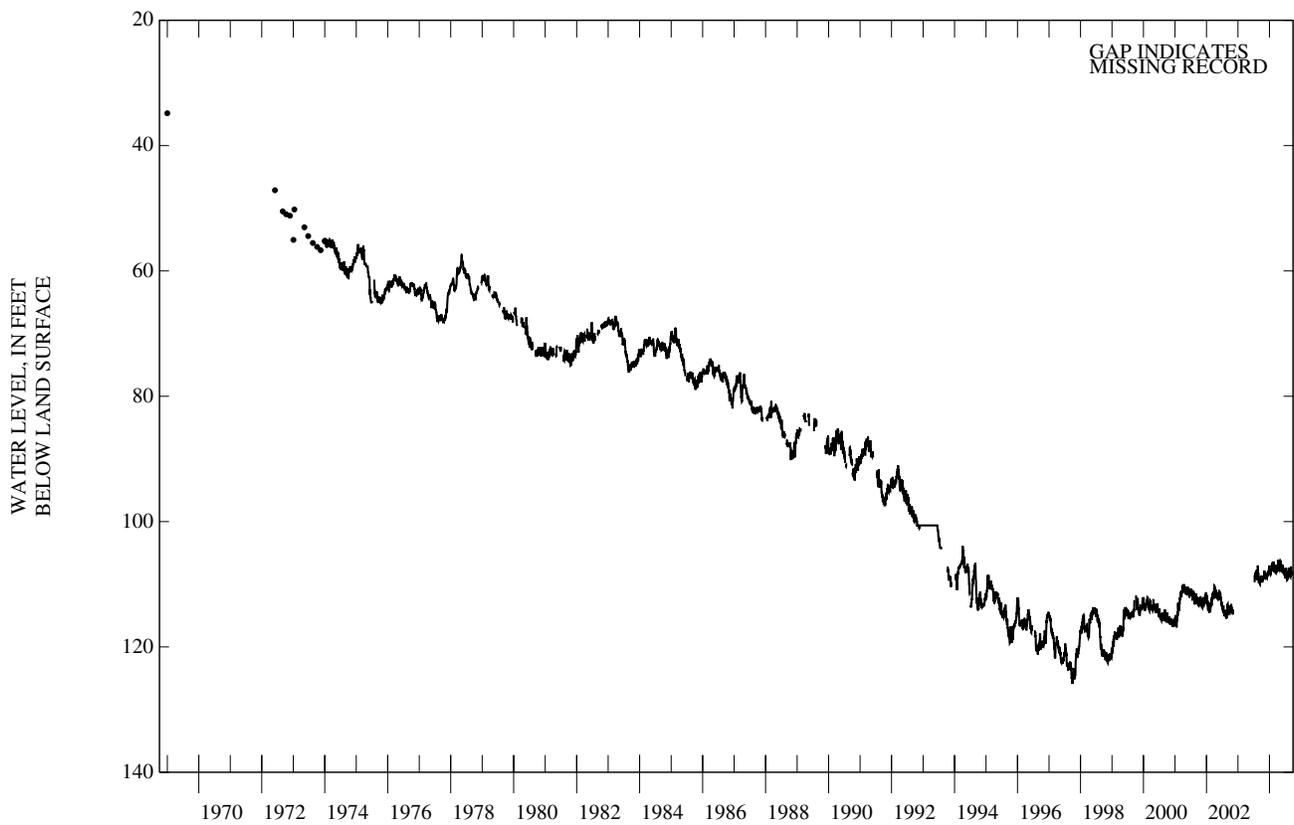
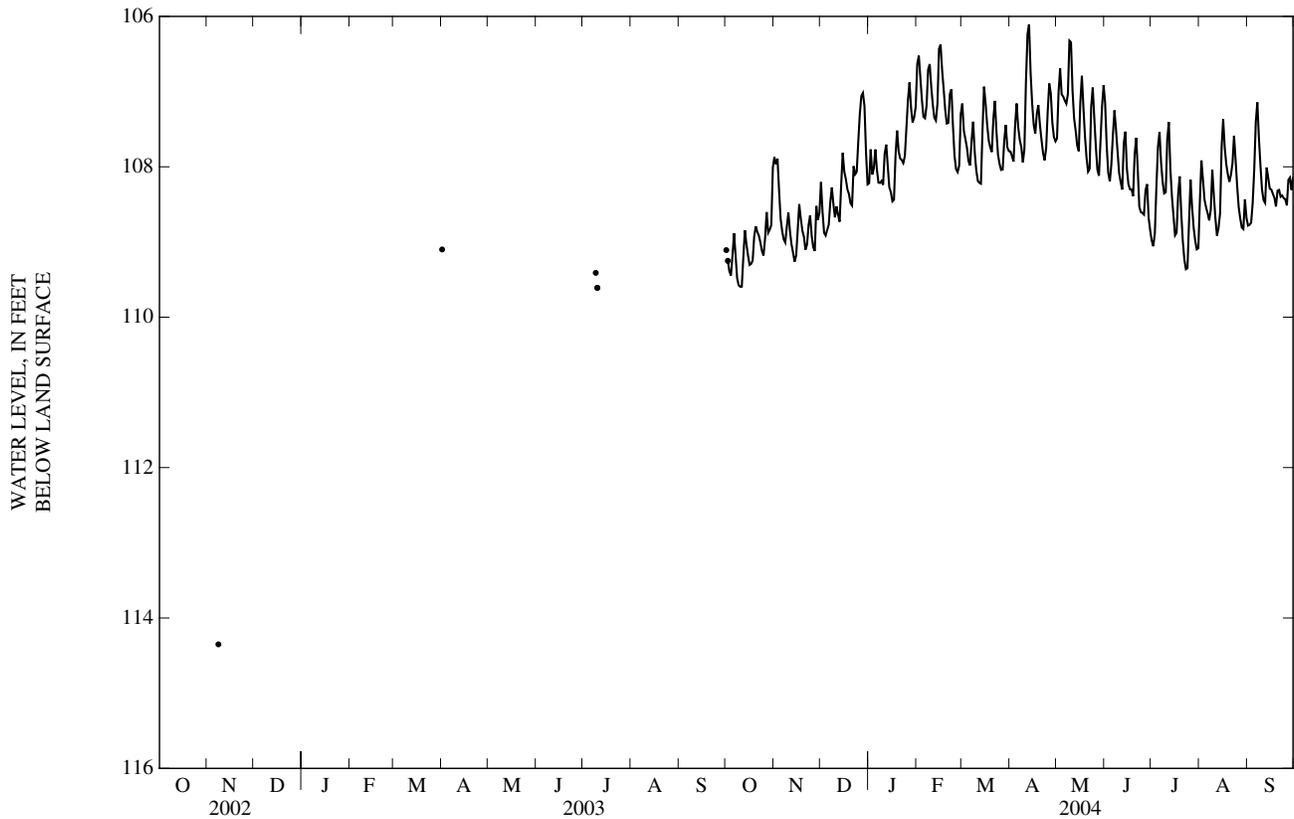
DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	109.11	107.87	108.20	108.22	106.63	107.16	107.80	107.62	107.15	108.98	108.45	108.78
2	109.25	107.97	108.60	107.77	106.52	107.52	107.86	107.01	107.72	109.06	107.92	108.77
3	109.39	107.89	108.88	108.10	106.81	107.63	107.93	106.69	108.08	108.88	108.17	108.75
4	109.45	108.32	108.91	108.03	107.11	107.75	107.45	107.04	108.20	108.27	108.44	108.48
5	109.18	108.69	108.84	107.77	107.34	107.92	107.16	107.07	107.97	107.74	108.54	108.04
6	108.88	108.86	108.77	108.03	107.35	107.98	107.47	107.12	107.57	107.54	108.62	107.40
7	109.18	108.96	108.47	108.21	107.19	107.65	107.64	107.16	107.25	107.94	108.71	107.14
8	109.48	109.01	108.27	108.21	106.71	107.40	107.74	107.03	107.51	108.20	108.57	107.61
9	109.58	108.80	108.50	108.19	106.63	107.80	107.94	106.32	107.80	108.35	108.04	107.98
10	109.60	108.61	108.67	108.24	106.94	108.05	107.77	106.34	108.08	108.34	108.39	108.30
11	109.59	108.85	108.53	107.83	107.17	108.19	106.86	106.99	108.21	107.63	108.69	108.44
12	109.20	109.03	108.64	107.70	107.35	108.21	106.23	107.35	108.30	107.41	108.91	108.48
13	108.84	109.14	108.73	107.99	107.39	108.22	106.11	107.52	107.68	108.03	108.82	108.01
14	109.03	109.26	108.24	108.27	107.16	107.52	106.76	107.72	107.53	108.39	108.62	108.15
15	109.18	109.18	107.81	108.34	106.43	106.93	107.16	107.79	108.03	108.65	107.74	108.29
16	109.31	108.84	108.06	108.46	106.37	107.16	107.44	107.15	108.23	108.91	107.37	108.30
17	109.29	108.50	108.16	108.44	106.71	107.44	107.56	106.79	108.30	108.88	107.74	108.36
18	109.25	108.69	108.30	107.85	106.97	107.65	107.29	107.21	108.30	108.37	107.97	108.41
19	108.93	108.85	108.36	107.52	107.24	107.74	107.18	107.59	108.39	108.13	108.10	108.53
20	108.79	108.93	108.48	107.79	107.42	107.80	107.45	107.87	107.83	108.62	108.20	108.32
21	108.87	109.10	108.52	107.89	107.42	107.36	107.64	108.07	107.62	108.98	108.11	108.31
22	108.92	109.04	107.99	107.91	107.03	107.12	107.82	108.03	108.03	109.23	107.95	108.40
23	109.01	108.78	108.10	107.95	106.97	107.53	107.91	107.20	108.53	109.36	107.59	108.38
24	109.12	108.65	108.07	107.86	107.46	107.84	107.75	106.95	108.60	109.35	107.91	108.42
25	109.18	108.92	107.67	107.49	107.85	107.96	107.27	107.35	108.61	108.75	108.25	108.43
26	108.95	109.07	107.30	107.11	108.03	108.04	106.89	107.73	108.64	108.17	108.54	108.51
27	108.60	109.12	107.06	106.88	108.07	108.04	107.02	108.04	108.31	108.54	108.69	108.17
28	108.88	108.52	107.02	107.22	107.98	107.66	107.42	108.12	108.23	108.81	108.81	108.14
29	108.84	108.71	107.19	107.41	107.30	107.44	107.60	107.66	108.68	108.98	108.83	108.31
30	108.77	108.61	107.81	107.34	---	107.74	107.66	107.20	108.85	109.10	108.43	108.14
31	108.01	---	108.23	107.20	---	107.79	---	106.91	---	109.08	108.68	---

WTR YR 2004 MEAN 108.06 HIGH 106.11 LOW 109.60

LENOIR COUNTY—Continued

351600077381001. Local number, NC-128; County number, LN-128.



## GROUND-WATER LEVELS

## LENOIR COUNTY—Continued

351937077284201. Local number, NC-185; DENR Graingers Research Station well Q25d12; County number, LN-110.

LOCATION.--Lat 35°19'38", long 77°28'41", Hydrologic Unit 03020202, 1.6 mi northeast of Graingers on N.C. Highway 11 at E. I. du Pont de Nemours and Company, Kinston Plant. Owner: DENR (North Carolina Department of Environment, and Natural Resources).

AQUIFER.--Peedee aquifer of Late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation well, depth 134 ft, diameter 4 in., screened interval from 124 to 134 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals.

DATUM.--Land-surface datum is 66 ft above NGVD of 1929 (from topographic map). Measuring point: Top of instrument shelf, 3.10 ft above land-surface datum.

REMARKS.--Well is part of areal-effects network. Water-level rise in late 1992 was a result of local pumping well shutdown.

PERIOD OF RECORD.--December 1985 to current year.

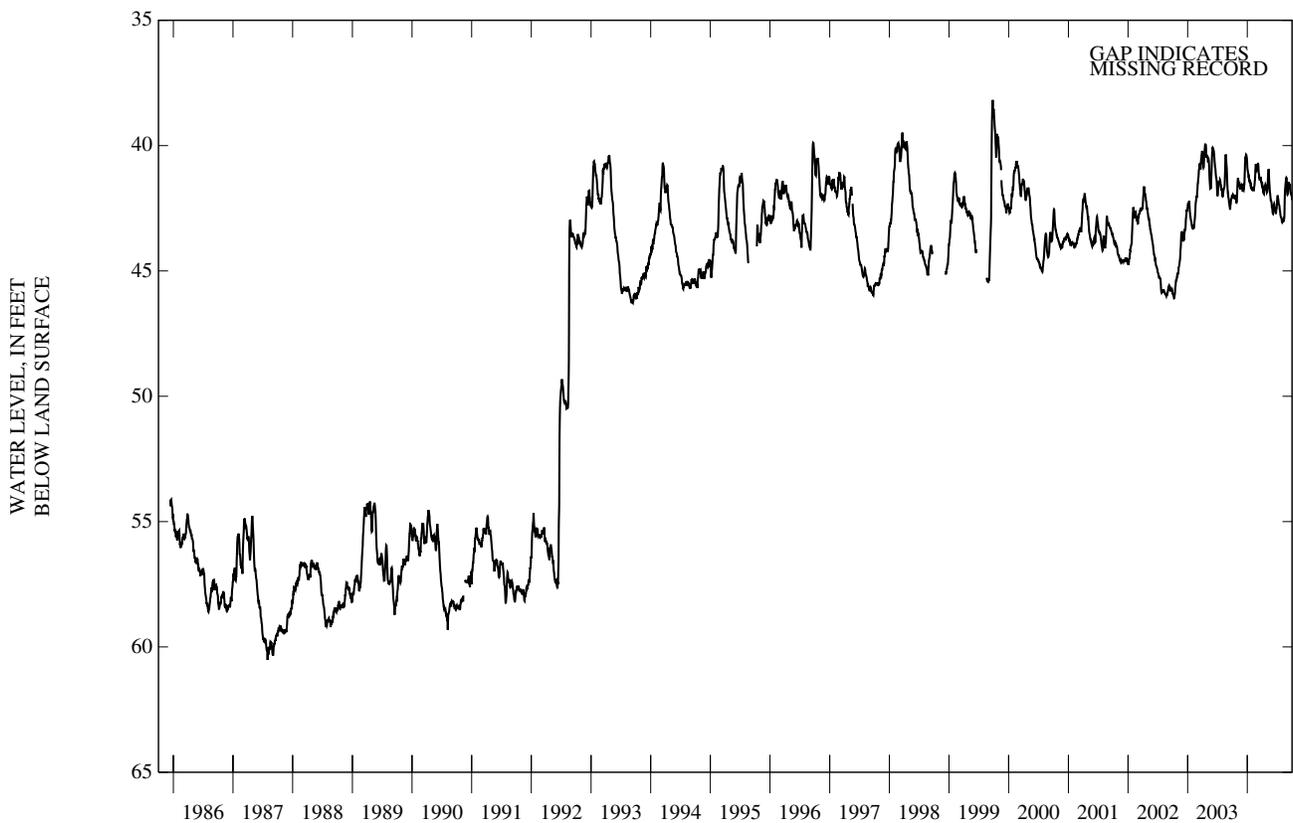
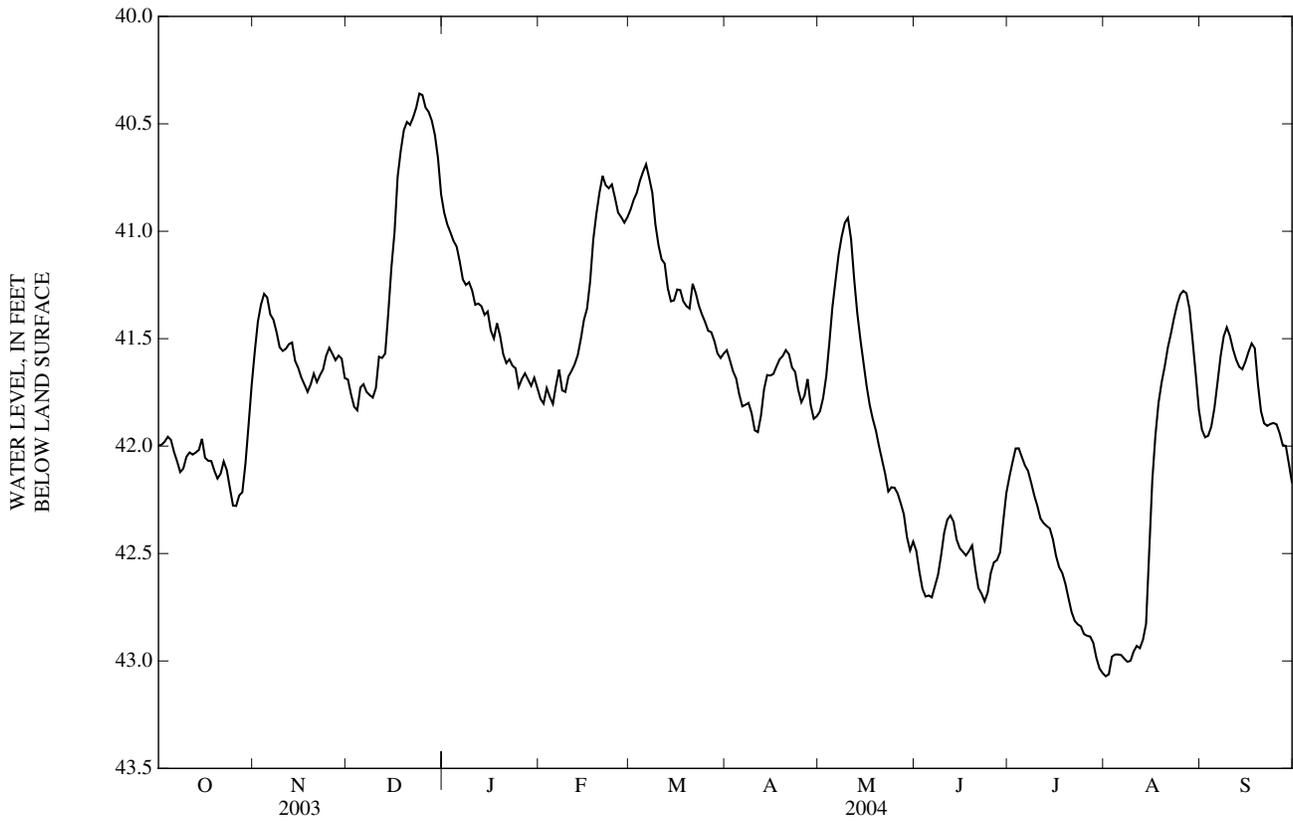
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 38.14 ft below land-surface datum, Sept. 24, 1999; lowest water level recorded, 60.61 ft below land-surface datum, July 31, 1987.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42.00	41.56	41.69	40.91	41.78	40.90	41.55	41.84	42.49	42.14	43.07	41.92
2	41.99	41.42	41.76	40.97	41.80	40.85	41.60	41.78	42.58	42.07	43.06	41.96
3	41.98	41.34	41.82	41.01	41.73	40.82	41.65	41.68	42.66	42.01	42.98	41.95
4	41.96	41.29	41.83	41.05	41.77	40.77	41.69	41.52	42.70	42.01	42.97	41.91
5	41.97	41.31	41.73	41.07	41.80	40.72	41.76	41.35	42.70	42.05	42.97	41.82
6	42.03	41.39	41.71	41.14	41.72	40.69	41.81	41.23	42.70	42.09	42.97	41.70
7	42.07	41.41	41.75	41.22	41.64	40.75	41.81	41.11	42.65	42.12	42.99	41.58
8	42.12	41.47	41.76	41.25	41.74	40.82	41.80	41.02	42.60	42.17	43.00	41.49
9	42.10	41.54	41.77	41.24	41.75	40.97	41.85	40.96	42.51	42.23	43.00	41.45
10	42.05	41.56	41.73	41.28	41.68	41.06	41.93	40.94	42.40	42.28	42.96	41.49
11	42.03	41.55	41.58	41.34	41.65	41.13	41.94	41.04	42.34	42.34	42.93	41.55
12	42.04	41.53	41.59	41.34	41.62	41.15	41.86	41.22	42.32	42.36	42.94	41.60
13	42.03	41.52	41.57	41.35	41.58	41.27	41.73	41.38	42.35	42.37	42.90	41.63
14	42.02	41.60	41.38	41.39	41.50	41.33	41.67	41.50	42.43	42.38	42.83	41.64
15	41.97	41.64	41.17	41.37	41.41	41.32	41.67	41.61	42.47	42.43	42.49	41.61
16	42.05	41.68	41.01	41.46	41.36	41.27	41.66	41.72	42.49	42.51	42.16	41.56
17	42.07	41.71	40.75	41.50	41.23	41.27	41.63	41.81	42.51	42.56	41.95	41.52
18	42.07	41.75	40.63	41.43	41.04	41.33	41.60	41.87	42.49	42.59	41.80	41.54
19	42.11	41.71	40.53	41.49	40.92	41.35	41.58	41.93	42.46	42.64	41.70	41.71
20	42.15	41.66	40.49	41.57	40.82	41.36	41.55	42.00	42.57	42.71	41.63	41.84
21	42.13	41.70	40.51	41.61	40.74	41.24	41.57	42.06	42.66	42.77	41.54	41.89
22	42.07	41.67	40.47	41.60	40.79	41.29	41.63	42.13	42.69	42.81	41.48	41.91
23	42.11	41.64	40.42	41.63	40.80	41.35	41.66	42.21	42.72	42.83	41.40	41.90
24	42.20	41.58	40.36	41.64	40.78	41.39	41.74	42.19	42.68	42.84	41.34	41.89
25	42.28	41.54	40.37	41.72	40.84	41.42	41.80	42.19	42.59	42.87	41.29	41.90
26	42.28	41.57	40.42	41.69	40.91	41.46	41.77	42.22	42.54	42.88	41.28	41.94
27	42.23	41.60	40.44	41.66	40.93	41.47	41.69	42.27	42.53	42.89	41.29	42.00
28	42.21	41.58	40.48	41.69	40.96	41.51	41.81	42.32	42.49	42.92	41.36	42.00
29	42.08	41.59	40.55	41.72	40.93	41.57	41.87	42.42	42.35	42.99	41.51	42.08
30	41.90	41.68	40.66	41.68	---	41.59	41.86	42.49	42.22	43.03	41.67	42.17
31	41.72	---	40.83	41.73	---	41.57	---	42.44	---	43.06	41.83	---
WTR YR	2004	MEAN	41.77	HIGH	40.36	LOW	43.07					

LENOIR COUNTY—Continued

351937077284201. Local number, NC-185; DENR Graingers Research Station well Q25d12; County number, LN-110.



## GROUND-WATER LEVELS

## LENOIR COUNTY—Continued

351937077284211. Local number, NC-223; DENR Graingers Research Station well Q25d11; County number, LN-105.

LOCATION.--Lat 35°19'38", long 77°28'41", Hydrologic Unit 03020202, 1.6 mi northeast of Graingers on N.C. Highway 11 at E. I. du Pont de Nemours and Company, Kinston Plant. Owner: DENR (North Carolina Department of Environment, and Natural Resources).

AQUIFER.--Surficial aquifer of post-Miocene age.

WELL CHARACTERISTICS.--Drilled observation well, depth 40 ft, diameter 4 in., screened interval from 30 to 40 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals.

DATUM.--Land-surface datum is 66 ft above NGVD of 1929 (from topographic map). Measuring point: Instrument shelter floor, 1.80 ft above land-surface datum.

REMARKS.--Well is part of areal-effects network.

PERIOD OF RECORD.--November 1985 to current year. Periodic water level measurements November 1985 to October 1986. Continuous record began June 2000.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 9.54 ft below land-surface datum, Dec. 19, 20, 25-27, 2003; lowest water level measured, 20.60 ft below land-surface datum, Nov. 19, 1985.

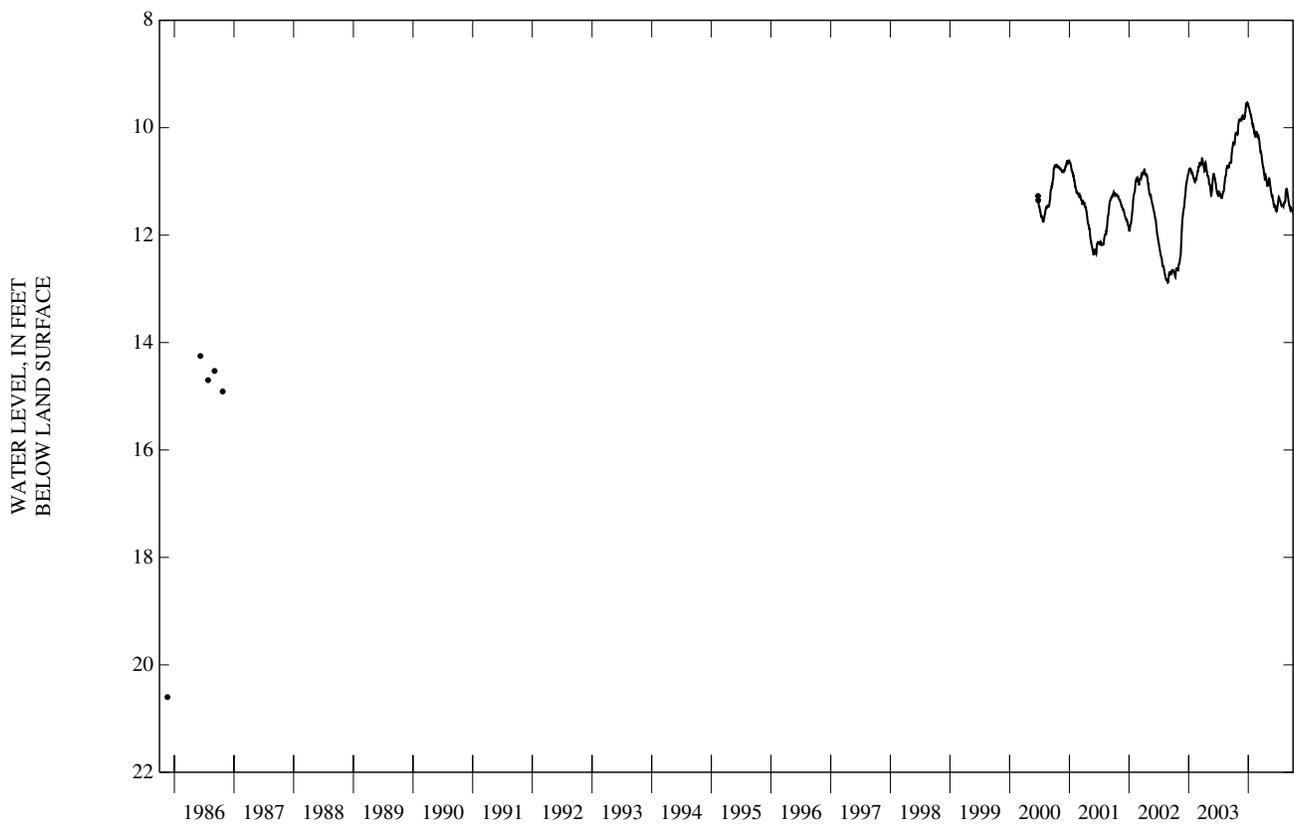
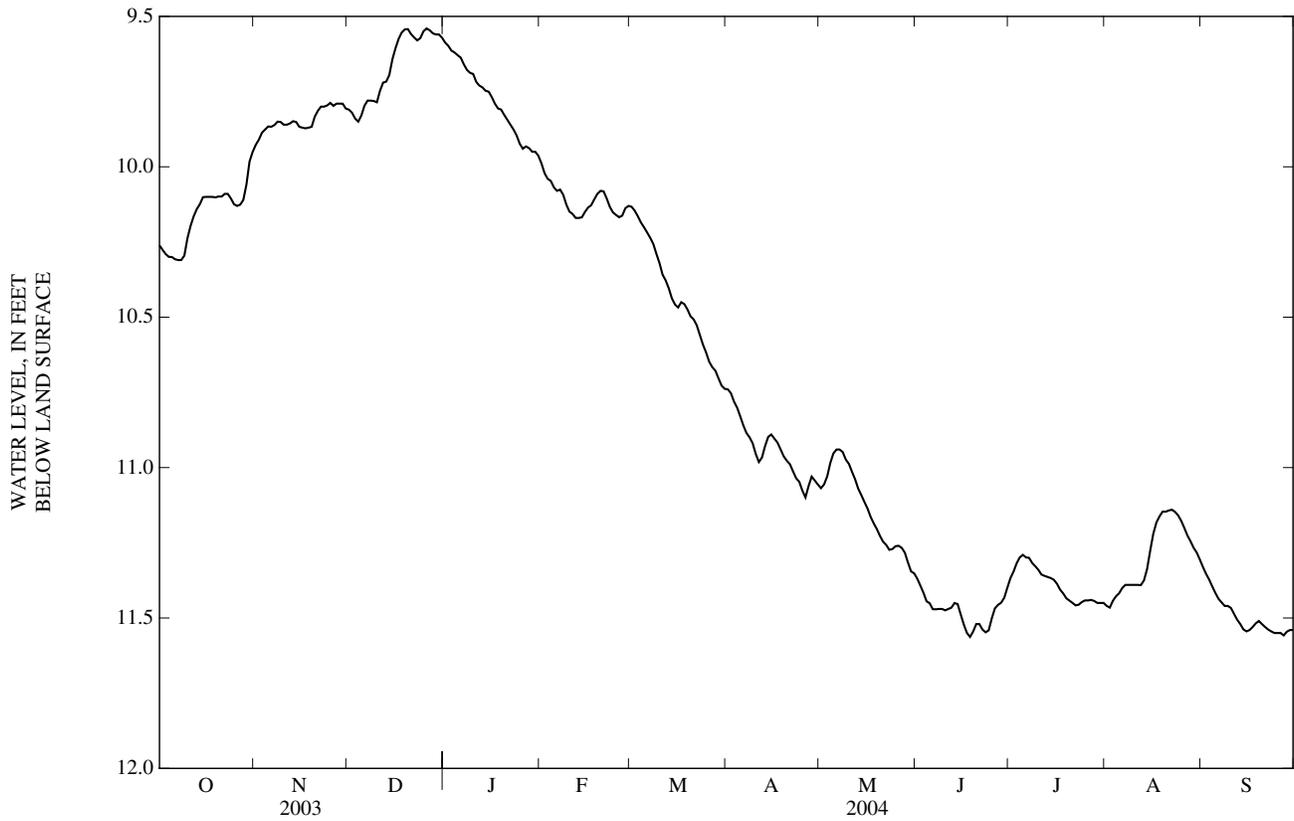
DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.26	9.93	9.81	9.59	9.99	10.13	10.74	11.07	11.37	11.37	11.46	11.33
2	10.28	9.91	9.82	9.60	10.02	10.15	10.75	11.06	11.39	11.35	11.47	11.35
3	10.29	9.89	9.84	9.61	10.04	10.16	10.78	11.03	11.42	11.32	11.44	11.37
4	10.30	9.88	9.85	9.62	10.05	10.18	10.80	10.98	11.44	11.30	11.43	11.40
5	10.30	9.87	9.83	9.63	10.07	10.20	10.83	10.95	11.45	11.29	11.42	11.42
6	10.31	9.87	9.80	9.64	10.08	10.22	10.86	10.94	11.47	11.30	11.40	11.44
7	10.31	9.86	9.78	9.66	10.08	10.24	10.88	10.94	11.47	11.30	11.39	11.45
8	10.31	9.85	9.78	9.68	10.09	10.26	10.90	10.95	11.47	11.32	11.39	11.46
9	10.30	9.85	9.78	9.69	10.13	10.29	10.92	10.97	11.47	11.33	11.39	11.46
10	10.24	9.86	9.79	9.69	10.15	10.32	10.95	10.99	11.47	11.34	11.39	11.47
11	10.20	9.86	9.75	9.72	10.16	10.36	10.98	11.01	11.47	11.36	11.39	11.49
12	10.16	9.86	9.72	9.73	10.17	10.38	10.97	11.04	11.47	11.36	11.39	11.51
13	10.14	9.85	9.72	9.74	10.17	10.40	10.93	11.07	11.45	11.36	11.38	11.52
14	10.12	9.85	9.69	9.75	10.17	10.44	10.90	11.09	11.45	11.37	11.34	11.54
15	10.10	9.87	9.64	9.75	10.15	10.46	10.89	11.11	11.49	11.37	11.28	11.54
16	10.10	9.87	9.61	9.77	10.14	10.47	10.90	11.14	11.52	11.39	11.22	11.54
17	10.10	9.87	9.57	9.79	10.13	10.45	10.92	11.16	11.55	11.41	11.18	11.53
18	10.10	9.87	9.55	9.81	10.11	10.46	10.94	11.19	11.56	11.42	11.16	11.52
19	10.10	9.87	9.54	9.81	10.09	10.47	10.96	11.20	11.54	11.43	11.15	11.51
20	10.10	9.83	9.54	9.83	10.08	10.50	10.98	11.23	11.52	11.44	11.15	11.52
21	10.10	9.81	9.56	9.84	10.08	10.51	10.99	11.25	11.52	11.45	11.14	11.53
22	10.09	9.80	9.57	9.86	10.11	10.53	11.01	11.26	11.54	11.46	11.14	11.54
23	10.09	9.80	9.58	9.88	10.13	10.56	11.04	11.27	11.55	11.46	11.15	11.54
24	10.11	9.80	9.57	9.90	10.15	10.59	11.05	11.27	11.54	11.45	11.16	11.55
25	10.12	9.79	9.55	9.92	10.16	10.62	11.08	11.26	11.50	11.44	11.18	11.55
26	10.13	9.80	9.54	9.94	10.17	10.65	11.10	11.26	11.47	11.44	11.20	11.55
27	10.13	9.79	9.55	9.93	10.16	10.67	11.06	11.27	11.46	11.44	11.23	11.56
28	10.11	9.79	9.56	9.94	10.14	10.68	11.03	11.28	11.45	11.44	11.25	11.55
29	10.06	9.79	9.56	9.95	10.13	10.70	11.04	11.32	11.43	11.45	11.27	11.54
30	9.98	9.81	9.56	9.95	---	10.73	11.06	11.35	11.40	11.45	11.28	11.54
31	9.95	---	9.57	9.96	---	10.74	---	11.35	---	11.45	11.31	---

WTR YR 2004 MEAN 10.64 HIGH 9.54 LOW 11.56

LENOIR COUNTY—Continued

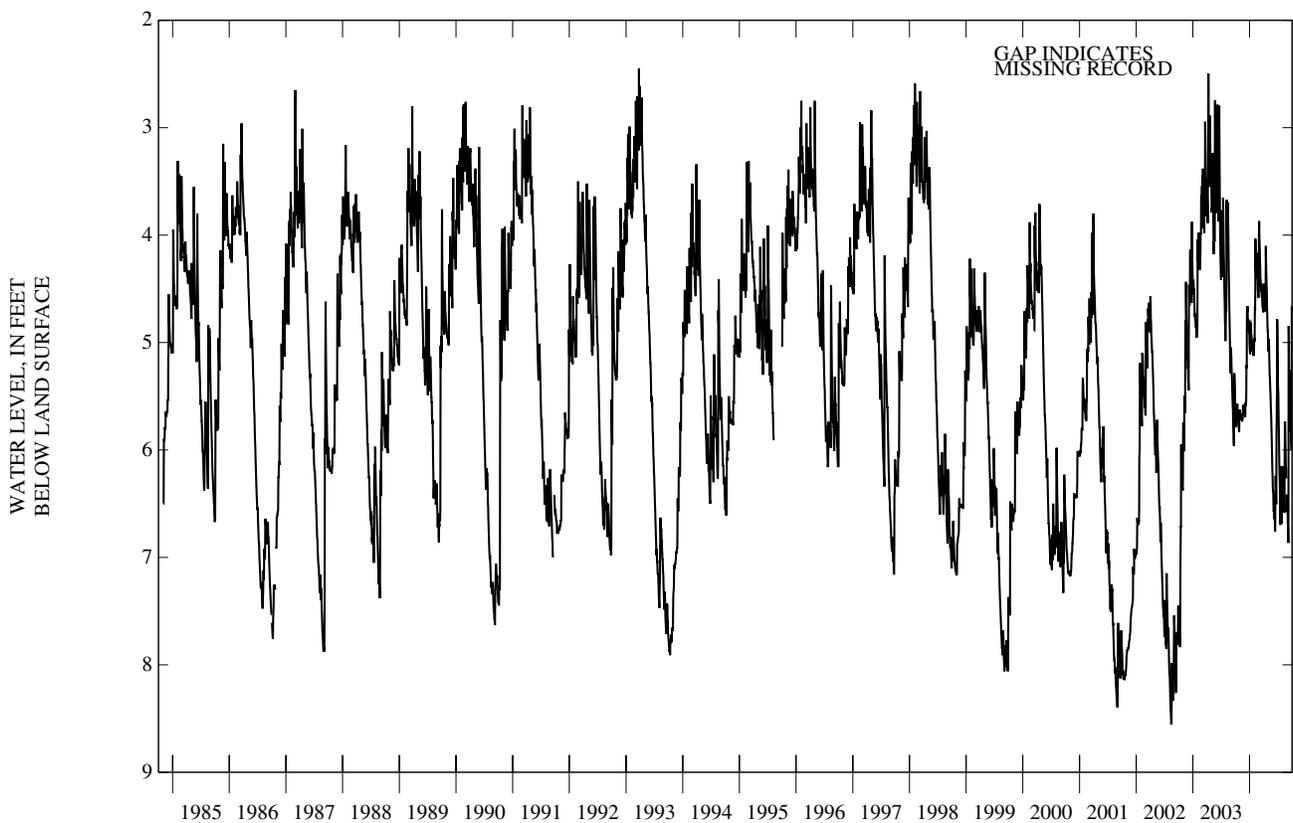
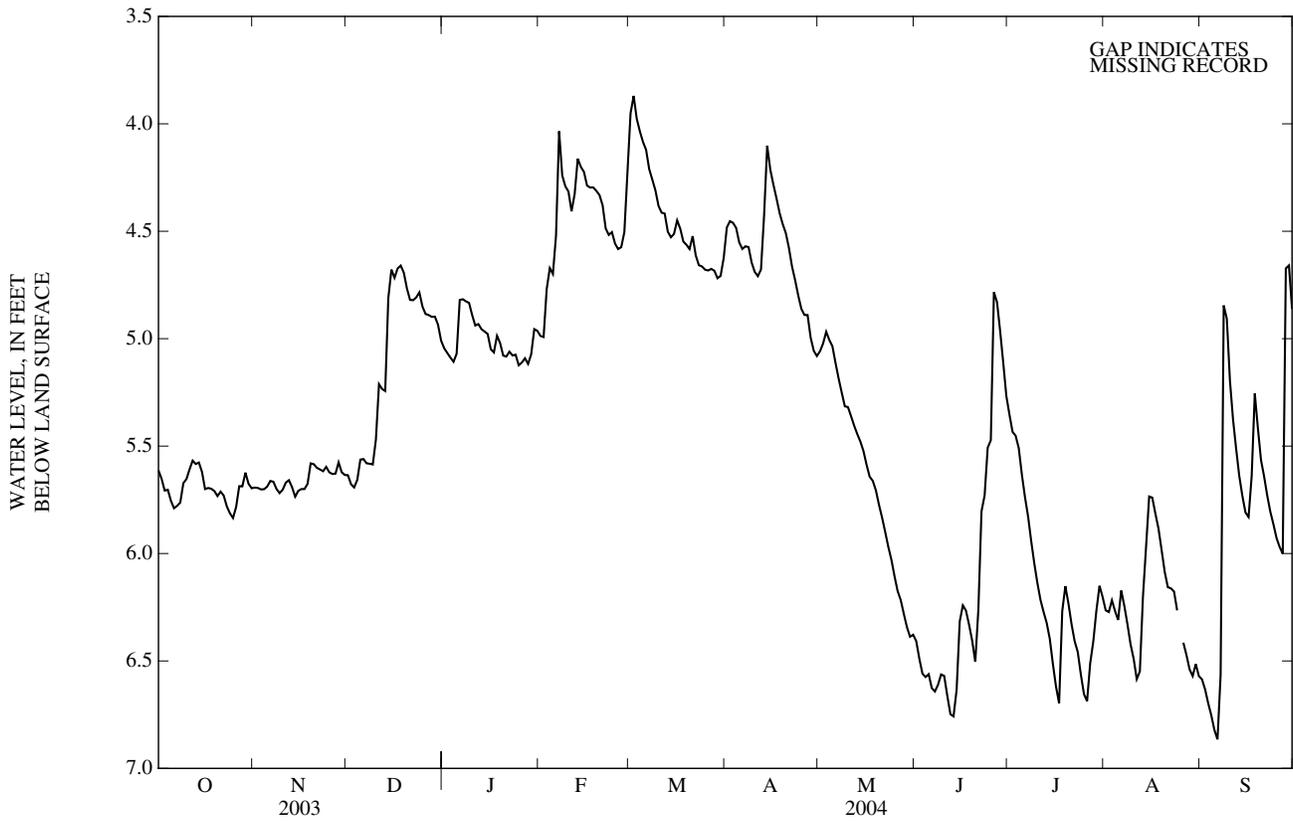
351937077284211. Local number, NC-223; DENR Graingers Research Station well Q25d11; County number, LN-105.





MECKLENBURG COUNTY—Continued

351730080524203. Local number, NC-146; County number, ME-301.



## GROUND-WATER LEVELS

## ONslow COUNTY

344425077272501. Local number, NC-52; County number, ON-035.

LOCATION.--Lat 34°44'18", long 77°27'27", Hydrologic Unit 03030001, southwest of Jacksonville, 0.25 mi east of U.S. Highway 17 at U.S. Marine Corps Camp Geiger, and 2 mi south of U.S. Highway 258. Owner: U.S. Marine Corps.

AQUIFER.--Castle Hayne aquifer of Oligocene and Eocene age.

WELL CHARACTERISTICS.--Drilled abandoned supply well, depth 70 ft, diameter 18 in. to 23 ft, open hole from 23 to 70 ft; measured depth 68 ft, January 1974.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals.

DATUM.--Land-surface datum is 17 ft above NGVD of 1929 (from topographic map). Measuring point: Top of instrument shelf, 1.83 ft above land-surface datum (since April 1993).

REMARKS.--Well is part of areal-effects network.

PERIOD OF RECORD.--January 1963 to current year. Continuous record began December 1966.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 1.19 ft below land-surface datum, Sept. 16, 1999; lowest water level recorded, 10.44 ft below land-surface datum, Jan. 3, 1966.

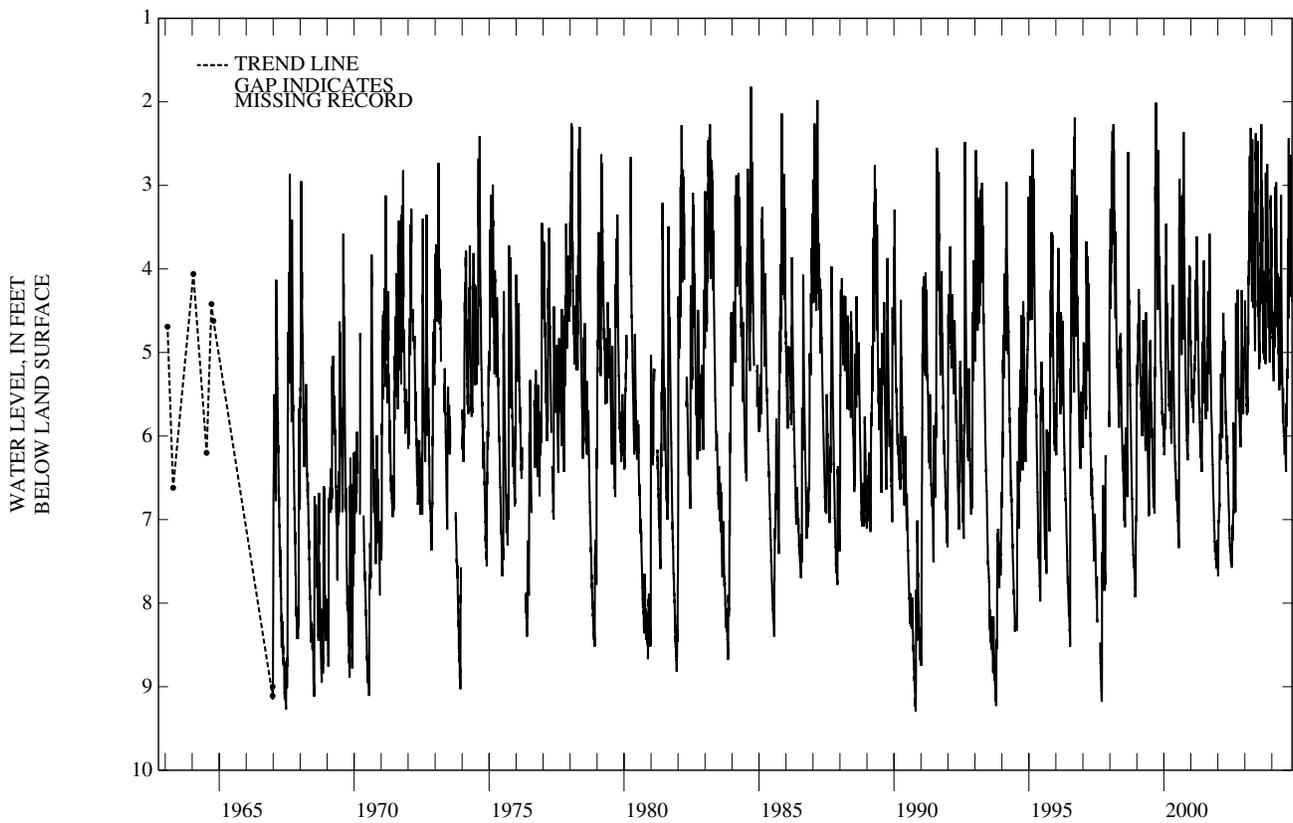
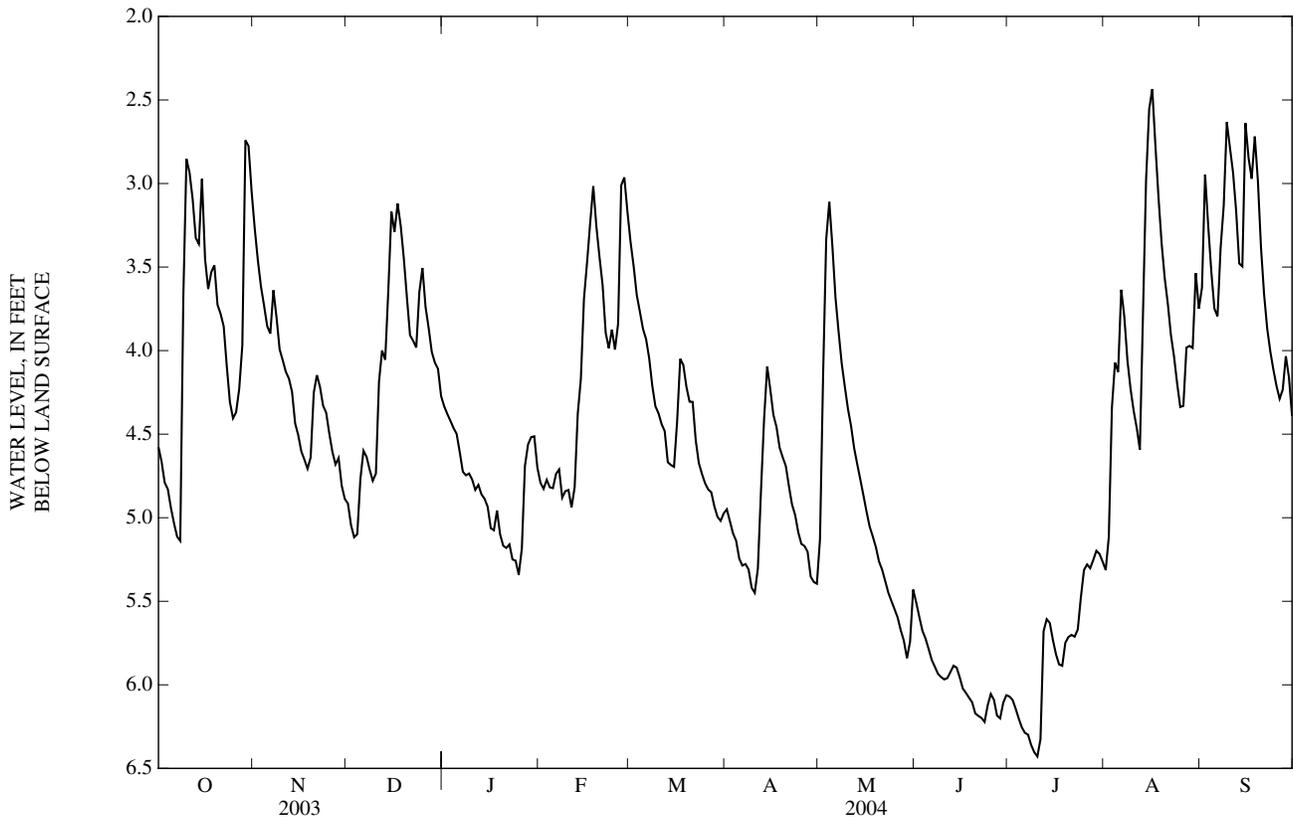
DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.58	3.27	4.92	4.33	4.79	3.35	4.95	5.13	5.51	6.07	5.31	3.62
2	4.67	3.46	5.05	4.38	4.83	3.50	5.02	4.15	5.60	6.09	5.12	2.95
3	4.79	3.62	5.12	4.42	4.77	3.67	5.09	3.33	5.68	6.14	4.34	3.25
4	4.83	3.73	5.10	4.46	4.82	3.77	5.14	3.11	5.72	6.20	4.07	3.53
5	4.94	3.85	4.77	4.50	4.82	3.87	5.24	3.38	5.79	6.25	4.13	3.75
6	5.03	3.90	4.60	4.61	4.74	3.93	5.29	3.69	5.85	6.29	3.64	3.79
7	5.11	3.64	4.64	4.72	4.71	4.05	5.28	3.89	5.89	6.30	3.80	3.39
8	5.14	3.80	4.71	4.75	4.88	4.21	5.31	4.08	5.93	6.36	4.06	3.13
9	3.67	3.99	4.78	4.74	4.84	4.33	5.42	4.22	5.95	6.40	4.23	2.63
10	2.85	4.06	4.74	4.77	4.83	4.38	5.45	4.35	5.97	6.43	4.36	2.78
11	2.94	4.13	4.18	4.83	4.94	4.44	5.30	4.45	5.96	6.33	4.46	2.93
12	3.09	4.17	4.00	4.80	4.82	4.48	4.84	4.58	5.92	5.68	4.59	3.16
13	3.33	4.25	4.05	4.86	4.38	4.67	4.41	4.68	5.89	5.61	3.79	3.48
14	3.36	4.44	3.64	4.89	4.17	4.68	4.10	4.77	5.90	5.63	2.98	3.50
15	2.97	4.51	3.17	4.93	3.69	4.70	4.23	4.87	5.96	5.73	2.55	2.64
16	3.45	4.60	3.29	5.06	3.47	4.42	4.38	4.96	6.02	5.82	2.43	2.85
17	3.63	4.65	3.12	5.07	3.24	4.05	4.46	5.05	6.05	5.88	2.77	2.97
18	3.53	4.71	3.25	4.96	3.02	4.09	4.58	5.11	6.08	5.89	3.08	2.72
19	3.49	4.64	3.45	5.10	3.26	4.22	4.64	5.18	6.10	5.75	3.36	2.98
20	3.73	4.25	3.68	5.17	3.44	4.31	4.69	5.26	6.17	5.71	3.57	3.38
21	3.78	4.15	3.91	5.18	3.61	4.31	4.81	5.31	6.19	5.70	3.72	3.67
22	3.85	4.22	3.94	5.16	3.89	4.54	4.92	5.38	6.20	5.71	3.91	3.87
23	4.10	4.33	3.98	5.25	3.99	4.67	4.98	5.45	6.22	5.67	4.04	4.01
24	4.31	4.37	3.65	5.26	3.87	4.74	5.09	5.50	6.12	5.48	4.20	4.12
25	4.41	4.50	3.51	5.34	3.99	4.79	5.16	5.55	6.05	5.31	4.34	4.21
26	4.37	4.61	3.74	5.19	3.84	4.83	5.17	5.60	6.09	5.28	4.33	4.29
27	4.23	4.68	3.87	4.69	3.01	4.85	5.20	5.67	6.18	5.30	3.98	4.23
28	3.97	4.64	4.01	4.56	2.96	4.93	5.35	5.74	6.20	5.25	3.97	4.03
29	2.74	4.81	4.07	4.52	3.17	4.99	5.38	5.84	6.11	5.20	3.98	4.16
30	2.78	4.89	4.11	4.51	---	5.02	5.39	5.74	6.06	5.22	3.54	4.39
31	3.05	---	4.27	4.70	---	4.97	---	5.43	---	5.26	3.75	---

WTR YR 2004 MEAN 4.54 HIGH 2.43 LOW 6.43

ONslow COUNTY—Continued

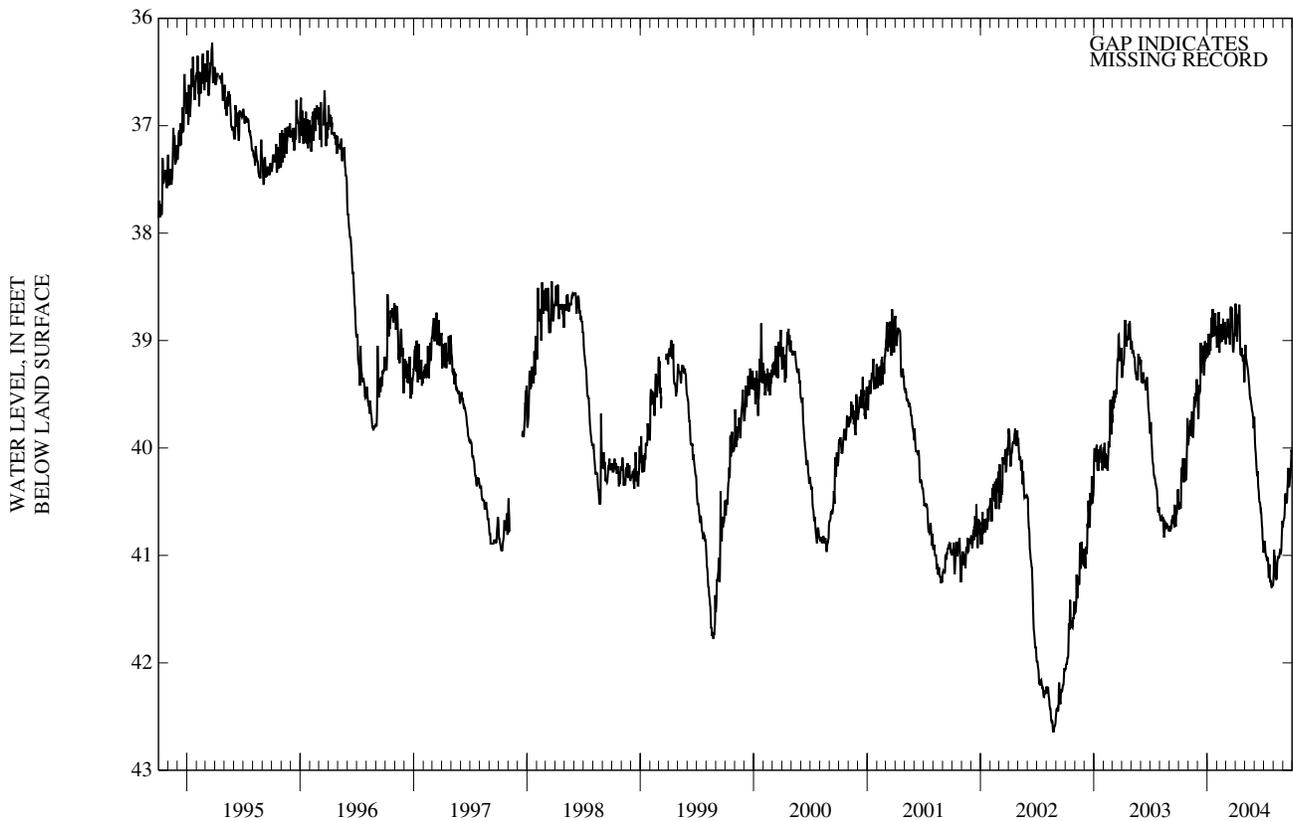
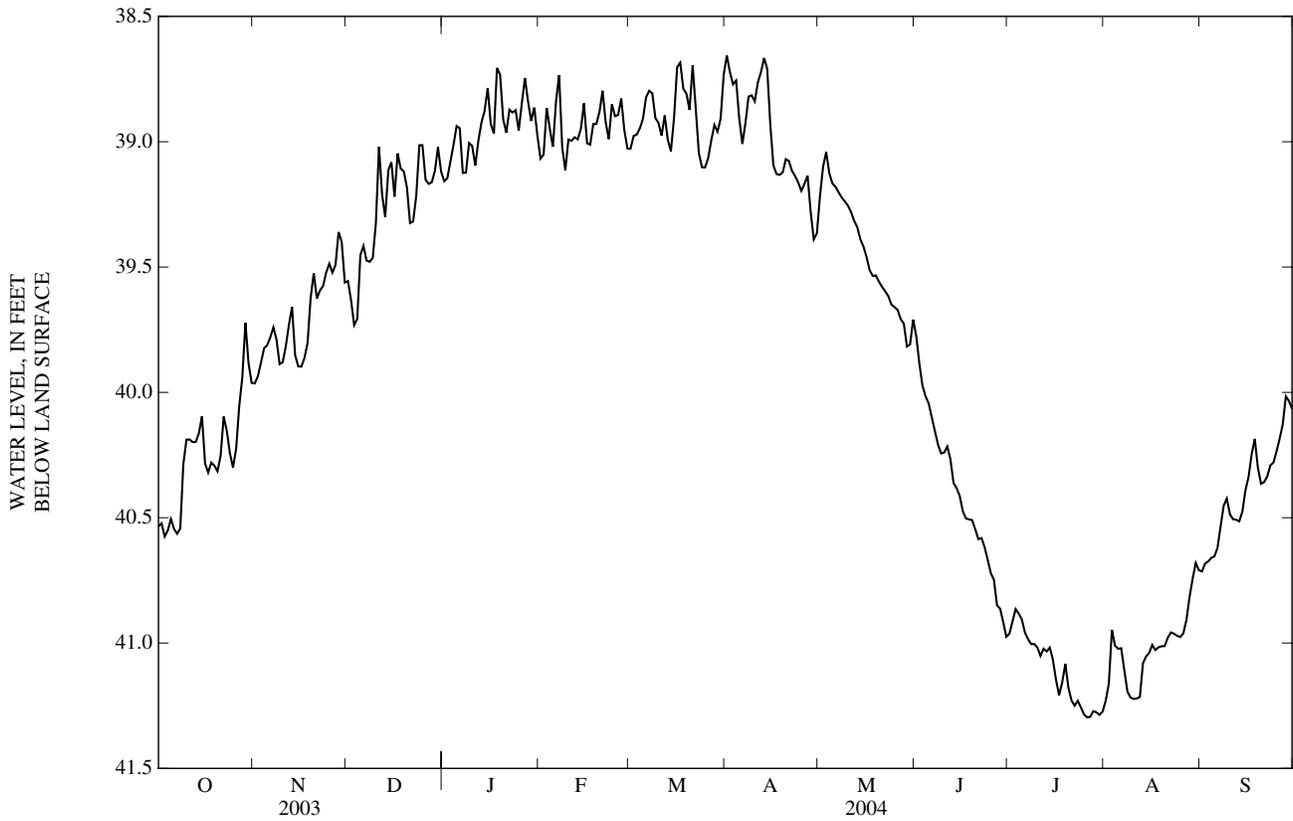
344425077272501. Local number, NC-52; County number, ON-035.





ONslow COUNTY—Continued

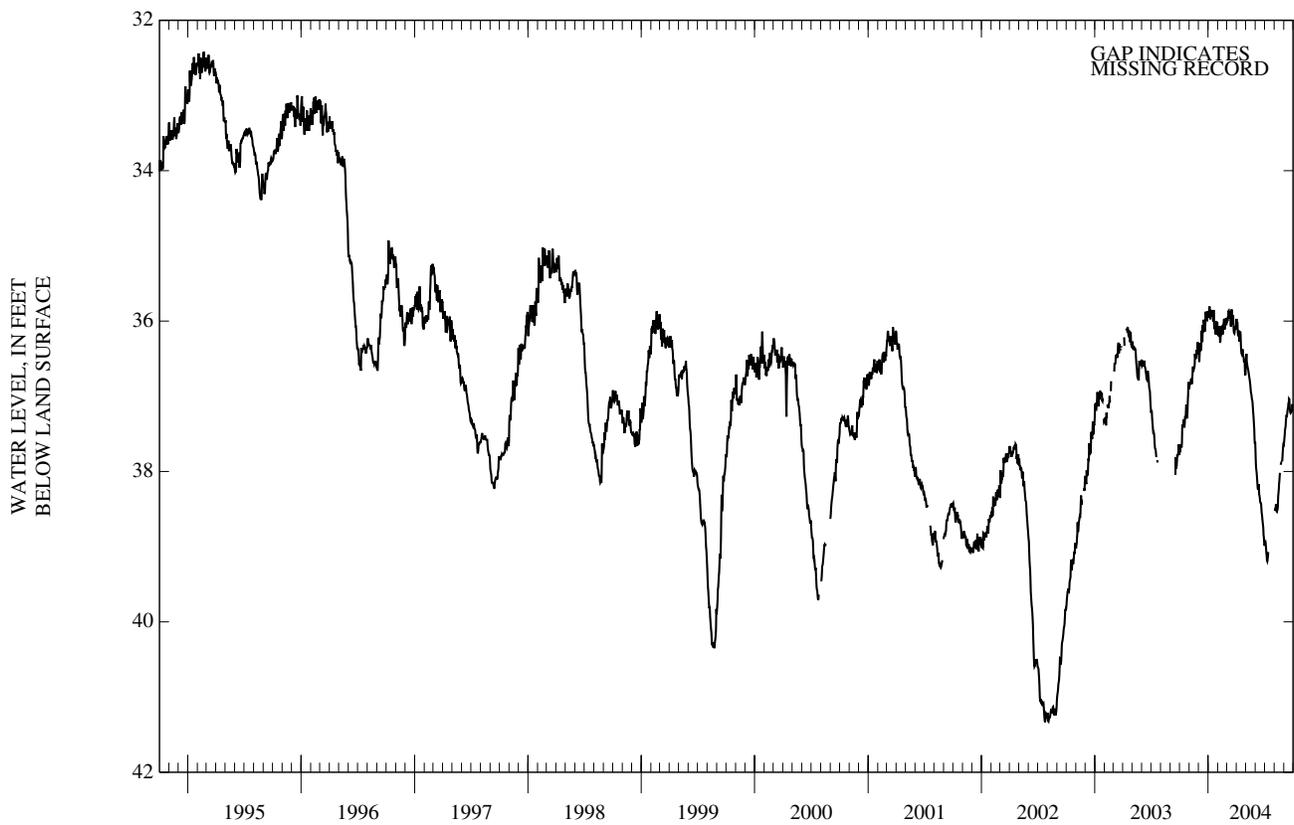
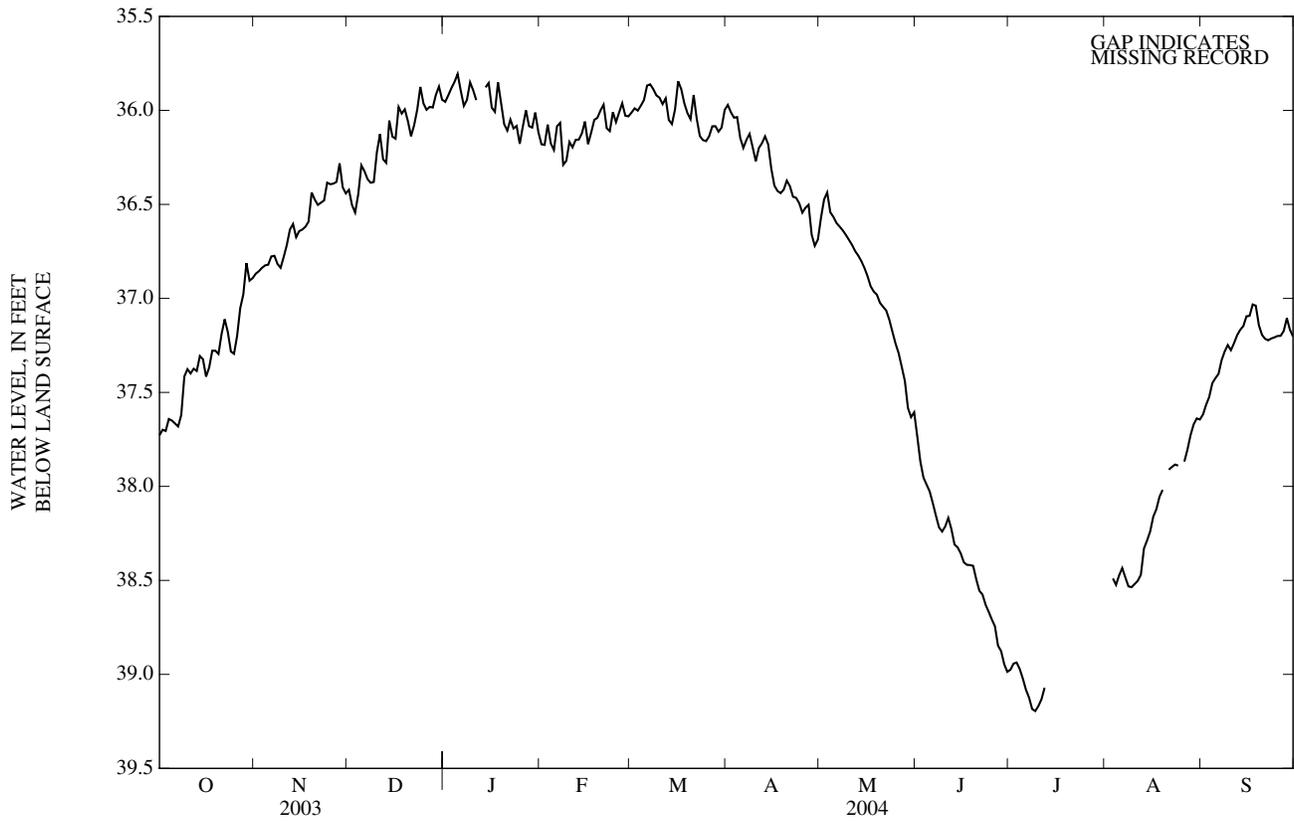
343512077265601. County number, ON-218; Rifle Range Well RR-97A.





GROUND-WATER LEVELS  
ONSLow COUNTY—Continued

343641077290103. County number, ON-227; DENR Dixon Tower Research Station well Y25q3.



## GROUND-WATER LEVELS

## ONslow COUNTY—Continued

343641077290106. County number, ON-230; DENR Dixon Tower Research Station well Y25q6.

LOCATION.--Lat 34°36'40.5", long 77°28'58.9", Hydrologic Unit 03030001, 1.5 mi. north of Dixon on U.S. Highway 17. Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Surficial aquifer.

WELL CHARACTERISTICS.--Drilled observation well, depth 22.0 ft, diameter 4 in., cased to 18.4 ft, screened interval from 18.4 to 22.0 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 68 ft above NGVD of 1929, (levels by DENR). Measuring point: Top of shelter floor, 2.52 ft above land-surface datum; revised from 2.10 ft above land-surface datum July 21, 1999.

REMARKS.--Well is part of U.S. Marine Corps Base, Camp Lejeune, North Carolina, Water Resources Network project.

PERIOD OF RECORD.--October 1994 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 6.37 ft below land-surface datum, Jan. 22, 1995; lowest water level recorded, 12.44 ft below land-surface datum, Aug. 25, 26, 2002.

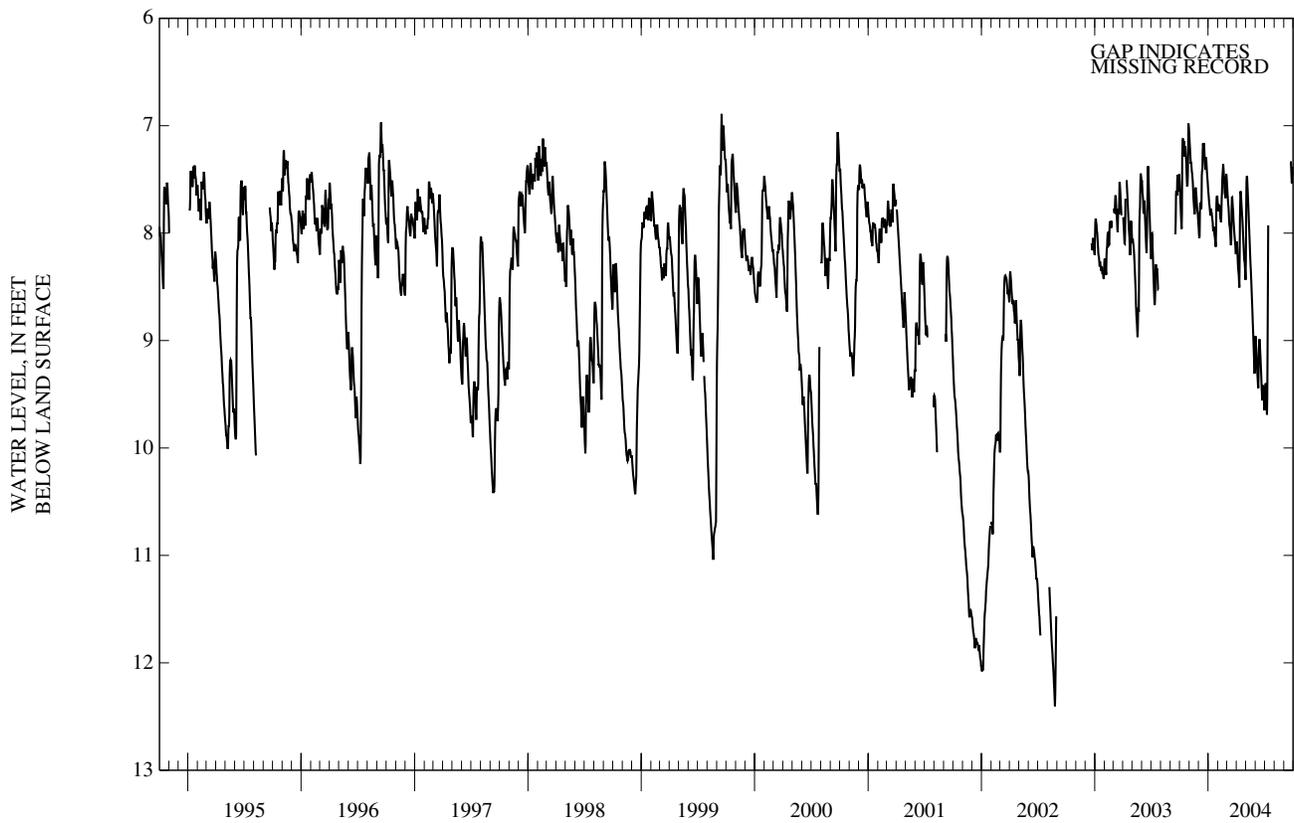
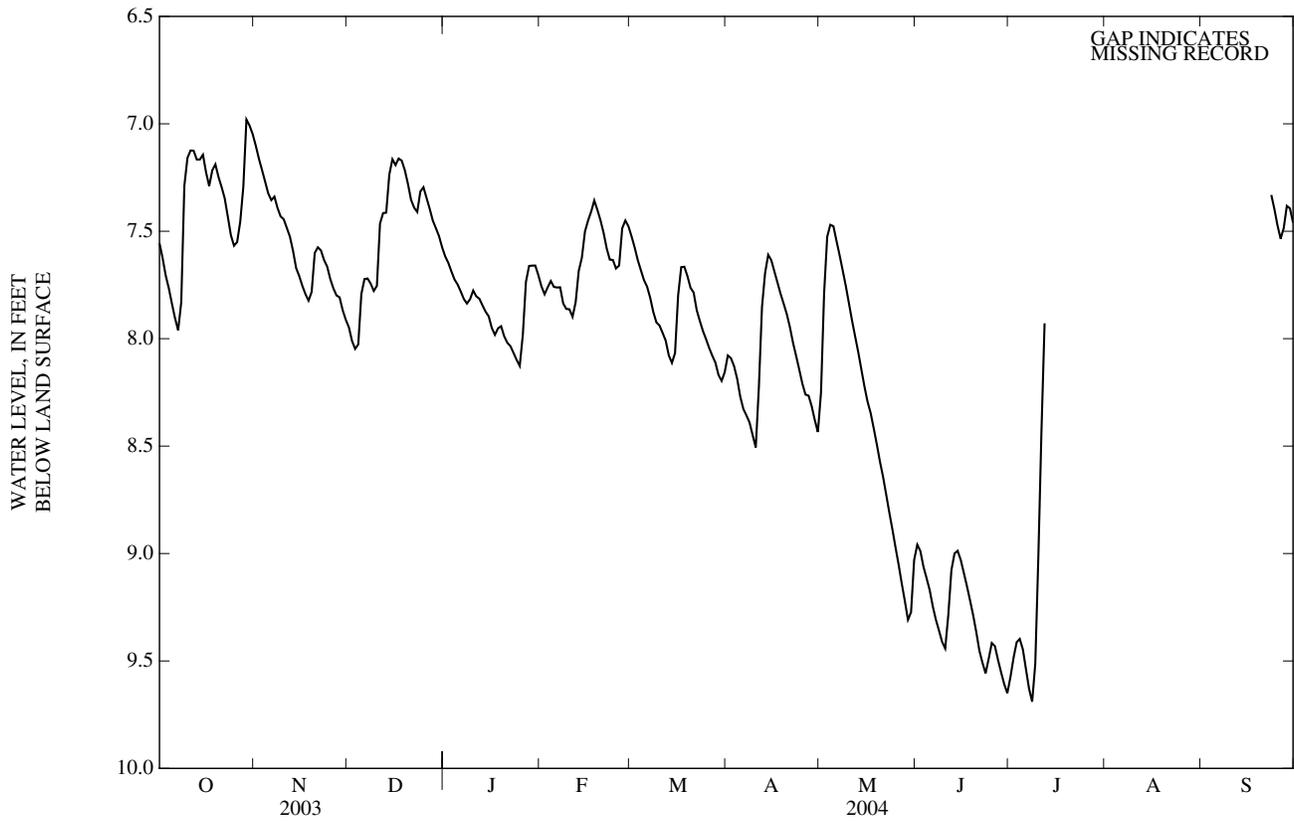
DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.55	7.10	7.95	7.62	7.76	7.52	8.08	8.25	8.96	9.58	---	---
2	7.62	7.16	8.01	7.65	7.79	7.58	8.09	7.79	8.99	9.49	---	---
3	7.71	7.21	8.05	7.69	7.76	7.63	8.13	7.53	9.06	9.41	---	---
4	7.77	7.27	8.03	7.72	7.73	7.68	8.19	7.47	9.11	9.40	---	---
5	7.84	7.32	7.79	7.75	7.76	7.73	8.27	7.48	9.17	9.45	---	---
6	7.90	7.36	7.72	7.78	7.76	7.76	8.33	7.55	9.25	9.54	---	---
7	7.96	7.34	7.72	7.82	7.76	7.81	8.36	7.61	9.31	9.63	---	---
8	7.83	7.39	7.74	7.84	7.84	7.88	8.39	7.68	9.36	9.69	---	---
9	7.29	7.43	7.78	7.82	7.86	7.92	8.45	7.76	9.41	9.51	---	---
10	7.16	7.44	7.75	7.78	7.86	7.94	8.51	7.84	9.44	9.01	---	---
11	7.12	7.48	7.46	7.80	7.90	7.97	8.23	7.92	9.29	8.43	---	---
12	7.13	7.53	7.42	7.81	7.83	8.01	7.85	7.99	9.08	7.93	---	---
13	7.17	7.59	7.41	7.84	7.68	8.08	7.69	8.06	9.00	---	---	---
14	7.17	7.67	7.24	7.87	7.62	8.11	7.61	8.14	8.99	---	---	---
15	7.14	7.71	7.16	7.90	7.50	8.07	7.63	8.22	9.03	---	---	---
16	7.23	7.75	7.19	7.95	7.45	7.80	7.69	8.29	9.09	---	---	---
17	7.29	7.79	7.16	7.98	7.41	7.67	7.74	8.35	9.15	---	---	---
18	7.22	7.82	7.17	7.95	7.36	7.67	7.79	8.42	9.22	---	---	---
19	7.19	7.78	7.22	7.94	7.40	7.71	7.84	8.49	9.29	---	---	---
20	7.25	7.60	7.28	7.99	7.45	7.76	7.89	8.57	9.37	---	---	---
21	7.29	7.57	7.35	8.02	7.51	7.79	7.95	8.64	9.45	---	---	---
22	7.35	7.59	7.39	8.03	7.58	7.87	8.02	8.73	9.51	---	---	---
23	7.43	7.63	7.41	8.07	7.63	7.92	8.08	8.81	9.56	---	---	7.33
24	7.52	7.66	7.31	8.10	7.63	7.96	8.14	8.89	9.49	---	---	7.40
25	7.57	7.72	7.29	8.13	7.67	8.00	8.21	8.97	9.42	---	---	7.47
26	7.55	7.77	7.35	7.98	7.66	8.04	8.26	9.05	9.43	---	---	7.53
27	7.46	7.80	7.39	7.74	7.49	8.08	8.27	9.14	9.50	---	---	7.49
28	7.29	7.81	7.45	7.66	7.45	8.11	8.31	9.22	9.55	---	---	7.38
29	6.98	7.87	7.49	7.66	7.48	8.17	8.38	9.31	9.61	---	---	7.39
30	7.01	7.91	7.52	7.66	---	8.20	8.43	9.27	9.65	---	---	7.46
31	7.05	---	7.57	7.71	---	8.16	---	9.03	---	---	---	---

WTR YR 2004 MEAN 7.99 HIGH 6.98 LOW 9.69

GROUND-WATER LEVELS  
ONslow COUNTY—Continued

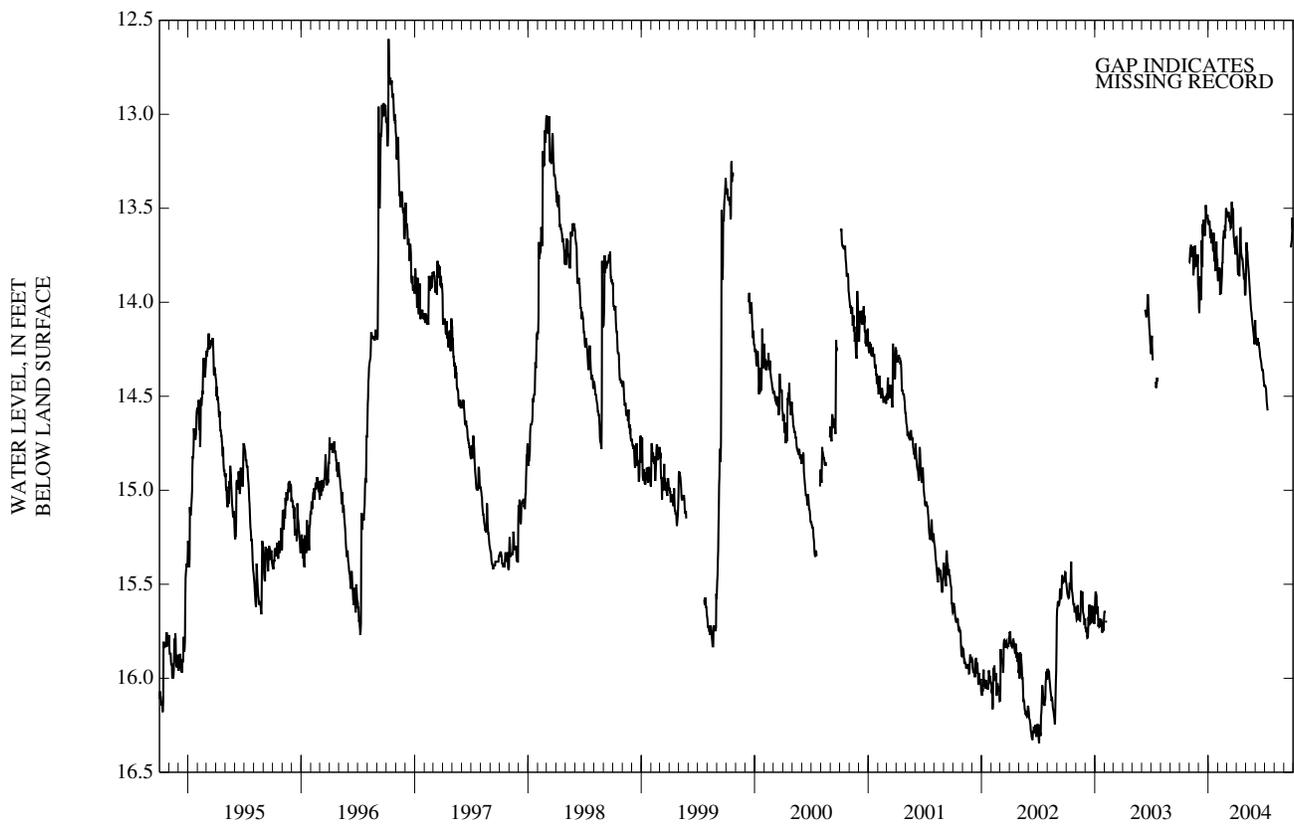
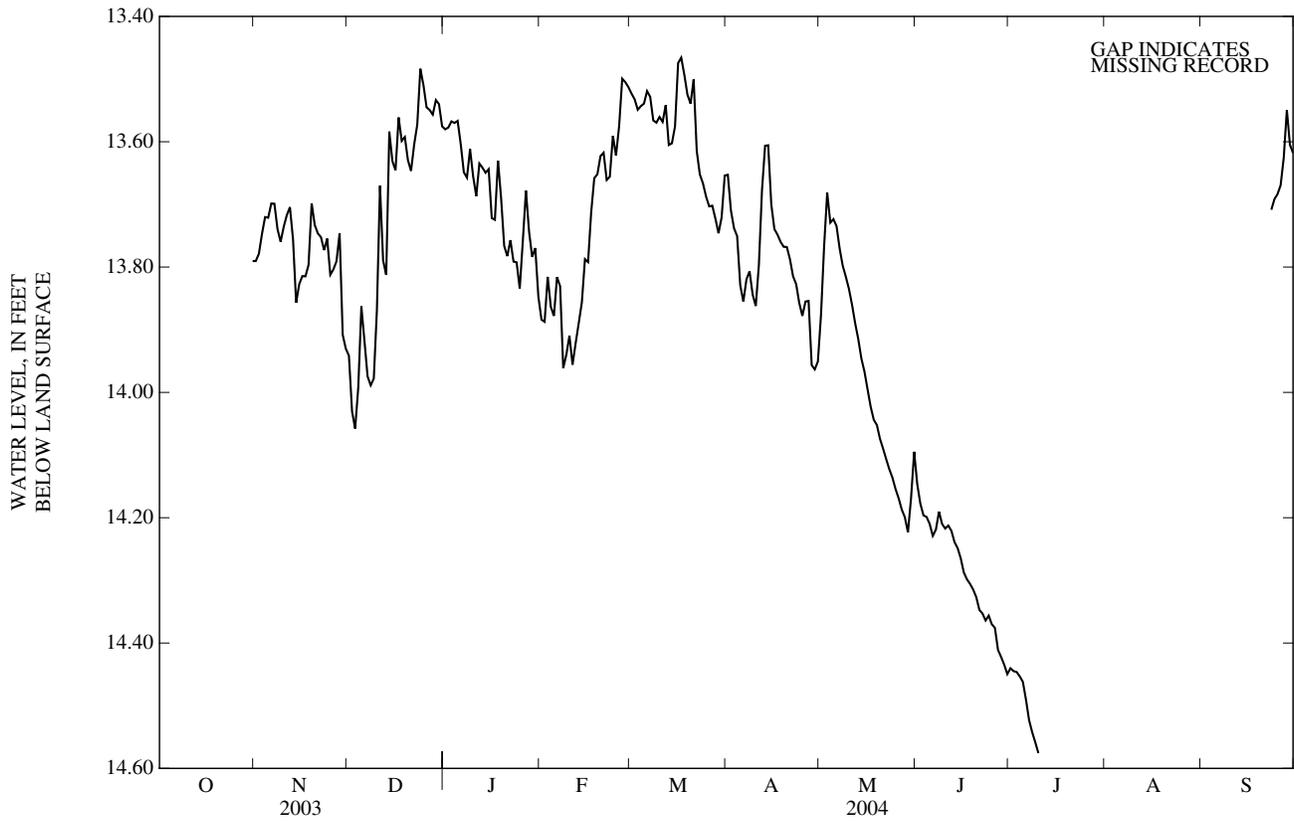
343641077290106. County number, ON-230; DENR Dixon Tower Research Station well Y25q6.





GROUND-WATER LEVELS  
ONslow COUNTY—Continued

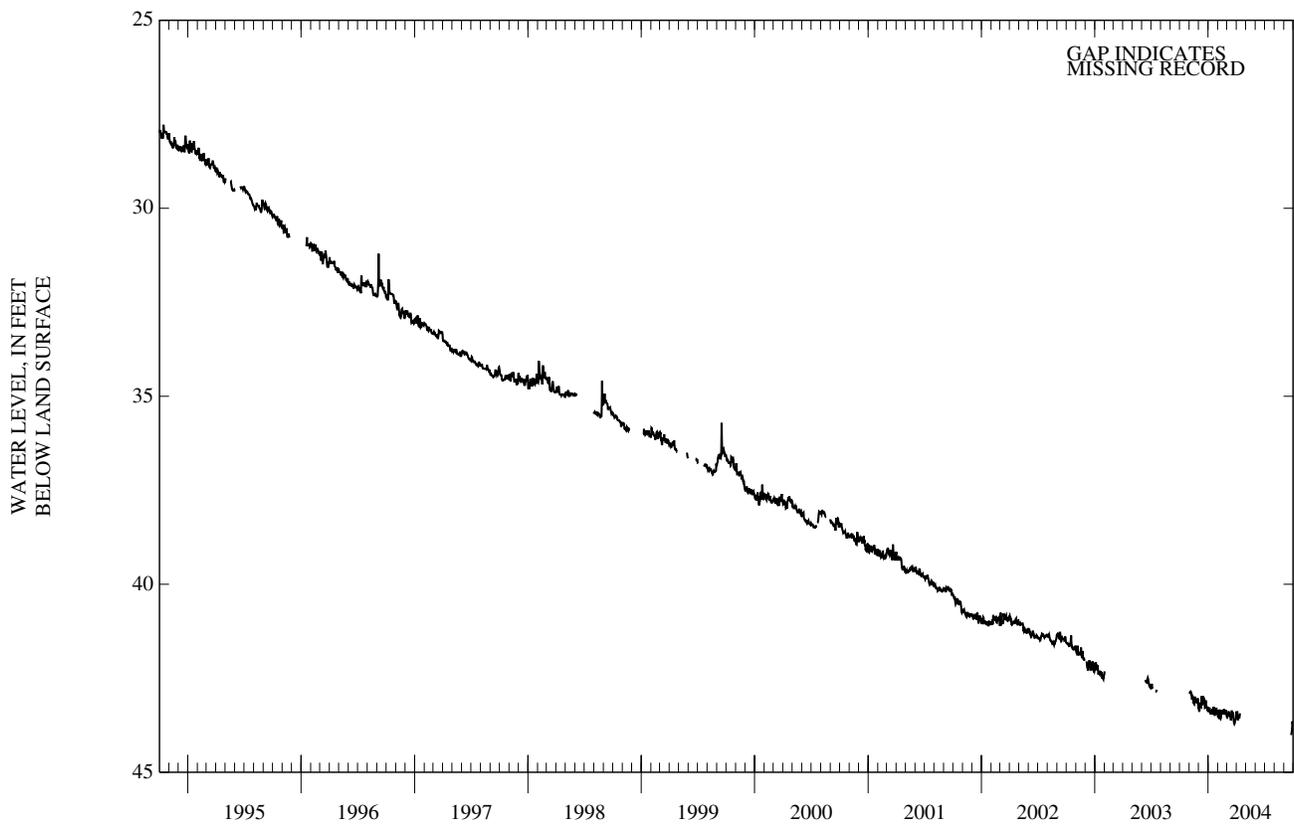
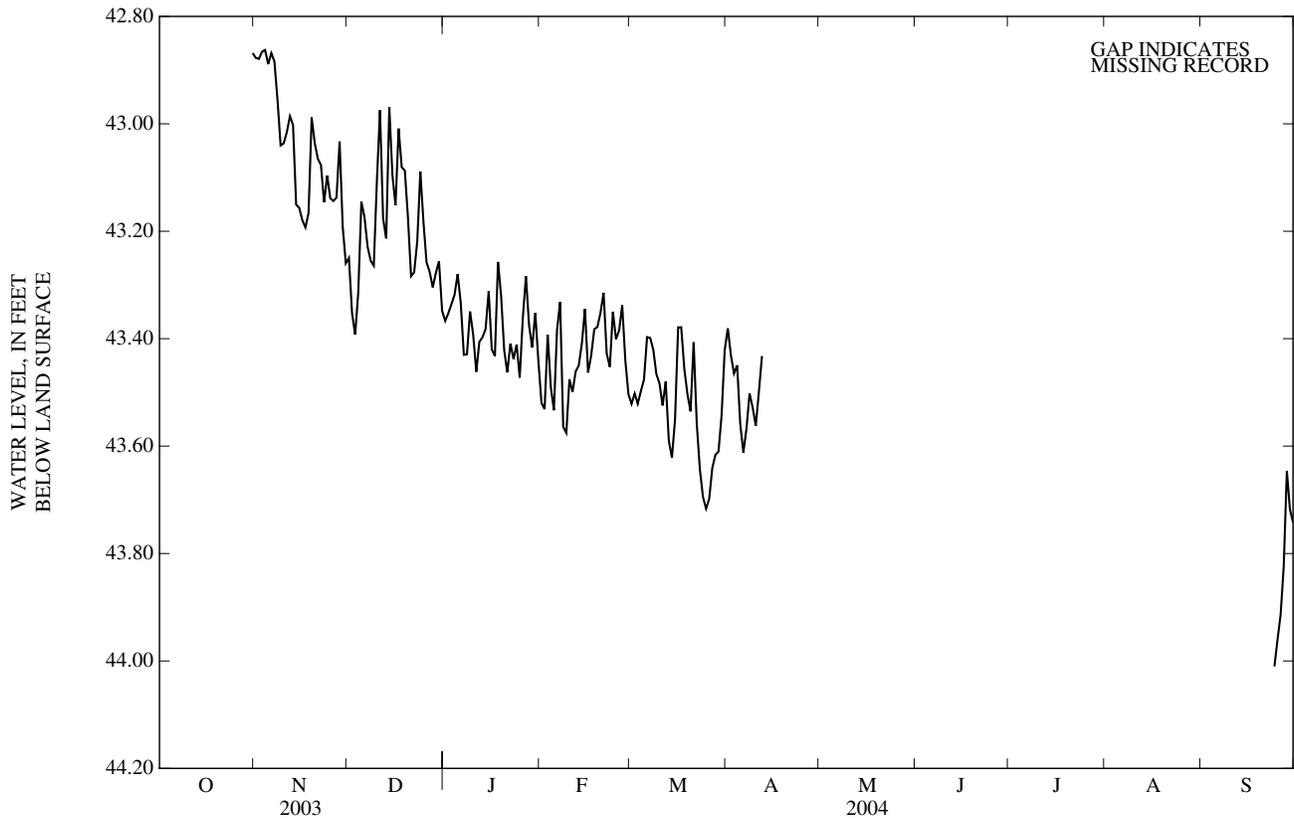
344139077211201. County number, ON-255; DENR Hadnot Point Research Station well X24s1.





GROUND-WATER LEVELS  
ONslow COUNTY—Continued

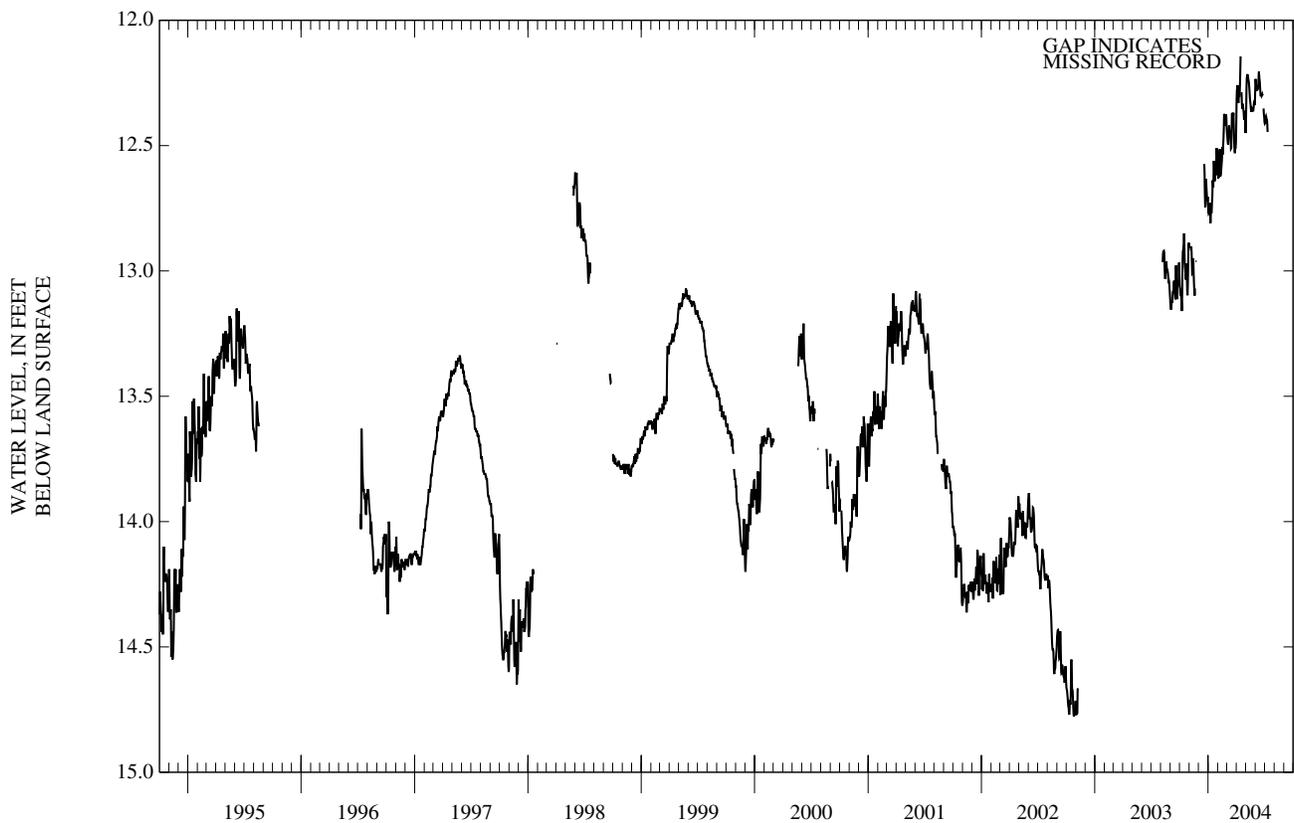
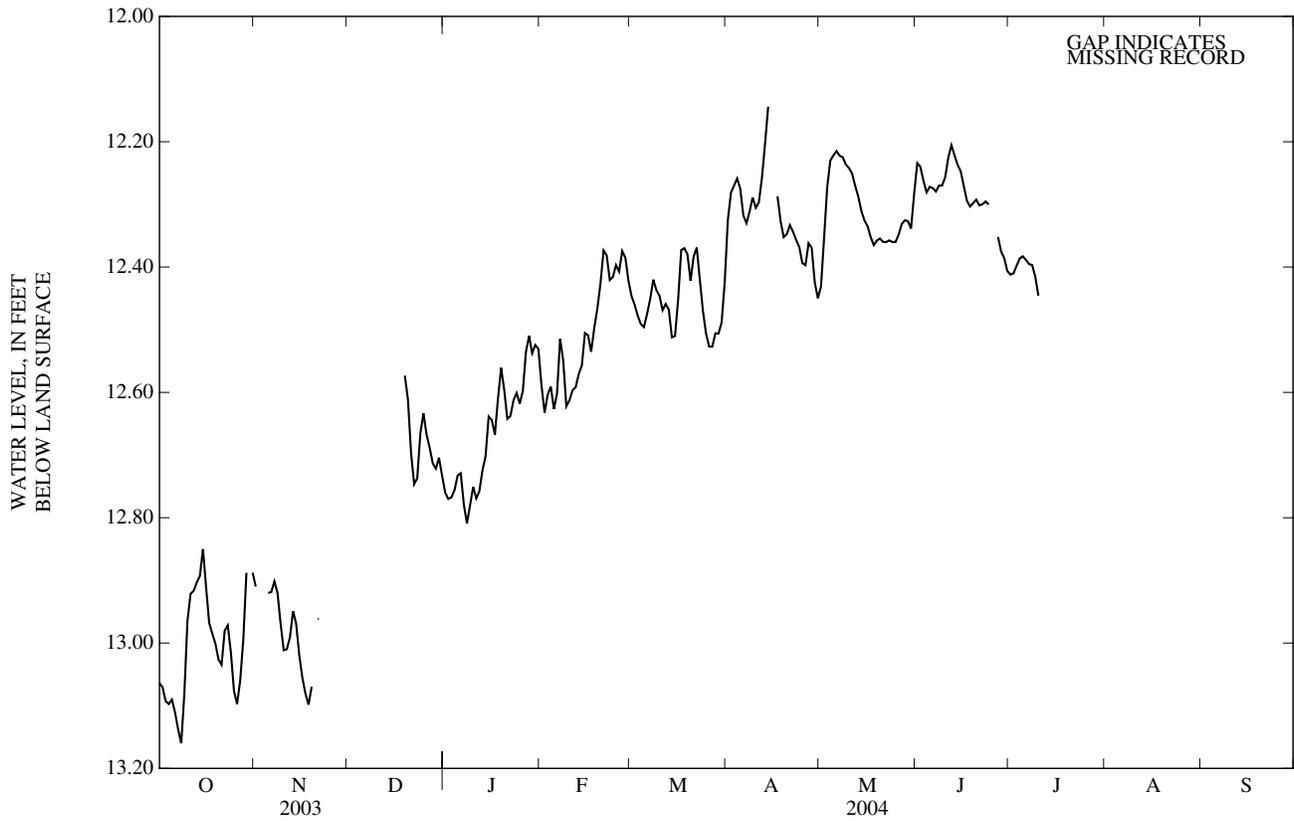
344139077211202. County number, ON-256; DENR Hadnot Point Research Station well X24s2.





GROUND-WATER LEVELS  
ONSLOW COUNTY—Continued

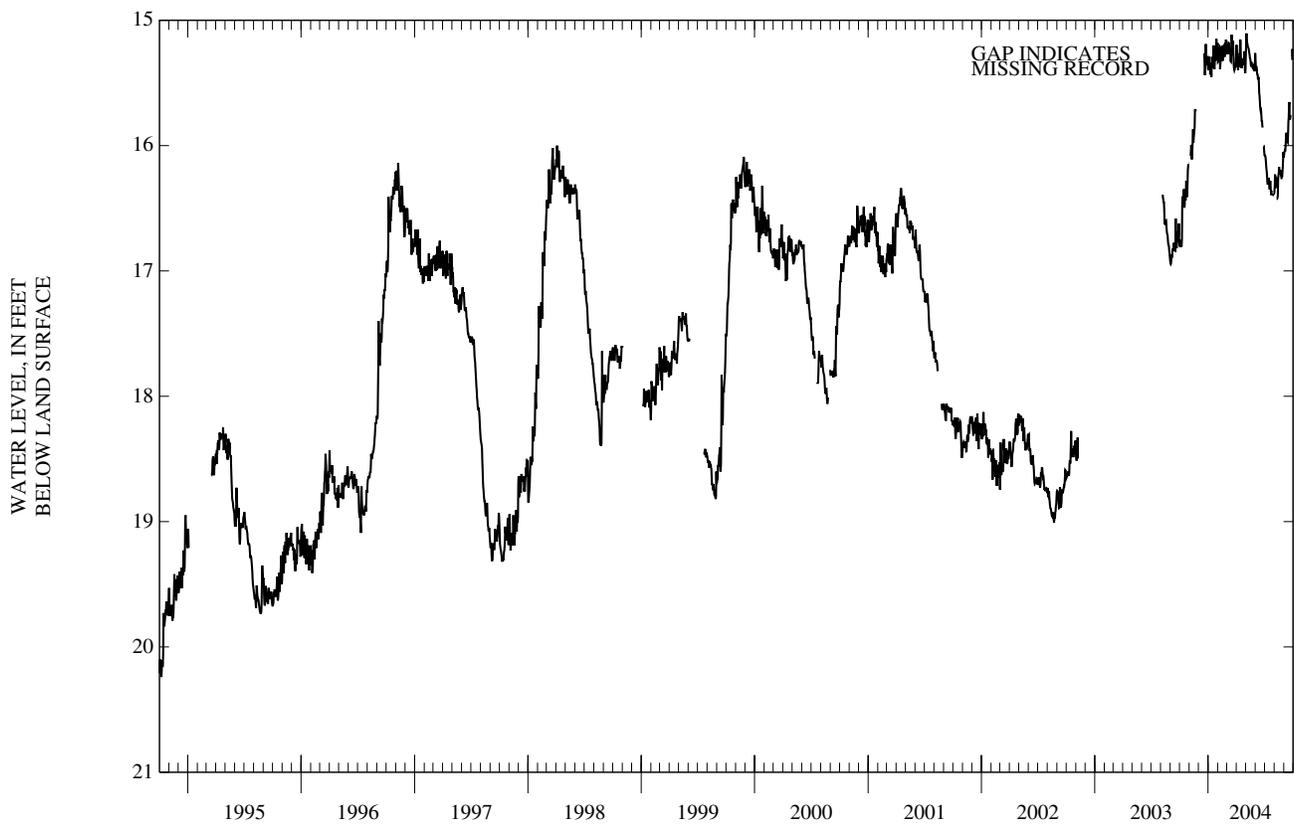
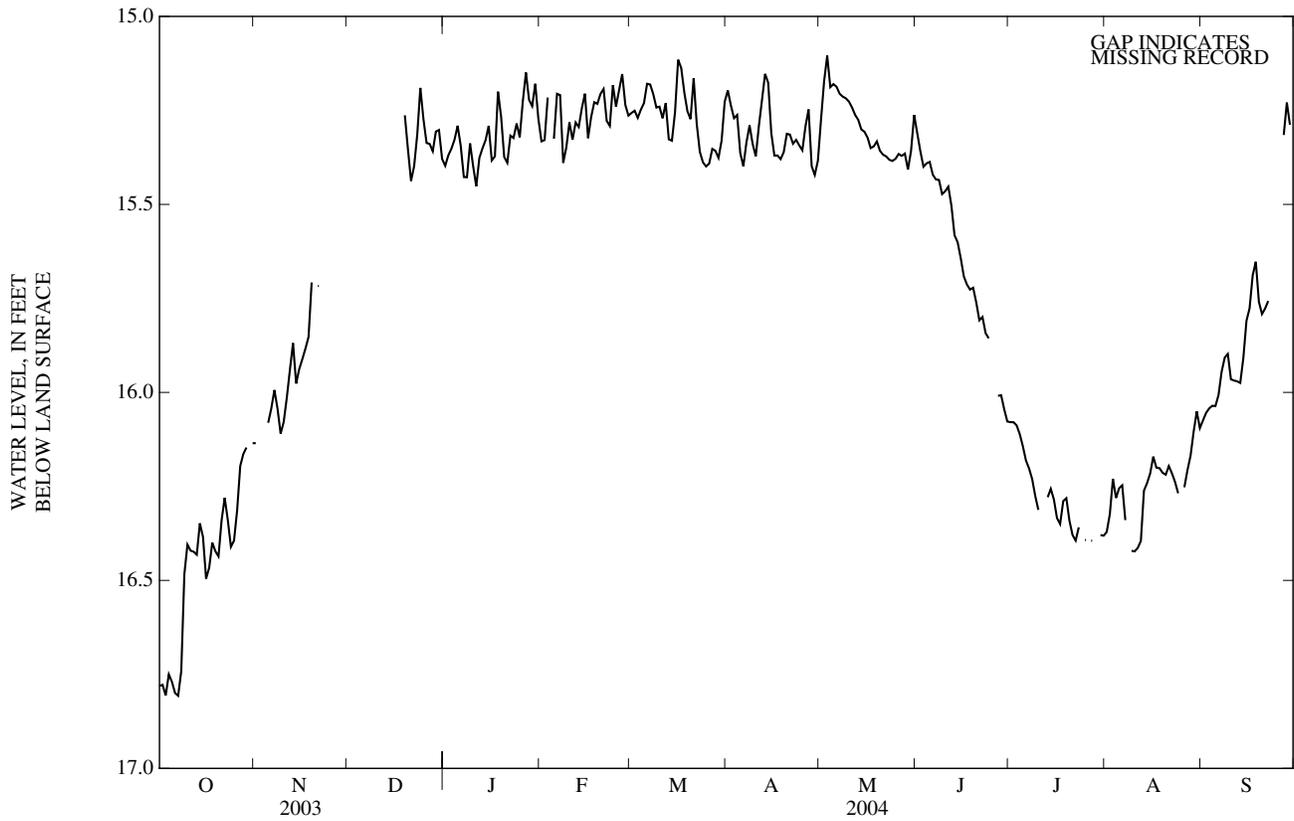
344139077211204. County number, ON-264; DENR Hadnot Point Research Station well X24s4.





GROUND-WATER LEVELS  
ONslow COUNTY—Continued

344139077211205. County number, ON-265; DENR Hadnot Point Research Station well X24s5.



GROUND-WATER LEVELS  
ON SLOW COUNTY—Continued

344139077211206. County number, ON-266; DENR Hadnot Point Research Station well X24s6.

LOCATION.--Lat 34°41'35", long 77°21'06", Hydrologic Unit 03030001, at Camp Lejeune, 1.6 mi south of intersection of Brewster Boulevard and Stone Street Extension, on Stone Street Extension, near tack shop, in pasture. Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Castle Hayne aquifer.

WELL CHARACTERISTICS.--Drilled observation well, depth 130 ft, diameter 6 in., cased to 120 ft, screened interval from 120 to 130 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 23.47 ft above NGVD of 1929, (levels by DENR). Measuring point: Top of shelter floor, 1.73 ft above land-surface datum.

REMARKS.--Well is part of U.S. Marine Corps Base, Camp Lejeune, North Carolina, Water Resources Network project.

PERIOD OF RECORD.--October 1994 to current year.

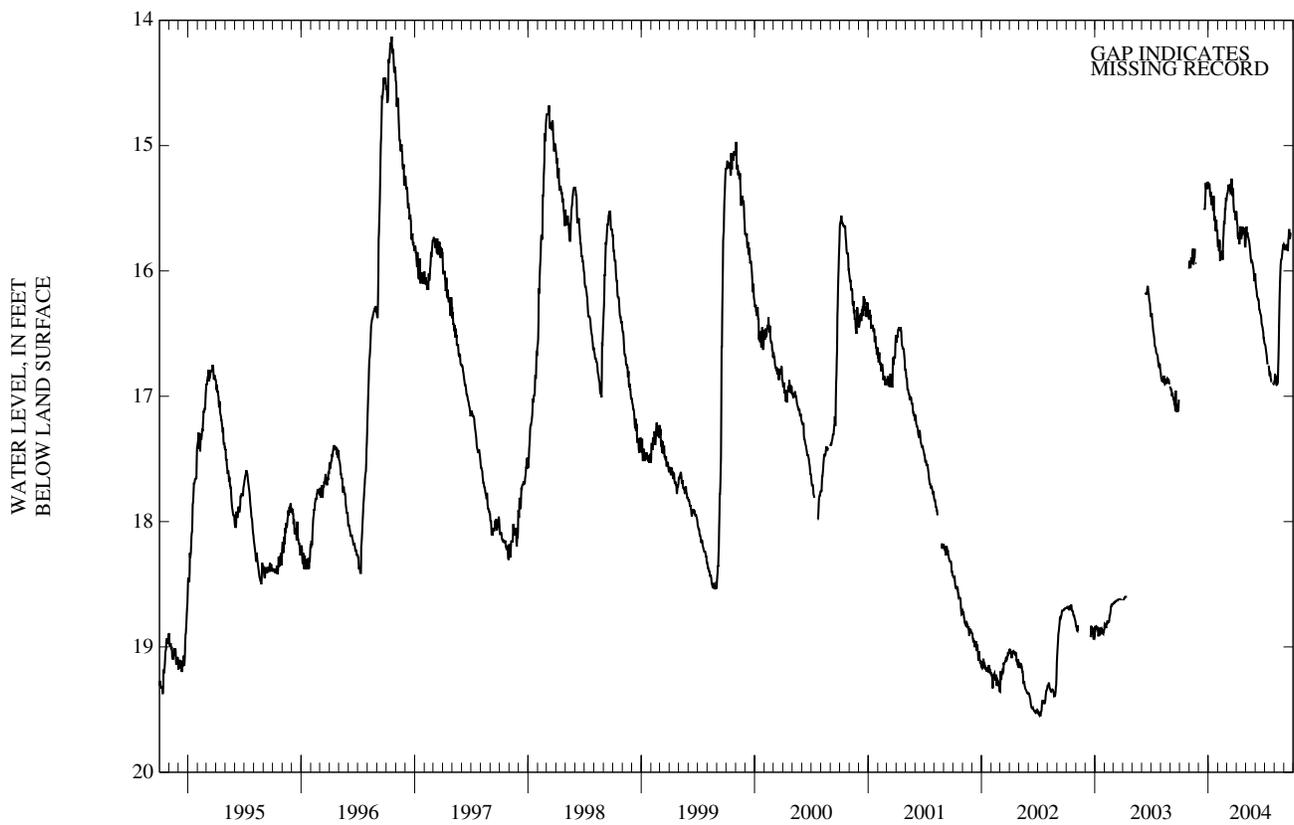
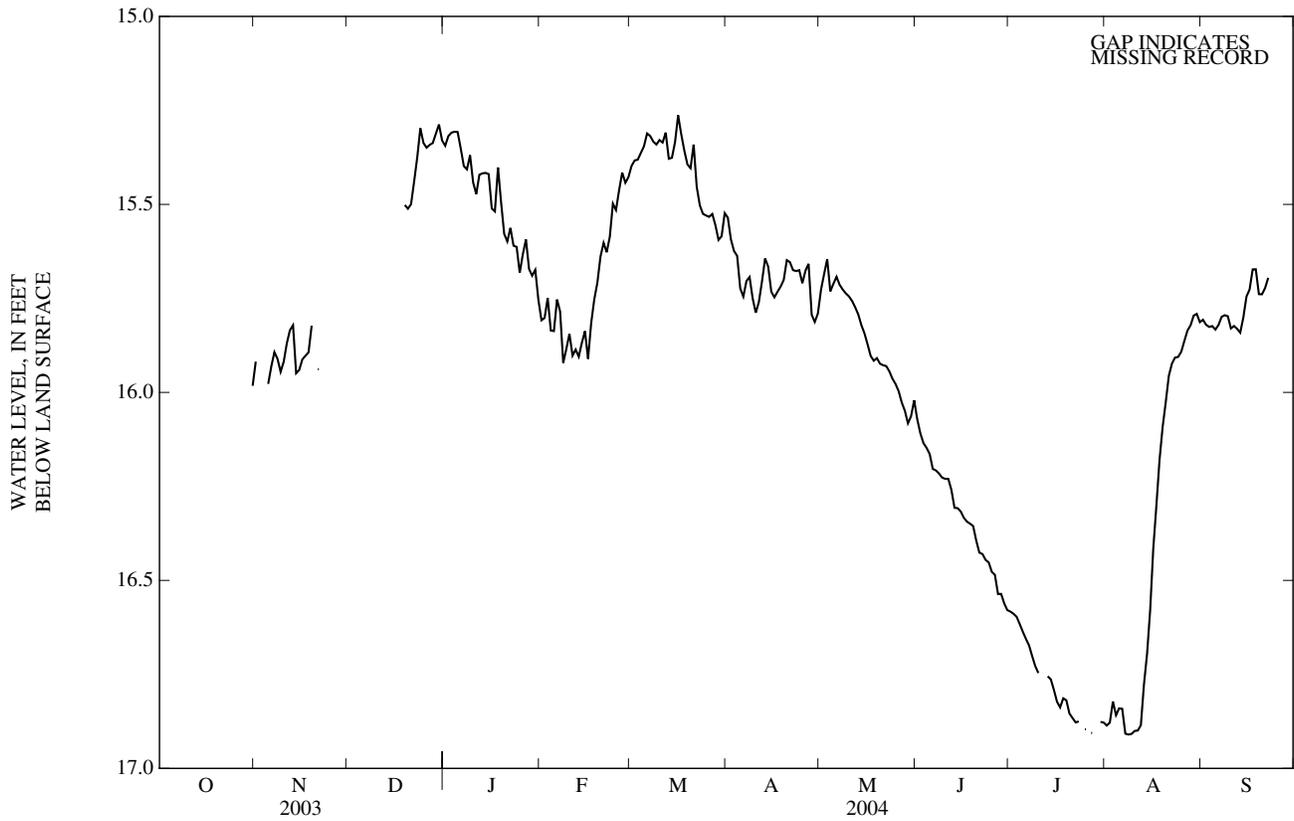
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 14.09 ft below land-surface datum, Oct. 18, 1996; lowest water level recorded, 19.55 ft below land-surface datum, July 5, 8, 9, 10, 2002.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	
1	---	15.92	---	15.34	15.81	15.40	15.54	15.73	16.07	16.58	16.89	15.81	
2	---	---	---	15.32	15.80	15.38	15.59	15.69	16.11	16.59	16.88	15.82	
3	---	---	---	15.31	15.75	15.38	15.62	15.65	16.14	16.60	16.82	15.83	
4	---	---	---	15.31	15.84	15.36	15.64	15.73	16.15	16.62	16.86	15.82	
5	---	15.98	---	15.31	15.84	15.35	15.72	15.71	16.16	16.64	16.84	15.83	
6	---	15.93	---	15.35	15.75	15.31	15.75	15.69	16.20	16.66	16.84	15.82	
7	---	15.89	---	15.40	15.78	15.32	15.70	15.71	16.21	16.67	16.91	15.80	
8	---	15.91	---	15.41	15.92	15.33	15.69	15.73	16.22	16.70	16.91	15.79	
9	---	15.95	---	15.37	15.88	15.34	15.75	15.74	16.23	16.73	16.91	15.80	
10	---	15.92	---	15.44	15.84	15.33	15.79	15.74	16.23	16.75	16.90	15.83	
11	---	15.87	---	15.47	15.90	15.34	15.76	15.76	16.23	---	16.90	15.82	
12	---	15.83	---	15.42	15.89	15.31	15.71	15.77	16.26	---	16.89	15.83	
13	---	15.82	---	15.42	15.90	15.38	15.64	15.79	16.31	16.76	16.78	15.84	
14	---	15.95	---	15.42	15.87	15.38	15.67	15.82	16.31	16.76	16.70	15.80	
15	---	15.94	---	15.42	15.84	15.33	15.73	15.84	16.32	16.79	16.58	15.74	
16	---	15.91	---	15.51	15.91	15.26	15.75	15.87	16.33	16.82	16.42	15.73	
17	---	15.90	---	15.52	15.82	15.31	15.73	15.90	16.34	16.84	16.30	15.67	
18	---	15.89	---	15.40	15.75	15.36	15.72	15.92	16.35	16.81	16.18	15.67	
19	---	15.82	15.50	15.49	15.71	15.39	15.70	15.91	16.36	16.82	16.09	15.74	
20	---	---	15.51	15.58	15.64	15.40	15.65	15.92	16.39	16.85	16.03	15.74	
21	---	15.94	15.50	15.60	15.60	15.34	15.65	15.93	16.43	16.87	15.96	15.72	
22	---	---	15.44	15.56	15.63	15.45	15.67	15.93	16.43	16.88	15.92	15.70	
23	---	---	15.37	15.61	15.59	15.50	15.68	15.94	16.45	16.88	15.91	---	
24	---	---	15.30	15.61	15.50	15.53	15.68	15.96	16.45	---	15.91	---	
25	---	---	15.34	15.68	15.52	15.53	15.71	15.98	16.48	16.90	15.89	---	
26	---	---	15.35	15.63	15.46	15.53	15.68	16.00	16.49	---	15.86	---	
27	---	---	15.34	15.59	15.42	15.53	15.66	16.03	16.54	16.91	15.84	---	
28	---	---	15.34	15.67	15.44	15.56	15.79	16.05	16.54	---	15.82	---	
29	---	---	15.31	15.69	15.43	15.59	15.81	16.08	16.56	---	15.80	---	
30	---	---	15.29	15.67	---	15.58	15.79	16.06	16.58	16.88	15.79	---	
31	15.98	---	15.33	15.75	---	15.52	---	16.02	---	16.88	15.81	---	
WTR YR	2004	MEAN	15.90	HIGH	15.26	LOW	16.91						

GROUND-WATER LEVELS  
ON SLOW COUNTY—Continued

344139077211206. County number, ON-266; DENR Hadnot Point Research Station well X24s6.



## GROUND-WATER LEVELS

## ONslow COUNTY—Continued

344139077211207. County number, ON-267; DENR Hadnot Point Research Station well X24s7.

LOCATION.--Lat 34°41'36", long 77°21'06", Hydrologic Unit 03030001, at Camp Lejeune, 1.6 mi south of intersection of Brewster Boulevard and Stone Street Extension, on Stone Street Extension, near tack shop, in pasture. Owner: DENR (North Carolina Department of Environment and Natural Resources).

## WATER-LEVEL RECORDS

AQUIFER.--Surficial aquifer.

WELL CHARACTERISTICS.--Drilled observation well, depth 40 ft, diameter 4 in., cased to 30 ft, screened interval from 30 to 40 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 24.06 ft above NGVD of 1929, (levels by DENR). Measuring point: Top of shelter floor, 0.93 ft above land-surface datum.

REMARKS.--Well is part of U.S. Marine Corps Base, Camp Lejeune, North Carolina, Water Resources Network project.

PERIOD OF RECORD.--October 1994 to current year.

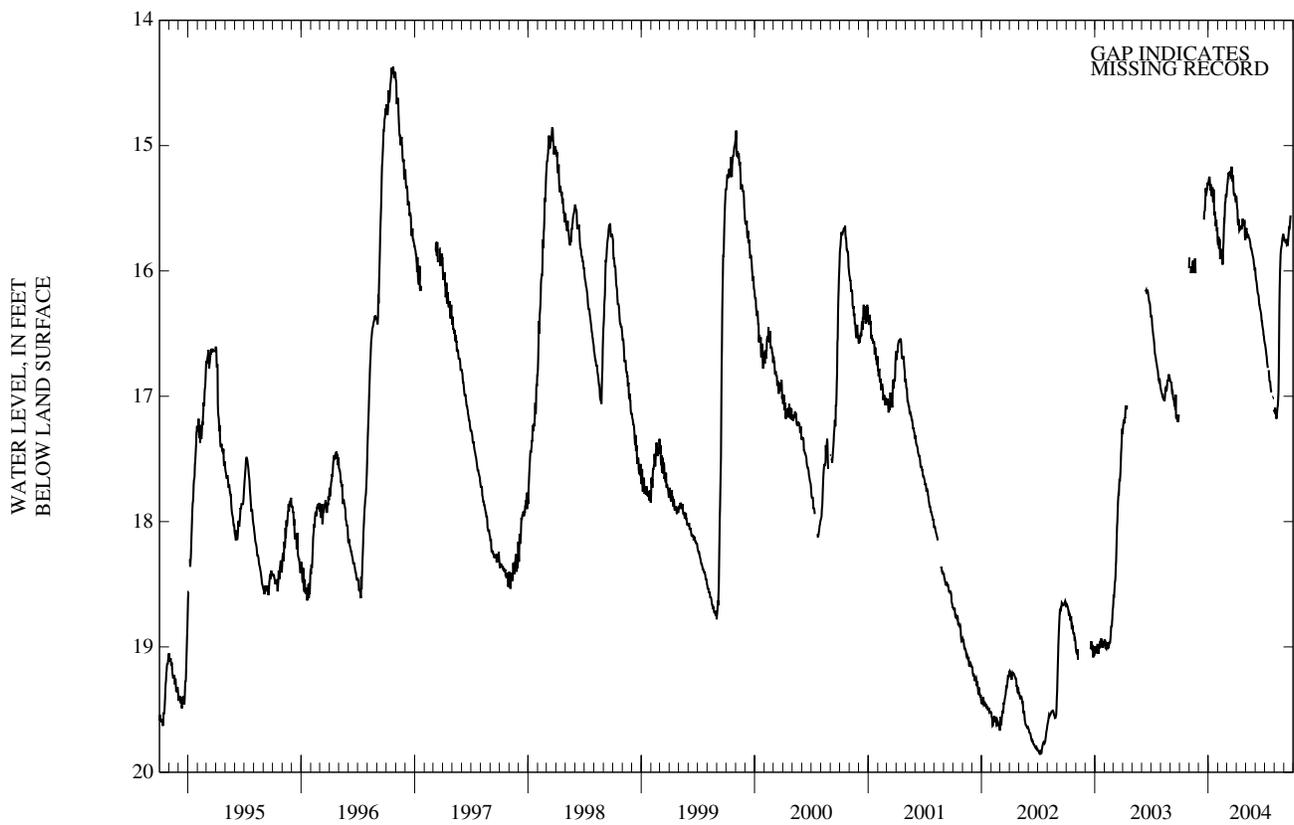
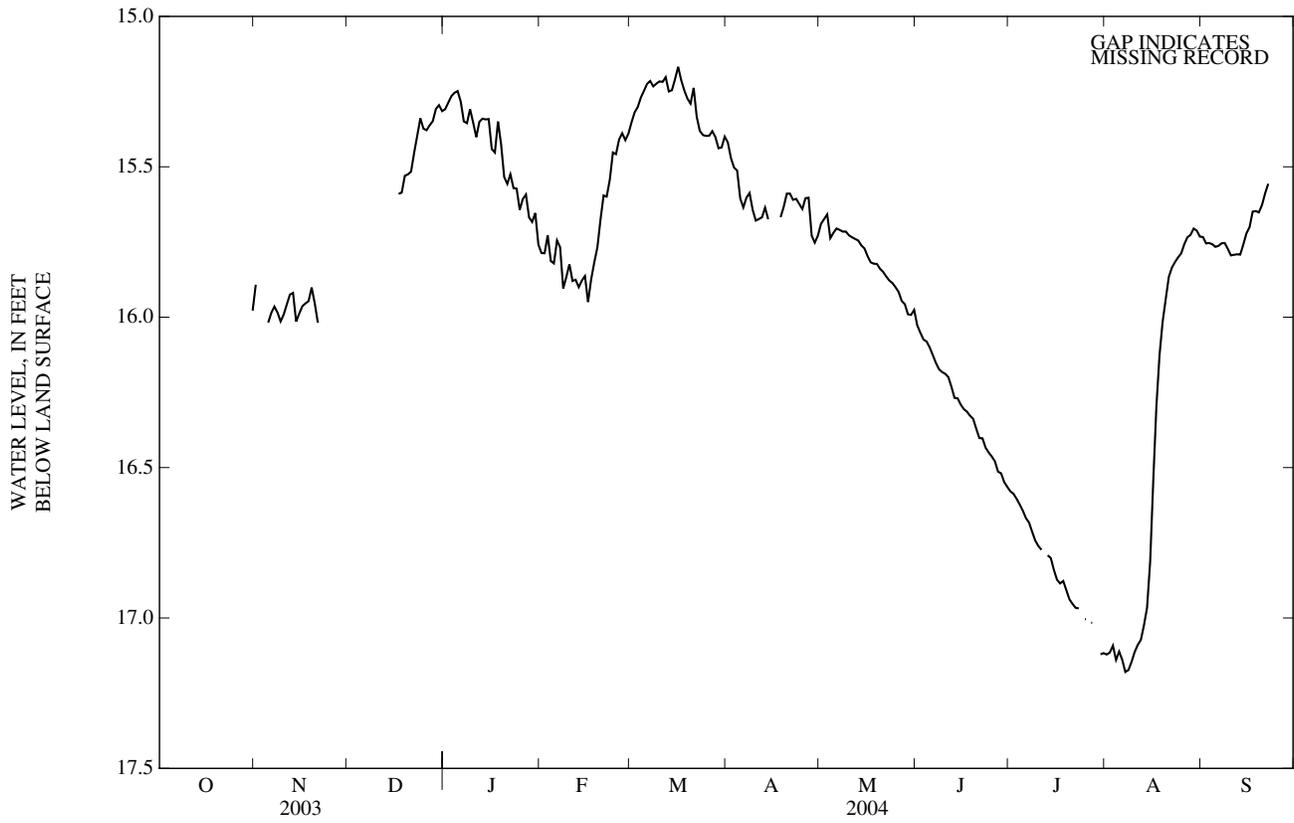
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 14.35 ft below land-surface datum, Oct. 18, 1996; lowest water level recorded, 19.86 ft below land-surface datum, July 7, 8, 9, 10, 12, 2002.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	15.89	---	15.31	15.79	15.35	15.42	15.69	16.03	16.58	17.12	15.73
2	---	---	---	15.29	15.79	15.32	15.47	15.67	16.05	16.59	17.11	15.75
3	---	---	---	15.27	15.73	15.30	15.50	15.66	16.07	16.60	17.09	15.75
4	---	---	---	15.25	15.81	15.27	15.51	15.74	16.08	16.62	17.14	15.76
5	---	16.02	---	15.25	15.82	15.25	15.61	15.72	16.10	16.64	17.11	15.77
6	---	15.99	---	15.28	15.74	15.22	15.64	15.71	16.13	16.67	17.14	15.76
7	---	15.96	---	15.35	15.77	15.21	15.60	15.71	16.15	16.68	17.18	15.75
8	---	15.98	---	15.36	15.90	15.23	15.59	15.72	16.17	16.71	17.17	15.75
9	---	16.01	---	15.31	15.87	15.22	15.64	15.72	16.18	16.74	17.15	15.77
10	---	15.99	---	15.35	15.82	15.22	15.68	15.73	16.19	16.76	17.11	15.79
11	---	15.96	---	15.40	15.88	15.22	15.67	15.73	16.20	16.77	17.09	15.79
12	---	15.92	---	15.35	15.88	15.20	15.67	15.74	16.23	---	17.07	15.79
13	---	15.92	---	15.34	15.90	15.25	15.64	15.75	16.27	16.79	17.02	15.79
14	---	16.01	---	15.34	15.88	15.25	15.67	15.76	16.27	16.80	16.97	15.76
15	---	15.99	---	15.34	15.86	15.21	---	15.77	16.29	16.84	16.81	15.72
16	---	15.96	---	15.44	15.95	15.17	---	15.80	16.31	16.87	16.54	15.70
17	---	15.95	15.59	15.45	15.87	15.21	---	15.82	16.31	16.89	16.30	15.65
18	---	15.95	15.59	15.35	15.82	15.25	15.67	15.82	16.33	16.88	16.13	15.65
19	---	15.90	15.53	15.43	15.77	15.27	15.63	15.82	16.34	16.91	16.02	15.65
20	---	15.95	15.53	15.53	15.68	15.29	15.59	15.84	16.37	16.94	15.94	15.63
21	---	16.02	15.52	15.56	15.60	15.24	15.59	15.85	16.40	16.95	15.87	15.59
22	---	---	15.45	15.53	15.60	15.33	15.61	15.86	16.40	16.97	15.84	15.56
23	---	---	15.40	15.57	15.54	15.38	15.61	15.88	16.43	16.97	15.82	---
24	---	---	15.34	15.57	15.45	15.39	15.62	15.89	16.45	---	15.80	---
25	---	---	15.37	15.64	15.46	15.40	15.64	15.90	16.46	17.00	15.79	---
26	---	---	15.38	15.61	15.41	15.40	15.60	15.92	16.48	---	15.76	---
27	---	---	15.36	15.59	15.39	15.38	15.60	15.95	16.51	17.02	15.73	---
28	---	---	15.35	15.67	15.41	15.40	15.73	15.96	16.52	---	15.73	---
29	---	---	15.31	15.68	15.39	15.44	15.75	15.99	16.55	---	15.71	---
30	---	---	15.29	15.65	---	15.44	15.73	15.99	16.56	17.12	15.71	---
31	15.98	---	15.31	15.76	---	15.40	---	15.98	---	17.12	15.73	---
WTR YR	2004	MEAN	15.88	HIGH	15.17	LOW	17.18					

GROUND-WATER LEVELS  
ONslow COUNTY—Continued

344139077211207. County number, ON-267; DENR Hadnot Point Research Station well X24s7.



PRECIPITATION RECORDS

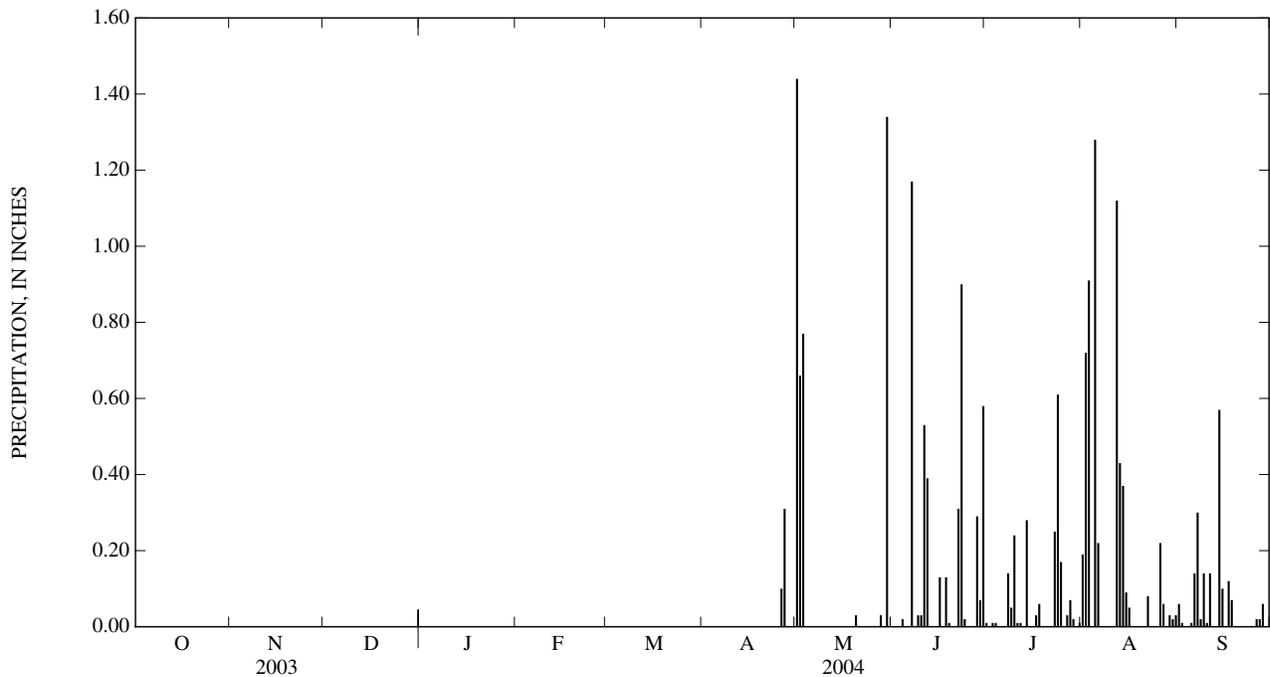
PERIOD OF RECORD.--April 2004 to September 2004.

GAGE.--Tipping-bucket raingage and electronic datalogger.

REMARKS.--Gage is operated as part of a U.S. Geological Survey Ground-water Resources Program recharge study. Precipitation data collected during freezing periods may not be accurately reflected in daily record; consequently, winter record is poor.

PRECIPITATION, TOTAL, INCHES  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY SUM VALUES

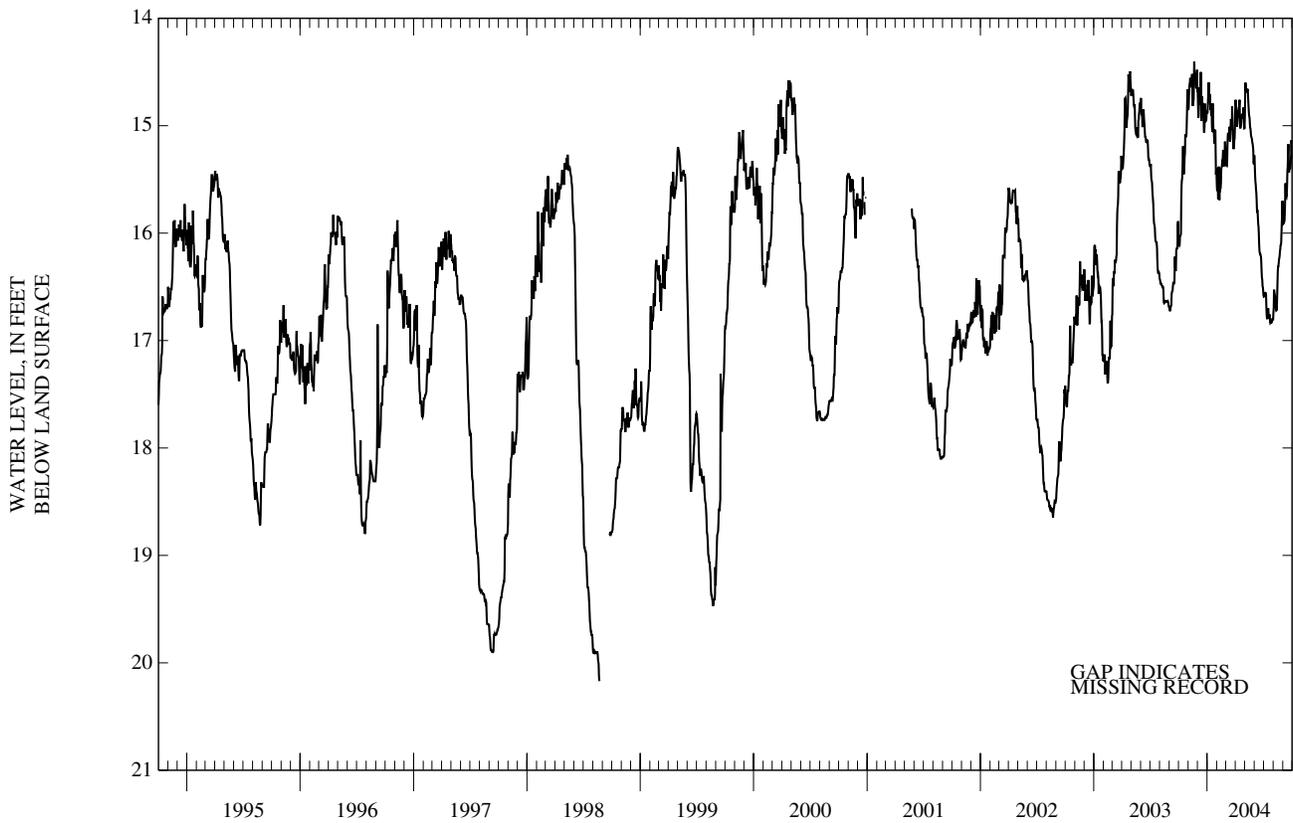
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	1.44	0.00	0.01	0.19	0.06
2	---	---	---	---	---	---	---	0.66	0.00	0.00	0.72	0.01
3	---	---	---	---	---	---	---	0.77	0.00	0.01	0.91	0.00
4	---	---	---	---	---	---	---	0.00	0.02	0.01	0.00	0.00
5	---	---	---	---	---	---	---	0.00	0.00	0.00	1.28	0.01
6	---	---	---	---	---	---	---	0.00	0.00	0.00	0.22	0.14
7	---	---	---	---	---	---	---	0.00	1.17	0.00	0.00	0.30
8	---	---	---	---	---	---	---	0.00	0.00	0.14	0.00	0.02
9	---	---	---	---	---	---	---	0.00	0.03	0.05	0.00	0.14
10	---	---	---	---	---	---	---	0.00	0.03	0.24	0.00	0.01
11	---	---	---	---	---	---	---	0.00	0.53	0.01	0.00	0.14
12	---	---	---	---	---	---	---	0.00	0.39	0.01	1.12	0.00
13	---	---	---	---	---	---	---	0.00	0.00	0.00	0.43	0.00
14	---	---	---	---	---	---	---	0.00	0.00	0.28	0.37	0.57
15	---	---	---	---	---	---	---	0.00	0.00	0.00	0.09	0.10
16	---	---	---	---	---	---	0.00	0.00	0.13	0.00	0.05	0.00
17	---	---	---	---	---	---	0.00	0.00	0.00	0.03	0.00	0.12
18	---	---	---	---	---	---	0.00	0.00	0.13	0.06	0.00	0.07
19	---	---	---	---	---	---	0.00	0.00	0.01	0.00	0.00	0.00
20	---	---	---	---	---	---	0.00	0.03	0.00	0.00	0.00	0.00
21	---	---	---	---	---	---	0.00	0.00	0.00	0.00	0.00	0.00
22	---	---	---	---	---	---	0.00	0.00	0.31	0.00	0.08	0.00
23	---	---	---	---	---	---	0.00	0.00	0.90	0.25	0.00	0.00
24	---	---	---	---	---	---	0.00	0.00	0.02	0.61	0.00	0.00
25	---	---	---	---	---	---	0.00	0.00	0.00	0.17	0.00	0.00
26	---	---	---	---	---	---	0.10	0.00	0.00	0.00	0.22	0.02
27	---	---	---	---	---	---	0.31	0.00	0.00	0.03	0.06	0.02
28	---	---	---	---	---	---	0.00	0.03	0.29	0.07	0.00	0.06
29	---	---	---	---	---	---	0.00	0.00	0.07	0.02	0.03	0.00
30	---	---	---	---	---	---	0.00	1.34	0.58	0.00	0.02	0.00
31	---	---	---	---	---	---	---	0.00	---	0.01	0.03	---
TOTAL	---	---	---	---	---	---	---	4.27	4.61	2.01	5.82	1.79





GROUND-WATER LEVELS  
ONSWLOW COUNTY—Continued

344037077253901. County number, ON-291; Ragged Point Well.



## GROUND-WATER LEVELS

209

## ON SLOW COUNTY—Continued

344304077232901. County number, ON-292; Paradise Point Well.

LOCATION.--Lat 34°43'05", long 77°23'31", Hydrologic Unit 03030001, north of Camp Lejeune golf course driving range. Owner: U.S. Geological Survey.

AQUIFER.--Castle Hayne aquifer.

WELL CHARACTERISTICS.--Drilled observation well, depth 232 ft, diameter 2 in., cased to 222 ft, screened interval from 222 to 232 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals.

DATUM.--Land-surface datum is 15 ft above NGVD of 1929 (from topographic map). Measuring point: Top of shelter floor, 2.47 ft above land-surface datum.

REMARKS.--Well is part of U.S. Marine Corps Base, Camp Lejeune, North Carolina, Water Resources Network project.

PERIOD OF RECORD.--October 1994 to current year. Prior to October 1997, published as ON-290, Paradise Point Well.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 4.62 ft below land-surface datum, Nov. 28, 2003; lowest water level recorded, 13.80 ft below land-surface datum, Aug. 20, 1998.

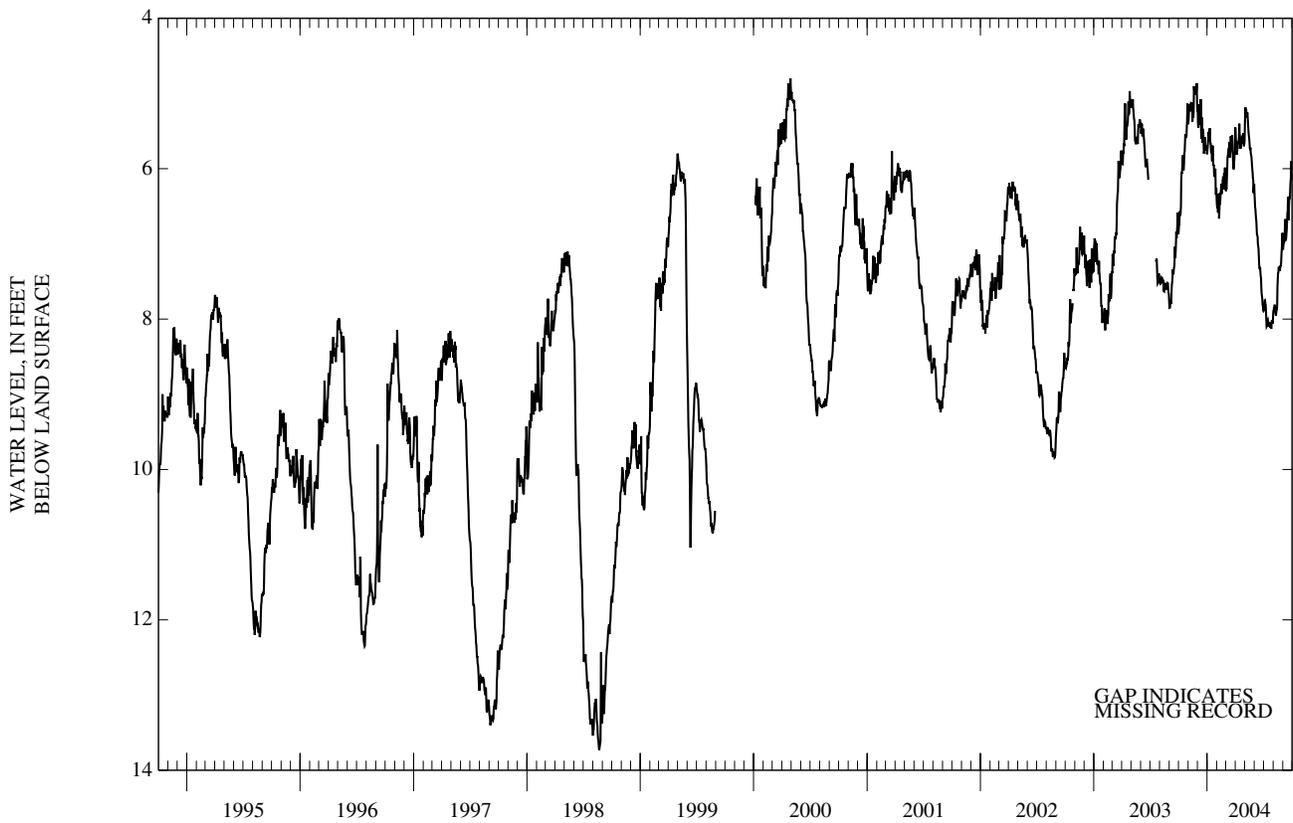
DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.81	5.38	5.19	5.77	6.48	6.30	5.49	5.43	6.33	7.89	7.89	7.08
2	6.76	5.33	5.41	5.73	6.52	6.25	5.62	5.26	6.42	7.88	7.88	7.03
3	6.74	5.23	5.46	5.66	6.37	6.27	5.64	5.18	6.51	7.86	7.84	6.99
4	6.57	5.15	5.40	5.60	6.57	6.14	5.65	5.32	6.54	7.75	7.86	6.99
5	6.60	5.18	5.14	5.51	6.58	6.03	5.81	5.21	6.61	7.75	7.81	6.97
6	6.63	5.16	5.25	5.54	6.35	5.86	5.79	5.26	6.66	7.81	7.86	6.91
7	6.59	5.15	5.37	5.60	6.34	5.83	5.71	5.27	6.70	7.81	7.90	6.78
8	6.50	5.18	5.36	5.51	6.66	5.83	5.64	5.29	6.80	7.88	7.92	6.67
9	6.16	5.24	5.41	5.46	6.54	5.74	5.66	5.25	6.88	8.01	7.95	6.71
10	6.05	5.21	5.34	5.61	6.43	5.73	5.66	5.31	6.89	8.10	7.92	6.96
11	6.07	5.16	5.08	5.66	6.48	5.71	5.62	5.39	6.90	8.09	7.88	6.92
12	6.01	5.13	5.50	5.67	6.40	5.64	5.57	5.47	7.01	8.04	7.87	6.86
13	5.94	5.12	5.60	5.77	6.34	5.83	5.40	5.52	7.03	8.02	7.82	6.81
14	5.85	5.38	5.32	5.79	6.29	5.85	5.53	5.57	7.07	8.01	7.57	6.70
15	5.82	5.28	5.50	5.74	6.20	5.79	5.74	5.60	7.16	8.03	7.47	6.59
16	6.03	5.31	5.65	5.89	6.34	5.58	5.69	5.66	7.27	8.08	7.38	6.57
17	6.01	5.33	5.47	5.89	6.23	5.57	5.69	5.73	7.33	8.10	7.38	6.37
18	5.94	5.24	5.56	5.69	6.24	5.61	5.73	5.74	7.33	8.07	7.31	6.44
19	5.80	4.90	5.52	5.82	6.19	5.70	5.71	5.72	7.31	8.05	7.32	6.69
20	5.77	4.96	5.63	5.92	6.14	5.65	5.65	5.79	7.37	8.09	7.36	6.50
21	5.67	4.98	5.80	5.96	6.15	5.55	5.59	5.81	7.43	8.11	7.32	6.40
22	5.55	4.98	5.77	5.95	6.27	5.77	5.60	5.84	7.45	8.08	7.36	6.37
23	5.56	5.02	5.75	6.06	6.25	5.80	5.62	5.89	7.59	8.05	7.31	6.38
24	5.55	4.95	5.58	6.03	6.06	5.91	5.67	5.95	7.66	8.11	7.28	6.29
25	5.59	4.97	5.65	6.11	6.11	5.98	5.64	6.01	7.69	8.13	7.30	6.18
26	5.57	4.96	5.73	6.01	6.05	6.01	5.53	6.05	7.73	8.06	7.23	6.13
27	5.43	4.96	5.73	6.00	5.99	5.92	5.54	6.12	7.81	8.01	7.13	6.05
28	5.37	4.86	5.75	6.26	6.11	5.89	5.70	6.15	7.83	8.03	7.06	5.90
29	5.13	5.11	5.73	6.35	6.24	5.78	5.67	6.32	7.88	8.04	6.95	6.12
30	5.32	5.24	5.69	6.26	---	5.60	5.64	6.25	7.89	8.06	6.86	6.15
31	5.41	---	5.81	6.40	---	5.45	---	6.21	---	7.94	7.06	---

WTR YR 2004 MEAN 6.27 HIGH 4.86 LOW 8.13

GROUND-WATER LEVELS  
ONslow COUNTY—Continued

344304077232901. County number, ON-292; Paradise Point Well.



## GROUND-WATER LEVELS

211

## ONslow COUNTY—Continued

343609077171301. County number, ON-293; Sneads Ferry Road Well.

LOCATION.--Lat 34°36'09", long 77°17'11", Hydrologic Unit 03030001, at Camp Lejeune, approximately 6.0 mi south on Sneads Ferry Road. Owner: U.S. Geological Survey.

AQUIFER.--Castle Hayne aquifer.

WELL CHARACTERISTICS.--Drilled observation well, depth 235 ft, diameter 2 in., cased to 225 ft, screened interval from 225 to 235 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals.

DATUM.--Land-surface datum is 42.56 ft above North American Vertical Datum of 1988. Measuring point: Top of shelter floor, 2.30 ft above land-surface datum.

REMARKS.--Well is part of U.S. Marine Corps Base, Camp Lejeune, North Carolina, Water Resources Network project.

PERIOD OF RECORD.--October 1994 to current year.

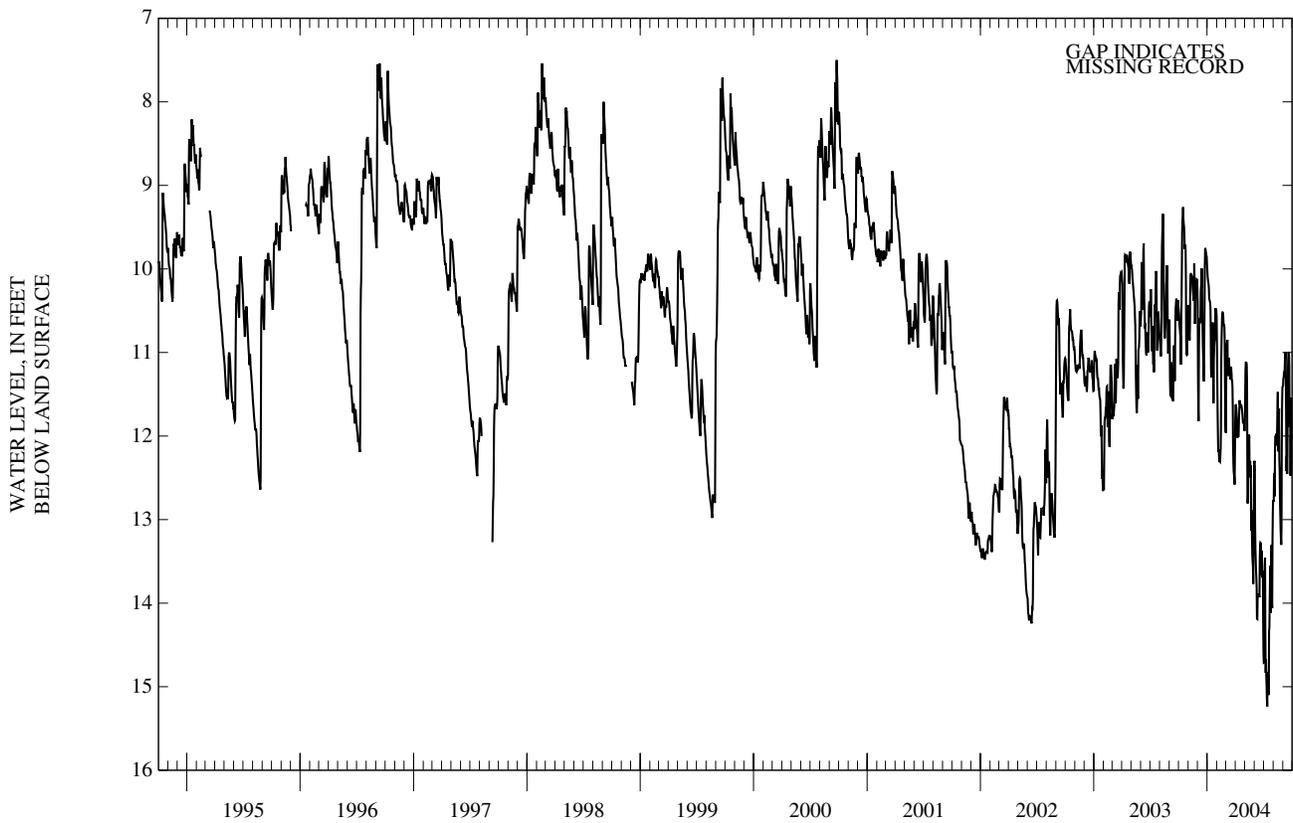
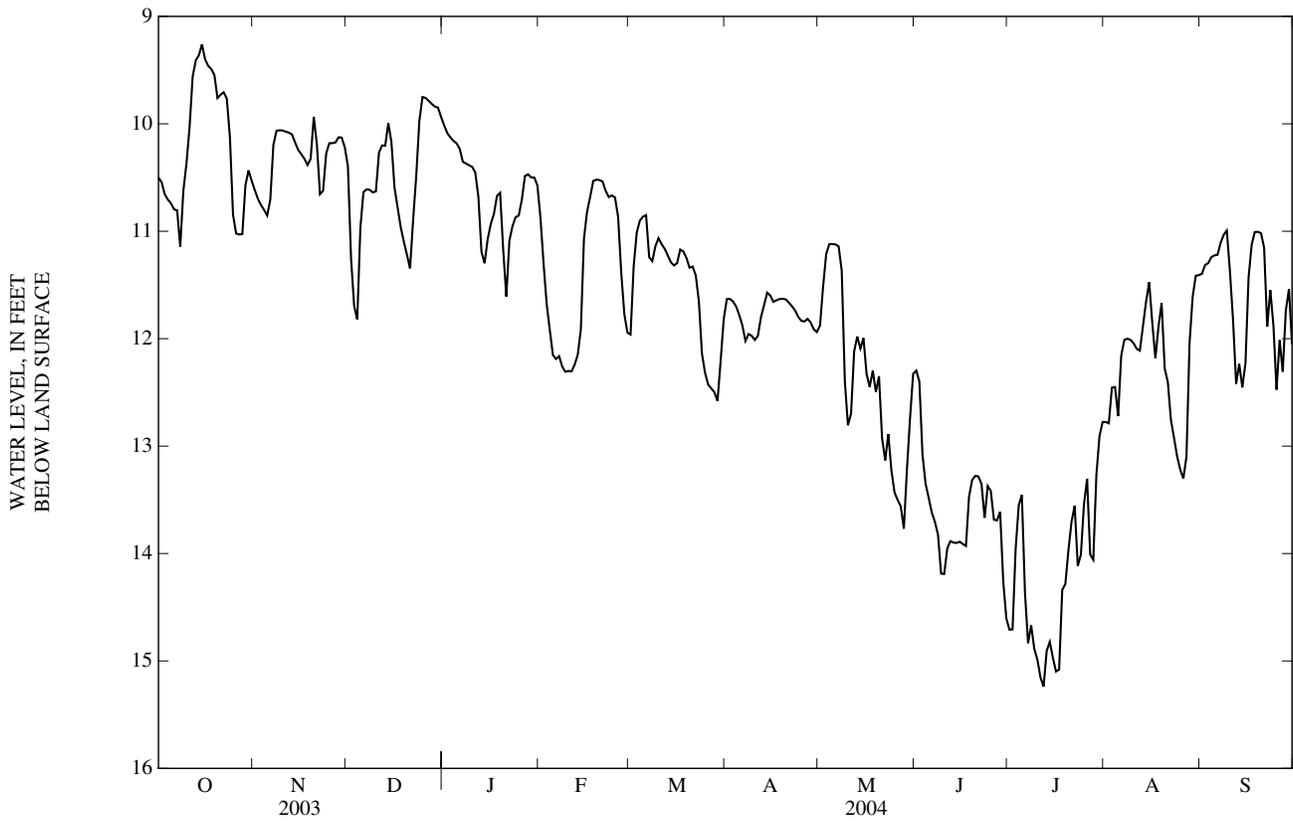
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 7.46 ft below land-surface datum, July 22, 2000; lowest water level recorded, 15.28 ft below land-surface datum, Jul. 12, 13, 2004.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	
1	10.50	10.62	10.40	10.02	10.88	11.96	11.63	11.88	12.30	14.71	12.78	11.40	
2	10.54	10.70	11.25	10.09	11.30	11.33	11.63	11.51	12.40	14.71	12.79	11.31	
3	10.65	10.76	11.70	10.13	11.68	11.01	11.65	11.21	13.08	13.95	12.46	11.30	
4	10.71	10.80	11.82	10.16	11.92	10.90	11.70	11.12	13.35	13.55	12.45	11.24	
5	10.74	10.85	10.97	10.18	12.15	10.86	11.78	11.12	13.48	13.46	12.72	11.22	
6	10.80	10.71	10.63	10.23	12.19	10.85	11.88	11.12	13.62	14.36	12.16	11.22	
7	10.81	10.19	10.61	10.35	12.16	11.24	12.02	11.14	13.71	14.83	12.01	11.11	
8	11.14	10.06	10.61	10.37	12.26	11.28	11.96	11.37	13.82	14.67	12.00	11.03	
9	10.62	10.06	10.64	10.39	12.31	11.14	11.97	12.39	14.19	14.89	12.01	10.99	
10	10.37	10.06	10.63	10.40	12.30	11.06	12.01	12.81	14.19	14.99	12.04	11.37	
11	10.03	10.07	10.27	10.45	12.31	11.12	11.97	12.70	13.95	15.15	12.09	11.82	
12	9.56	10.08	10.20	10.68	12.24	11.16	11.80	12.12	13.88	15.24	12.11	12.42	
13	9.41	10.10	10.20	11.19	12.15	11.23	11.69	11.98	13.90	14.91	11.88	12.24	
14	9.36	10.17	9.99	11.30	11.91	11.29	11.57	12.09	13.90	14.82	11.65	12.45	
15	9.26	10.24	10.17	11.07	11.07	11.32	11.60	11.99	13.89	14.97	11.47	12.23	
16	9.40	10.28	10.59	10.93	10.82	11.30	11.66	12.33	13.91	15.10	11.85	11.43	
17	9.46	10.33	10.78	10.84	10.68	11.17	11.64	12.45	13.93	15.08	12.18	11.12	
18	9.49	10.38	10.96	10.67	10.53	11.19	11.63	12.30	13.47	14.34	11.89	11.01	
19	9.55	10.32	11.10	10.64	10.52	11.25	11.63	12.50	13.31	14.28	11.67	11.01	
20	9.76	9.93	11.22	11.17	10.52	11.34	11.63	12.35	13.28	13.97	12.28	11.02	
21	9.73	10.19	11.35	11.61	10.54	11.33	11.67	12.93	13.28	13.70	12.40	11.15	
22	9.71	10.66	10.89	11.09	10.62	11.41	11.70	13.13	13.35	13.55	12.76	11.89	
23	9.77	10.62	10.48	10.95	10.68	11.65	11.74	12.89	13.67	14.12	12.92	11.55	
24	10.12	10.28	9.97	10.87	10.67	12.14	11.80	13.23	13.37	14.01	13.10	11.88	
25	10.85	10.18	9.75	10.85	10.69	12.32	11.83	13.43	13.42	13.54	13.22	12.47	
26	11.02	10.18	9.76	10.71	10.87	12.43	11.84	13.50	13.68	13.30	13.30	12.01	
27	11.03	10.17	9.79	10.49	11.38	12.46	11.81	13.56	13.69	14.01	13.10	12.31	
28	11.03	10.12	9.81	10.47	11.77	12.50	11.85	13.77	13.61	14.06	12.04	11.74	
29	10.57	10.13	9.84	10.50	11.94	12.58	11.91	13.22	14.26	13.27	11.61	11.54	
30	10.43	10.22	9.85	10.50	---	12.21	11.94	12.74	14.60	12.91	11.41	12.05	
31	10.53	---	9.94	10.57	---	11.82	---	12.33	---	12.78	11.41	---	
WTR YR	2004	MEAN	11.70	HIGH	9.26	LOW	15.24						

GROUND-WATER LEVELS  
ONslow COUNTY—Continued

343609077171301. County number, ON-293; Sneads Ferry Road Well.



## GROUND-WATER LEVELS

213

## ONslow COUNTY—Continued

343842077241501. County number, ON-294; Town Creek Well 1.

LOCATION.--Lat 34°38'42", long 77°24'29", Hydrologic Unit 03030001, 4 mi east of Verona, 0.4 mi north of Town Point Road, on dirt road. Owner: U.S. Geological Survey.

AQUIFER.--Surficial Aquifer.

WELL CHARACTERISTICS.--Drilled observation well, depth 23 ft, diameter 2 in., screened interval from 12 to 22 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals.

DATUM.--Land-surface datum is 29.83 ft above North American Vertical Datum of 1988. Measuring point: Top of shelter floor, 2.43 ft above land-surface datum.

REMARKS.--Well is part of U.S. Marine Corps Base, Camp Lejeune, North Carolina, Water Resources Network project.

PERIOD OF RECORD.--October 1994 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 3.55 ft below land-surface datum, Mar. 21, 22, 2003, Oct. 29, 2003; lowest water level recorded, 11.29 ft below land-surface datum, Dec. 10-13, 2002.

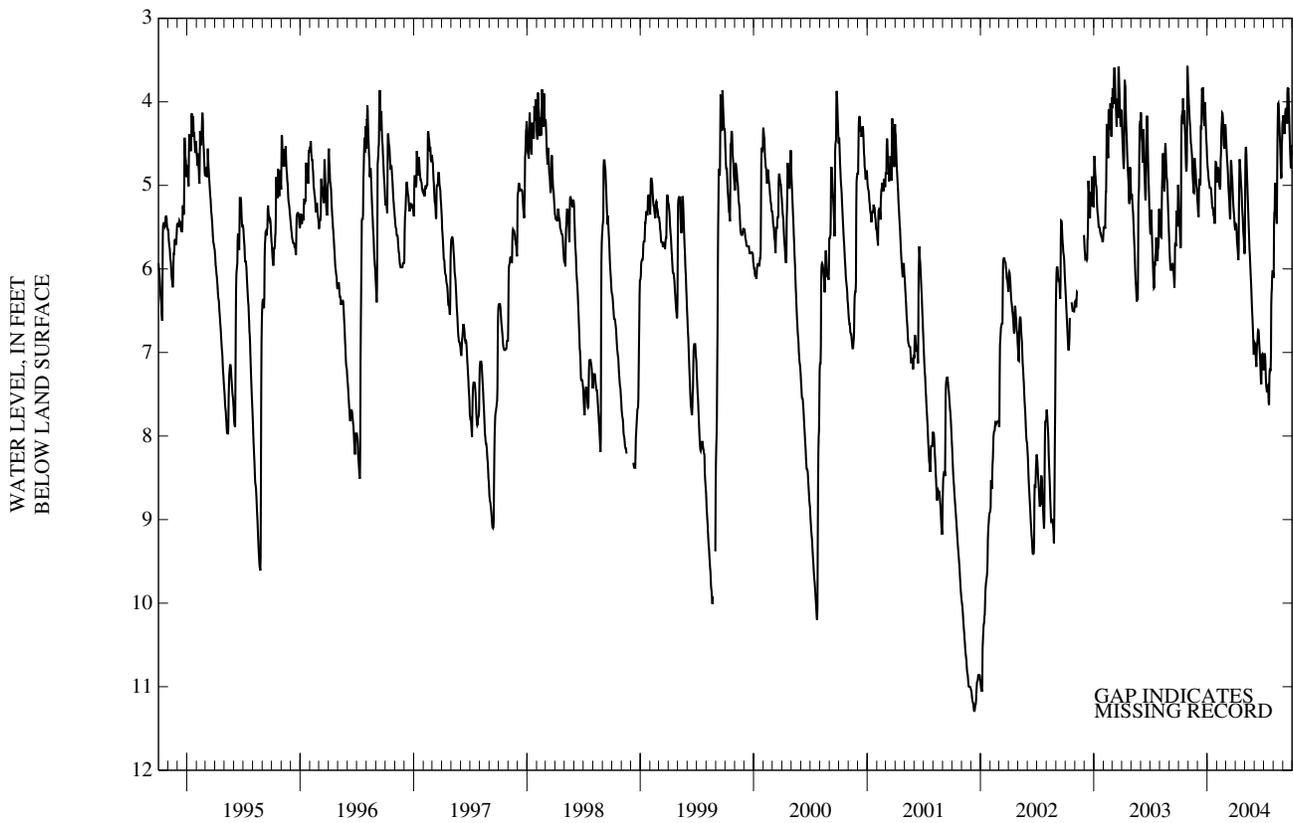
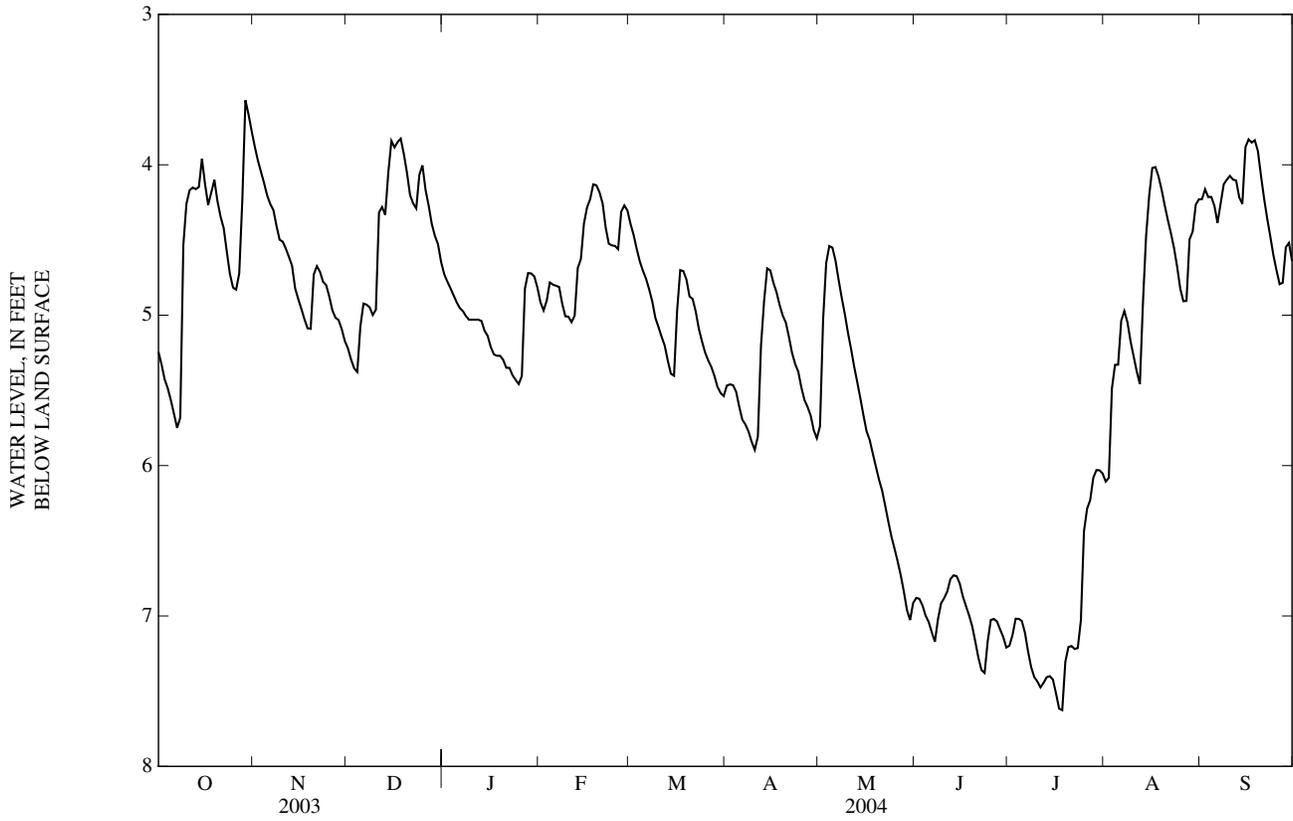
DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.24	3.88	5.22	4.73	4.92	4.39	5.47	5.74	6.88	7.20	6.11	4.23
2	5.33	3.97	5.29	4.78	4.97	4.47	5.46	5.03	6.89	7.13	6.08	4.16
3	5.43	4.05	5.35	4.82	4.90	4.56	5.46	4.65	6.93	7.02	5.49	4.21
4	5.49	4.12	5.38	4.87	4.78	4.64	5.51	4.54	7.00	7.02	5.33	4.21
5	5.57	4.20	5.08	4.91	4.80	4.71	5.61	4.55	7.04	7.03	5.33	4.27
6	5.66	4.26	4.92	4.95	4.80	4.76	5.70	4.64	7.11	7.11	5.04	4.39
7	5.75	4.30	4.93	4.97	4.81	4.83	5.73	4.77	7.17	7.24	4.97	4.26
8	5.68	4.41	4.95	5.01	4.92	4.91	5.77	4.88	7.02	7.34	5.05	4.13
9	4.53	4.50	5.00	5.03	5.01	5.02	5.84	4.99	6.92	7.41	5.17	4.10
10	4.26	4.51	4.96	5.03	5.01	5.08	5.90	5.12	6.88	7.44	5.27	4.07
11	4.17	4.56	4.32	5.03	5.05	5.14	5.81	5.22	6.84	7.47	5.37	4.10
12	4.15	4.61	4.28	5.03	5.00	5.20	5.20	5.34	6.75	7.44	5.46	4.10
13	4.16	4.67	4.33	5.04	4.69	5.30	4.91	5.45	6.73	7.41	4.92	4.22
14	4.15	4.82	4.05	5.10	4.63	5.39	4.69	5.55	6.74	7.40	4.48	4.26
15	3.96	4.89	3.84	5.14	4.39	5.40	4.70	5.67	6.78	7.42	4.21	3.88
16	4.13	4.96	3.88	5.21	4.28	4.97	4.78	5.77	6.87	7.51	4.02	3.83
17	4.27	5.03	3.85	5.26	4.23	4.70	4.85	5.83	6.93	7.62	4.01	3.85
18	4.18	5.09	3.83	5.27	4.13	4.71	4.93	5.92	7.00	7.63	4.08	3.84
19	4.10	5.09	3.93	5.27	4.14	4.76	5.00	6.01	7.07	7.30	4.17	3.91
20	4.24	4.73	4.05	5.30	4.18	4.88	5.05	6.09	7.17	7.21	4.27	4.07
21	4.35	4.67	4.20	5.35	4.26	4.89	5.14	6.17	7.28	7.20	4.37	4.23
22	4.42	4.71	4.26	5.35	4.42	4.98	5.25	6.27	7.36	7.22	4.46	4.36
23	4.58	4.78	4.29	5.40	4.53	5.09	5.32	6.37	7.38	7.21	4.55	4.48
24	4.73	4.80	4.07	5.43	4.54	5.17	5.38	6.47	7.17	7.03	4.68	4.60
25	4.82	4.88	4.00	5.46	4.54	5.25	5.48	6.55	7.03	6.44	4.82	4.70
26	4.83	4.97	4.17	5.40	4.56	5.30	5.56	6.64	7.02	6.29	4.91	4.79
27	4.72	5.02	4.27	4.82	4.31	5.34	5.61	6.73	7.04	6.23	4.91	4.78
28	4.23	5.03	4.39	4.72	4.27	5.40	5.67	6.84	7.09	6.08	4.50	4.55
29	3.57	5.09	4.47	4.72	4.30	5.48	5.77	6.96	7.14	6.03	4.44	4.52
30	3.67	5.17	4.53	4.74	---	5.52	5.82	7.03	7.21	6.03	4.27	4.64
31	3.78	---	4.65	4.82	---	5.54	---	6.91	---	6.05	4.23	---

WTR YR 2004 MEAN 5.22 HIGH 3.57 LOW 7.63

GROUND-WATER LEVELS  
ONslow COUNTY—Continued

343842077241501. County number, ON-294; Town Creek Well 1.



## GROUND-WATER LEVELS

215

## ON SLOW COUNTY—Continued

343442077292301. County number, ON-312; Great Sandy Run well.

LOCATION.--Lat 34°34'42", long 77°29'23", Hydrologic Unit 03030007, at Camp Lejeune, 13.5 mi south of Highway 24 and Highway 17 intersection, on dirt road. Owner: U.S. Geological Survey.

AQUIFER.--Surficial aquifer.

WELL CHARACTERISTICS.--Drilled observation well, depth 5.9 ft, diameter 2 in., cased to 5.9 ft, screened interval from 0.6 to 5.6 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 15-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 25 ft above NGVD of 1929 (from topographic map). Measuring point: Bottom of shelter floor, 3.82 ft above land-surface datum.

REMARKS.--Well is part of a Coastal Plains recharge study.

PERIOD OF RECORD.--December 2003 to September 2004.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, -0.14 ft below land-surface datum, Aug. 14, 2004; lowest water level recorded, 3.64 ft below land-surface datum, June 30, 2004.

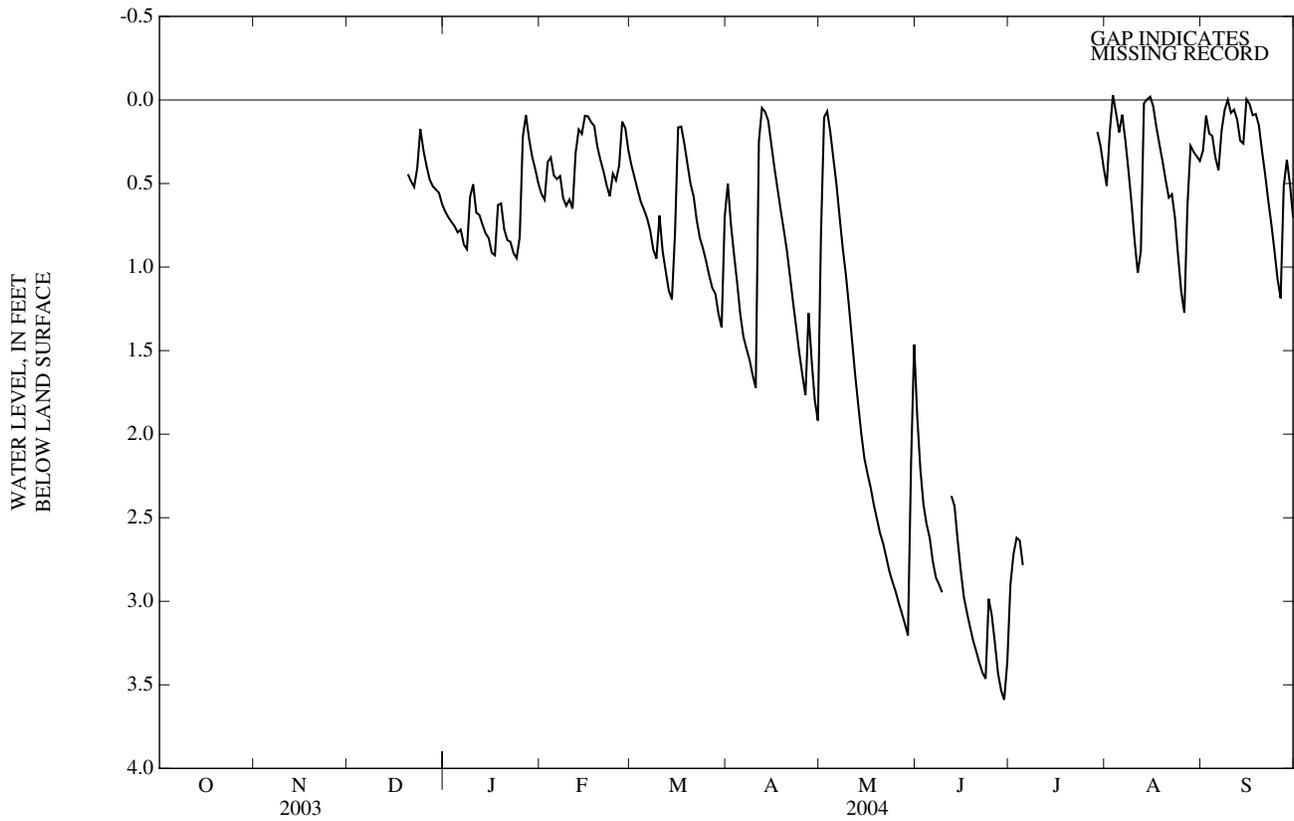
DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	0.67	0.56	0.39	0.50	0.80	1.90	2.90	0.51	0.30
2	---	---	---	0.70	0.60	0.47	0.75	0.10	2.21	2.72	0.19	0.09
3	---	---	---	0.73	0.37	0.54	0.93	0.07	2.42	2.62	-0.03	0.20
4	---	---	---	0.75	0.34	0.61	1.09	0.19	2.54	2.64	0.08	0.22
5	---	---	---	0.79	0.45	0.66	1.28	0.35	2.62	2.78	0.19	0.34
6	---	---	---	0.78	0.47	0.71	1.41	0.51	2.76	---	0.09	0.42
7	---	---	---	0.87	0.46	0.78	1.49	0.70	2.86	---	0.24	0.18
8	---	---	---	0.89	0.59	0.90	1.56	0.89	2.90	---	0.42	0.06
9	---	---	---	0.58	0.63	0.95	1.65	1.04	2.95	---	0.62	0.00
10	---	---	---	0.50	0.60	0.69	1.72	1.23	---	---	0.85	0.08
11	---	---	---	0.67	0.65	0.90	0.25	1.44	---	---	1.03	0.06
12	---	---	---	0.69	0.31	1.02	0.05	1.64	2.37	---	0.90	0.12
13	---	---	---	0.75	0.18	1.14	0.07	1.83	2.43	---	0.02	0.24
14	---	---	---	0.80	0.20	1.19	0.12	2.00	2.63	---	0.00	0.26
15	---	---	---	0.83	0.09	0.80	0.26	2.15	2.82	---	-0.02	0.00
16	---	---	---	0.91	0.10	0.16	0.40	2.24	2.97	---	0.04	0.03
17	---	---	---	0.93	0.13	0.16	0.53	2.32	3.07	---	0.16	0.09
18	---	---	---	0.63	0.16	0.26	0.66	2.42	3.15	---	0.27	0.08
19	---	---	---	0.62	0.28	0.38	0.77	2.51	3.24	---	0.37	0.15
20	---	---	0.44	0.77	0.36	0.50	0.90	2.59	3.30	---	0.48	0.30
21	---	---	0.49	0.84	0.43	0.58	1.05	2.65	3.37	---	0.58	0.44
22	---	---	0.52	0.85	0.51	0.72	1.21	2.74	3.43	---	0.56	0.60
23	---	---	0.41	0.92	0.58	0.83	1.36	2.82	3.46	---	0.71	0.74
24	---	---	0.17	0.95	0.44	0.89	1.51	2.88	2.99	---	0.94	0.90
25	---	---	0.30	0.82	0.48	0.96	1.64	2.94	3.09	---	1.15	1.07
26	---	---	0.40	0.22	0.39	1.05	1.77	3.01	3.25	---	1.27	1.19
27	---	---	0.48	0.09	0.13	1.13	1.28	3.07	3.43	---	0.63	0.52
28	---	---	0.52	0.23	0.17	1.16	1.56	3.13	3.53	---	0.27	0.36
29	---	---	0.54	0.34	0.30	1.28	1.80	3.20	3.59	0.19	0.31	0.50
30	---	---	0.56	0.41	---	1.36	1.92	2.18	3.36	0.27	0.34	0.70
31	---	---	0.62	0.50	---	0.70	---	1.46	---	0.40	0.36	---

WTR YR 2004 MEAN 1.04 HIGH -0.03 LOW 3.59

GROUND-WATER LEVELS  
ONSLow COUNTY—Continued

343442077292301. County number, ON-312; Great Sandy Run well.



## ORANGE COUNTY

355522079043001. Local number, NC-126; County number, OR-069.

LOCATION.--Lat 35°54'31", long 79°03'29", Hydrologic Unit 03030002, in Chapel Hill, west of University of North Carolina campus, southeast of intersection of Cameron Avenue and Ransom Street. Owner: Chi Psi Fraternity.

AQUIFER.--Unconfined saprolite derived from granite of Paleozoic age.

WELL CHARACTERISTICS.--Dug observation well, depth 48 ft, diameter 36 in., lined with rock; measured depth 46.2 ft, August 1986.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals.

DATUM.--Land-surface datum is 511.50 ft above NGVD of 1929. Measuring point: Top of shelf, 3.27 ft above land-surface datum (since July 1981).

REMARKS.-- Well is part of terrane-effects network. Well found dry from October 13, 1988 to January 24, 1989. No periodic measurements made from January 24 to July 19, 1989.

PERIOD OF RECORD.--January 1943 to current year. Continuous record January 1943 to March 1948, December 1999 to current year.

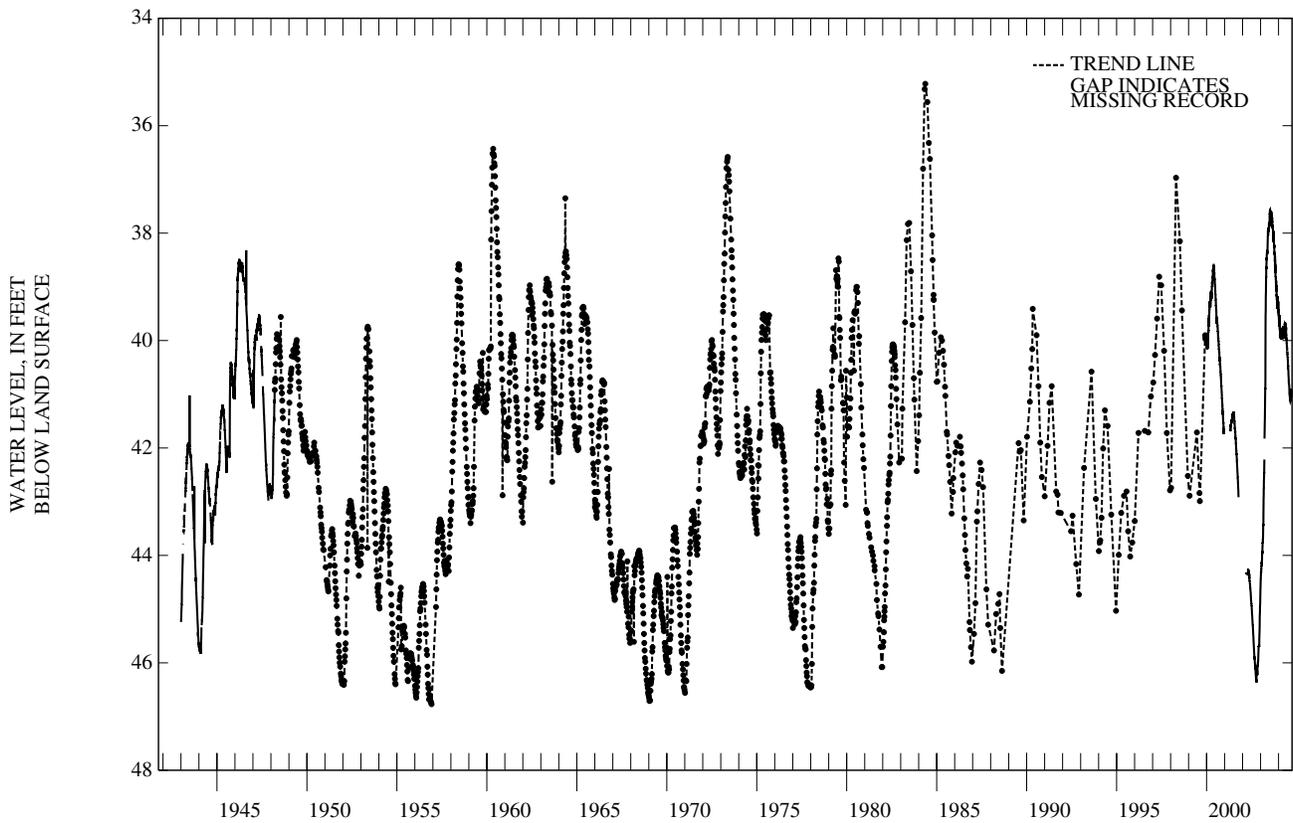
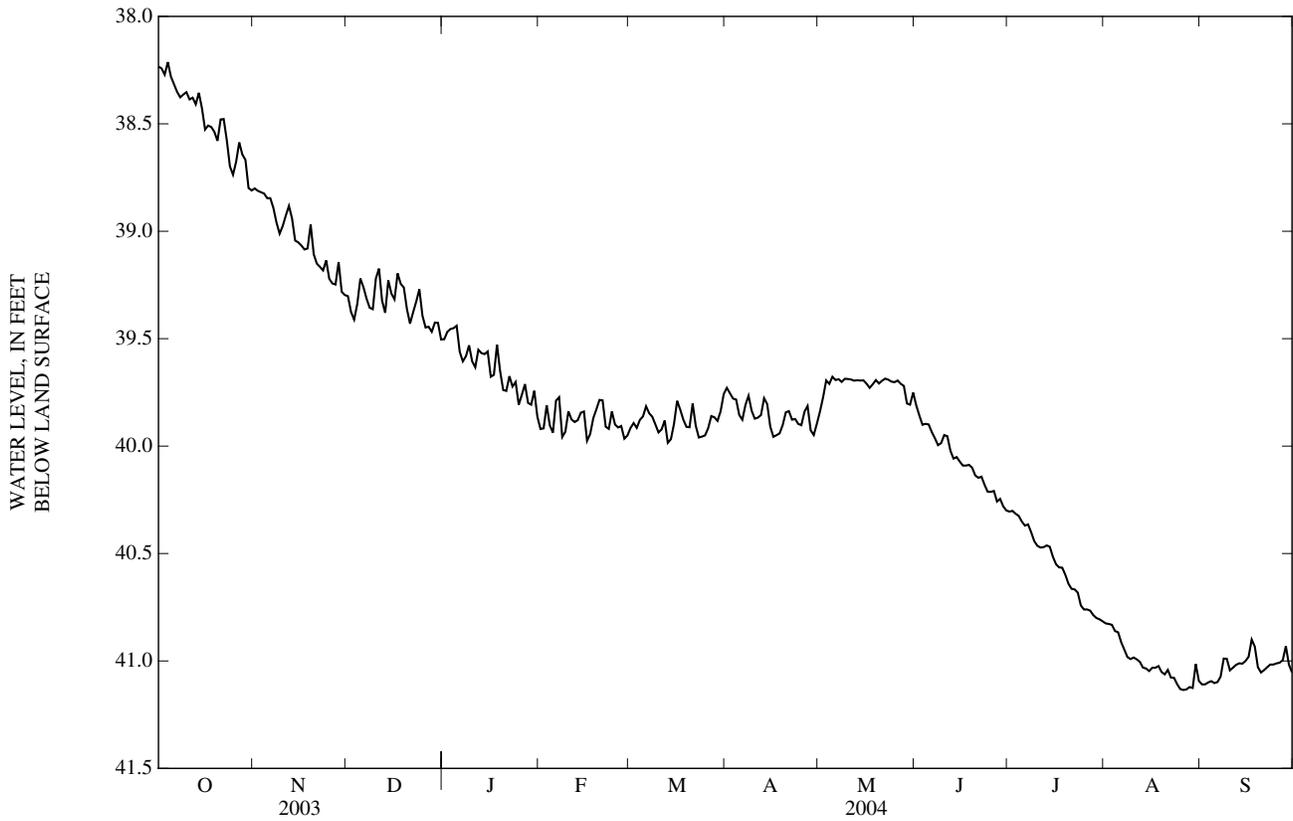
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 35.22 ft below land-surface datum, May 14, 1984; lowest water level occurred during periods when well was dry, Oct. 11 to Dec. 31, 1940, and Oct. 13, 1988 to Jan. 24, 1989.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38.23	38.80	39.30	39.50	39.92	39.92	39.73	39.84	39.81	40.30	40.83	41.11
2	38.24	38.81	39.38	39.47	39.92	39.89	39.75	39.77	39.86	40.30	40.83	41.11
3	38.27	38.82	39.41	39.45	39.81	39.92	39.78	39.69	39.90	40.31	40.83	41.10
4	38.21	38.82	39.34	39.45	39.90	39.88	39.78	39.71	39.90	40.33	40.86	41.09
5	38.28	38.85	39.22	39.44	39.94	39.86	39.86	39.68	39.90	40.35	40.87	41.10
6	38.32	38.85	39.26	39.56	39.79	39.81	39.88	39.69	39.93	40.37	40.91	41.10
7	38.35	38.89	39.31	39.61	39.77	39.85	39.81	39.69	39.96	40.36	40.95	41.07
8	38.38	38.96	39.36	39.58	39.96	39.86	39.77	39.70	40.00	40.40	40.98	40.99
9	38.36	39.01	39.36	39.53	39.93	39.90	39.84	39.69	39.99	40.44	40.99	40.99
10	38.35	38.98	39.22	39.61	39.84	39.94	39.87	39.69	39.95	40.46	40.98	41.04
11	38.39	38.93	39.17	39.63	39.88	39.92	39.87	39.69	39.95	40.47	40.99	41.03
12	38.38	38.88	39.32	39.55	39.89	39.88	39.86	39.70	40.02	40.47	41.00	41.02
13	38.41	38.94	39.38	39.57	39.88	39.98	39.78	39.69	40.06	40.46	41.03	41.01
14	38.36	39.04	39.23	39.57	39.84	39.97	39.80	39.70	40.05	40.47	41.04	41.01
15	38.43	39.05	39.29	39.56	39.84	39.90	39.91	39.69	40.07	40.52	41.05	41.00
16	38.53	39.07	39.32	39.68	39.98	39.79	39.96	39.71	40.09	40.55	41.03	40.98
17	38.51	39.08	39.20	39.67	39.94	39.83	39.95	39.73	40.09	40.56	41.03	40.90
18	38.52	39.08	39.24	39.53	39.87	39.88	39.94	39.71	40.09	40.57	41.02	40.93
19	38.54	38.97	39.26	39.65	39.83	39.91	39.90	39.69	40.10	40.60	41.05	41.03
20	38.58	39.11	39.36	39.74	39.78	39.91	39.84	39.71	40.14	40.64	41.06	41.05
21	38.48	39.15	39.43	39.74	39.79	39.80	39.84	39.70	40.15	40.66	41.04	41.04
22	38.48	39.17	39.38	39.67	39.91	39.91	39.88	39.69	40.14	40.67	41.08	41.03
23	38.58	39.18	39.33	39.72	39.92	39.96	39.87	39.69	40.18	40.68	41.08	41.02
24	38.70	39.14	39.27	39.70	39.84	39.96	39.90	39.70	40.21	40.74	41.11	41.02
25	38.74	39.22	39.39	39.81	39.90	39.95	39.90	39.70	40.21	40.76	41.13	41.01
26	38.68	39.24	39.45	39.76	39.91	39.92	39.84	39.69	40.21	40.76	41.14	41.01
27	38.59	39.25	39.44	39.71	39.91	39.86	39.81	39.71	40.26	40.77	41.13	41.00
28	38.64	39.14	39.47	39.80	39.97	39.87	39.93	39.72	40.25	40.79	41.12	40.93
29	38.67	39.28	39.42	39.81	39.95	39.88	39.95	39.80	40.28	40.80	41.13	41.02
30	38.80	39.30	39.43	39.74	---	39.84	39.90	39.81	40.30	40.81	41.01	41.05
31	38.81	---	39.50	39.86	---	39.76	---	39.75	---	40.82	41.09	---
WTR YR	2004	MEAN	39.87	HIGH	38.21	LOW	41.14					

GROUND-WATER LEVELS  
ORANGE COUNTY—Continued

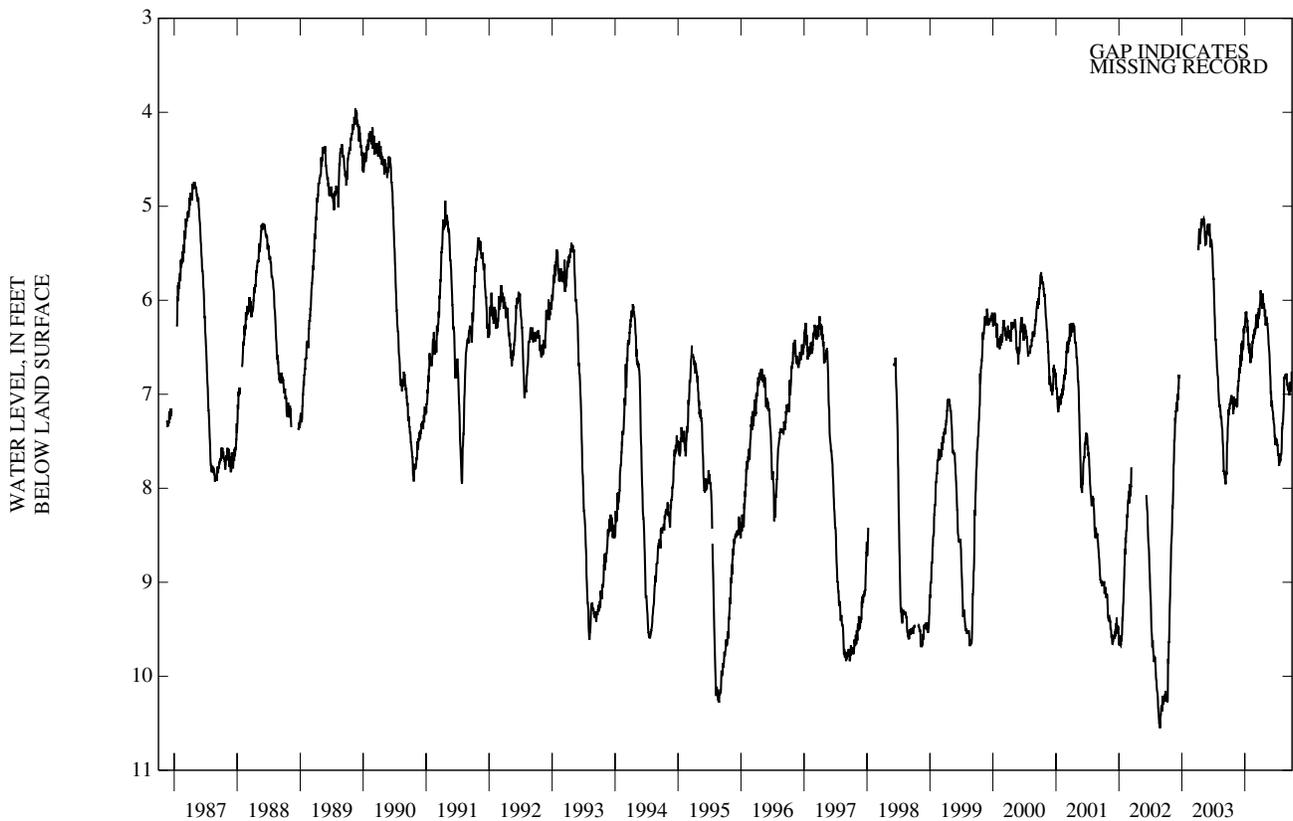
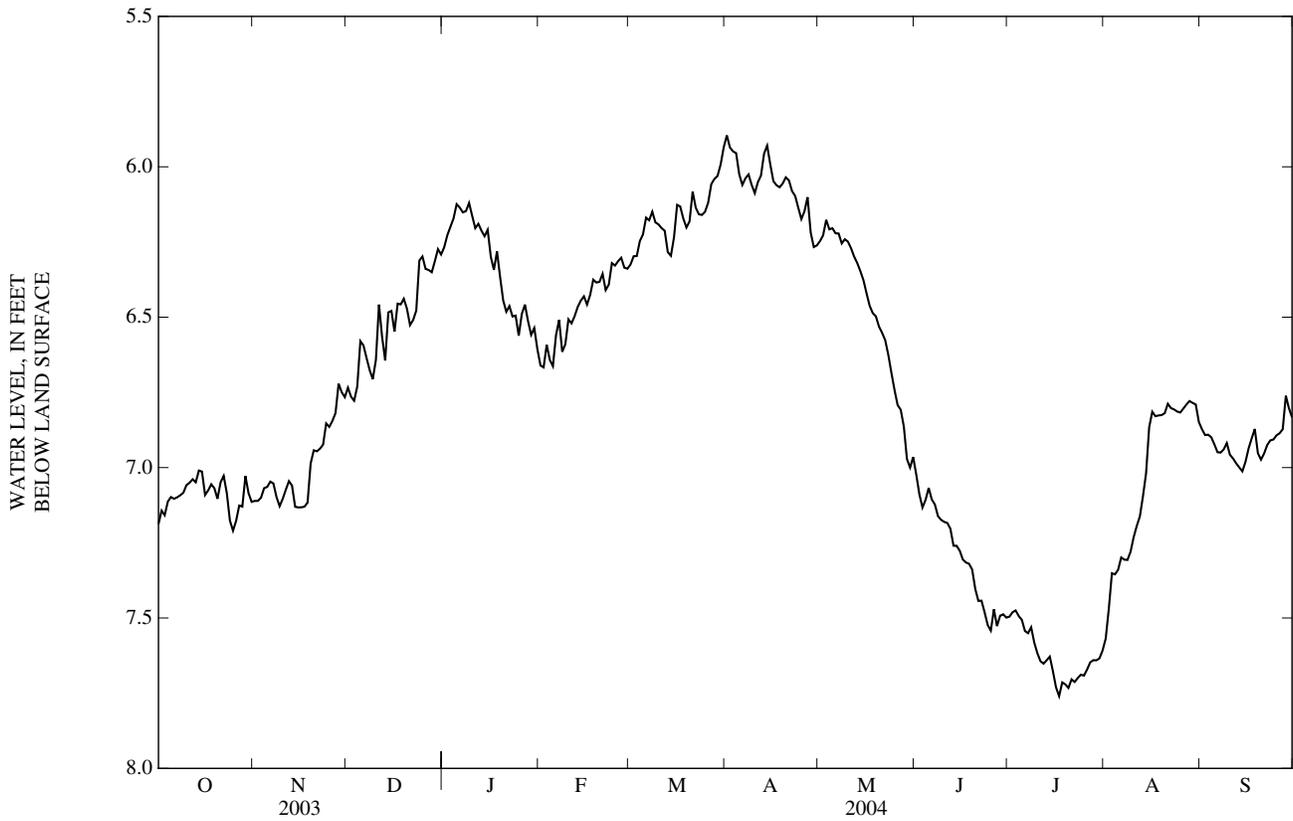
355522079043001. Local number, NC-126; County number, OR-069.





GROUND-WATER LEVELS  
PASQUOTANK COUNTY—Continued

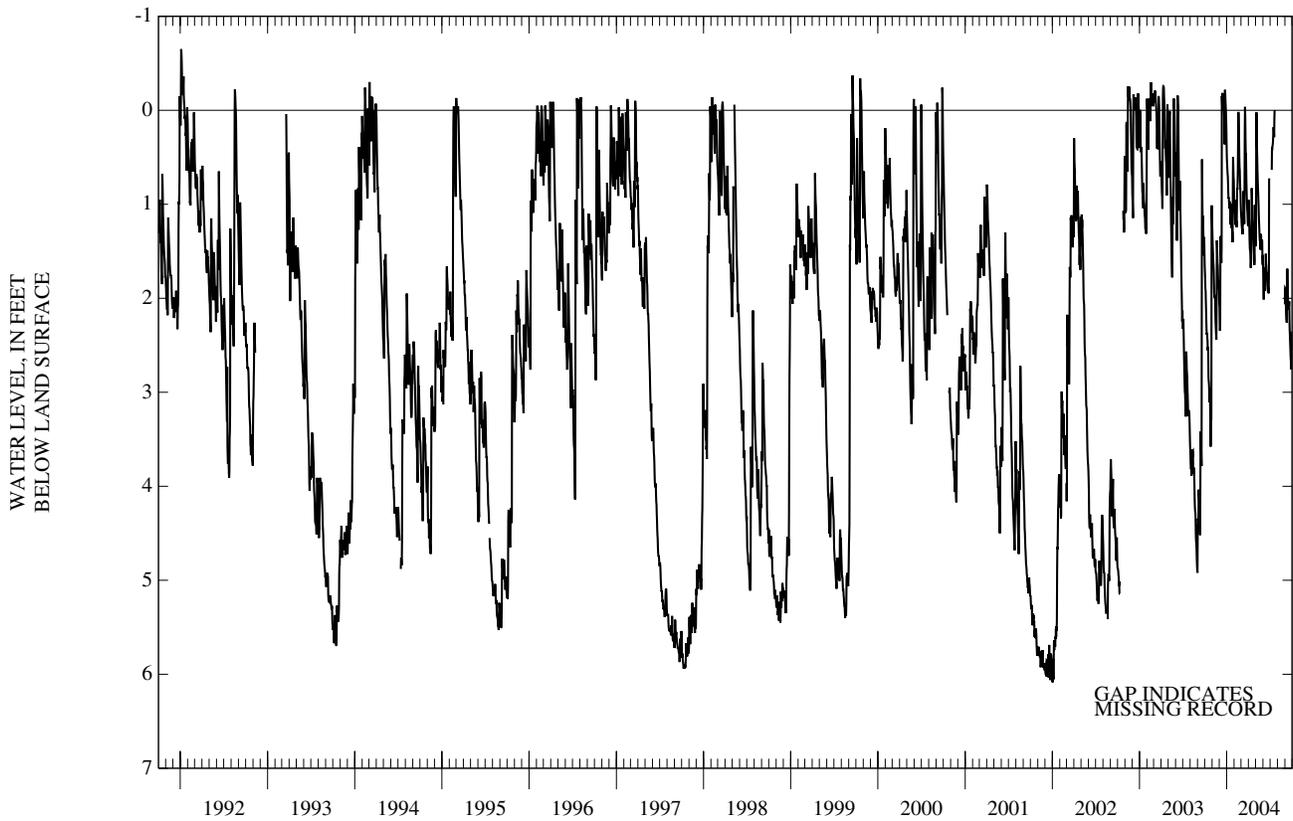
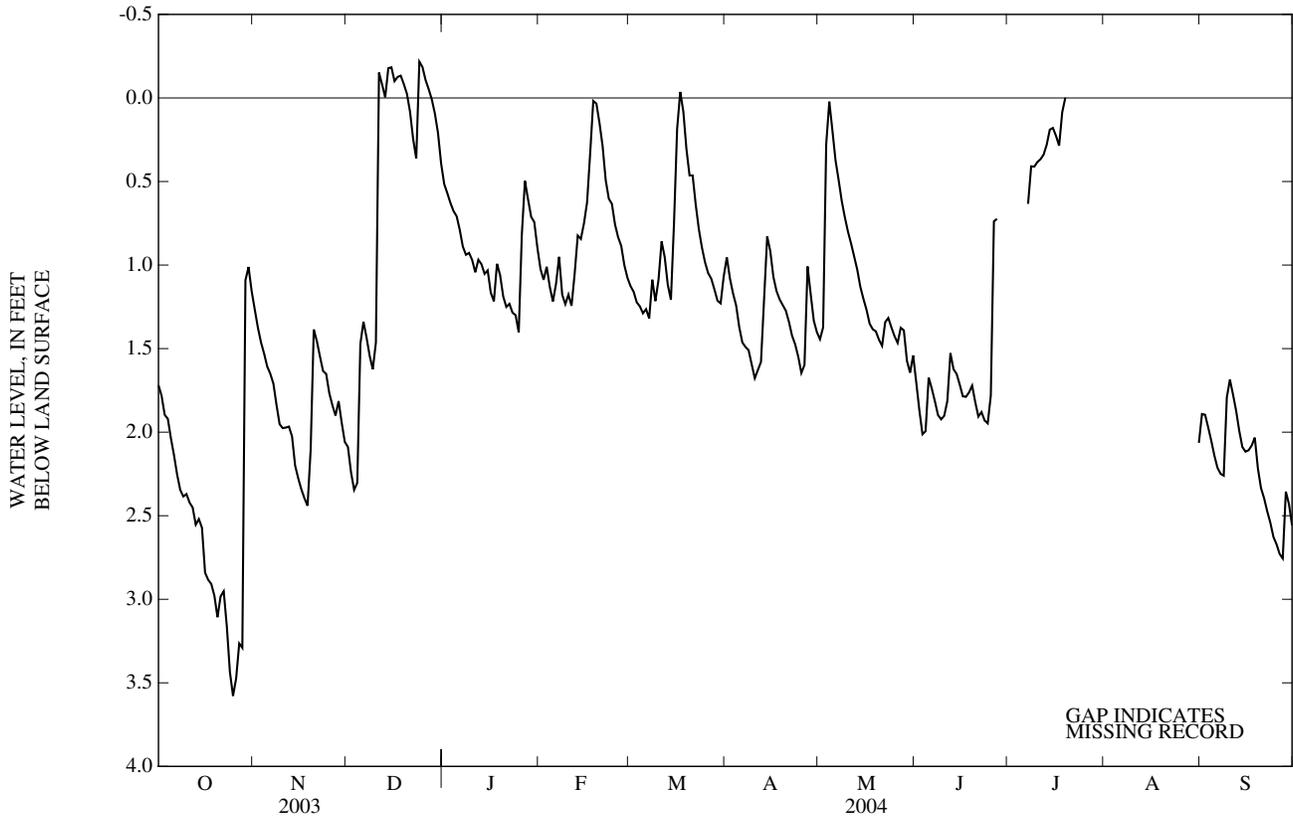
362050076163705. Local number, NC-150; DENR Elizabeth City Forest Service Research Station well D11v5; County number, PK-199.





GROUND-WATER LEVELS  
PASQUOTANK COUNTY—Continued

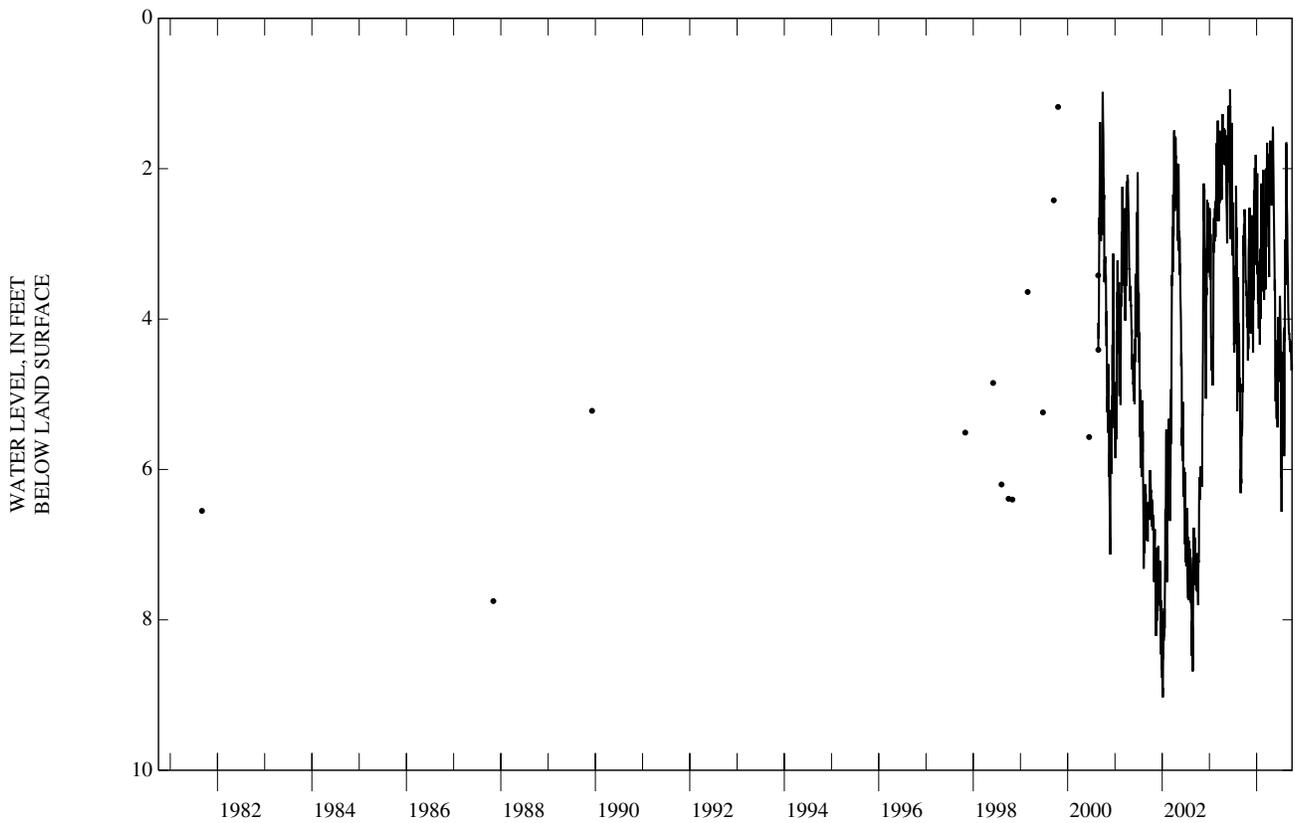
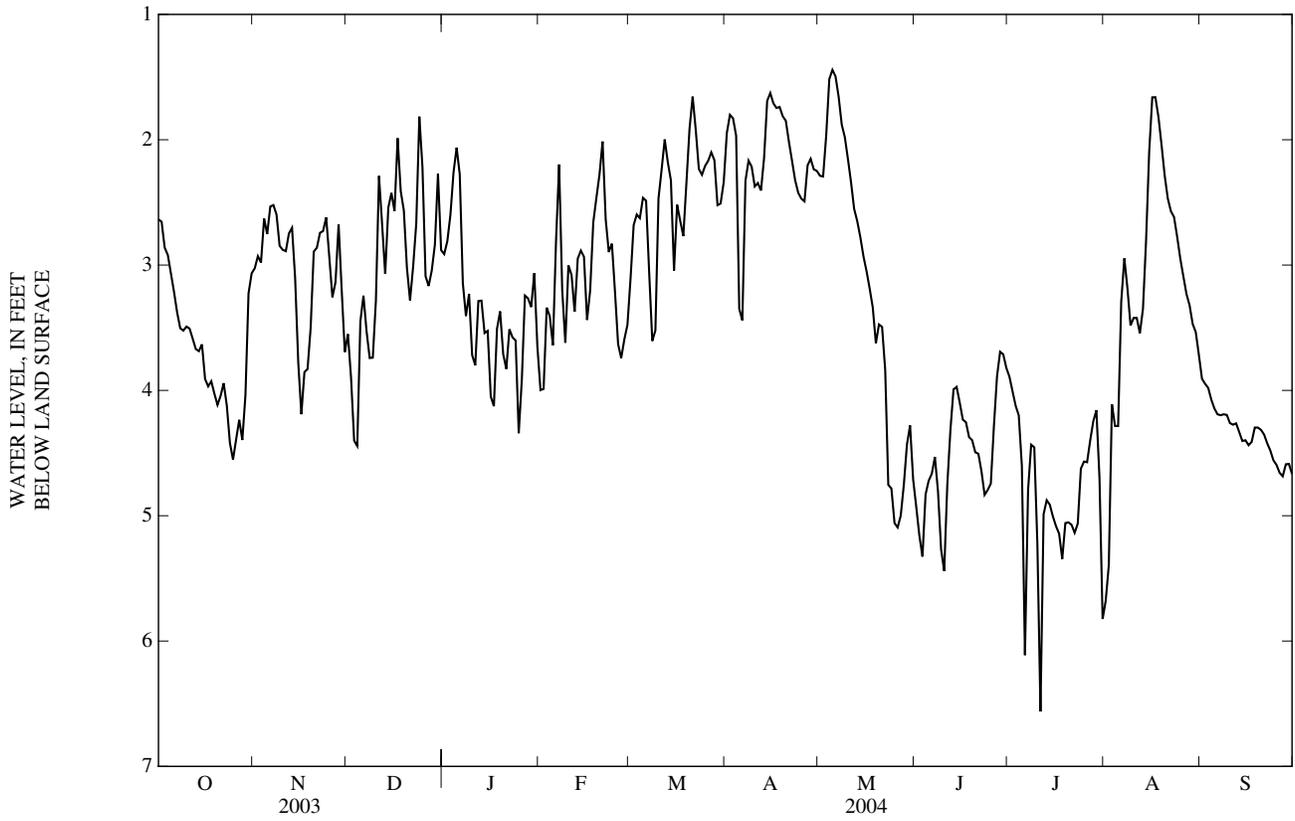
361829076163201. Local number, NC-195; County number, PK-141.





GROUND-WATER LEVELS  
PASQUOTANK COUNTY—Continued

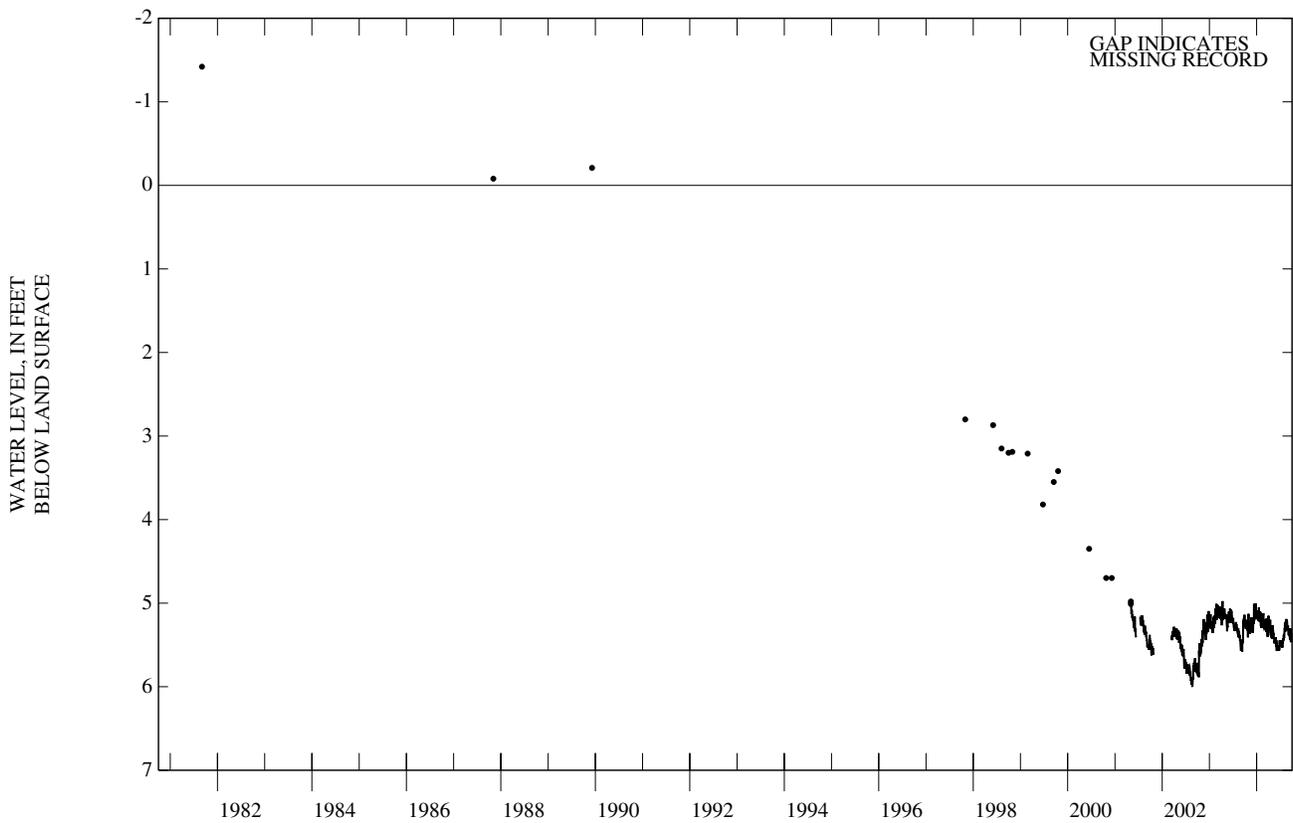
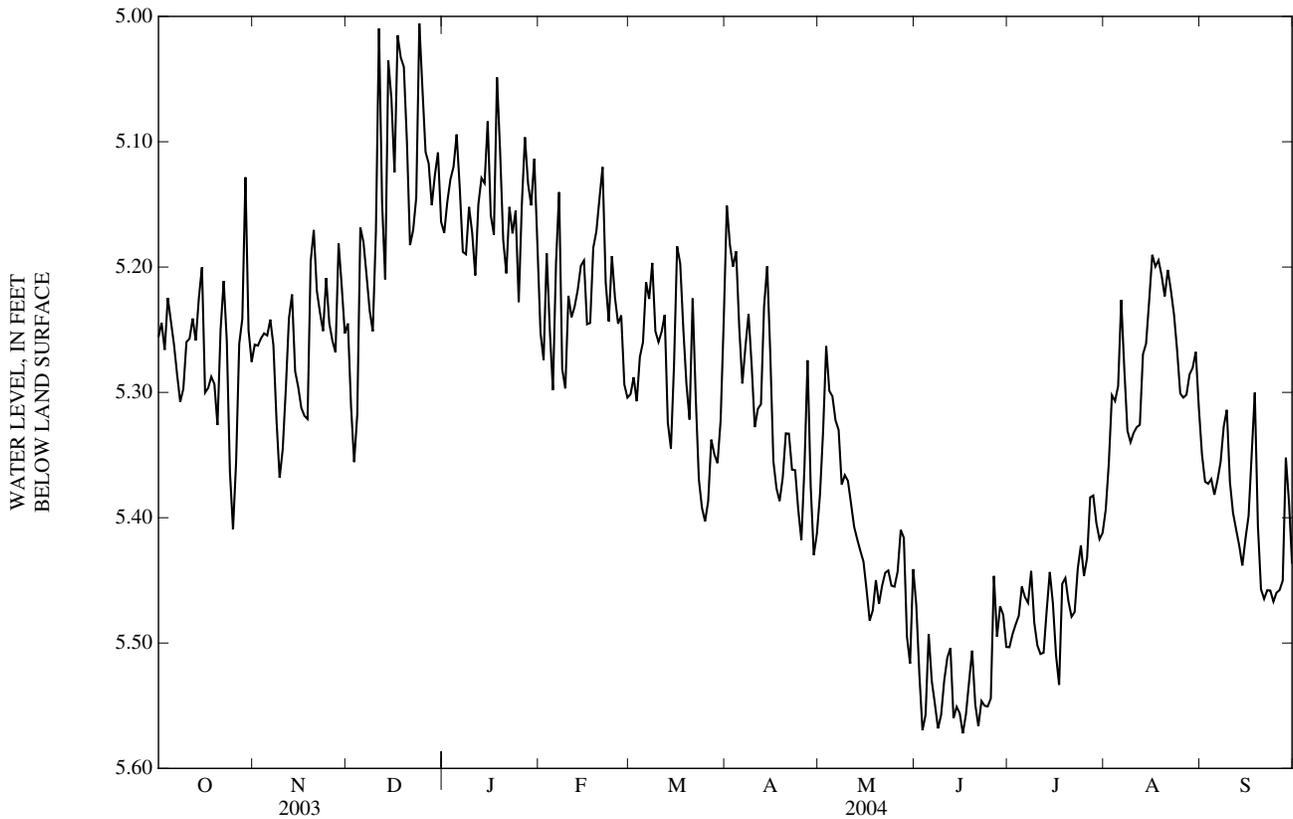
362601076230702. Local number, NC-203; DENR Morgans Corner Research Station well C12w2; County number, PK-190.





GROUND-WATER LEVELS  
PASQUOTANK COUNTY—Continued

362601076230704. Local number, NC-204: DENR Morgans Corner Research Station well C12w4; County number, PK-191.



## PITT COUNTY

353219077153801. Local number, NC-160; County number, PI-532.

LOCATION.--Lat 35°32'18", long 77°15'41", Hydrologic Unit 03020103, 2.7 mi southwest of Simpson at intersection of Secondary Roads 1755 and 1769.  
Owner: U.S. Geological Survey.

AQUIFER.--Surficial aquifer of post-Miocene age.

WELL CHARACTERISTICS.--Bored observation well, augered to 12 ft, diameter 6 in., cased to 5.9 ft, screened interval from 5.9 to 10.9 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 56.27 ft above NGVD of 1929 (levels by Soil Conservation Service). Measuring point: Top of instrument shelf, 3.72 ft above land-surface datum; revised from 1.04 ft above land-surface datum, Oct. 4, 1990.

REMARKS.--Well is part of climatic-effects network.

PERIOD OF RECORD.--December 1976 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 0.55 ft below land-surface datum, Sept. 16, 1999; lowest water level recorded, 8.87 ft below land-surface datum, Oct. 10, 2002.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

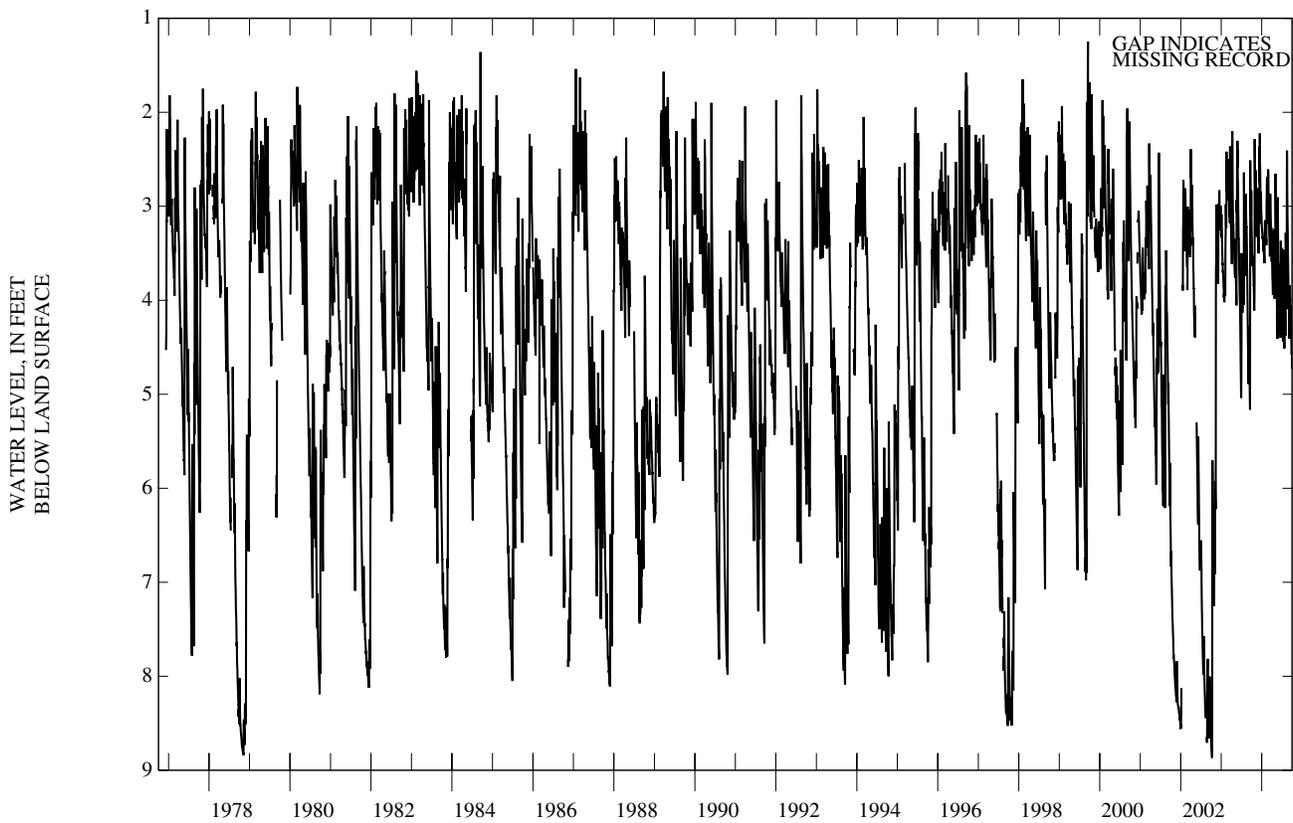
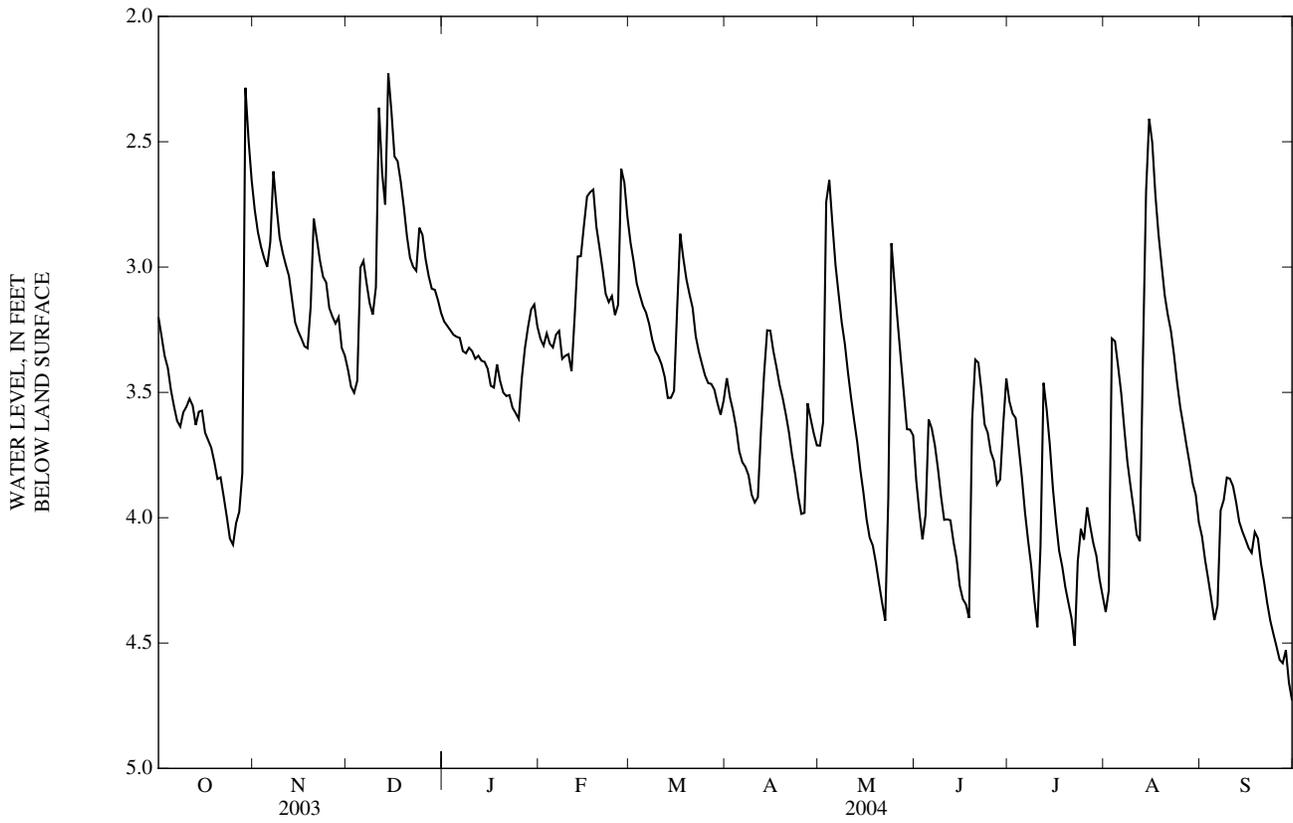
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.20	2.77	3.41	3.22	3.29	2.90	3.44	3.71	3.85	3.54	4.38	4.07
2	3.28	2.86	3.48	3.23	3.31	2.98	3.52	3.62	3.98	3.58	4.29	4.17
3	3.36	2.92	3.50	3.25	3.26	3.07	3.57	2.74	4.09	3.60	3.28	4.24
4	3.40	2.96	3.45	3.27	3.31	3.11	3.64	2.65	3.99	3.72	3.30	4.32
5	3.49	3.00	3.00	3.28	3.32	3.15	3.73	2.83	3.61	3.84	3.40	4.41
6	3.56	2.90	2.98	3.28	3.27	3.18	3.78	2.99	3.64	3.98	3.50	4.35
7	3.61	2.62	3.06	3.34	3.25	3.23	3.80	3.11	3.71	4.09	3.65	3.97
8	3.64	2.76	3.14	3.34	3.37	3.29	3.83	3.22	3.81	4.19	3.78	3.93
9	3.58	2.88	3.19	3.32	3.35	3.33	3.91	3.31	3.92	4.33	3.87	3.84
10	3.56	2.94	3.08	3.34	3.35	3.36	3.94	3.42	4.01	4.44	3.97	3.84
11	3.53	2.99	2.36	3.37	3.42	3.39	3.92	3.52	4.01	4.12	4.07	3.87
12	3.55	3.04	2.62	3.35	3.20	3.44	3.65	3.61	4.01	3.46	4.09	3.94
13	3.63	3.13	2.75	3.37	2.96	3.52	3.43	3.70	4.10	3.57	3.36	4.02
14	3.58	3.22	2.23	3.38	2.96	3.52	3.25	3.81	4.17	3.71	2.70	4.05
15	3.57	3.26	2.38	3.41	2.83	3.49	3.25	3.90	4.27	3.88	2.41	4.09
16	3.66	3.28	2.56	3.47	2.72	3.17	3.34	4.01	4.32	4.02	2.50	4.12
17	3.69	3.32	2.58	3.48	2.70	2.87	3.40	4.08	4.35	4.13	2.71	4.14
18	3.72	3.32	2.66	3.39	2.69	2.97	3.47	4.11	4.40	4.20	2.87	4.06
19	3.78	3.16	2.76	3.45	2.84	3.05	3.52	4.18	3.61	4.28	2.99	4.08
20	3.85	2.81	2.88	3.50	2.92	3.11	3.59	4.26	3.37	4.34	3.11	4.18
21	3.84	2.89	2.96	3.51	3.01	3.16	3.66	4.34	3.38	4.40	3.19	4.26
22	3.92	2.97	3.00	3.51	3.11	3.28	3.75	4.41	3.49	4.51	3.25	4.34
23	4.00	3.04	3.02	3.56	3.14	3.34	3.83	3.92	3.63	4.17	3.35	4.41
24	4.08	3.06	2.84	3.58	3.12	3.39	3.91	2.90	3.66	4.04	3.46	4.46
25	4.11	3.16	2.87	3.61	3.19	3.43	3.98	3.07	3.74	4.09	3.56	4.51
26	4.02	3.20	2.97	3.44	3.15	3.46	3.98	3.22	3.77	3.96	3.63	4.57
27	3.98	3.23	3.04	3.32	2.61	3.47	3.54	3.36	3.87	4.03	3.71	4.58
28	3.82	3.20	3.09	3.24	2.66	3.49	3.61	3.50	3.85	4.10	3.78	4.53
29	2.28	3.32	3.09	3.17	2.80	3.54	3.66	3.65	3.63	4.15	3.86	4.66
30	2.49	3.35	3.13	3.15	---	3.59	3.71	3.65	3.44	4.24	3.91	4.73
31	2.65	---	3.18	3.24	---	3.53	---	3.67	---	4.31	4.02	---

WTR YR 2004 MEAN 3.51 HIGH 2.23 LOW 4.73

GROUND-WATER LEVELS

PITT COUNTY—Continued

353219077153801. Local number, NC-160; County number, PI-532.

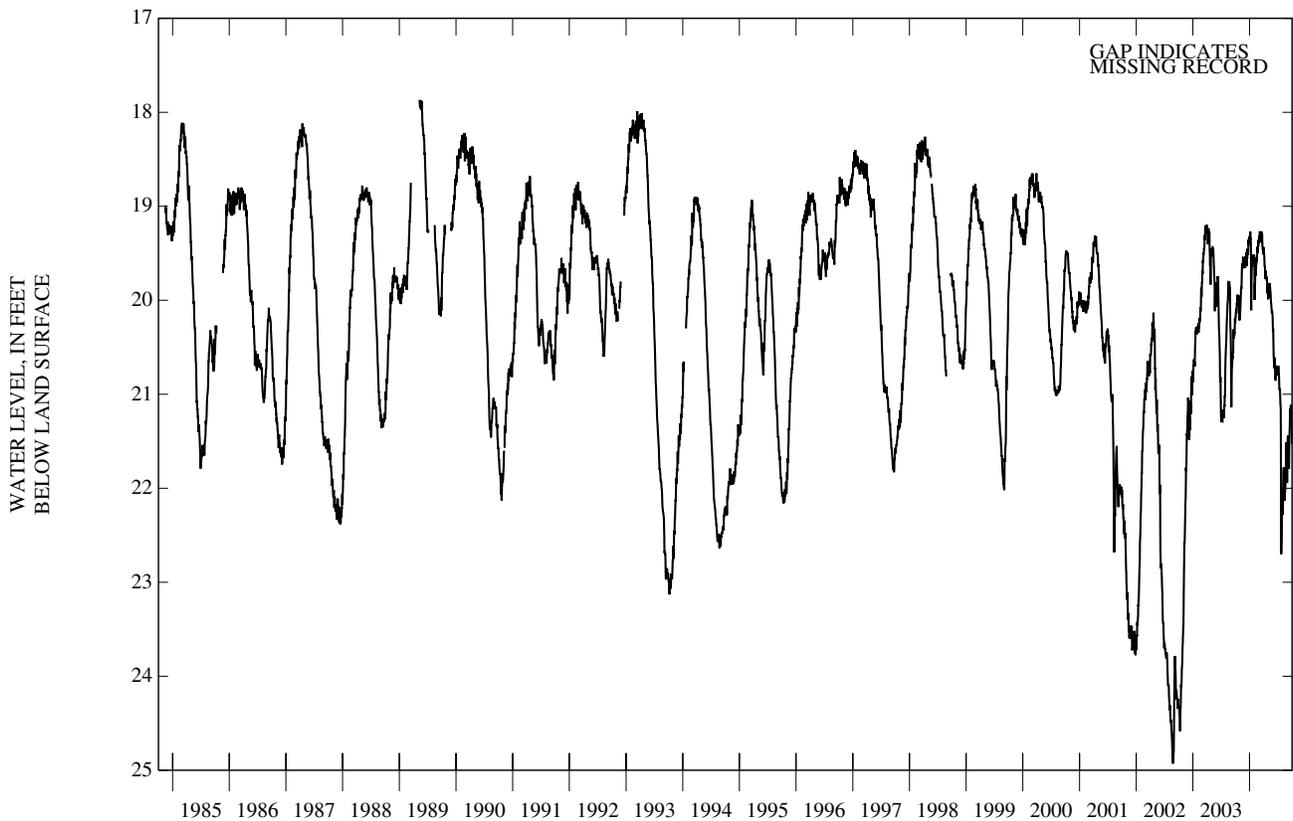
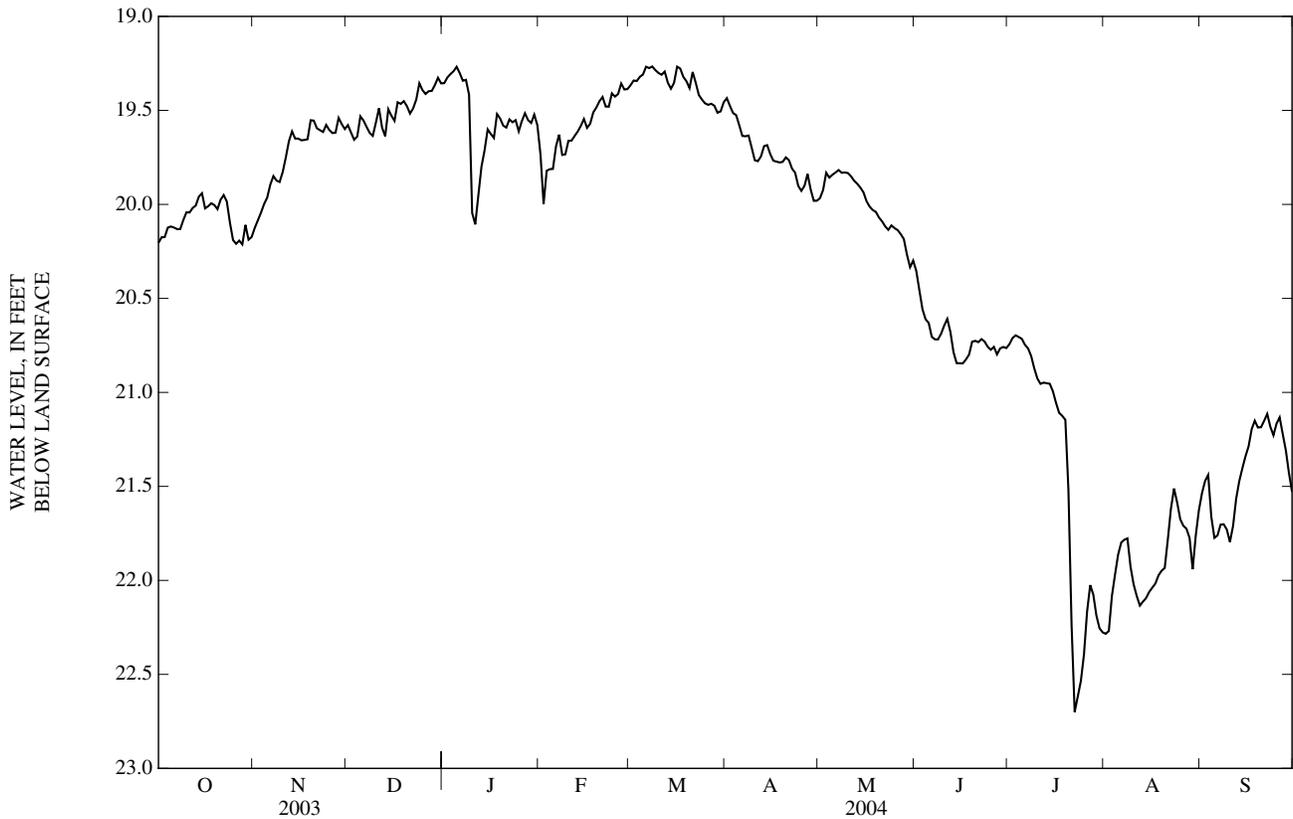




GROUND-WATER LEVELS

PITT COUNTY—Continued

353146077193403. Local number, NC-184; DENR Conley Research Station well N23p3; County number, PI-536.

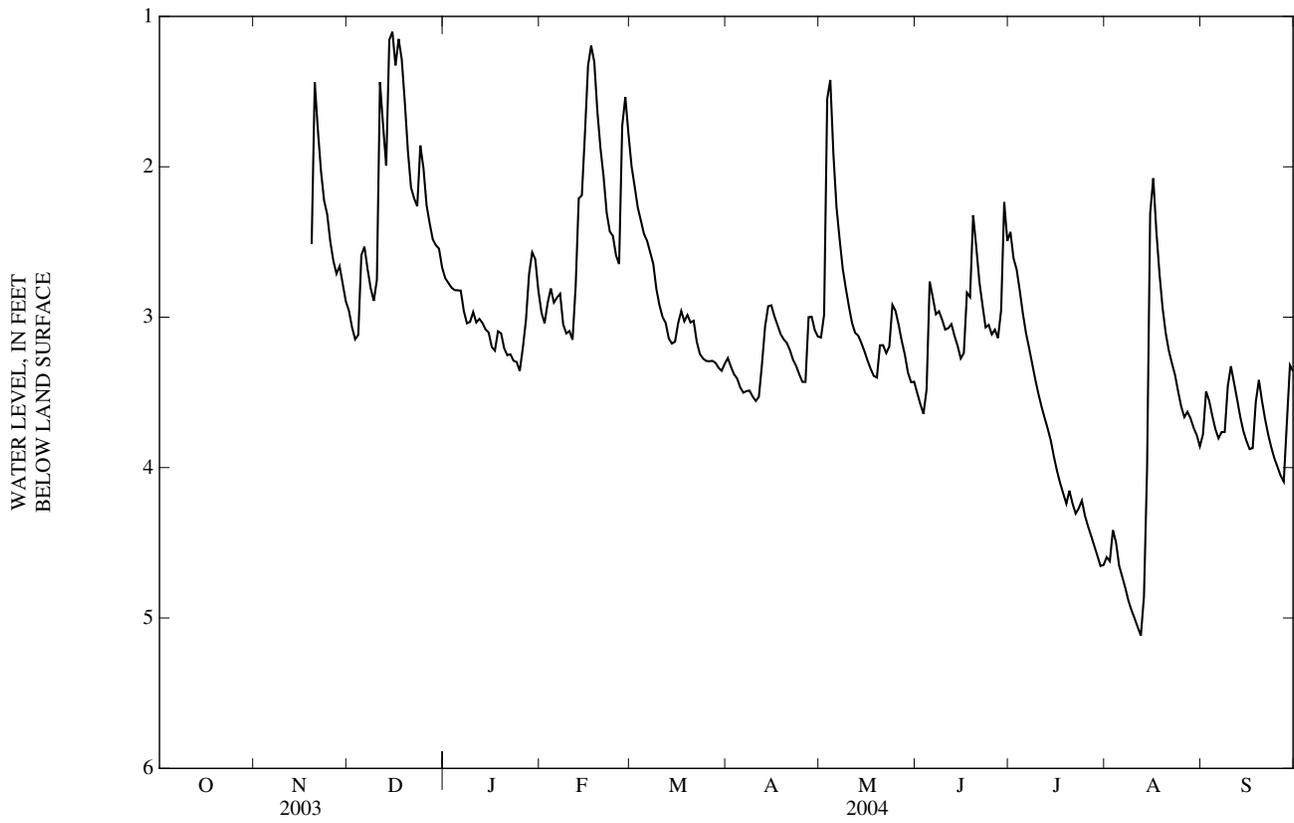




GROUND-WATER LEVELS

PITT COUNTY—Continued

353143077303501. County number, PI-614; Ballard's Crossroads well.



353143077303501 County number, PI-614; Ballard's Crossroads well—Continued

PRECIPITATION RECORDS

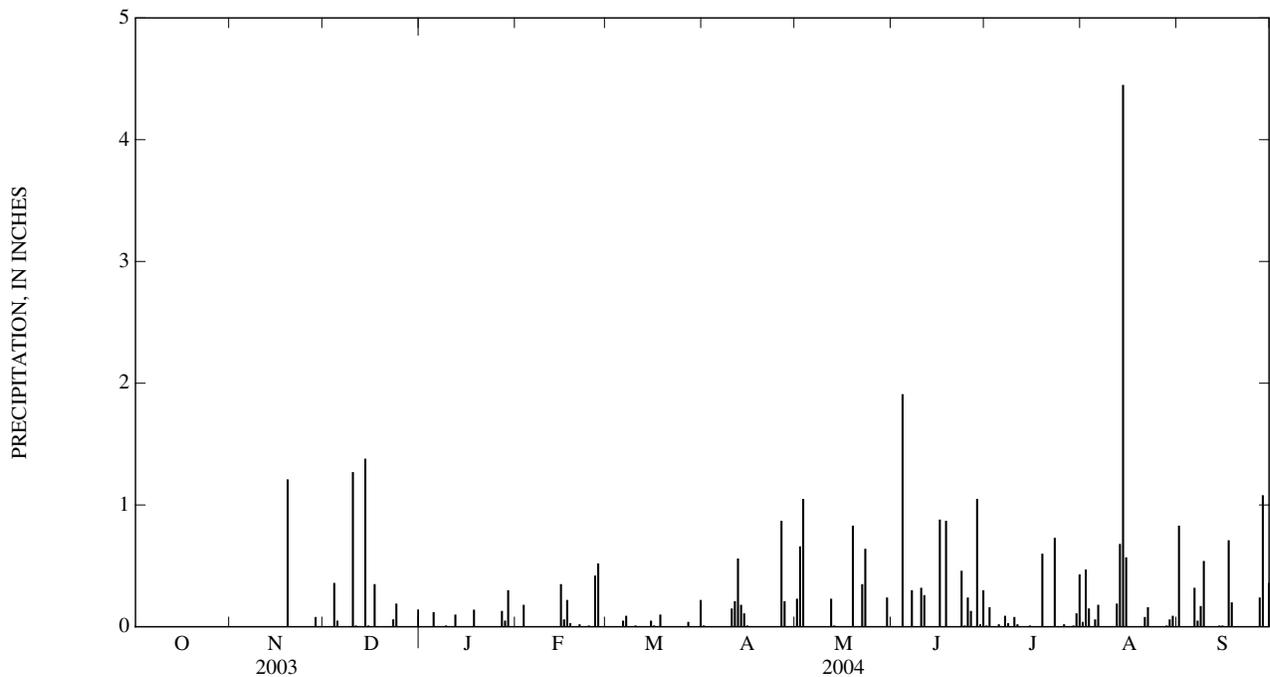
PERIOD OF RECORD.--November 2003 to September 2004.

GAGE.--Tipping-bucket raingage collecting data at 15-minute intervals. Satellite telemetry at station.

REMARKS.--Gage is operated as part of a U.S. Geological Survey Ground-water Resources Program recharge study. Precipitation data collected during freezing periods may not be accurately reflected in daily record; consequently, winter record is poor.

PRECIPITATION, TOTAL, INCHES  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	0.00	0.00	0.00	0.00	0.01	0.23	0.00	0.01	0.04	0.83
2	---	---	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.16	0.47	0.00
3	---	---	0.00	0.00	0.18	0.00	0.00	1.05	0.00	0.00	0.15	0.00
4	---	---	0.36	0.00	0.00	0.00	0.00	0.00	1.91	0.00	0.00	0.00
5	---	---	0.05	0.12	0.00	0.00	0.00	0.00	0.00	0.02	0.06	0.00
6	---	---	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.18	0.32
7	---	---	0.00	0.00	0.00	0.09	0.00	0.00	0.30	0.09	0.00	0.05
8	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.17
9	---	---	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54
10	---	---	1.27	0.00	0.00	0.01	0.15	0.00	0.32	0.08	0.00	0.00
11	---	---	0.01	0.00	0.00	0.00	0.21	0.00	0.26	0.02	0.00	0.00
12	---	---	0.00	0.10	0.00	0.00	0.56	0.23	0.00	0.00	0.19	0.00
13	---	---	0.00	0.00	0.00	0.00	0.18	0.01	0.00	0.00	0.68	0.00
14	---	---	1.38	0.00	0.00	0.00	0.11	0.00	0.00	0.00	4.45	0.01
15	---	---	0.01	0.00	0.35	0.05	0.01	0.00	0.00	0.01	0.57	0.01
16	---	---	0.00	0.00	0.06	0.01	0.00	0.00	0.88	0.00	0.00	0.00
17	---	---	0.35	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.71
18	---	---	0.00	0.14	0.03	0.10	0.00	0.00	0.87	0.00	0.00	0.20
19	---	1.21	0.00	0.00	0.00	0.00	0.00	0.83	0.00	0.60	0.00	0.00
20	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	---	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.08	0.00
22	---	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.16	0.00
23	---	0.00	0.06	0.00	0.00	0.00	0.00	0.64	0.46	0.73	0.00	0.00
24	---	0.00	0.19	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00
25	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00
26	---	0.00	0.00	0.00	0.42	0.00	0.87	0.00	0.13	0.02	0.00	0.00
27	---	0.00	0.00	0.13	0.52	0.04	0.21	0.00	0.00	0.00	0.00	0.24
28	---	0.08	0.00	0.05	0.00	0.00	0.00	0.00	1.05	0.00	0.01	1.08
29	---	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.02	0.01	0.06	0.00
30	---	0.00	0.00	0.00	---	0.00	0.00	0.24	0.30	0.11	0.09	0.36
31	---	---	0.00	0.00	---	0.22	---	0.00	---	0.43	0.00	---
TOTAL	---	---	3.68	0.85	1.81	0.57	2.31	4.24	6.75	2.32	7.19	4.52



## GROUND-WATER LEVELS

## ROBESON COUNTY

343840078550009. Local number, NC-177; DENR Littlefield School Research Station well Y42f9; County number, RB-183.

LOCATION.--Lat 34°38'40", long 78°54'58", Hydrologic Unit 03040203, 6 mi east of Lumberton on State Highway 41 at Littlefield School. Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Upper Cape Fear aquifer of Late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation well, depth 468 ft; diameter 6 in. to 348 ft, diameter 4 in. from 348 to 468 ft; screened intervals from 390 to 395 ft, 429 to 434 ft, and 444 to 449 ft; measured depth 462 ft, December 1987.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals.

DATUM.--Land-surface datum is 140.8 ft above NGVD of 1929. Measuring point: Top of instrument shelf, 1.40 ft above land-surface datum.

REMARKS.--Well is part of areal-effects network. Records prior to July 1985 are from Littlefield School Research Station well Y42f3 which was adjacent to and of similar construction to well Y42f9. Well Y42f3 was destroyed in September 1987.

PERIOD OF RECORD.--October 1970 to July 2004 (discontinued). Periodic water level measurements June 1981 to February 2000. Continuous record March 2000 to July 2004. Records for well Y42f3 from October 1970 to June 1985 are unpublished and available in the files of the Division of Water Quality, DENR.

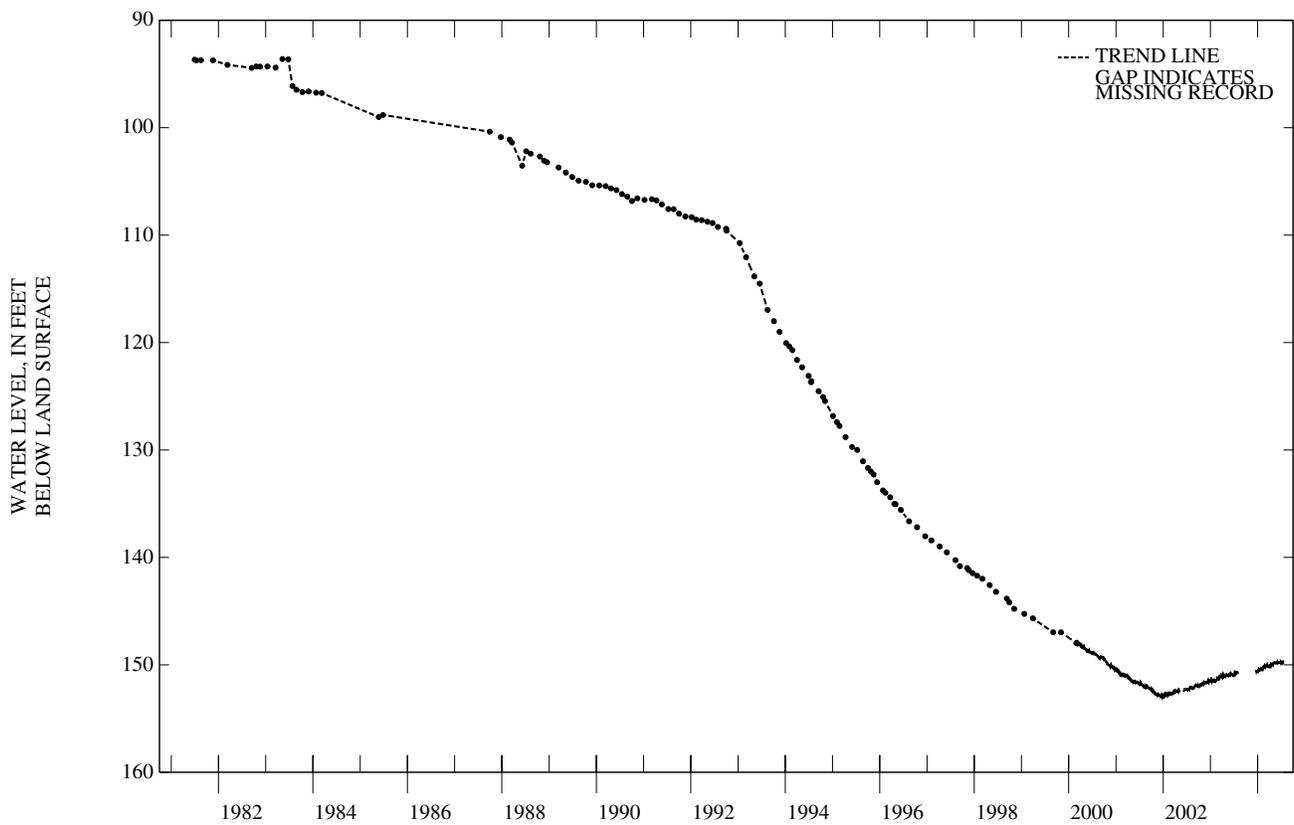
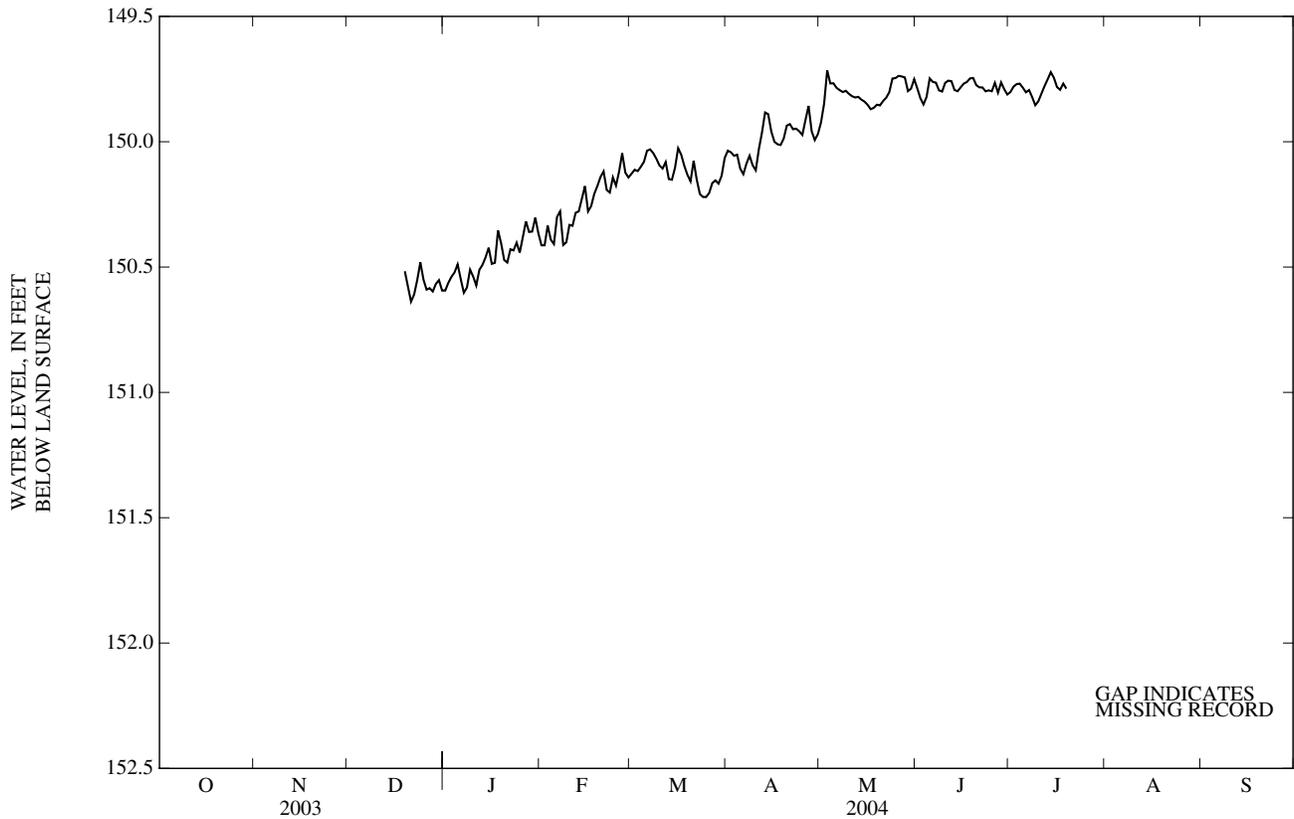
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 76.40 ft below land-surface datum, Jan. 5, 1971; lowest water level recorded, 153.02 ft below land-surface datum, Jan. 2, 2002.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	150.59	150.41	150.13	150.04	149.92	149.79	149.80	---	---
2	---	---	---	150.56	150.41	150.11	150.04	149.85	149.83	149.78	---	---
3	---	---	---	150.54	150.34	150.12	150.06	149.72	149.85	149.77	---	---
4	---	---	---	150.52	150.39	150.10	150.05	149.77	149.82	149.77	---	---
5	---	---	---	150.49	150.41	150.08	150.11	149.77	149.75	149.78	---	---
6	---	---	---	150.55	150.30	150.04	150.13	149.78	149.76	149.80	---	---
7	---	---	---	150.60	150.28	150.03	150.09	149.79	149.76	149.79	---	---
8	---	---	---	150.58	150.41	150.05	150.06	149.80	149.79	149.82	---	---
9	---	---	---	150.51	150.40	150.07	150.09	149.80	149.80	149.85	---	---
10	---	---	---	150.54	150.33	150.09	150.11	149.81	149.76	149.84	---	---
11	---	---	---	150.57	150.34	150.11	150.03	149.82	149.76	149.81	---	---
12	---	---	---	150.51	150.28	150.08	149.96	149.82	149.76	149.78	---	---
13	---	---	---	150.49	150.28	150.15	149.88	149.82	149.79	149.75	---	---
14	---	---	---	150.46	150.23	150.15	149.89	149.83	149.80	149.72	---	---
15	---	---	---	150.42	150.18	150.10	149.96	149.84	149.78	149.75	---	---
16	---	---	---	150.49	150.28	150.03	150.00	149.85	149.77	149.78	---	---
17	---	---	---	150.48	150.26	150.05	150.01	149.87	149.76	149.79	---	---
18	---	---	---	150.35	150.21	150.10	150.01	149.86	149.75	149.77	---	---
19	---	---	150.52	150.40	150.18	150.13	149.99	149.85	149.75	149.79	---	---
20	---	---	150.58	150.47	150.14	150.16	149.94	149.85	149.77	---	---	---
21	---	---	150.64	150.48	150.12	150.08	149.93	149.84	149.78	---	---	---
22	---	---	150.61	150.43	150.19	150.15	149.95	149.82	149.78	---	---	---
23	---	---	150.55	150.43	150.20	150.21	149.95	149.80	149.80	---	---	---
24	---	---	150.48	150.40	150.14	150.22	149.96	149.75	149.79	---	---	---
25	---	---	150.55	150.44	150.18	150.22	149.97	149.75	149.80	---	---	---
26	---	---	150.59	150.38	150.12	150.20	149.91	149.74	149.77	---	---	---
27	---	---	150.58	150.32	150.05	150.16	149.86	149.74	149.80	---	---	---
28	---	---	150.60	150.36	150.12	150.15	149.96	149.74	149.76	---	---	---
29	---	---	150.57	150.36	150.14	150.17	149.99	149.80	149.79	---	---	---
30	---	---	150.55	150.30	---	150.14	149.97	149.79	149.81	---	---	---
31	---	---	150.59	150.37	---	150.06	---	149.75	---	---	---	---
WTR YR	2004	MEAN	150.07	HIGH	149.72	LOW	150.64					

ROBESON COUNTY—Continued

343840078550009. Local number, NC-177; DENR Littlefield School Research Station well Y42f9; County number, RB-183.



GROUND-WATER LEVELS

ROCKINGHAM COUNTY

362335079421701. County number, RK-157; DENR Upper Piedmont Research Station PZ-1.

LOCATION.--Lat 36°23'35", long 79°42'17", Hydrologic Unit 03010103, .6 mi north of Wentworth St, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 50 ft, diameter 2 in., cased to 40 ft, screened interval from 40 ft to 50 ft, sand filter packed from 38 ft to 50 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 675.95 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.33 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--June 2003 to September 2004.

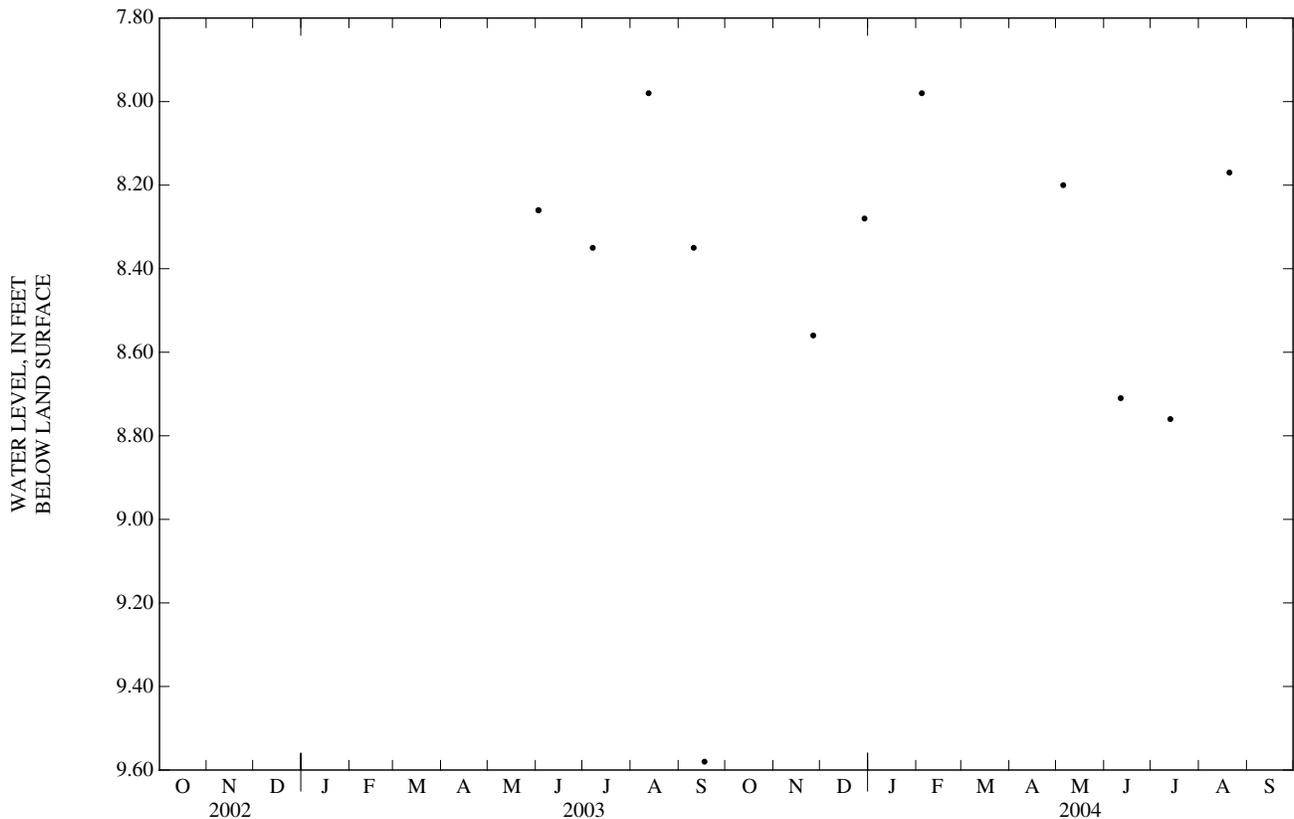
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.98 ft below land-surface datum, Aug. 12, 2003, Feb. 4, 2004; lowest water level measured 9.58 ft below land-surface datum, Sept. 12, 2003.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DATE	WATER LEVEL										
JUN 02	8.26	JUN 02	8.26	JUL 07	8.35	AUG 12	7.98	SEP 10	8.35	SEP 17	9.58

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL						
NOV 26	8.56	FEB 04	7.98	JUN 11	8.71	AUG 20	8.17
DEC 29	8.28	MAY 05	8.20	JUL 13	8.76		



ROCKINGHAM COUNTY--Continued

362334079421601. County number, RK-227; DENR Upper Piedmont Research Station MW-N1S (Regolith well).

LOCATION.--Lat 36°23'35", long 79°42'17", Hydrologic Unit 03010103, .6 mi north of Wentworth St, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 15 ft, diameter 4 in., cased to 5 ft, screened interval from 5 ft to 15 ft, sand filter packed from 4 ft to 15 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 672.76 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.85 ft above land-surface datum.

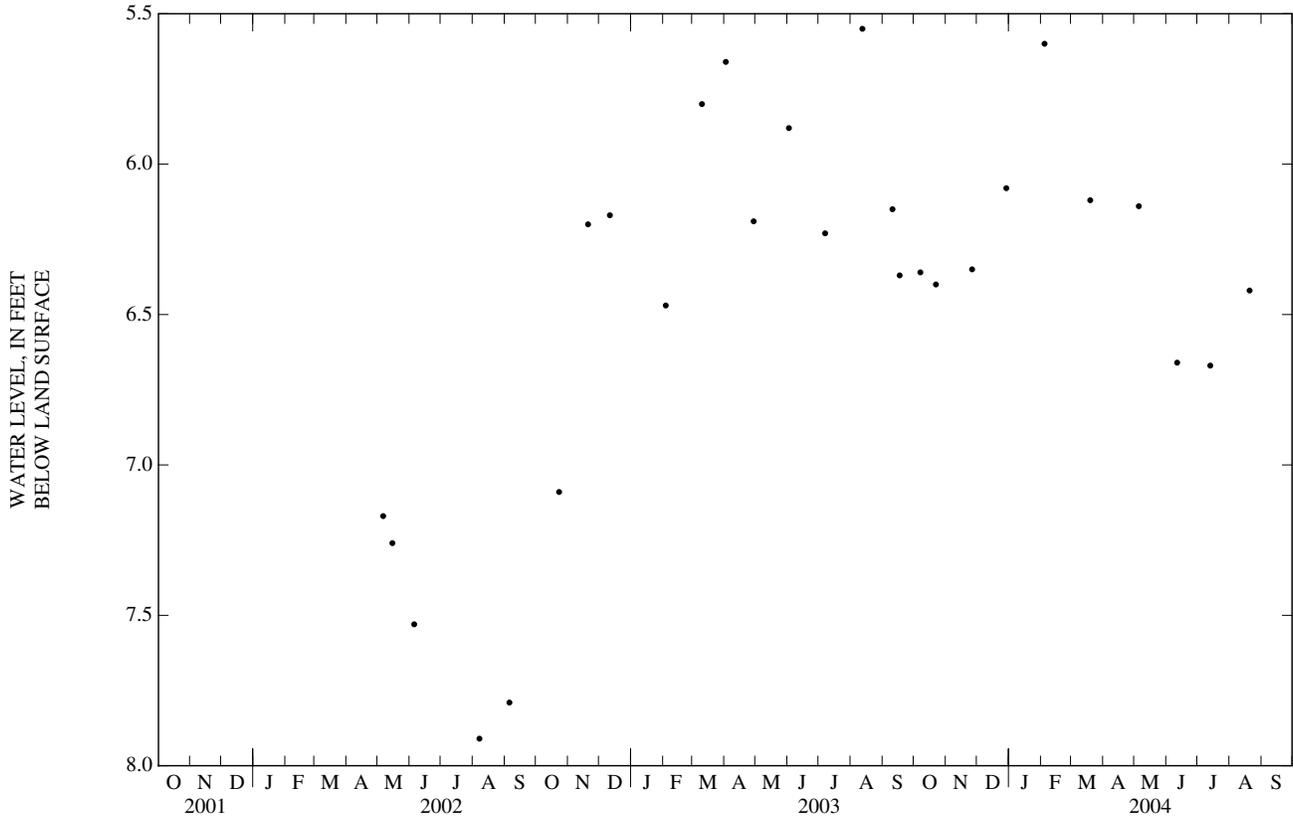
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--May 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.55 ft below land-surface datum, Aug. 12, 2003; lowest water level measured 7.91 ft below land-surface datum, Aug. 7, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL								
OCT 07	6.36	NOV 26	6.35	FEB 04	5.60	MAY 05	6.14	JUL 13	6.67
22	6.40	DEC 29	6.08	MAR 19	6.12	JUN 11	6.66	AUG 20	6.42



GROUND-WATER LEVELS  
ROCKINGHAM COUNTY—Continued

362334079421602. County number, RK-228; DENR Upper Piedmont Research Station MW-N11 (Transition Zone well).

LOCATION.--Lat 36°23'35", long 79°42'17", Hydrologic Unit 03010103, .6 mi north of Wentworth Street, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 65 ft, diameter 4 in., cased to 50 ft, screened interval from 50 ft to 65 ft, sand filter packed from 20 ft to 50 ft, natural fill from 50 ft to 65 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 672.27 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.81 ft above land-surface datum.

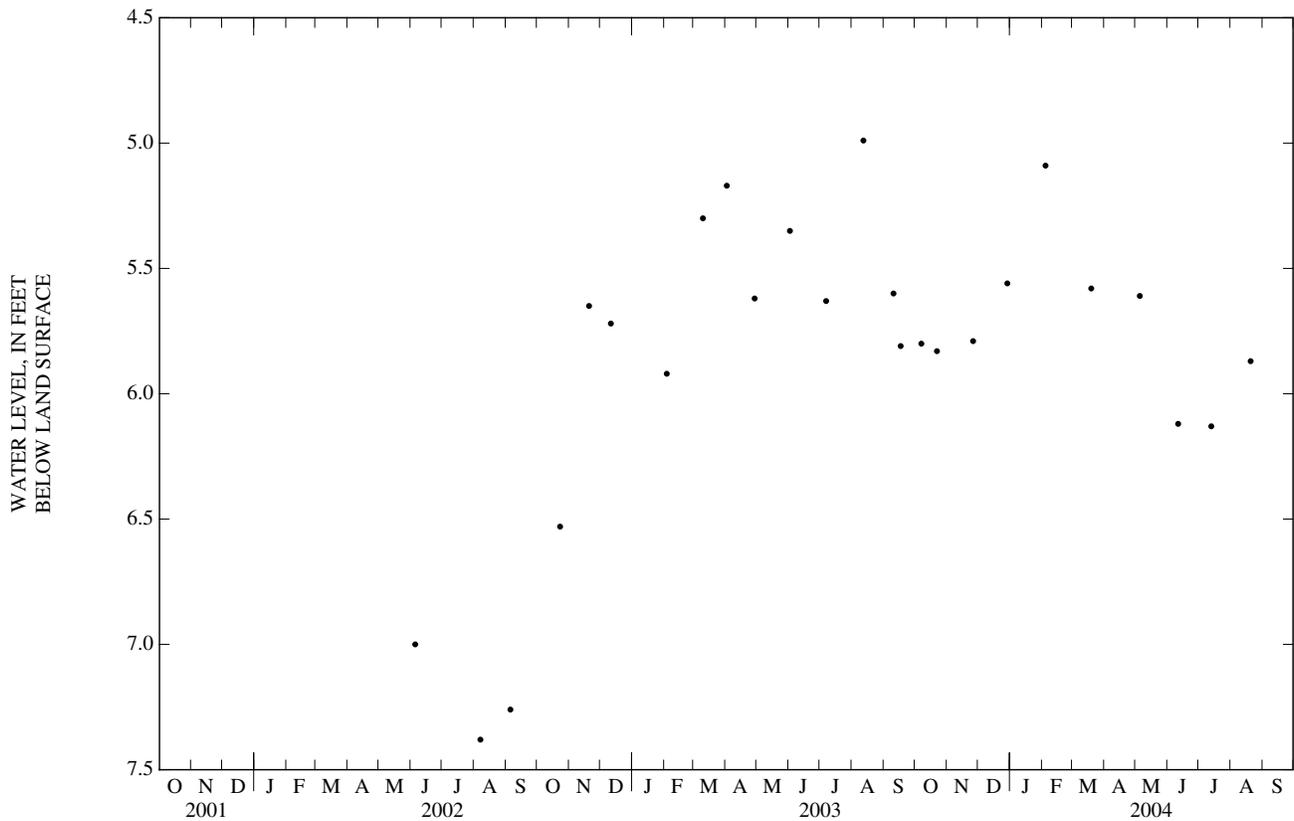
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--May 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.99 ft below land-surface datum, Aug. 12, 2003; lowest water level measured 7.38 ft below land-surface datum, Aug. 7, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL								
OCT 07	5.80	NOV 26	5.79	FEB 04	5.09	MAY 05	5.61	JUL 13	6.13
22	5.83	DEC 29	5.56	MAR 19	5.58	JUN 11	6.12	AUG 20	5.87



ROCKINGHAM COUNTY—Continued

362334079421603. County number, RK-229; DENR Upper Piedmont Research Station MW-N1D (Bedrock well).

LOCATION.--Lat 36°23'35", long 79°42'17", Hydrologic Unit 03010103, .6 mi north of Wentworth Street, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Biotite Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 300 ft, diameter 6 in., cased to 100 ft, open hole from 100 ft to 300 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 672.51 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.90 ft above land-surface datum.

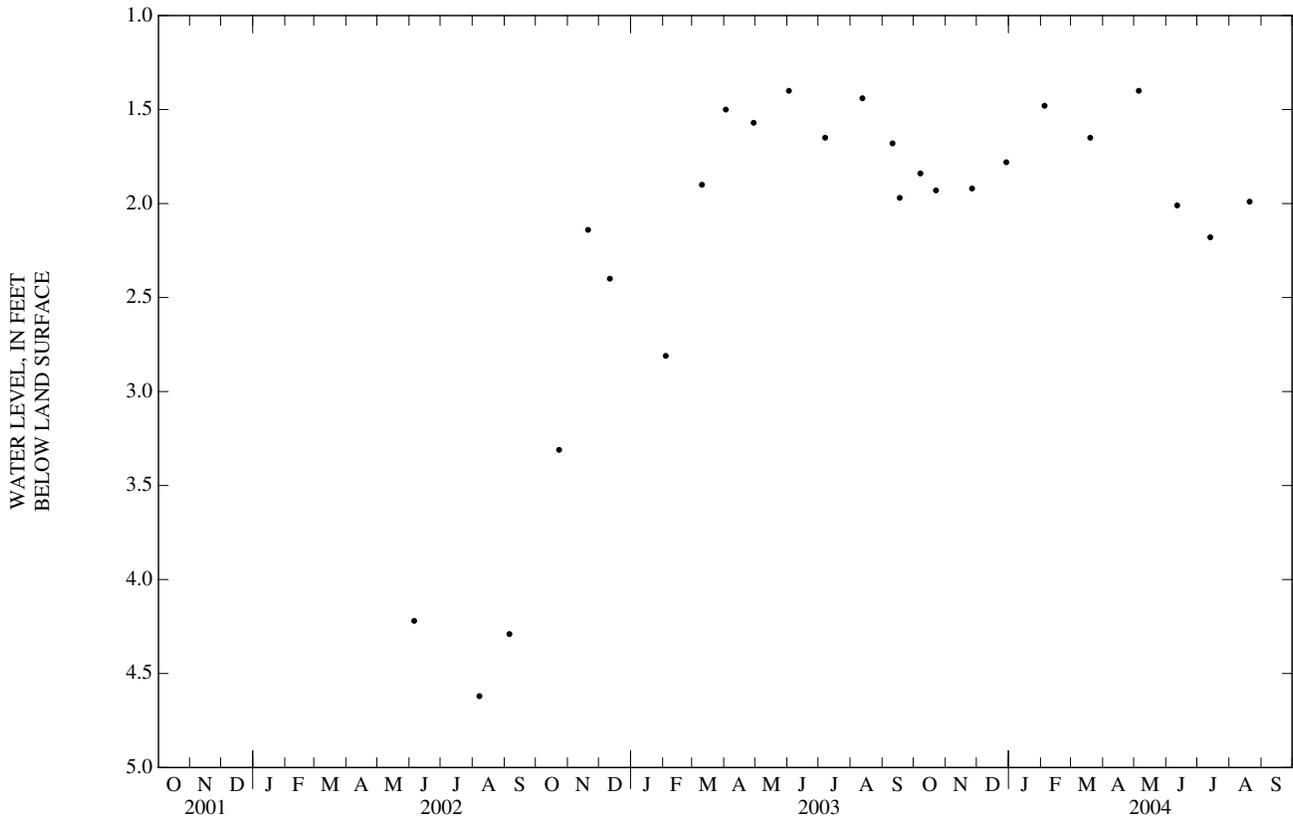
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--May 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.40 ft below land-surface datum, June 2, 2003, May 5, 2004; lowest water level measured 4.62 ft below land-surface datum, Aug. 7, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL								
OCT 07	1.84	NOV 26	1.92	FEB 04	1.48	MAY 05	1.40	JUL 13	2.18
22	1.93	DEC 29	1.78	MAR 19	1.65	JUN 11	2.01	AUG 20	1.99



GROUND-WATER LEVELS

ROCKINGHAM COUNTY—Continued

362331079421601. County number, RK-230; DENR Upper Piedmont Research Station MW-N2S (Regolith well).

LOCATION.--Lat 36°23'32", long 79°42'17", Hydrologic Unit 03010103, .6 mi north of Wentworth Street, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 13 ft, diameter 4 in., cased to 3 ft, screened interval from 3 ft to 13 ft, sand filter packed from 3 ft to 13 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 672.48 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.41 ft above land-surface datum.

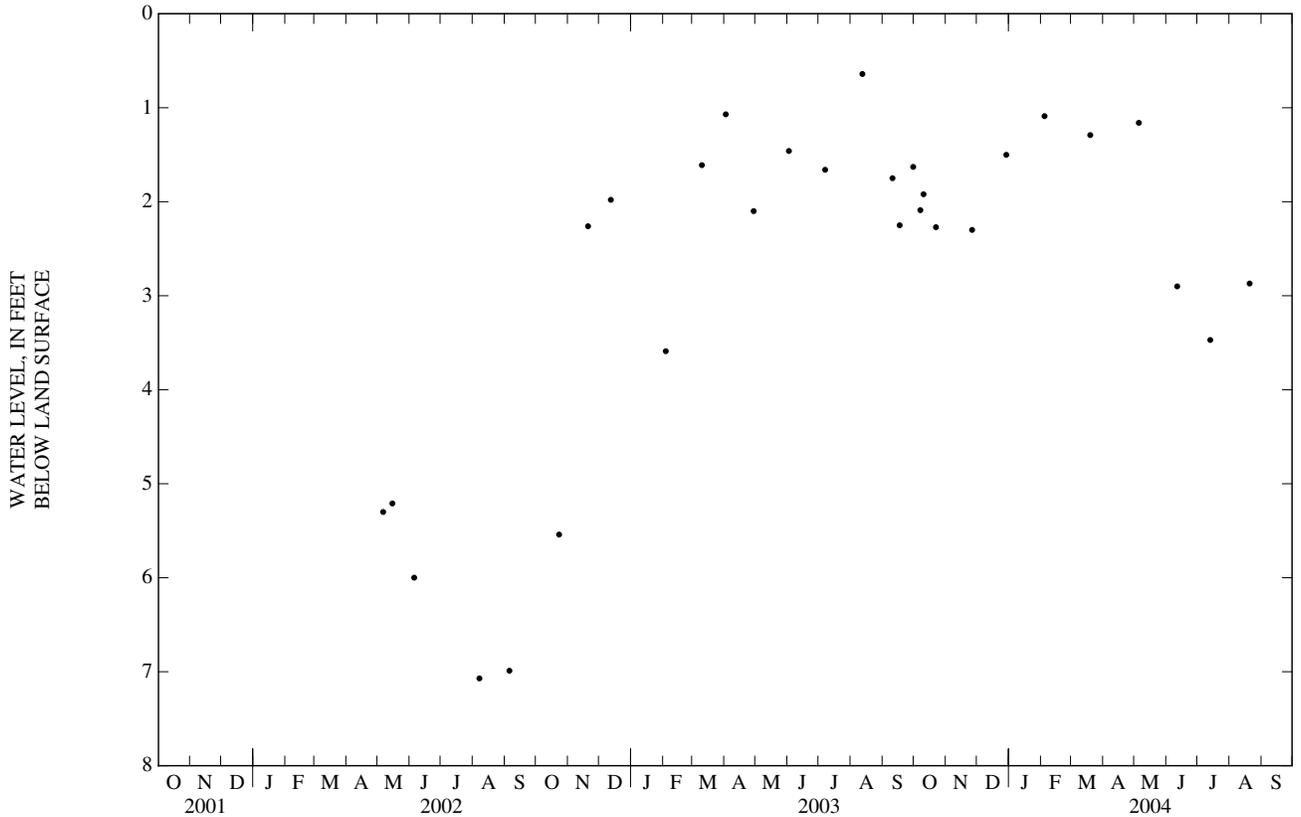
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--May 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.64 ft below land-surface datum, Aug. 12, 2003; lowest water level measured 7.07 ft below land-surface datum, Aug. 7, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 07	2.09	OCT 22	2.27	DEC 29	1.50	MAR 19	1.29	JUN 11	2.90	AUG 20	2.87
10	1.92	NOV 26	2.30	FEB 04	1.09	MAY 05	1.16	JUL 13	3.47		



ROCKINGHAM COUNTY—Continued

362331079421602. County number, RK-231; DENR Upper Piedmont Research Station MW-N2I (Transition Zone well).

LOCATION.--Lat 36°23'32", long 79°42'16", Hydrologic Unit 03010103, .6 mi north of Wentworth Street, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 50 ft, diameter 4 in., cased to 25 ft, open hole from 25 ft to 50 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 671.56 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.99 ft above land-surface datum.

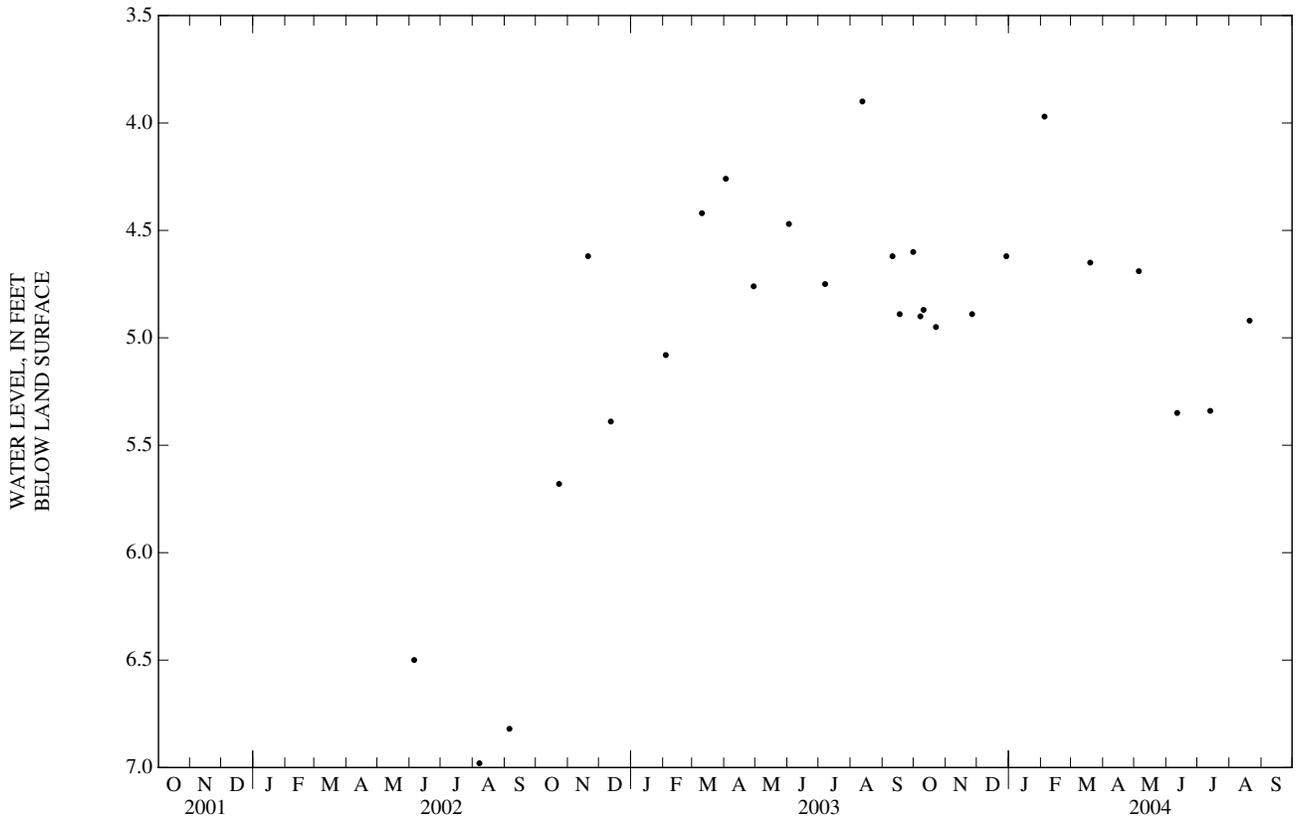
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--June 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.90 ft below land-surface datum, Aug. 12, 2003; lowest water level measured, 6.98 ft below land-surface datum, Aug. 7, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 07	4.90	OCT 22	4.95	DEC 29	4.62	MAR 19	4.65	JUN 11	5.35	AUG 20	4.92
10	4.87	NOV 26	4.89	FEB 04	3.97	MAY 05	4.69	JUL 13	5.34		



GROUND-WATER LEVELS  
ROCKINGHAM COUNTY—Continued

362331079421603. County number, RK-232; DENR Upper Piedmont Research Station MW-N2D (Bedrock well).

LOCATION.--Lat 36°23'32", long 79°42'17", Hydrologic Unit 03010103, .6 mi north of Wentworth Street, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Biotite Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 300 ft, diameter 4 in., cased to 60 ft, open hole from 60 ft to 300 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 671.91 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 3.05 ft above land-surface datum.

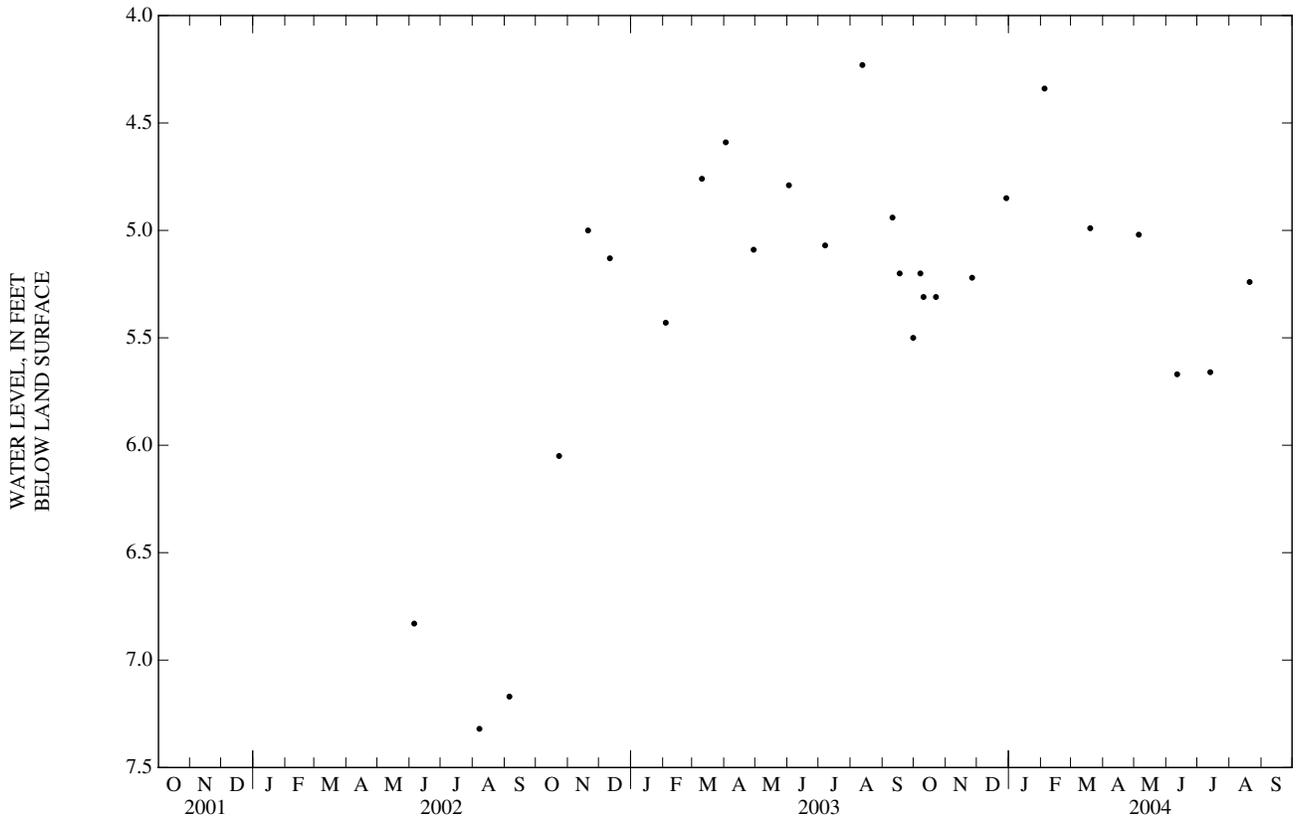
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--June 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.23 ft below land-surface datum, Aug. 12, 2003; lowest water level measured 7.32 ft below land-surface datum, Aug. 7, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 07	5.20	OCT 22	5.31	DEC 29	4.85	MAR 19	4.99	JUN 11	5.67	AUG 20	5.24
10	5.31	NOV 26	5.22	FEB 04	4.34	MAY 05	5.02	JUL 13	5.66		



ROCKINGHAM COUNTY—Continued

362328079421701. County number, RK-233; DENR Upper Piedmont Research Station MW-N3I (Transition Zone well).

LOCATION.--Lat 36°23'28", long 79°42'17", Hydrologic Unit 03010103, .6 mi north of Wentworth Street, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 30 ft, diameter 4 in., cased to 15 ft, screened interval from 25 ft to 50 ft, sand filter packed from 12 ft to 30 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 770.44 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.20 ft above land-surface datum.

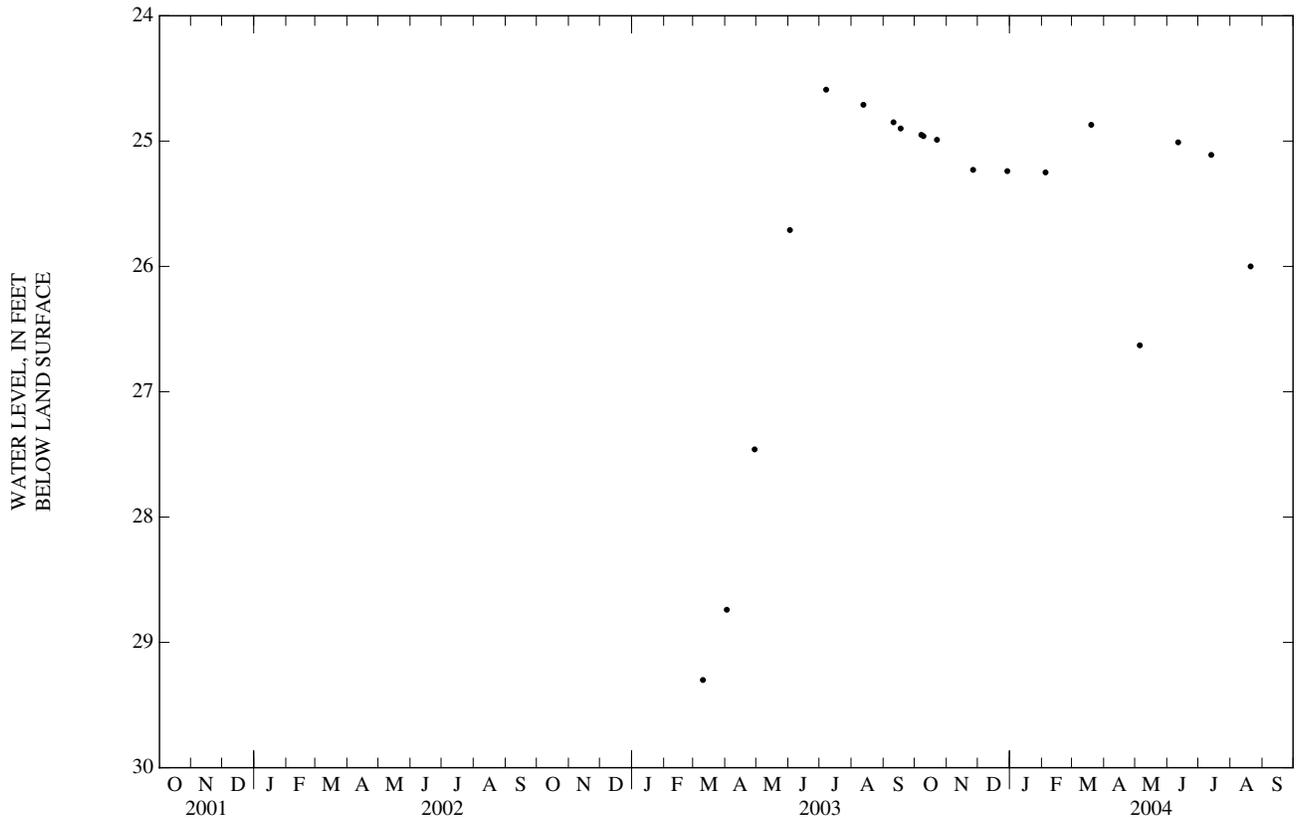
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--August 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 24.59 ft below land-surface datum, July 7, 2003; lowest water level measured 29.30 ft below land-surface datum, Mar. 10, 2003.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 07	24.95	OCT 22	24.99	DEC 29	25.24	MAR 19	24.87	JUN 11	25.01	AUG 20	26.00
09	24.96	NOV 26	25.23	FEB 04	25.25	MAY 05	26.63	JUL 13	25.11		



GROUND-WATER LEVELS  
ROCKINGHAM COUNTY—Continued

362328079421702. County number, RK-234; DENR Upper Piedmont Research Station MW-N3D (Bedrock well).

LOCATION.--Lat 36°23'28", long 79°42'17", Hydrologic Unit 03010103, .6 mi north of Wentworth Street, .6 mi west of State Highway 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Biotite Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 260 ft, diameter 6 in., cased to 40 ft, open hole from 40 ft to 300 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 770.26 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.26 ft above land-surface datum.

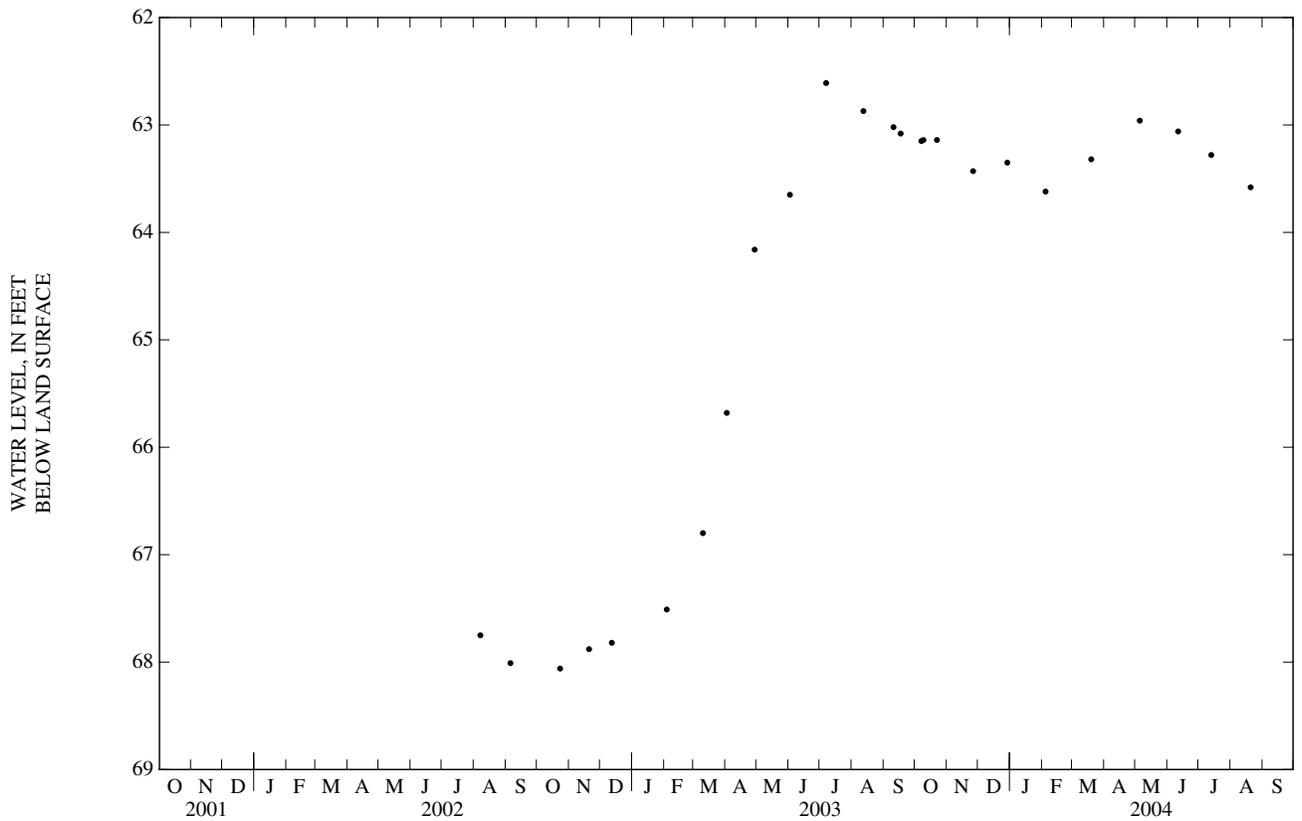
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--August 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 62.61 ft below land-surface datum, July 7, 2003; lowest water level measured 68.06 ft below land-surface datum, Oct. 23, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 07	63.15	OCT 22	63.14	DEC 29	63.35	MAR 19	63.32	JUN 11	63.06	AUG 20	63.58
09	63.14	NOV 26	63.43	FEB 04	63.62	MAY 05	62.96	JUL 13	63.28		



ROCKINGHAM COUNTY—Continued

362323079421201. County number, RK-235; DENR Upper Piedmont Research Station MW-N4I (Transition Zone well).

LOCATION.--Lat 36°23'23", long 79°42'13", Hydrologic Unit 03010103, .6 mi north of Wentworth Street, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 70 ft, diameter 4 in., cased to 44 ft, open hole from 44 ft to 70 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 839.63 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.80 ft above land-surface datum.

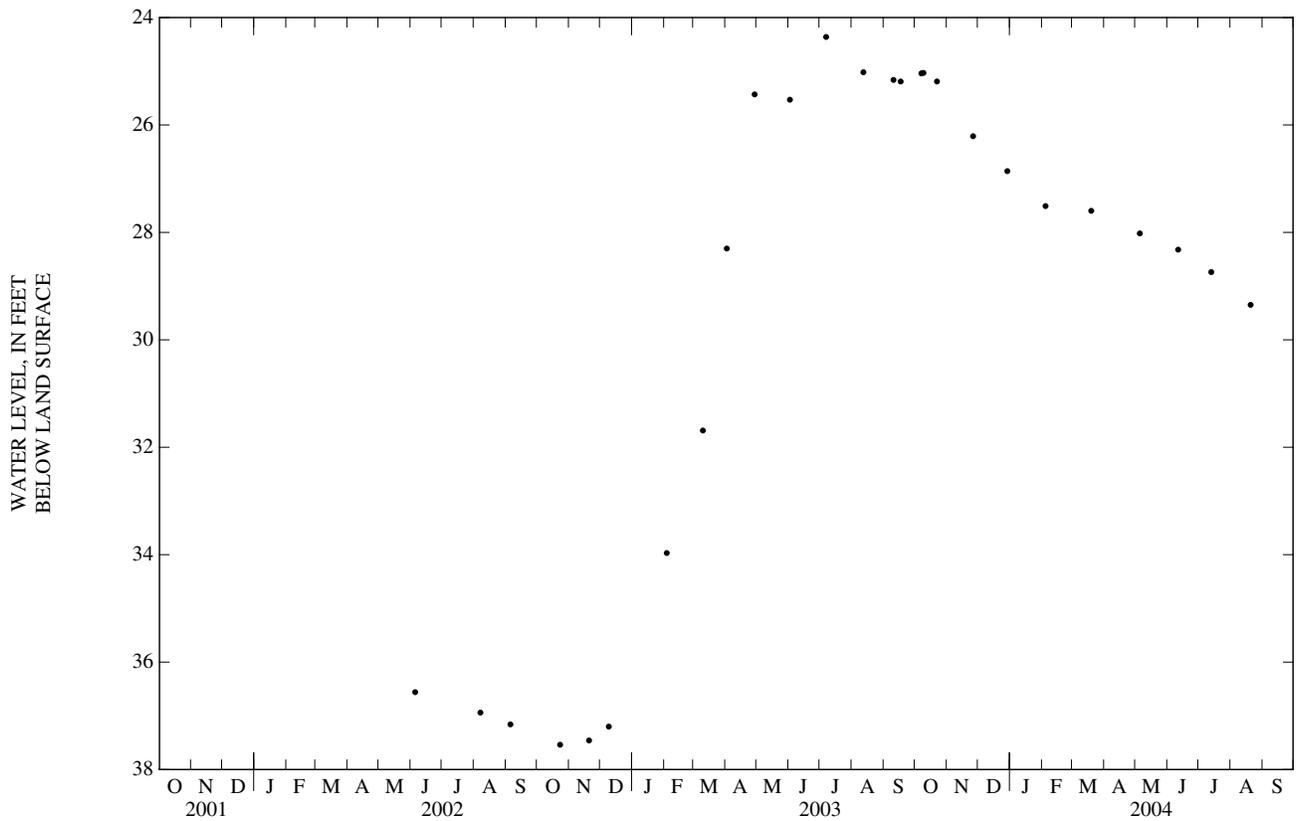
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--June 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 24.36 ft below land-surface datum, July 7, 2003; lowest water level measured 37.54 ft below land-surface datum, Oct. 23, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 07 09	25.04 25.03	OCT 22 NOV 26	25.19 26.21	DEC 29 FEB 04	26.86 27.51	MAR 19 MAY 05	27.60 28.02	JUN 11 JUL 13	28.32 28.74	AUG 20	29.35
WATER YEAR 2004		HIGHEST	25.03	OCT 09, 2003	LOWEST	29.35	AUG 20, 2004				



GROUND-WATER LEVELS  
ROCKINGHAM COUNTY—Continued

362323079421202. County number, RK-236; DENR Upper Piedmont Research Station MW-N4D (Bedrock well).

LOCATION.--Lat 36°23'23", long 79°42'13", Hydrologic Unit 03010103, .6 mi north of Wentworth Street, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Biotite Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 300 ft, diameter 6 in., cased to 80 ft, open hole from 80 ft to 300 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 840.19 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.58 ft above land-surface datum.

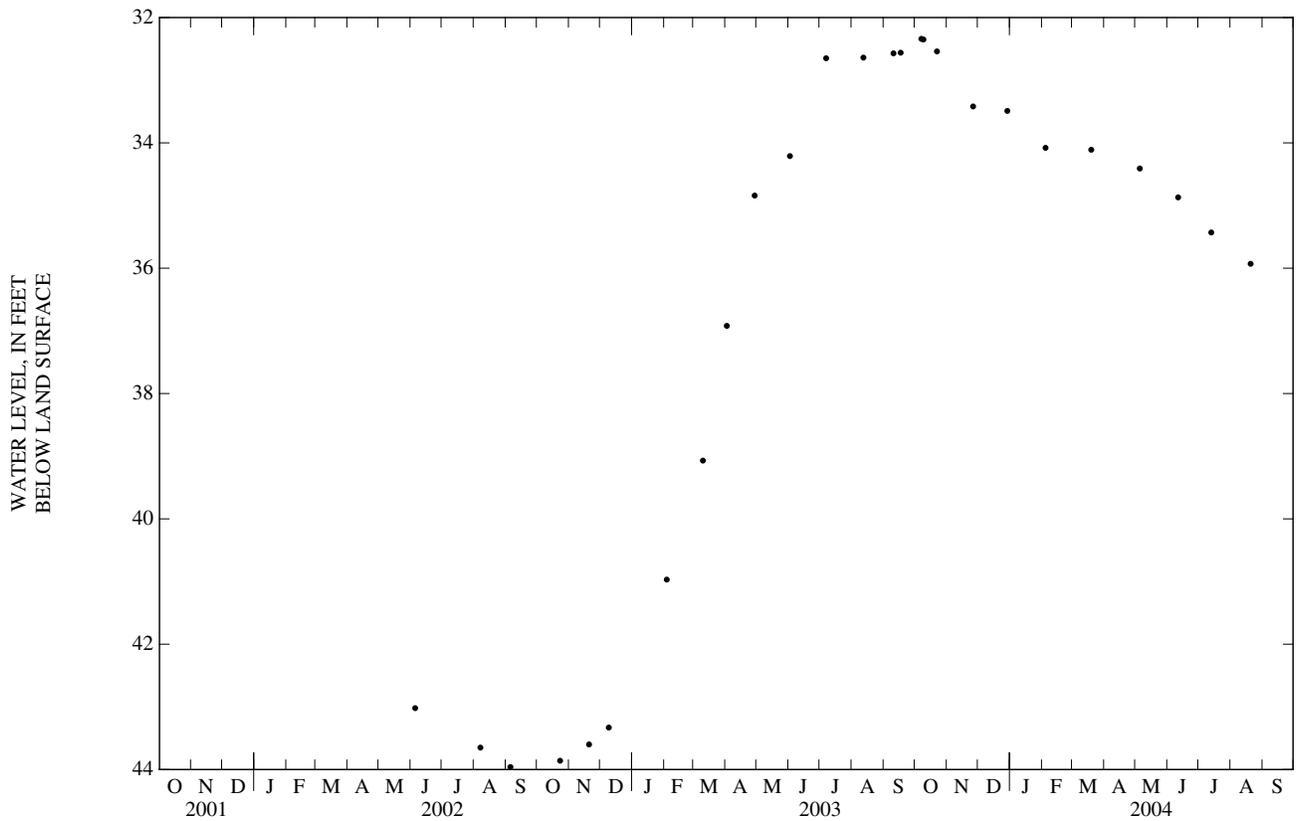
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--June 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 32.34 ft below land-surface datum, Oct. 7, 2003; lowest water level measured 43.96 ft below land-surface datum, Sept. 5, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 07	32.34	OCT 22	32.54	DEC 29	33.49	MAR 19	34.11	JUN 11	34.87	AUG 20	35.93
09	32.35	NOV 26	33.42	FEB 04	34.08	MAY 05	34.41	JUL 13	35.43		



ROCKINGHAM COUNTY—Continued

362240079411801. County number, RK-237; DENR Upper Piedmont Research Station MW-S1I (Transition Zone well).

LOCATION.--Lat 36°22'41", long 79°41'19", Hydrologic Unit 03010103, .6 mi north of Wentworth Street, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 50 ft, diameter 4 in., cased to 35 ft, screened interval from 35 ft to 50 ft, sand filter packed from 30 ft to 50 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 803.34 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.50 ft above land-surface datum.

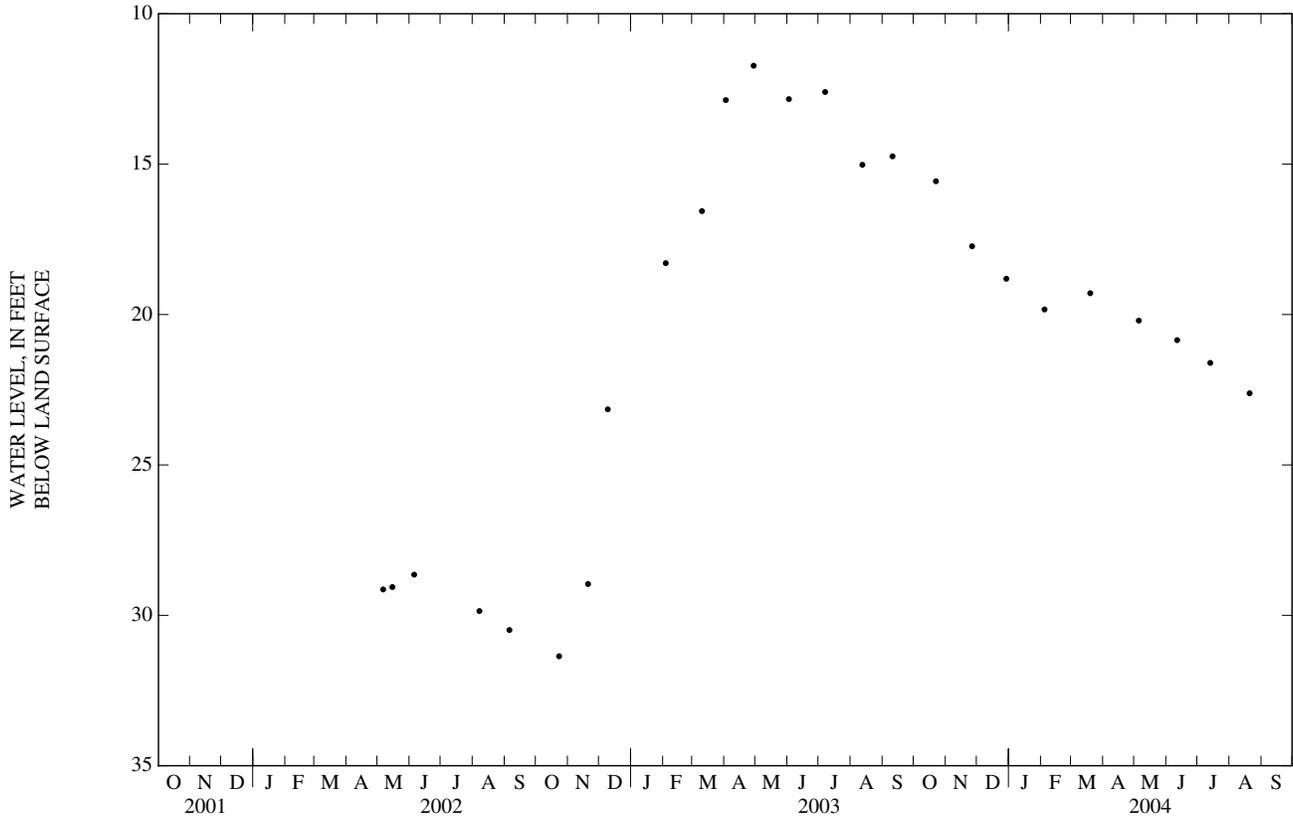
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--May 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.73 ft below land-surface datum, April 29, 2003; lowest water level measured 31.36 ft below land-surface datum, Oct. 23, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL								
OCT 22	15.57	DEC 29	18.81	MAR 19	19.29	JUN 11	20.85	AUG 20	22.62
NOV 26	17.73	FEB 04	19.83	MAY 05	20.20	JUL 13	21.61		



GROUND-WATER LEVELS  
ROCKINGHAM COUNTY—Continued

362240079411802. County number, RK-238; DENR Upper Piedmont Research Station MW-S1D (Bedrock well).

LOCATION.--Lat 36°22'41", long 79°41'19", Hydrologic Unit 03010103, .2 mi north of Wentworth Street, 1.5 mi west of State Highway 14 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Biotite Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 302 ft, diameter 6 in., cased to 62 ft, open hole from 62 ft to 302 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 802.55 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.80 ft above land-surface datum.

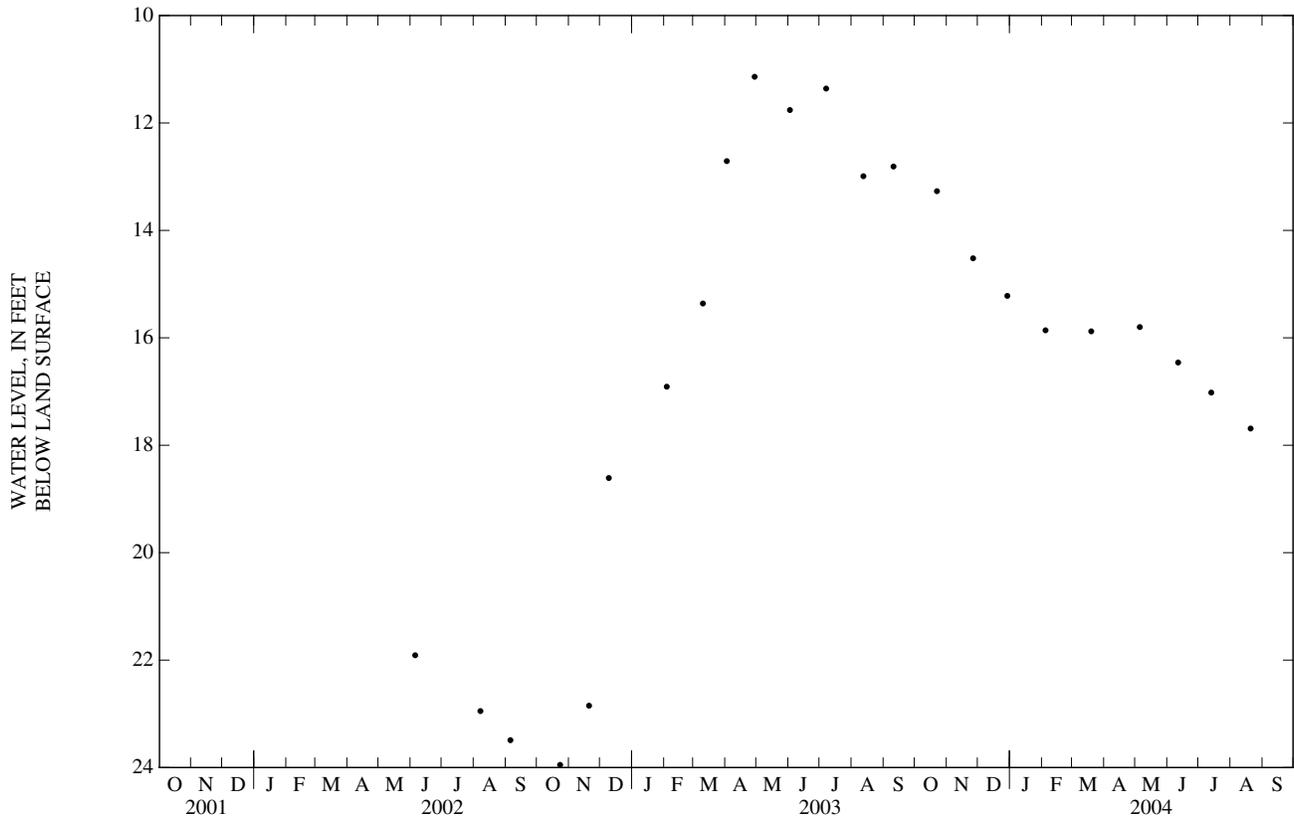
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--June 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.14 ft below land-surface datum, April 29, 2003; lowest water level measured 23.95 ft below land-surface datum, Oct. 23, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL								
OCT 22	13.27	DEC 29	15.22	MAR 19	15.88	JUN 11	16.46	AUG 20	17.69
NOV 26	14.52	FEB 04	15.86	MAY 05	15.80	JUL 13	17.02		



ROCKINGHAM COUNTY—Continued

362231079410801. County number, RK-239; DENR Upper Piedmont Research Station MW-S3S (Regolith well).

LOCATION.--Lat 36°22'31", long 79°41'08", Hydrologic Unit 03010103, .6 mi north of Wentworth Street, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 38 ft, diameter 4 in., cased to 23 ft, screened interval from 23 ft to 38 ft, sand filter packed from 21 ft to 38 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 705.16 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.99 ft above land-surface datum.

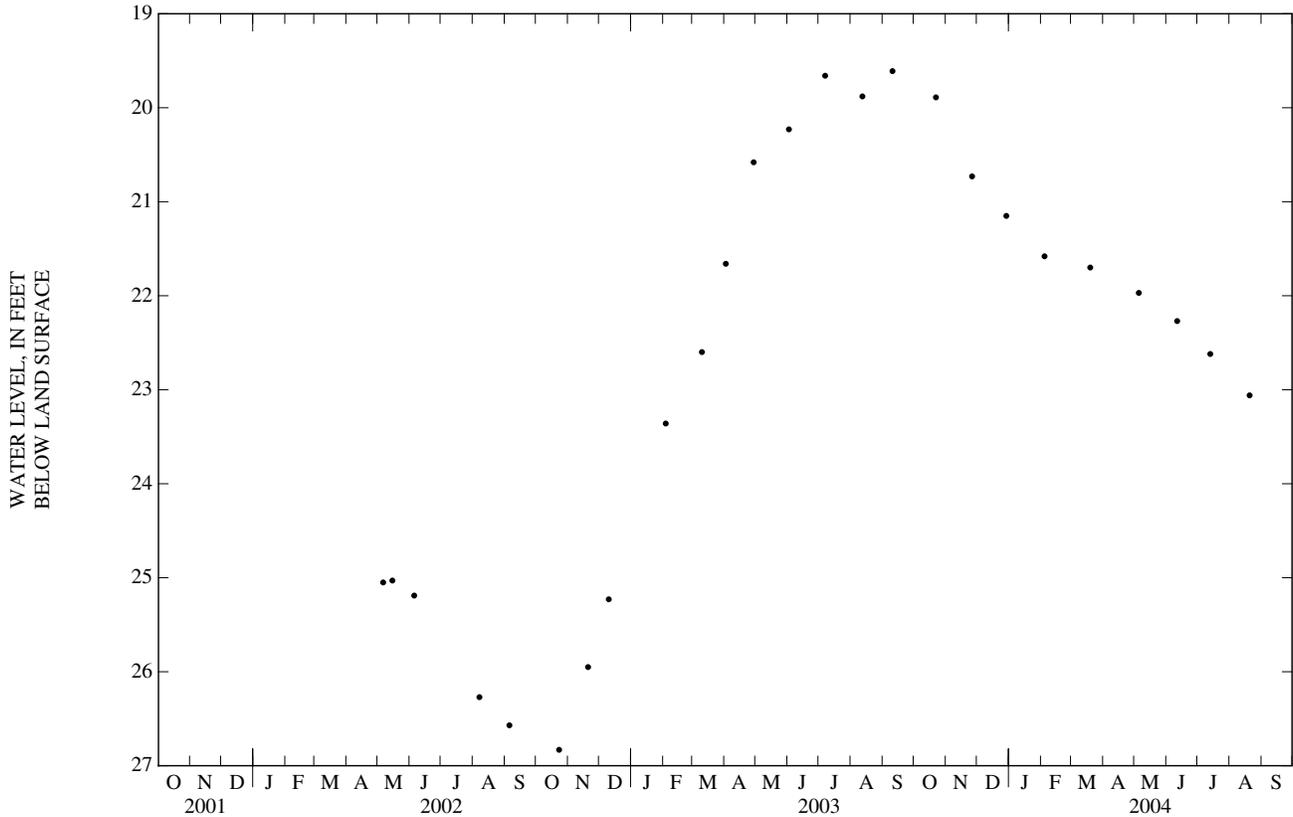
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--May 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.61 ft below land-surface datum, Sept. 10, 2003; lowest water level measured 26.83 ft below land-surface datum, Oct. 23, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL								
OCT 22	19.89	DEC 29	21.15	MAR 19	21.70	JUN 11	22.27	AUG 20	23.06
NOV 26	20.73	FEB 04	21.58	MAY 05	21.97	JUL 13	22.62		



GROUND-WATER LEVELS  
ROCKINGHAM COUNTY—Continued

362231079410802. County number, RK-240; DENR Upper Piedmont Research Station MW-S3UI (Transition Zone well).

LOCATION.--Lat 36°22'32", long 79°41'08", Hydrologic Unit 03010103, .6 mi north of Wentworth Street, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 55 ft, diameter 4 in., cased to 45 ft, screened interval from 45 ft to 55 ft, sand filter packed from 38 ft to 55 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 705.60 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.73 ft above land-surface datum.

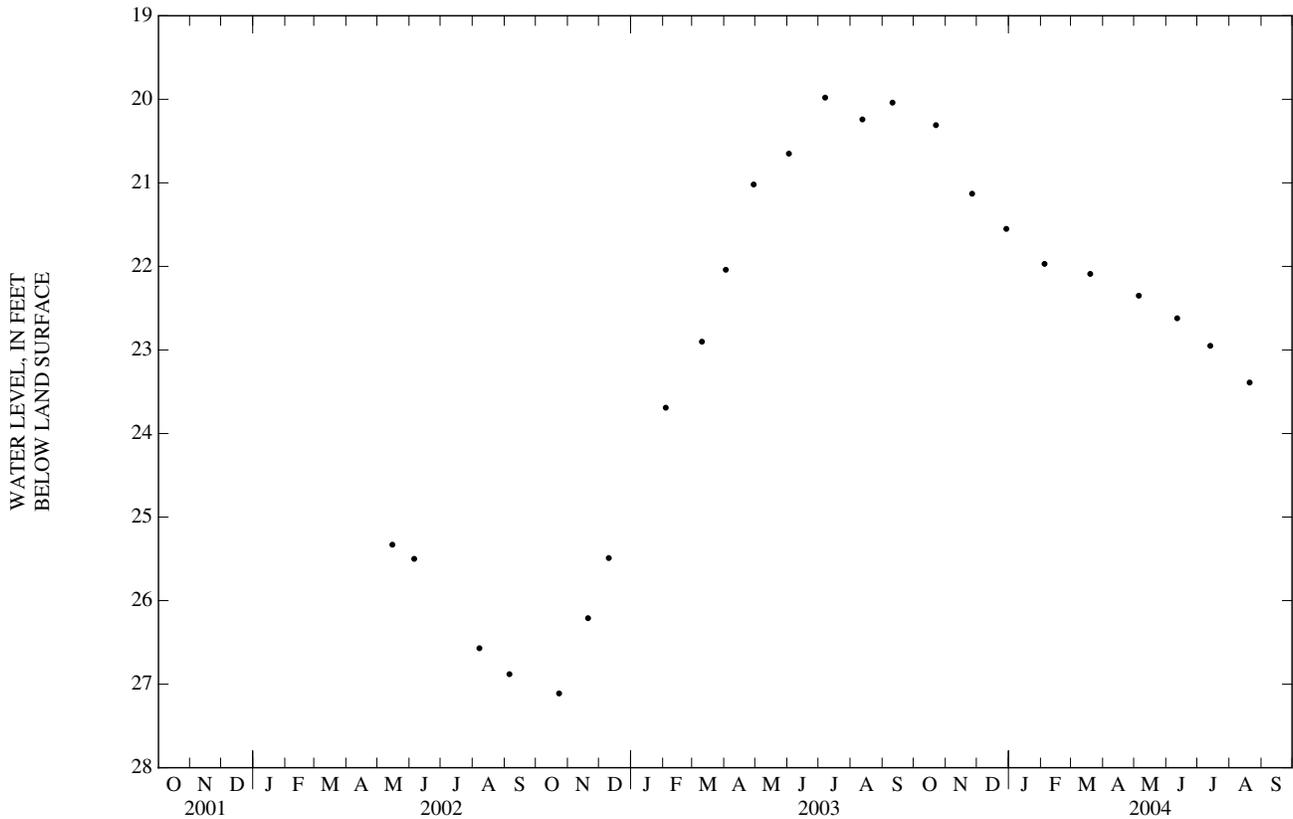
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--May 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.98 ft below land-surface datum, July 7, 2003; lowest water level measured 27.11 ft below land-surface datum, Oct. 23, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL								
OCT 22	20.31	DEC 29	21.55	MAR 19	22.09	JUN 11	22.62	AUG 20	23.39
NOV 26	21.13	FEB 04	21.97	MAY 05	22.35	JUL 13	22.95		



ROCKINGHAM COUNTY—Continued

362231079310803. County number, RK-241; DENR Upper Piedmont Research Station MW-S3LI (Transition Zone well).

LOCATION.--Lat 36°22'32", long 79°41'08", Hydrologic Unit 03010103, .6 mi north of Wentworth Street, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 73 ft, diameter 4 in., cased to 63 ft, screened interval from 63 ft to 73 ft, sand filter packed from 61 ft to 73 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 705.60 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.65 ft above land-surface datum.

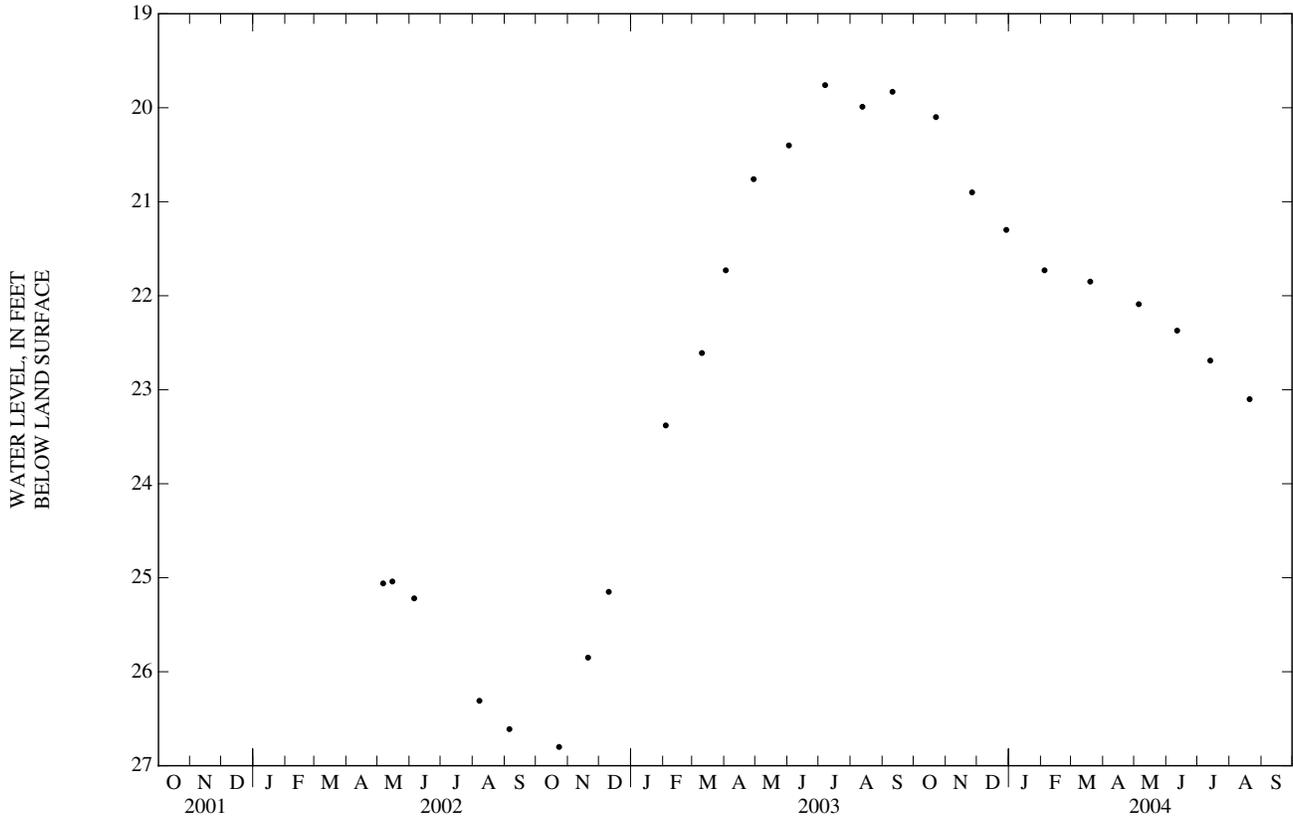
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--May 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.76 ft below land-surface datum, July 7, 2003; lowest water level measured 26.80 ft below land-surface datum, Oct. 23, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL								
OCT 22	20.10	DEC 29	21.30	MAR 19	21.85	JUN 11	22.37	AUG 20	23.10
NOV 26	20.90	FEB 04	21.73	MAY 05	22.09	JUL 13	22.69		



GROUND-WATER LEVELS  
ROCKINGHAM COUNTY—Continued

362231079310804. County number, RK-242; DENR Upper Piedmont Research Station MW-S3D (Bedrock well).

LOCATION.--Lat 36°22'32", long 79°41'08", Hydrologic Unit 03010103, .6 mi north of Wentworth Street, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Biotite Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 438 ft, diameter 6 in., cased to 88 ft, open hole from 88 ft to 438 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 705.48 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.94 ft above land-surface datum.

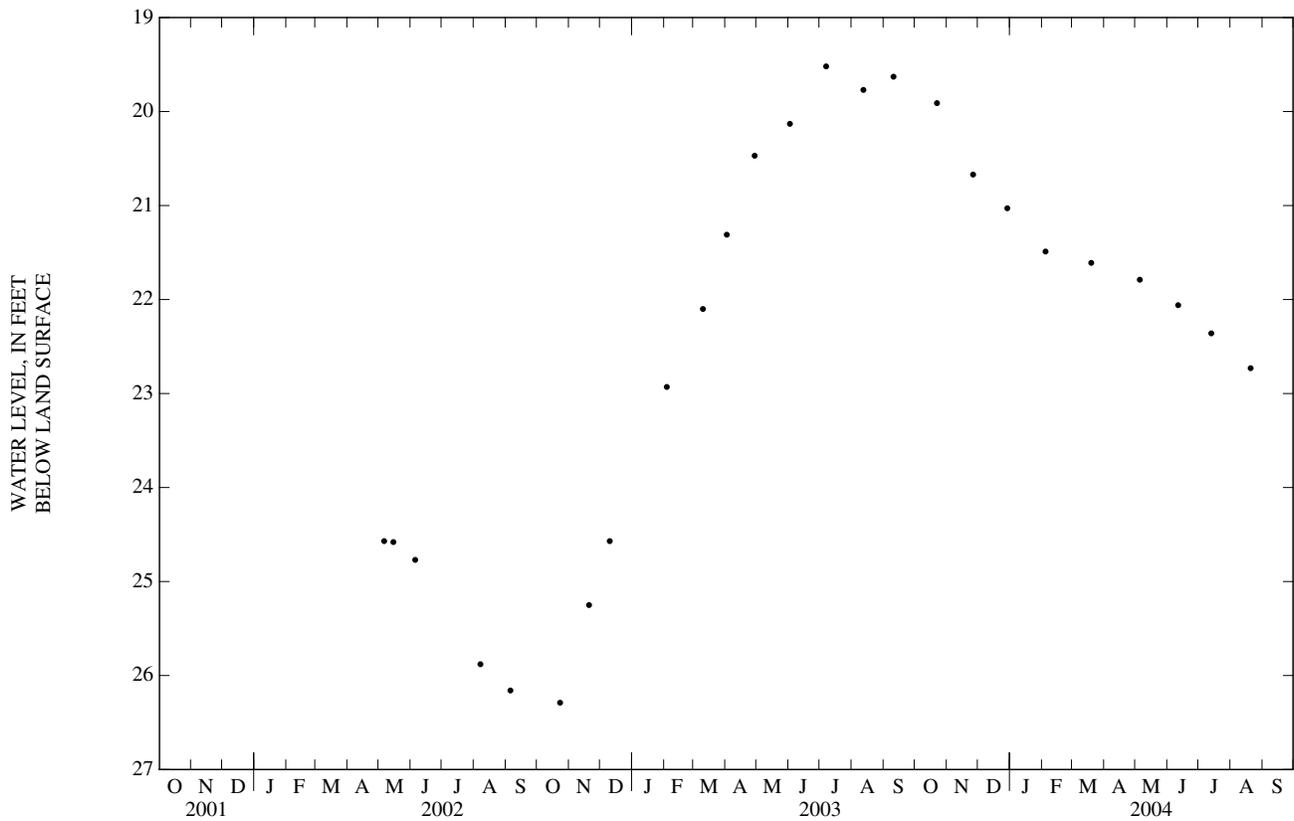
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--May 2002 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.52 ft below land-surface datum, July 7, 2003; lowest water level measured 26.29 ft below land-surface datum, Oct. 23, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL								
OCT 22	19.91	DEC 29	21.03	MAR 19	21.61	JUN 11	22.06	AUG 20	22.73
NOV 26	20.67	FEB 04	21.49	MAY 05	21.79	JUL 13	22.36		



## ROCKINGHAM COUNTY—Continued

362226079410101. County number, RK-243; DENR Upper Piedmont Research Station MW-S4S (Regolith well).

LOCATION.--Lat 36°22'26", long 79°41'01", Hydrologic Unit 03010103, .6 mi north of Wentworth Street, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

## WATER-LEVEL RECORDS

AQUIFER.--Regolith (saprolitic Felsic Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 15 ft, diameter 4 in., cased to 5 ft, screened interval from 5 ft to 15 ft, sand filter packed from 4 ft to 15 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at site.

DATUM.--Land-surface datum is 659.50 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 1.99 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study. Well is located in close proximity of stream.

PERIOD OF RECORD.--May 2002 to current year. Continuous record began May 2003.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 2.11 ft below land-surface datum, Feb. 6, 2004; lowest water level measured 5.47 ft below land-surface datum, Aug. 7, 2002.

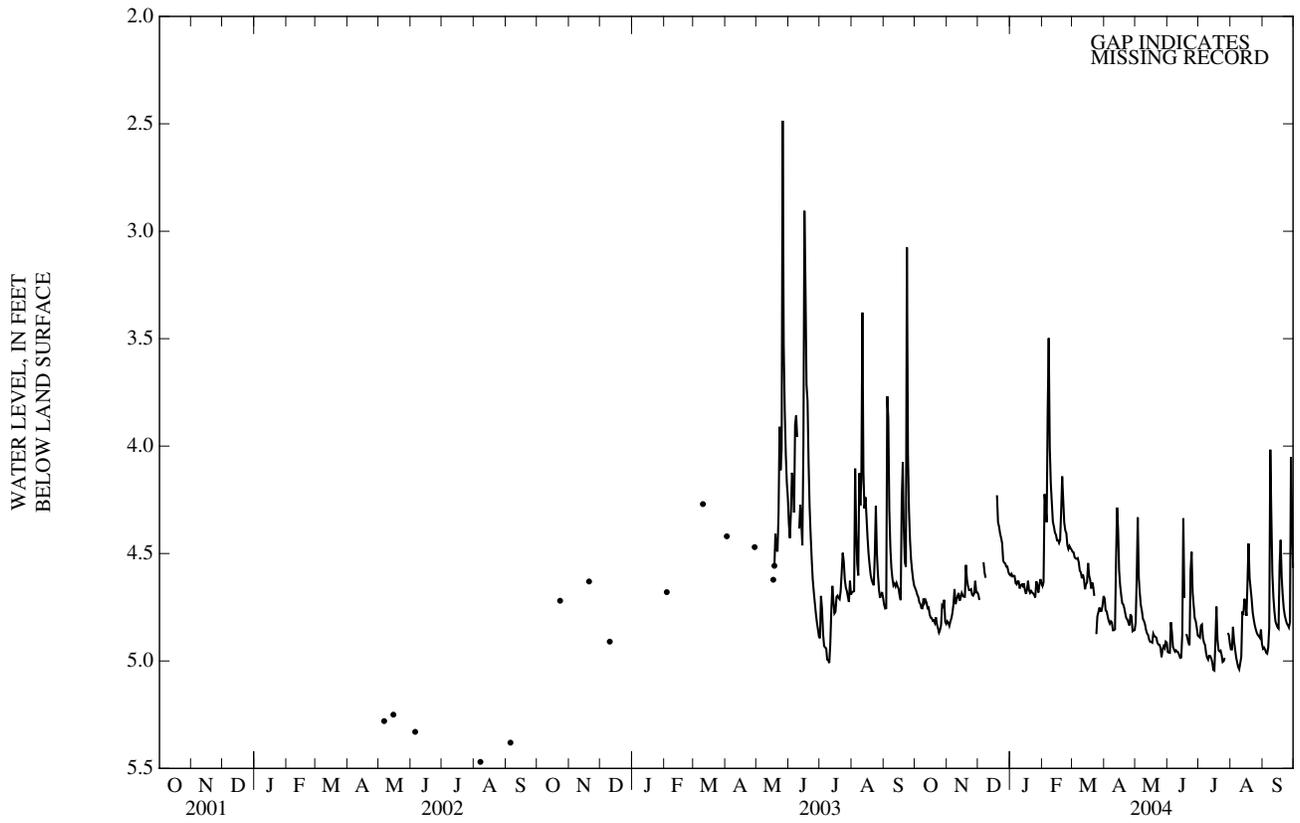
DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.66	4.82	4.69	4.60	4.65	4.49	4.71	4.82	4.96	4.89	4.95	4.94
2	4.67	4.82	4.72	4.59	4.63	4.49	4.77	4.61	4.96	4.89	4.95	4.94
3	4.69	4.84	---	4.61	4.22	4.52	4.77	4.33	4.96	4.84	4.84	4.95
4	4.70	4.82	---	4.60	4.28	4.52	4.79	4.61	4.82	4.83	4.91	4.96
5	4.73	4.80	---	4.60	4.35	4.52	4.81	4.69	4.87	4.89	4.94	4.97
6	4.73	4.78	4.54	4.64	3.84	4.52	4.83	4.74	4.94	4.92	4.98	4.94
7	4.75	4.73	4.59	4.64	3.50	4.54	4.82	4.77	4.95	4.93	5.01	4.84
8	4.75	4.67	4.61	4.63	4.01	4.58	4.82	4.80	4.96	4.96	5.03	4.02
9	4.71	4.74	---	4.63	4.17	4.59	4.86	4.81	4.95	4.98	5.04	4.32
10	4.73	4.72	---	4.66	4.26	4.62	4.86	4.83	4.96	4.99	5.01	4.59
11	4.72	4.70	---	4.65	4.35	4.60	4.85	4.86	4.96	4.98	4.98	4.70
12	4.73	4.68	---	4.64	4.37	4.62	4.54	4.87	4.97	4.98	4.77	4.77
13	4.75	4.72	---	4.65	4.40	4.67	4.29	4.88	4.99	4.99	4.79	4.82
14	4.75	4.70	---	4.64	4.41	4.64	4.39	4.90	4.98	5.01	4.71	4.83
15	4.78	4.68	---	4.67	4.44	4.63	4.58	4.91	4.87	5.04	4.74	4.84
16	4.80	4.70	---	4.69	4.44	4.54	4.65	4.91	4.34	5.04	4.79	4.85
17	4.80	4.70	---	4.67	4.45	4.60	4.69	4.91	4.71	4.91	4.64	4.55
18	4.81	4.70	---	4.63	4.44	4.62	4.73	4.87	---	4.75	4.45	4.44
19	4.81	4.55	4.23	4.67	4.31	4.66	4.74	4.88	4.87	4.90	4.61	4.61
20	4.82	4.62	4.35	4.68	4.14	4.63	4.75	4.89	4.89	4.95	4.66	4.69
21	4.80	4.65	4.38	4.67	4.25	4.66	4.78	4.89	4.92	4.96	4.71	4.75
22	4.83	4.67	4.41	4.68	4.36	4.70	4.80	4.92	4.93	4.95	4.77	4.79
23	4.85	4.67	4.43	4.69	4.39	---	4.81	4.92	4.58	4.97	4.81	4.81
24	4.87	4.67	4.45	4.69	4.41	4.88	4.82	4.92	4.49	5.00	4.83	4.83
25	4.86	4.69	4.53	4.70	4.46	4.79	4.83	4.94	4.68	5.00	4.85	4.83
26	4.83	4.70	4.54	4.63	4.48	4.77	4.78	4.98	4.74	4.99	4.87	4.84
27	4.74	4.69	4.55	4.65	4.46	4.75	4.79	4.95	4.80	---	4.88	4.82
28	4.75	4.63	4.56	4.68	4.47	4.77	4.86	4.93	4.81	---	4.88	4.05
29	4.72	4.68	4.56	4.65	4.48	4.77	4.86	4.94	4.85	4.87	4.89	4.35
30	4.82	4.68	4.59	4.62	---	4.74	4.86	4.91	4.88	4.88	4.85	4.57
31	4.83	---	4.60	4.64	---	4.70	---	4.91	---	4.92	4.92	---

WTR YR 2004 MEAN 4.72 HIGH 3.50 LOW 5.04

GROUND-WATER LEVELS  
ROCKINGHAM COUNTY—Continued

362226079410101. County number, RK-243; DENR Upper Piedmont Research Station MW-S4S (Regolith well).



362226079410101 RK-243 DENR Upper Piedmont Research Station MW-S4S (Regolith well)—Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 2003 to October 2004 (discontinued).

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May 2003 to October 2004.

pH: May 2003 to October 2004.

WATER TEMPERATURE: May 2003 to October 2004.

DISSOLVED OXYGEN: May 2003 to October 2004.

DISSOLVED OXYGEN, PERCENT SATURATION: May 2003 to October 2004.

INSTRUMENTATION.-- Water-quality monitor with satellite telemetry from May 2003 to October 2004.

REMARKS.--Station operated in cooperation with North Carolina Department of Environment and Natural Resources, Water Resources Division, as part of the Piedmont/Mountains ground-water study. Dissolved oxygen, percent saturation, is computed using a barometric pressure of 750 mm Hg.

EXTREMES FOR PERIOD OF DAILY RECORD.--

CONSTITUENT	MAXIMUM RECORDED	MINIMUM RECORDED
SPECIFIC CONDUCTANCE, microsiemens	388, August 14, 2003	312, June 7, 8, 2003
pH, standard units	7.6, October 19, 2004	6.2, on several days during the period
WATER TEMPERATURE, °C	17.3, October 19, 2004	10.7, on several days during the period
DISSOLVED OXYGEN, mg/L	0.5, on several days during the period	0.0, on many days during the period
DISSOLVED OXYGEN, PERCENT SATURATION, %	5, on several days during the period	0, on many days during the period

EXTREMES FOR CURRENT PERIOD.--

CONSTITUENT	MAXIMUM RECORDED	MINIMUM RECORDED
SPECIFIC CONDUCTANCE, microsiemens	333, December 18, 19, 20	317, June 16, 23, 24
pH, standard units	7.6, October 19	6.2, October 1-6
WATER TEMPERATURE, °C	17.3, October 19	10.7, on several days during the period
DISSOLVED OXYGEN, mg/L	0.5, on several days during the period	0.0, on many days during the period
DISSOLVED OXYGEN, PERCENT SATURATION, %	5, on several days during the period	0, on many days during the period

362226079410101 RK-243 DENR Upper Piedmont Research Station MW-S4S (Regolith well)—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Dis- solved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	Specif. conduc- tance, wat unf uS/cm 25 degC (00095)	Temper- ature, water, deg C (00010)	Hard- ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes- ium, water, fltrd, mg/L (00925)	Potas- sium, water, fltrd, mg/L (00935)	Sodium, water, fltrd, mg/L (00930)	ANC, wat unf incrm. titr., field, mg/L as CaCO3 (00419)	Bromide water, fltrd, mg/L (71870)	Chlor- ide, water, fltrd, mg/L (00940)
MAR 23...	1655	.8	6.7	319	11.5	140	30.8	16.0	2.32	7.94	87	.07	16.9

Date	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue on evap. at 180degC wat flt mg/L (70300)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Arsenic water, fltrd, ug/L (01000)	Boron, water, fltrd, ug/L (01020)	Iron, water, fltrd, ug/L (01046)	Mangan- ese, water, fltrd, ug/L (01056)
MAR 23...	38.4	45.4	219	.15	<.06	<.008	<.006	<2	<7.0	449	563

Remark codes used in this table:  
< -- Less than

362226079410101 RK-243 DENR Upper Piedmont Research Station MW-S4S (Regolith well)—Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	327	328	331	331	327	327	324	323	322	321	324	324
2	327	328	331	331	327	326	323	323	321	322	324	325
3	327	328	---	330	327	326	323	322	321	322	324	324
4	327	328	---	330	327	326	323	322	321	323	324	324
5	327	327	---	330	327	326	323	322	320	324	324	324
6	327	327	331	330	327	326	323	322	319	324	325	324
7	327	327	331	330	327	326	323	322	319	324	324	323
8	327	327	331	330	328	326	323	323	319	325	324	324
9	328	327	---	330	328	327	323	323	319	325	324	324
10	327	327	---	330	328	326	323	323	319	325	324	324
11	327	327	---	329	328	326	323	323	319	325	324	324
12	328	327	---	329	328	326	323	323	319	325	324	324
13	327	328	---	329	328	326	323	323	319	325	323	324
14	328	327	---	329	328	326	322	323	319	326	324	324
15	327	328	---	329	328	326	323	323	319	326	324	324
16	327	328	---	329	327	326	323	323	318	325	324	324
17	327	328	---	329	327	326	323	323	318	325	324	324
18	328	328	---	329	327	326	322	323	319	324	325	324
19	327	328	332	329	327	326	322	322	319	324	325	324
20	327	329	332	329	327	325	322	322	318	325	325	324
21	328	329	332	329	327	325	322	322	319	325	325	324
22	328	329	332	329	327	325	322	322	319	325	325	324
23	328	329	332	328	327	325	322	322	318	325	324	324
24	327	329	332	328	327	324	322	322	319	325	324	324
25	327	329	332	328	327	325	322	322	320	325	324	324
26	328	330	331	328	327	325	322	322	320	325	324	324
27	328	330	331	328	327	325	322	322	321	325	324	324
28	328	330	331	328	327	325	322	322	321	---	325	324
29	328	330	331	328	326	324	322	322	321	---	324	324
30	328	330	331	327	---	324	323	322	321	324	325	324
31	328	---	331	327	---	324	---	322	---	325	324	---
MEAN	327	328	---	329	327	326	323	322	320	---	324	324
MAX	328	330	--	331	328	327	324	323	322	--	325	325
MIN	327	327	--	327	326	324	322	322	318	--	323	323



362226079410101 RK-243 DENR Upper Piedmont Research Station MW-S4S (Regolith well)—Continued

PH, WATER, UNFILTERED, FIELD, STANDARD UNITS  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.2	6.4	6.5	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.6
2	6.2	6.4	6.5	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.6
3	6.2	6.4	---	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.5
4	6.2	6.4	---	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.5
5	6.2	6.4	---	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6
6	6.3	6.4	6.5	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6
7	6.3	6.4	6.5	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6
8	6.3	6.4	6.5	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.7
9	6.3	6.4	---	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6
10	6.3	6.4	---	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6
11	6.3	6.4	---	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6
12	6.3	6.4	---	6.6	6.5	6.4	6.5	6.5	6.5	6.5	6.6	6.6
13	6.3	6.4	---	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6
14	6.3	6.4	---	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6
15	6.3	6.4	---	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.5
16	6.3	6.4	---	6.5	6.5	6.4	6.5	6.5	6.5	6.5	6.6	6.6
17	6.3	6.4	---	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6
18	6.3	6.4	---	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6
19	6.3	6.4	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6
20	6.3	6.4	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6
21	6.3	6.4	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6
22	6.3	6.4	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.6
23	6.3	6.4	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.6	6.7
24	6.3	6.4	6.5	6.5	6.5	6.4	6.5	6.5	6.5	6.5	6.6	6.7
25	6.3	6.4	6.5	6.5	6.5	6.4	6.5	6.5	6.5	6.5	6.6	6.7
26	6.3	6.4	6.5	6.5	6.5	6.4	6.5	6.5	6.5	6.6	6.6	6.7
27	6.3	6.4	6.5	6.5	6.5	6.4	6.5	6.5	6.5	---	6.5	6.7
28	6.4	6.5	6.6	6.5	6.5	6.4	6.5	6.5	6.5	---	6.5	6.8
29	6.4	6.5	6.6	6.5	6.5	6.4	6.5	6.6	6.5	6.6	6.5	6.7
30	6.4	6.5	6.6	6.5	---	6.4	6.5	6.6	6.5	6.6	6.6	6.7
31	6.4	---	6.6	6.5	---	6.5	---	6.5	---	6.5	6.6	---
MEAN	6.3	6.4	---	6.5	6.5	6.5	6.5	6.5	6.5	---	6.6	6.6
MAX	6.4	6.5	---	6.6	6.5	6.5	6.5	6.6	6.5	---	6.6	6.8
MIN	6.2	6.4	---	6.5	6.5	6.4	6.5	6.5	6.5	---	6.5	6.5



362226079410101 RK-243 DENR Upper Piedmont Research Station MW-S4S (Regolith well)—Continued

TEMPERATURE, WATER, DEGREES CELSIUS  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.3	16.4	15.6	13.7	12.1	10.9	11.0	11.5	12.4	13.6	14.9	16.0
2	16.3	16.4	15.6	13.6	12.0	10.9	11.0	11.5	12.4	13.7	15.0	16.1
3	16.4	16.4	---	13.6	11.9	10.8	11.0	11.5	12.5	13.8	15.1	16.1
4	16.4	16.4	---	13.5	11.9	10.8	11.0	11.6	12.5	13.8	15.1	16.1
5	16.4	16.4	---	13.4	11.9	10.8	11.0	11.6	12.6	13.9	15.1	16.2
6	16.4	16.4	15.3	13.4	11.7	10.8	11.0	11.6	12.6	13.9	15.2	16.2
7	16.4	16.4	15.3	13.4	11.6	10.8	11.0	11.7	12.6	14.0	15.2	16.2
8	16.4	16.3	15.2	13.3	11.8	10.8	11.0	11.7	12.7	14.0	15.2	16.5
9	16.4	16.3	---	13.3	11.8	10.8	11.0	11.7	12.7	14.1	15.3	16.1
10	16.5	16.3	---	13.2	11.7	10.8	11.0	11.8	12.8	14.1	15.3	16.1
11	16.5	16.3	---	13.2	11.7	10.8	11.0	11.8	12.8	14.2	15.4	16.2
12	16.5	16.2	---	13.1	11.6	10.8	11.0	11.8	12.8	14.2	15.5	16.2
13	16.5	16.2	---	13.1	11.6	10.8	11.0	11.8	12.9	14.3	15.5	16.2
14	16.5	16.2	---	13.0	11.5	10.8	11.1	11.9	12.9	14.3	15.5	16.3
15	16.5	16.1	---	13.0	11.5	10.8	11.1	11.9	13.0	14.3	15.5	16.3
16	16.5	16.1	---	12.9	11.4	10.8	11.1	11.9	13.0	14.4	15.5	16.4
17	16.5	16.1	---	12.9	11.4	10.8	11.1	11.9	13.0	14.5	15.6	16.5
18	16.5	16.1	---	12.8	11.3	10.8	11.1	12.0	13.1	14.5	15.4	16.4
19	16.5	16.0	14.7	12.8	11.3	10.8	11.2	12.0	13.1	14.6	15.5	16.4
20	16.5	16.0	14.6	12.7	11.3	10.8	11.2	12.0	13.2	14.6	15.5	16.4
21	16.5	15.9	14.5	12.7	11.2	10.8	11.2	12.1	13.2	14.7	15.6	16.4
22	16.5	15.9	14.5	12.6	11.2	10.8	11.2	12.1	13.3	14.7	15.6	16.4
23	16.5	15.9	14.4	12.6	11.2	---	11.2	12.1	13.4	14.8	15.6	16.5
24	16.5	15.9	14.3	12.5	11.1	11.1	11.2	12.2	13.3	14.8	15.7	16.5
25	16.5	15.8	14.2	12.4	11.1	11.1	11.3	12.2	13.4	14.9	15.7	16.6
26	16.5	15.8	14.2	12.4	11.1	11.0	11.3	12.2	13.4	14.9	15.8	16.6
27	16.5	15.8	14.1	12.3	11.0	11.0	11.3	---	13.5	---	15.8	16.6
28	16.5	15.7	14.0	12.3	11.0	11.0	11.4	12.3	13.5	---	15.9	16.7
29	16.5	15.7	14.0	12.2	11.0	11.0	11.4	12.3	13.6	14.8	15.9	16.6
30	16.4	15.6	13.9	12.2	---	10.9	11.4	12.3	13.6	14.9	16.0	16.6
31	16.4	---	13.8	12.1	---	11.0	---	12.4	---	14.9	16.0	---
MEAN	16.5	16.1	---	12.9	11.5	---	11.1	---	13.0	---	15.5	16.3
MAX	16.5	16.4	---	13.7	12.1	---	11.4	---	13.6	---	16.0	16.7
MIN	16.3	15.6	---	12.1	11.0	---	11.0	---	12.4	---	14.9	16.0



362226079410101 RK-243 DENR Upper Piedmont Research Station MW-S4S (Regolith well)—Continued

DISSOLVED OXYGEN, WATER, UNFILTERED, MILLIGRAMS PER LITER  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.1	0.0	0.3	0.2	0.5	0.2	0.2	0.1	---	---	---	---
2	0.1	0.1	0.3	0.2	0.4	0.2	0.2	0.1	---	---	---	---
3	0.1	0.1	---	0.2	0.4	0.2	0.2	0.1	---	---	---	---
4	0.1	0.2	---	0.2	0.4	0.2	0.3	0.1	---	---	---	---
5	0.1	0.3	---	0.2	0.3	0.2	0.3	0.1	---	---	---	---
6	0.1	0.3	0.4	0.2	0.2	0.2	0.3	0.1	---	---	---	---
7	0.1	0.2	0.3	0.2	0.2	0.2	0.3	0.2	---	---	---	---
8	0.1	0.3	0.3	0.2	0.1	0.2	0.3	0.2	---	---	---	---
9	0.1	0.3	---	0.2	0.1	0.2	0.3	0.2	---	---	---	---
10	0.1	0.3	---	0.2	0.1	0.2	0.3	0.2	---	---	---	---
11	0.1	0.3	---	0.3	0.1	0.2	0.3	0.2	---	---	---	---
12	0.1	0.3	---	0.3	0.1	0.2	0.4	0.2	---	---	---	---
13	0.1	0.3	---	0.3	0.1	0.2	0.4	0.2	---	---	---	---
14	0.1	0.3	---	0.3	0.1	0.2	0.4	0.2	---	---	---	---
15	0.1	0.3	---	0.3	0.1	0.2	0.3	0.2	---	---	---	---
16	0.1	0.3	---	0.3	0.2	0.2	0.3	0.2	---	---	---	---
17	0.1	0.3	---	0.3	0.2	0.2	0.3	0.2	---	---	---	---
18	0.1	0.3	---	0.3	0.1	0.2	0.4	0.2	---	---	---	---
19	0.1	0.3	0.2	0.3	0.2	0.2	0.4	0.2	---	---	---	---
20	0.1	0.3	0.2	0.3	0.1	0.2	0.4	0.2	---	---	---	---
21	0.1	0.3	0.1	0.4	0.1	0.2	0.3	0.2	---	---	---	---
22	0.1	0.3	0.1	0.4	0.1	0.2	0.3	0.2	---	---	---	---
23	0.1	0.3	0.1	0.4	0.1	---	0.4	0.2	---	---	---	---
24	0.1	0.3	0.1	0.4	0.1	0.1	0.3	0.2	---	---	---	---
25	0.1	0.3	0.2	0.4	0.1	0.1	0.2	0.2	---	---	---	---
26	0.1	0.3	0.2	0.4	0.1	0.1	0.2	0.2	---	---	---	---
27	0.1	0.3	0.1	0.4	0.2	0.1	0.1	---	---	---	---	---
28	0.1	0.3	0.2	0.4	0.2	0.2	0.1	---	---	---	---	---
29	0.1	0.3	0.2	0.5	0.2	0.2	0.1	---	---	---	---	---
30	0.1	0.3	0.2	0.5	---	0.2	0.1	---	---	---	---	---
31	0.1	---	0.2	0.5	---	0.2	---	---	---	---	---	---
MEAN	0.1	0.3	---	0.3	0.2	---	0.3	---	---	---	---	---
MAX	0.1	0.3	---	0.5	0.5	---	0.4	---	---	---	---	---
MIN	0.1	0.0	---	0.2	0.1	---	0.1	---	---	---	---	---

362226079410101 RK-243 DENR Upper Piedmont Research Station MW-S4S (Regolith well)—Continued

DISSOLVED OXYGEN, WATER, UNFILTERED, PERCENT OF SATURATION  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1	0	3	2	5	1	2	0	---	---	---	---
2	0	0	3	2	4	2	2	0	---	---	---	---
3	0	0	---	2	4	2	2	0	---	---	---	---
4	1	2	---	2	4	2	3	0	---	---	---	---
5	0	3	---	2	3	2	3	0	---	---	---	---
6	0	3	4	2	2	2	3	0	---	---	---	---
7	0	2	3	2	2	2	3	1	---	---	---	---
8	0	3	3	2	0	2	3	2	---	---	---	---
9	0	3	---	2	0	2	3	2	---	---	---	---
10	0	3	---	2	0	2	3	2	---	---	---	---
11	0	3	---	3	1	2	3	2	---	---	---	---
12	0	3	---	3	1	2	4	2	---	---	---	---
13	0	3	---	3	1	2	4	2	---	---	---	---
14	0	3	---	3	1	2	4	2	---	---	---	---
15	0	3	---	3	1	2	3	2	---	---	---	---
16	0	3	---	3	2	2	3	2	---	---	---	---
17	0	3	---	3	2	2	3	2	---	---	---	---
18	0	3	---	3	1	2	4	2	---	---	---	---
19	0	3	2	3	2	2	4	2	---	---	---	---
20	0	3	2	3	1	2	4	2	---	---	---	---
21	0	3	1	4	0	2	3	2	---	---	---	---
22	0	3	1	4	0	2	3	2	---	---	---	---
23	0	3	1	4	0	---	4	2	---	---	---	---
24	0	3	1	4	1	0	3	2	---	---	---	---
25	0	3	2	4	0	0	2	2	---	---	---	---
26	0	3	2	4	0	0	2	2	---	---	---	---
27	0	3	1	4	2	0	0	---	---	---	---	---
28	0	3	2	4	2	1	0	---	---	---	---	---
29	0	3	2	5	1	2	0	---	---	---	---	---
30	0	3	2	5	---	2	0	---	---	---	---	---
31	0	---	2	5	---	2	---	---	---	---	---	---
MEAN	0	3	---	3	1	---	3	---	---	---	---	---
MAX	1	3	--	5	5	--	4	--	---	---	---	---
MIN	0	0	--	2	0	--	0	--	---	---	---	---

## ROCKINGHAM COUNTY—Continued

362226079410102. County number, RK-244; DENR Upper Piedmont Research Station MW-S4I (Transition Zone well).

LOCATION.--Lat 36°22'26", long 79°41'01", Hydrologic Unit 03010103, .6 mi north of Wentworth Street, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

## WATER-LEVEL RECORDS

AQUIFER.--Regolith (saprolitic Felsic Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 35 ft, diameter 4 in., cased to 25 ft, open hole from 25 ft to 35 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at site.

DATUM.--Land-surface datum is 659.32 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.85 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study. Well is located in close proximity to stream.

PERIOD OF RECORD.--May 2002 to current year. Continuous record began May 2003.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 2.46 ft below land-surface datum, Feb. 6, 2004; lowest water level measured 5.28 ft below land-surface datum, Aug. 7, 2002.

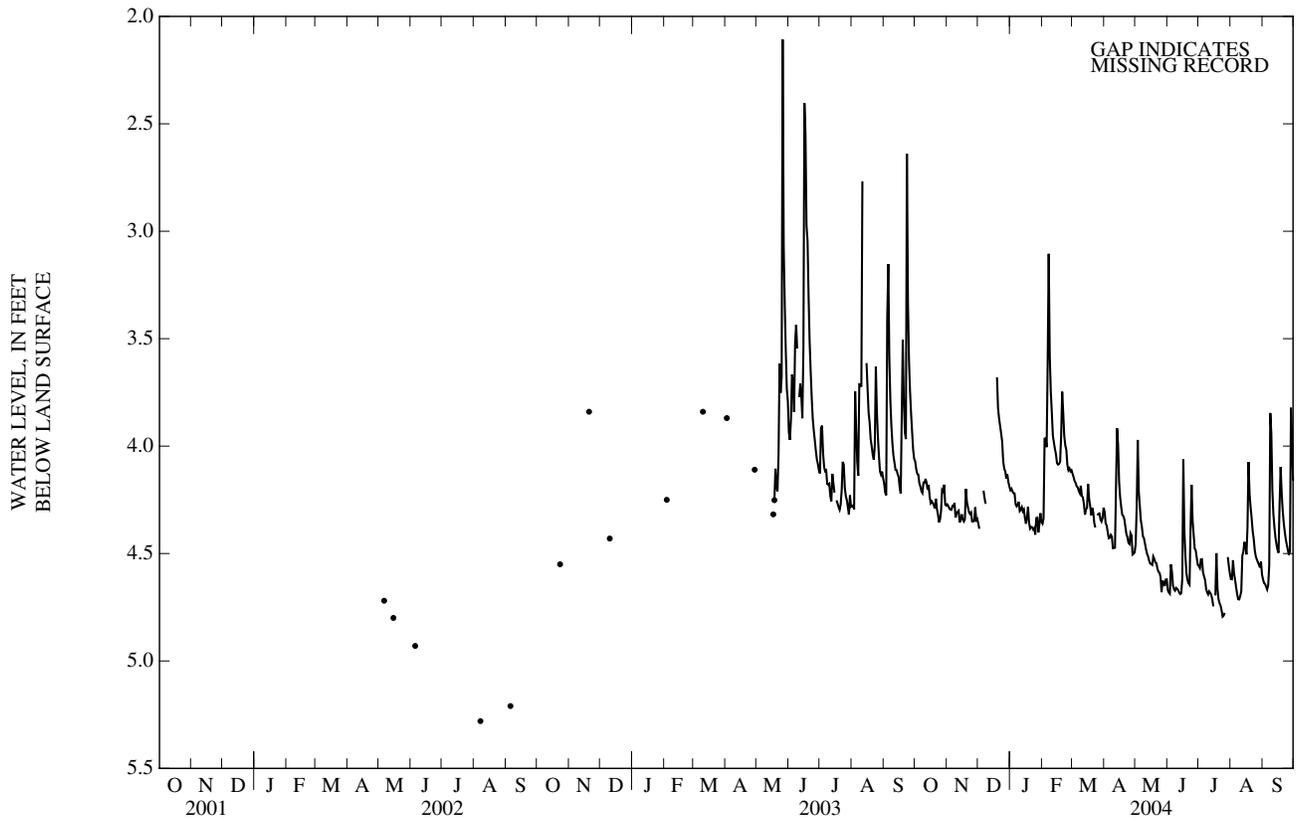
DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.07	4.27	4.36	4.21	4.36	4.13	4.31	4.46	4.67	4.56	4.62	4.62
2	4.11	4.28	4.38	4.20	4.34	4.14	4.36	4.28	4.68	4.57	4.62	4.64
3	4.13	4.29	---	4.21	3.97	4.16	4.37	3.97	4.69	4.53	4.53	4.64
4	4.13	4.30	---	4.22	3.96	4.17	4.40	4.21	4.55	4.53	4.59	4.66
5	4.17	4.30	---	4.22	4.00	4.19	4.43	4.28	4.58	4.59	4.62	4.67
6	4.19	4.28	4.21	4.27	3.60	4.19	4.43	4.35	4.65	4.61	4.66	4.65
7	4.21	4.28	4.24	4.28	3.10	4.21	4.41	4.38	4.67	4.62	4.69	4.55
8	4.22	4.26	4.27	4.27	3.58	4.22	4.42	4.42	4.67	4.66	4.71	3.85
9	4.17	4.33	---	4.26	3.75	4.18	4.48	4.43	4.66	4.68	4.71	3.94
10	4.17	4.31	---	4.30	3.85	4.23	4.47	4.45	4.66	4.69	4.70	4.20
11	4.15	4.31	---	4.30	3.95	4.24	4.47	4.48	4.67	4.68	4.68	4.32
12	4.17	4.30	---	4.28	3.98	4.27	4.19	4.50	4.68	4.68	4.51	4.38
13	4.20	4.36	---	4.30	4.01	4.32	3.92	4.51	4.69	4.69	4.49	4.43
14	4.18	4.34	---	4.30	4.04	4.29	3.99	4.53	4.68	4.71	4.45	4.46
15	4.24	4.32	---	4.33	4.08	4.29	4.17	4.55	4.62	4.75	4.46	4.48
16	4.26	4.34	---	4.36	4.09	4.18	4.24	4.55	4.06	---	4.50	4.50
17	4.26	4.35	---	4.33	4.08	4.25	4.28	4.55	4.39	4.70	4.38	4.27
18	4.26	4.34	---	4.28	4.07	4.28	4.32	4.51	4.51	4.50	4.07	4.10
19	4.28	4.20	3.68	4.36	3.95	4.32	4.33	4.52	4.59	4.66	4.22	4.22
20	4.29	4.26	3.82	4.38	3.75	4.29	4.34	4.54	4.62	4.71	4.29	4.30
21	4.24	4.29	3.87	4.38	3.85	4.31	4.37	4.54	4.64	4.73	4.33	4.36
22	4.29	4.31	3.91	4.38	3.95	4.36	4.41	4.57	4.65	4.74	4.40	4.40
23	4.32	4.32	3.94	4.39	4.00	4.38	4.42	4.58	4.38	4.76	4.43	4.43
24	4.35	4.31	3.98	4.38	4.02	---	4.45	4.59	4.18	4.79	4.48	4.46
25	4.34	4.35	4.07	4.41	4.09	4.32	4.46	4.61	4.35	4.79	4.51	4.48
26	4.30	4.35	4.11	4.33	4.11	4.31	4.41	4.68	4.41	4.78	4.53	4.51
27	4.20	4.35	4.12	4.33	4.10	4.31	4.42	4.63	4.48	---	4.54	4.49
28	4.21	4.28	4.15	4.40	4.12	4.34	4.50	4.63	4.49	---	4.55	3.82
29	4.18	4.34	4.13	4.36	4.11	4.35	4.50	4.65	4.52	4.52	4.57	3.96
30	4.27	4.34	4.17	4.31	---	4.33	4.49	4.62	4.55	4.56	4.54	4.16
31	4.28	---	4.19	4.35	---	4.29	---	4.62	---	4.59	4.60	---

WTR YR 2004 MEAN 4.35 HIGH 3.10 LOW 4.79

GROUND-WATER LEVELS  
 ROCKINGHAM COUNTY—Continued

362226079410102. County number, RK-244; DENR Upper Piedmont Research Station MW-S4I (Transition Zone well).



362226079410102 RK-244 DENR Upper Piedmont Research Station MW-S4I (Transition zone well)—Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 2003 to October 2004 (discontinued).

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May 2003 to October 2004.

pH: May 2003 to October 2004.

WATER TEMPERATURE: May 2003 to October 2004.

DISSOLVED OXYGEN: May 2003 to October 2004.

DISSOLVED OXYGEN, PERCENT SATURATION: May 2003 to October 2004.

INSTRUMENTATION.-- Water-quality monitor with satellite telemetry from May 2003 to October 2004.

REMARKS.--Station operated in cooperation with North Carolina Department of Environment and Natural Resources, Water Resources Division as part of the Piedmont/Mountains ground-water study. Dissolved oxygen, percent saturation, is computed using a barometric pressure of 750 mm Hg.

EXTREMES FOR PERIOD OF DAILY RECORD.--

CONSTITUENT	MAXIMUM RECORDED	MINIMUM RECORDED
SPECIFIC CONDUCTANCE, microsiemens	315, March 6, 7, 8, 25, 2004, July 28-31, 2004	289, July 17, 18, 2003
pH, standard units	7.7, May 27, 2004	6.8, June 19, 20, 21, 2003
WATER TEMPERATURE, °C	14.6, on several days during the period	13.5, on many days during the period
DISSOLVED OXYGEN, mg/L	0.9, August 9, 10, 14, 2003	0.0, on many days during the period
DISSOLVED OXYGEN, PERCENT SATURATION, %	9, August 9, 10, 14, 2003	0, on many days during the period

EXTREMES FOR CURRENT PERIOD.--

CONSTITUENT	MAXIMUM RECORDED	MINIMUM RECORDED
SPECIFIC CONDUCTANCE, microsiemens	315, March 6, 7, 8, 25, July 28-31	292, November 10, 11
pH, standard units	7.7, May 27	7.2, on many days during the period
WATER TEMPERATURE, °C	14.6, on several days during the period	13.5, on many days during the period
DISSOLVED OXYGEN, mg/L	0.3, on several days during the period	0.0, on many days during the period
DISSOLVED OXYGEN, PERCENT SATURATION, %	3, on several days during the period	0, on many days during the period

362226079410102 RK-244 DENR Upper Piedmont Research Station MW-S4I (Transition zone well)—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Dis- solved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	Specif. conduc- tance, wat unf uS/cm 25 degC (00095)	Temper- ature, water, deg C (00010)	Hard- ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes- ium, water, fltrd, mg/L (00925)	Potas- sium, water, fltrd, mg/L (00935)	Sodium, water, fltrd, mg/L (00930)	ANC, wat unf incrm. titr., field, mg/L as CaCO3 (00419)	Bromide water, fltrd, mg/L (71870)	Chlor- ide, water, fltrd, mg/L (00940)
MAR 24...	1020	M	6.9	304	14.7	130	32.4	11.5	2.07	9.24	73	.10	14.7
Date		Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue on evap. at 180degC wat flt mg/L (70300)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Arsenic water, fltrd, ug/L (01000)	Boron, water, fltrd, ug/L (01020)	Iron, water, fltrd, ug/L (01046)	Mangan- ese, water, fltrd, ug/L (01056)	
MAR 24...		32.2	51.0	208	<.04	<.06	<.008	<.006	<2	<7.0	829	156	

Remark codes used in this table:  
 < -- Less than  
 M-- Presence verified, not quantified

362226079410102 RK-244 DENR Upper Piedmont Research Station MW-S4I (Transition zone well)—Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	299	296	295	300	310	313	306	307	310	312	313	303
2	299	296	295	300	310	314	306	307	310	312	312	303
3	299	296	---	300	311	314	306	308	310	312	311	303
4	299	295	---	301	311	314	305	308	311	312	310	303
5	298	295	---	301	311	314	305	307	311	312	310	303
6	298	295	296	301	311	314	305	307	311	312	309	302
7	299	294	296	301	311	314	305	307	311	312	309	302
8	299	293	296	302	311	314	305	308	311	312	308	302
9	299	293	---	302	311	313	304	308	312	313	308	303
10	299	293	---	302	311	313	304	308	312	313	308	302
11	298	293	---	303	311	312	304	309	312	313	307	302
12	298	293	---	303	312	313	305	309	312	313	307	302
13	298	293	---	303	312	313	305	309	312	313	307	302
14	298	293	---	304	312	313	305	308	312	313	307	301
15	298	293	---	304	312	313	305	309	312	313	307	300
16	298	293	---	304	312	313	305	309	312	312	307	300
17	297	294	---	305	312	313	305	309	312	311	306	300
18	297	294	---	305	312	313	304	309	312	312	306	300
19	297	294	297	305	312	313	304	309	311	312	305	300
20	297	294	297	306	312	313	305	310	310	312	304	300
21	297	294	297	306	312	314	305	310	310	313	304	300
22	297	294	297	307	312	313	305	310	310	313	304	301
23	296	294	297	307	312	313	305	309	310	313	304	301
24	296	295	298	307	313	---	306	309	311	313	304	301
25	297	295	298	308	313	314	306	309	311	313	304	300
26	297	295	298	308	313	313	305	309	311	313	303	300
27	297	295	298	309	313	312	305	310	311	313	303	300
28	297	295	299	309	313	311	306	309	311	---	303	300
29	296	295	299	309	313	310	306	309	311	315	303	300
30	296	295	299	310	---	309	307	309	312	315	303	300
31	296	---	299	310	---	307	---	309	---	314	303	---
MEAN	298	294	---	305	312	---	305	309	311	---	306	301
MAX	299	296	--	310	313	--	307	310	312	--	313	303
MIN	296	293	--	300	310	--	304	307	310	--	303	300



362226079410102 RK-244 DENR Upper Piedmont Research Station MW-S4I (Transition zone well)—Continued

PH, WATER, UNFILTERED, FIELD, STANDARD UNITS  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.3	7.3	7.4	7.5	7.5	7.4	7.4	7.5	7.5	7.5	7.3	7.4
2	7.3	7.2	7.4	7.5	7.5	7.4	7.4	7.5	7.5	7.5	7.3	7.4
3	7.3	7.2	---	7.5	7.5	7.4	7.3	7.5	7.5	7.5	7.4	7.4
4	7.3	7.2	---	7.5	7.5	7.4	7.3	7.5	7.5	7.5	7.4	7.4
5	7.3	7.2	---	7.5	7.5	7.4	7.4	7.5	7.5	7.5	7.4	7.4
6	7.3	7.2	7.4	7.5	7.5	7.4	7.4	7.5	7.5	7.5	7.4	7.4
7	7.3	7.2	7.4	7.5	7.5	7.4	7.4	7.5	7.5	7.5	7.4	7.4
8	7.2	7.2	7.4	7.5	7.5	7.4	7.4	7.5	7.5	7.5	7.4	7.4
9	7.2	7.2	---	7.5	7.5	7.4	7.4	7.5	7.5	7.4	7.4	7.4
10	7.2	7.2	---	7.5	7.5	7.4	7.4	7.5	7.6	7.4	7.4	7.4
11	7.2	7.2	---	7.5	7.5	7.4	7.4	7.5	7.6	7.4	7.4	7.4
12	7.2	7.2	---	7.5	7.5	7.4	7.4	7.5	7.5	7.4	7.4	7.3
13	7.2	7.3	---	7.5	7.5	7.4	7.4	7.5	7.5	7.4	7.4	7.3
14	7.3	7.3	---	7.6	7.5	7.4	7.4	7.5	7.5	7.4	7.4	7.3
15	7.3	7.3	---	7.6	7.5	7.4	7.4	7.5	7.5	7.4	7.5	7.3
16	7.3	7.3	---	7.6	7.5	7.4	7.4	7.5	7.5	---	7.5	7.3
17	7.3	7.3	---	7.6	7.5	7.4	7.4	7.5	7.5	---	7.4	7.3
18	7.3	7.3	---	7.6	7.5	7.4	7.4	7.5	---	7.5	7.4	7.3
19	7.3	7.3	7.5	7.6	7.5	7.4	7.4	7.5	---	7.5	7.4	7.3
20	7.3	7.4	7.5	7.6	7.5	7.4	7.4	7.5	---	7.5	7.4	7.3
21	7.3	7.4	7.5	7.6	7.5	7.4	7.4	7.5	7.5	7.5	7.4	7.3
22	7.3	7.4	7.5	7.6	7.4	7.4	7.4	7.5	7.5	7.5	7.4	7.3
23	7.3	7.4	7.5	7.6	7.4	7.4	7.4	7.4	7.5	7.5	7.4	7.3
24	7.3	7.4	7.5	7.6	7.4	---	7.4	7.4	7.5	7.5	7.4	7.3
25	7.3	7.4	7.5	7.6	7.4	7.3	7.4	7.4	7.5	7.5	7.4	7.3
26	7.3	7.4	7.5	7.6	7.4	7.3	7.4	7.5	7.5	7.5	7.4	7.3
27	7.3	7.4	7.6	7.5	7.4	7.4	7.4	---	7.5	7.5	7.4	7.3
28	7.3	7.4	7.6	7.5	7.4	7.4	7.5	---	7.5	---	7.4	7.3
29	7.3	7.4	7.6	7.5	7.4	7.4	7.5	7.5	7.5	7.3	7.4	7.3
30	7.3	7.4	7.6	7.5	---	7.4	7.5	7.5	7.5	7.3	7.4	7.3
31	7.3	---	7.6	7.5	---	7.4	---	7.5	---	7.3	7.4	---
MEAN	7.3	7.3	---	7.5	7.5	---	7.4	---	---	---	7.4	7.3
MAX	7.3	7.4	---	7.6	7.5	---	7.5	---	---	---	7.5	7.4
MIN	7.2	7.2	---	7.5	7.4	---	7.3	---	---	---	7.3	7.3



362226079410102 RK-244 DENR Upper Piedmont Research Station MW-S4I (Transition zone well)—Continued

TEMPERATURE, WATER, DEGREES CELSIUS  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.2	14.4	14.6	14.4	14.1	13.7	13.6	13.6	13.7	13.8	13.9	14.0
2	14.2	14.4	14.6	14.4	14.1	13.7	13.6	13.6	13.7	13.8	13.9	14.1
3	14.2	14.4	---	14.4	14.1	13.7	13.6	13.6	13.7	13.8	13.9	14.1
4	14.2	14.4	---	14.4	14.0	13.7	13.6	13.6	13.7	13.8	13.9	14.1
5	14.3	14.4	---	14.4	14.0	13.7	13.6	13.6	13.7	13.8	13.9	14.1
6	14.3	14.4	14.6	14.4	14.0	13.7	13.6	13.6	13.7	13.8	13.9	14.1
7	14.3	14.5	14.6	14.4	13.8	13.7	13.6	13.6	13.7	13.8	13.9	14.1
8	14.3	14.5	14.6	14.3	13.9	13.7	13.6	13.6	13.7	13.8	13.9	14.1
9	14.3	14.5	---	14.3	13.9	13.7	13.6	13.6	13.7	13.8	13.9	14.1
10	14.3	14.5	---	14.3	13.9	13.7	13.6	13.6	13.7	13.8	14.0	14.1
11	14.3	14.5	---	14.3	13.9	13.7	13.6	13.6	13.7	13.8	14.0	14.1
12	14.3	14.5	---	14.3	13.9	13.7	13.6	13.6	13.7	13.8	14.0	14.1
13	14.3	14.5	---	14.3	13.9	13.7	13.6	13.6	13.7	13.8	14.0	14.1
14	14.3	14.5	---	14.3	13.9	13.7	13.6	13.6	13.7	13.8	14.0	---
15	14.3	14.5	---	14.3	13.9	13.7	13.6	13.6	13.7	13.8	14.0	14.1
16	14.3	14.5	---	14.3	13.9	13.7	13.6	13.6	13.7	13.8	14.0	14.1
17	14.3	14.5	---	14.3	13.8	13.7	13.6	13.6	13.7	13.9	14.0	14.1
18	14.3	14.5	---	14.3	13.8	13.7	13.6	13.6	13.8	13.9	14.0	14.1
19	14.3	14.5	14.4	14.3	13.8	13.7	13.6	13.6	13.8	13.9	14.0	14.1
20	14.3	14.5	14.4	14.3	13.8	13.7	13.6	13.6	13.8	13.9	14.0	14.1
21	14.4	14.6	14.4	14.2	13.8	13.7	13.6	13.6	13.8	13.9	14.0	14.1
22	14.4	14.6	14.4	14.2	13.8	13.7	13.6	13.6	13.8	13.9	14.0	14.1
23	14.4	14.6	14.4	14.2	13.8	13.7	13.6	13.6	13.8	13.9	14.0	14.2
24	14.4	14.6	14.4	14.2	13.7	---	13.6	13.7	13.8	13.9	14.0	14.2
25	14.4	14.6	14.4	14.2	13.7	13.7	13.6	13.7	13.8	13.9	14.0	14.2
26	14.4	14.6	14.4	14.2	13.7	13.7	13.6	13.7	13.8	13.9	14.0	14.2
27	14.4	14.6	14.4	14.2	13.7	13.6	13.6	13.7	13.8	13.9	14.0	14.2
28	14.4	14.6	14.4	14.2	13.7	13.6	13.6	13.7	13.8	---	14.0	14.2
29	14.4	14.6	14.4	14.2	13.7	13.6	13.6	13.7	13.8	13.9	14.0	14.2
30	14.4	14.6	14.4	14.2	---	13.6	13.6	13.7	13.8	13.9	14.0	14.2
31	14.4	---	14.4	14.1	---	13.6	---	13.7	---	13.9	14.0	---
MEAN	14.3	14.5	---	14.3	13.9	---	13.6	13.6	13.7	---	14.0	---
MAX	14.4	14.6	---	14.4	14.1	---	13.6	13.7	13.8	---	14.0	---
MIN	14.2	14.4	---	14.1	13.7	---	13.6	13.6	13.7	---	13.9	---



362226079410102 RK-244 DENR Upper Piedmont Research Station MW-S4I (Transition zone well)—Continued

DISSOLVED OXYGEN, WATER, UNFILTERED, MILLIGRAMS PER LITER  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
3	0.2	0.2	---	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
4	0.2	0.2	---	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
5	0.2	0.2	---	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
6	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
7	0.2	---	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
8	0.2	0.2	0.1	0.1	0.1	---	0.1	0.1	0.1	0.1	0.1	0.0
9	0.2	0.2	---	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
10	0.2	0.2	---	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
11	0.2	0.2	---	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
12	0.2	0.2	---	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
13	0.1	0.2	---	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
14	0.1	0.1	---	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	---
15	0.1	0.2	---	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	---
16	0.1	0.2	---	0.1	0.1	0.1	0.1	0.1	0.1	---	0.1	---
17	0.2	0.1	---	0.1	0.1	0.1	0.1	0.1	0.1	---	0.0	0.1
18	0.2	0.1	---	0.1	0.1	0.1	0.1	0.1	---	---	0.1	0.1
19	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	---	0.1	0.0	0.1
20	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	---	0.1	0.0	0.1
21	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
22	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
23	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
24	0.2	0.1	0.1	0.1	0.1	---	0.1	0.1	0.1	0.1	0.0	0.1
25	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
26	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
27	0.2	0.1	0.1	0.1	0.1	0.1	0.1	---	0.1	0.1	0.0	0.1
28	0.2	0.1	0.1	0.1	0.1	0.1	0.1	---	0.1	---	0.0	0.1
29	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	---	0.0	0.1
30	0.2	0.1	0.1	0.1	---	0.1	0.1	0.1	0.1	---	0.0	0.1
31	0.2	---	0.1	0.1	---	0.1	---	0.1	---	---	0.0	---
MEAN	0.2	---	---	0.1	0.1	---	0.1	---	---	---	0.1	---
MAX	0.2	---	---	0.1	0.1	---	0.1	---	---	---	0.1	---
MIN	0.1	---	---	0.1	0.1	---	0.1	---	---	---	0.0	---



362226079410102 RK-244 DENR Upper Piedmont Research Station MW-S4I (Transition zone well)—Continued

DISSOLVED OXYGEN, WATER, UNFILTERED, PERCENT OF SATURATION  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2	2	1	1	1	1	1	1	1	1	1	0
2	2	2	1	1	1	1	1	1	1	1	1	0
3	2	2	---	1	1	1	1	1	1	1	1	0
4	2	2	---	1	1	1	1	1	1	1	0	0
5	2	2	---	1	1	1	1	1	1	1	1	0
6	2	2	1	1	1	1	1	1	1	1	1	0
7	2	---	1	1	1	1	1	1	1	1	0	0
8	2	2	1	1	1	---	1	1	1	1	0	0
9	2	2	---	1	1	1	1	1	1	0	0	0
10	2	2	---	1	1	1	1	1	1	1	0	0
11	2	2	---	1	1	1	1	1	1	1	0	0
12	2	2	---	1	1	1	1	1	1	1	0	0
13	1	2	---	1	1	1	1	1	1	1	0	0
14	1	2	---	1	1	1	1	1	1	0	0	---
15	1	2	---	1	1	1	1	1	1	0	0	---
16	1	2	---	1	1	1	1	1	1	---	0	---
17	2	1	---	1	1	1	1	1	1	---	0	1
18	2	1	---	1	1	1	1	1	---	---	0	1
19	2	1	2	1	1	1	1	1	---	1	0	0
20	2	1	2	1	1	1	1	1	---	1	0	0
21	2	1	1	1	1	1	1	1	1	1	0	0
22	2	1	1	1	1	1	1	1	1	1	0	0
23	2	1	1	1	1	1	1	1	1	1	0	0
24	2	1	1	1	1	---	1	1	1	0	0	0
25	2	1	1	1	1	1	1	1	1	0	0	0
26	2	1	1	1	1	1	1	1	1	0	0	0
27	2	1	1	1	1	1	1	---	1	0	0	0
28	2	1	1	1	1	1	1	---	1	---	0	0
29	2	1	1	1	1	1	1	1	1	---	0	0
30	2	1	1	1	---	1	1	1	1	---	0	0
31	2	---	1	1	---	1	---	1	---	---	0	---
MEAN	2	---	---	1	1	---	1	---	---	---	0	---
MAX	2	--	--	1	1	--	1	--	--	--	1	--
MIN	1	--	--	1	1	--	1	--	--	--	0	--



## ROCKINGHAM COUNTY—Continued

362226079410103. County number, RK-245; DENR Upper Piedmont Research Station MW-S4D (Bedrock well).

LOCATION.--Lat 36°22'26", long 79°41'01", Hydrologic Unit 03010103, .6 mi north of Wentworth Street, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

## WATER-LEVEL RECORDS

AQUIFER.--Felsic Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 380 ft, diameter 6 in., cased to 77 ft, open hole from 77 ft to 380 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at site.

DATUM.--Land-surface datum is 659.57 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 3.02 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study. Well is located in close proximity to stream.

PERIOD OF RECORD.--May 2002 to current year. Continuous record began May 2003.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 2.51 ft below land-surface datum, Feb. 6, 2004; lowest water level measured 5.55 ft below land-surface datum, Aug. 7, 2002.

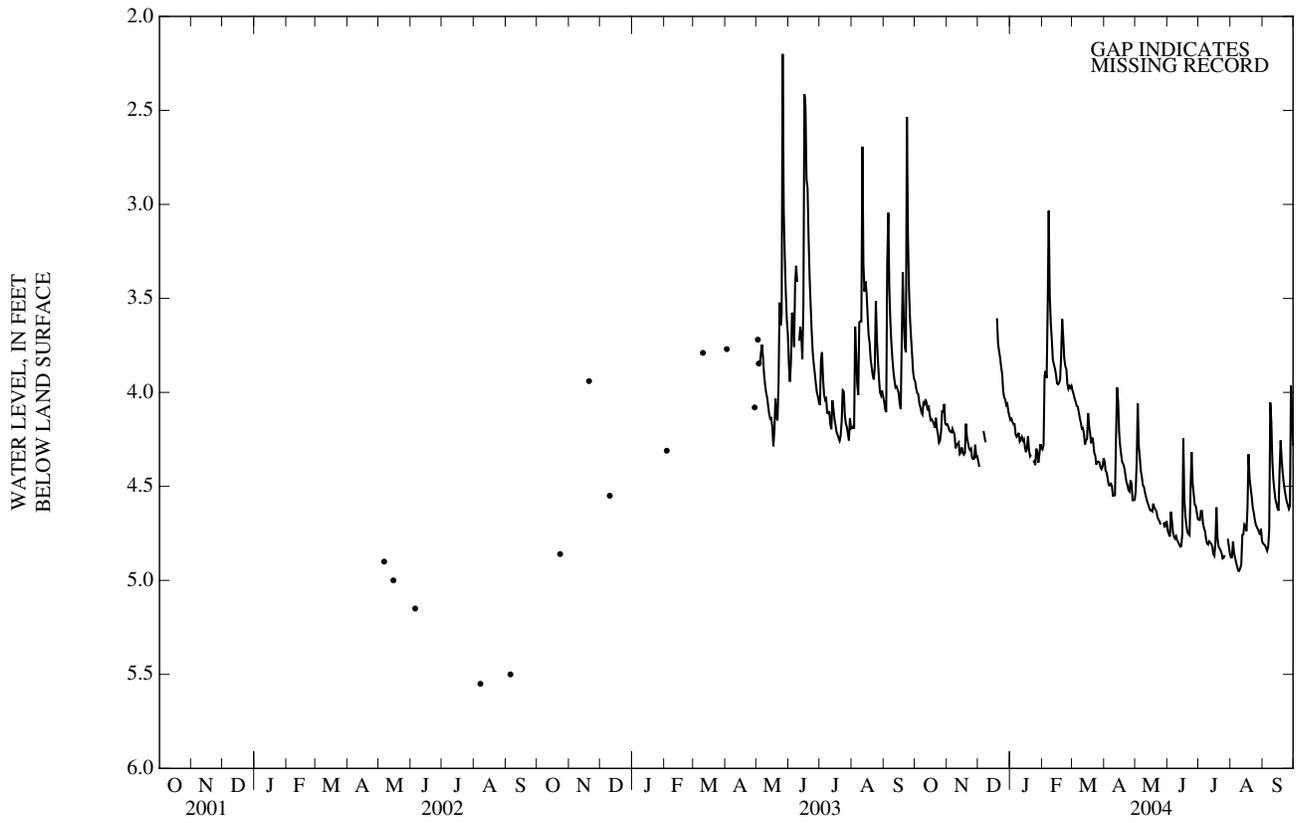
DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.94	4.17	4.37	4.15	4.30	3.99	4.37	4.53	4.74	4.68	4.88	4.80
2	3.98	4.18	4.40	4.14	4.28	4.01	4.42	4.36	4.75	4.68	4.88	4.81
3	4.00	4.20	---	4.16	3.91	4.03	4.43	4.06	4.77	4.63	4.79	4.82
4	4.01	4.21	---	4.17	3.89	4.05	4.46	4.29	4.64	4.63	4.85	4.83
5	4.06	4.21	---	4.17	3.92	4.07	4.49	4.35	4.68	4.70	4.88	4.84
6	4.08	4.19	4.21	4.22	3.55	4.08	4.49	4.42	4.75	4.72	4.90	4.82
7	4.11	4.21	4.24	4.24	3.03	4.10	4.49	4.45	4.77	4.74	4.93	4.73
8	4.12	4.22	4.27	4.23	3.49	4.14	4.50	4.49	4.78	4.78	4.95	4.05
9	4.06	4.30	---	4.22	3.63	4.16	4.55	4.50	4.77	4.80	4.95	4.15
10	4.06	4.28	---	4.26	3.72	4.19	4.55	4.53	4.79	4.81	4.93	4.37
11	4.04	4.27	---	4.25	3.83	4.19	4.55	4.56	4.80	4.79	4.92	4.46
12	4.06	4.27	---	4.24	3.85	4.22	4.24	4.58	4.81	4.80	4.76	4.52
13	4.10	4.33	---	4.26	3.87	4.28	3.97	4.59	4.82	4.81	4.76	4.57
14	4.07	4.32	---	4.25	3.90	4.25	4.04	4.61	4.82	4.82	4.70	4.59
15	4.12	4.29	---	4.29	3.95	4.25	4.21	4.63	4.75	4.86	4.71	4.62
16	4.15	4.32	---	4.32	3.96	4.11	4.28	4.63	4.24	4.87	4.74	4.63
17	4.14	4.33	---	4.29	3.95	4.18	4.33	4.63	4.57	4.80	4.62	4.41
18	4.15	4.32	---	4.23	3.93	4.22	4.37	4.59	4.66	4.61	4.33	4.26
19	4.17	4.17	3.61	4.31	3.80	4.27	4.38	4.61	4.71	4.77	4.45	4.36
20	4.19	4.24	3.74	4.34	3.61	4.24	4.40	4.62	4.74	4.82	4.51	4.43
21	4.14	4.27	3.78	4.33	3.71	4.26	4.44	4.63	4.75	4.83	4.55	4.48
22	4.19	4.30	3.81	---	3.82	4.32	4.48	4.66	4.76	4.84	4.61	4.52
23	4.22	4.31	3.86	4.37	3.86	4.34	4.49	4.68	4.52	4.86	4.64	4.55
24	4.27	4.30	3.90	4.37	3.88	4.38	4.52	4.69	4.32	4.88	4.68	4.58
25	4.26	4.35	3.99	4.39	3.95	4.37	4.53	4.70	4.48	4.88	4.70	4.60
26	4.21	4.35	4.03	4.30	3.98	4.37	4.47	---	4.54	4.87	4.72	4.62
27	4.10	4.35	4.04	4.32	3.97	4.37	4.49	---	4.60	---	4.73	4.60
28	4.10	4.28	4.07	4.37	3.98	4.40	4.57	4.69	4.60	---	4.74	3.96
29	4.06	4.34	4.06	4.33	3.97	4.41	4.57	4.72	4.64	4.78	4.76	4.10
30	4.16	4.34	4.10	4.28	---	4.39	4.57	4.69	4.67	4.82	4.73	4.28
31	4.17	---	4.13	4.30	---	4.35	---	4.69	---	4.86	4.79	---

WTR YR 2004 MEAN 4.38 HIGH 3.03 LOW 4.95

GROUND-WATER LEVELS  
ROCKINGHAM COUNTY—Continued

362226079410103. County number, RK-245; DENR Upper Piedmont Research Station MW-S4D (Bedrock well).



362226079410103 RK-245 DENR Upper Piedmont Research Station MW-S4D (Transition zone well)—Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 2003 to October 2004 (discontinued).

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May 2003 to October 2004.

pH: May 2003 to October 2004.

WATER TEMPERATURE: May 2003 to October 2004.

DISSOLVED OXYGEN: May 2003 to October 2004.

DISSOLVED OXYGEN, PERCENT SATURATION: May 2003 to October 2004.

INSTRUMENTATION.-- Water-quality monitor with satellite telemetry from May 2003 to October 2004.

REMARKS.--Station operated in cooperation with North Carolina Department of Environment and Natural Resources, Water Resources Division, as part of the Piedmont/Mountains ground-water study. Dissolved oxygen, percent saturation, is computed using a barometric pressure of 750 mm Hg.

EXTREMES FOR PERIOD OF DAILY RECORD.--

CONSTITUENT	MAXIMUM RECORDED	MINIMUM RECORDED
SPECIFIC CONDUCTANCE, microsiemens	397, September 16, 19, 23, 25, 2004, October 6, 2004	304, on several days during the period
pH, standard units	8.1, June 21-24, 2004	7.0, on many days during the period
WATER TEMPERATURE, °C	14.8, on many days during the period	14.7, on many days during the period
DISSOLVED OXYGEN, mg/L	1.1, May 1, 2003	0.0, on many days during the period
DISSOLVED OXYGEN, PERCENT SATURATION, %	11, May 1, 2003	0, on many days during the period

EXTREMES FOR CURRENT PERIOD.--

CONSTITUENT	MAXIMUM RECORDED	MINIMUM RECORDED
SPECIFIC CONDUCTANCE, microsiemens	397, September 16, 19, 23, 25, October 6	304, on several days during the period
pH, standard units	8.1, June 21-24	7.0, on many days during the period
WATER TEMPERATURE, °C	14.8, on many days during the period	14.7, on many days during the period
DISSOLVED OXYGEN, mg/L	0.1, on many days during the period	0.0, on many days during the period
DISSOLVED OXYGEN, PERCENT SATURATION, %	1, on many days during the period	0, on many days during the period

362226079410103 RK-245 DENR Upper Piedmont Research Station MW-S4D (Transition zone well)—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Dis-solved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unf uS/cm 25 degC (00095)	Temper-ature, water, deg C (00010)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes-ium, water, fltrd, mg/L (00925)	Potas-sium, water, fltrd, mg/L (00935)	Sodium, water, fltrd, mg/L (00930)	ANC, wat unf incrm. titr., field, mg/L as CaCO3 (00419)	Bromide water, fltrd, mg/L (71870)	Chlor-ide, water, fltrd, mg/L (00940)
MAY													
26...	1415	M	6.8	291	15.5	110	33.7	7.46	3.01	10.3	68	.04	14.9
26...	1830	.0	7.9	358	16.2	130	48.5	2.62	1.20	23.4	62	.03	5.27
27...	1155	.1	7.5	336	16.8	120	43.0	3.65	1.65	21.0	66	.02	7.07

Date	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue on evap. at 180degC wat flt mg/L (70300)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho-phosphate, water, fltrd, mg/L as P (00671)	Arsenic water, fltrd, ug/L (01000)	Boron, water, fltrd, ug/L (01020)	Iron, water, fltrd, ug/L (01046)	Mangan-ese, water, fltrd, ug/L (01056)
MAY											
26...	30.5	46.2	202	<.04	<.06	<.008	<.006	<2	<7.0	332	88.7
26...	21.5	96.3	251	<.04	<.06	<.008	<.006	<2	13	E5	21.2
27...	23.2	79.5	234	<.04	<.06	E.004	<.006	<2	13	30	48.4

Remark codes used in this table:  
 < -- Less than  
 E -- Estimated value  
 M-- Presence verified, not quantified

362226079410103 RK-245 DENR Upper Piedmont Research Station MW-S4D (Transition zone well)—Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	308	305	309	322	332	329	339	351	365	362	373	384
2	308	304	310	322	332	329	340	352	365	362	373	385
3	308	304	---	322	333	329	340	352	365	362	374	385
4	308	304	---	322	333	329	340	353	365	362	374	385
5	308	305	---	322	333	329	341	353	365	361	374	386
6	307	305	311	323	332	329	341	354	366	362	374	386
7	307	304	311	323	332	329	342	354	366	362	374	387
8	307	305	311	323	333	330	343	354	367	362	375	387
9	307	305	---	323	333	331	343	355	367	362	375	388
10	307	305	---	324	333	332	344	355	367	361	375	388
11	307	305	---	324	333	332	344	355	---	362	375	389
12	306	305	---	324	333	332	345	356	---	362	376	390
13	306	305	---	325	333	333	345	356	---	361	377	390
14	306	305	---	325	332	333	346	356	---	362	377	391
15	306	305	---	325	332	334	346	357	---	361	378	395
16	306	306	---	326	332	334	346	357	---	362	378	395
17	306	306	---	326	332	334	346	358	---	364	378	395
18	306	306	---	326	332	335	346	358	---	365	380	395
19	306	306	322	327	331	335	346	359	363	366	380	395
20	306	307	322	327	331	335	347	359	364	367	380	395
21	306	307	322	328	330	335	347	359	363	368	381	395
22	305	307	322	---	330	335	347	360	363	369	381	395
23	305	307	322	327	330	336	348	360	363	369	382	394
24	305	308	321	328	330	336	348	361	363	371	382	394
25	305	308	321	329	330	337	348	361	363	371	382	394
26	305	308	321	330	330	337	349	---	363	371	382	394
27	305	308	321	330	330	337	350	---	363	372	382	394
28	305	309	321	331	330	338	350	---	363	---	383	393
29	305	309	321	331	330	338	350	363	363	373	383	393
30	305	309	321	332	---	339	351	364	362	373	383	393
31	305	---	321	332	---	339	---	364	---	374	383	---
MEAN	306	306	---	---	332	334	345	---	---	---	378	391
MAX	308	309	--	--	333	339	351	--	--	--	383	395
MIN	305	304	--	--	330	329	339	--	--	--	373	384



362226079410103 RK-245 DENR Upper Piedmont Research Station MW-S4D (Transition zone well)—Continued

PH, WATER, UNFILTERED, FIELD, STANDARD UNITS  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.1	7.0	7.2	7.5	7.6	7.6	7.6	7.7	7.9	8.0	7.9	7.9
2	7.1	7.0	7.2	7.5	7.6	7.6	7.6	7.8	7.9	8.0	7.9	7.9
3	7.1	7.0	---	7.5	7.6	7.6	7.6	7.8	7.9	8.0	7.9	7.9
4	7.1	7.0	---	7.5	7.6	7.6	7.6	7.8	7.9	8.0	7.9	7.9
5	7.1	7.0	---	7.5	7.6	7.6	7.6	7.8	7.9	8.0	7.9	7.9
6	7.1	7.0	7.2	7.5	7.6	7.6	7.6	7.8	7.9	8.0	7.9	7.9
7	7.1	7.0	7.2	7.5	7.6	7.6	7.6	7.8	7.9	7.9	7.9	7.9
8	7.1	7.0	7.2	7.5	7.6	7.6	7.6	7.8	7.9	7.9	7.9	7.9
9	7.1	7.0	---	7.5	7.6	7.5	7.6	7.8	7.9	7.9	7.9	7.9
10	7.1	7.0	---	7.5	7.6	7.5	7.6	7.8	7.9	7.9	7.9	7.9
11	7.1	7.0	---	7.5	7.6	7.5	7.6	7.8	---	7.9	7.8	7.9
12	7.1	7.0	---	7.5	7.6	7.5	7.6	7.8	---	7.9	7.8	7.9
13	7.1	7.0	---	7.5	7.6	7.5	7.6	7.8	---	7.9	7.8	7.9
14	7.1	7.1	---	7.5	7.6	7.5	7.6	7.8	---	7.9	7.8	---
15	7.1	7.1	---	7.5	7.6	7.5	7.6	7.8	---	7.9	7.8	7.9
16	7.1	7.1	---	7.5	7.6	7.5	7.6	7.8	---	---	7.8	7.9
17	7.1	7.1	---	7.5	7.6	7.5	7.6	7.8	---	7.9	7.8	7.9
18	7.1	7.1	---	7.6	7.6	7.5	7.6	7.8	---	7.9	7.8	7.9
19	7.0	7.1	7.4	7.6	7.6	7.5	7.6	7.8	8.0	7.9	7.8	7.9
20	7.0	7.1	7.4	7.6	7.6	7.5	7.6	7.8	8.0	7.9	7.8	7.9
21	7.0	7.1	7.4	7.6	7.6	7.5	7.6	7.8	8.1	7.9	7.8	7.9
22	7.0	7.1	7.4	---	7.6	7.5	7.6	7.8	8.1	7.9	7.8	7.9
23	7.0	7.1	7.4	7.5	7.6	7.6	7.6	7.8	8.1	7.9	7.9	7.9
24	7.0	7.1	7.4	7.6	7.6	7.6	7.6	7.8	8.1	7.9	7.9	7.9
25	7.0	7.1	7.4	7.6	7.6	7.6	7.6	7.8	8.0	7.9	7.9	7.9
26	7.0	7.1	7.4	7.6	7.6	7.6	7.6	---	8.0	7.9	7.9	7.8
27	7.0	7.1	7.4	7.6	7.6	7.6	7.7	---	8.0	7.9	7.9	7.8
28	7.0	7.2	7.5	7.6	7.6	7.6	7.7	7.7	8.0	---	7.9	7.8
29	7.0	7.2	7.5	7.6	7.6	7.6	7.7	7.8	8.0	7.9	7.9	7.8
30	7.0	7.2	7.5	7.6	---	7.6	7.7	7.8	8.0	7.9	7.9	7.8
31	7.0	---	7.5	7.6	---	7.6	---	7.8	---	7.9	7.9	---
MEAN	7.1	7.1	---	---	7.6	7.6	7.6	---	---	---	7.9	---
MAX	7.1	7.2	---	---	7.6	7.6	7.7	---	---	---	7.9	---
MIN	7.0	7.0	---	---	7.6	7.5	7.6	---	---	---	7.8	---



362226079410103 RK-245 DENR Upper Piedmont Research Station MW-S4D (Transition zone well)—Continued

TEMPERATURE, WATER, DEGREES CELSIUS  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.8	14.8
2	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.8	14.8
3	14.7	14.7	---	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.8	14.8
4	14.7	14.7	---	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.8	14.8
5	14.7	14.7	---	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.8	14.8
6	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.8	14.8
7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.8	14.8
8	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.8	14.8
9	14.7	14.7	---	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.8	14.8
10	14.7	14.7	---	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.8	14.8
11	14.7	14.7	---	14.7	14.7	14.7	14.7	14.7	---	14.8	14.8	14.8
12	14.7	14.7	---	14.7	14.7	14.7	14.7	14.7	---	14.8	14.8	14.8
13	14.7	14.7	---	14.7	14.7	14.7	14.7	14.7	---	14.8	14.8	14.8
14	14.7	14.7	---	14.7	14.7	14.7	14.7	14.7	---	14.8	14.8	14.8
15	14.7	14.7	---	14.7	14.7	14.7	14.7	14.7	---	14.8	14.8	14.8
16	14.7	14.7	---	14.7	14.7	14.7	14.7	14.7	---	14.8	14.8	14.8
17	14.7	14.7	---	14.7	14.7	14.7	14.7	14.7	---	14.8	14.8	14.8
18	14.7	14.7	---	14.7	14.7	14.7	14.7	14.7	---	14.8	14.8	14.8
19	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.8	14.8	14.8
20	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.8	14.8	14.8
21	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.8	14.8	14.8
22	14.7	14.7	14.7	---	14.7	14.7	14.7	14.7	14.8	14.8	14.8	14.8
23	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.8	14.8	14.8
24	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.8	14.8	14.8
25	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.8	14.8	14.8
26	14.7	14.7	14.7	14.7	14.7	14.7	14.7	---	14.8	14.8	14.8	14.8
27	14.7	14.7	14.7	14.7	14.7	14.7	14.7	---	14.8	14.8	14.8	14.8
28	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.8	---	14.8	14.8
29	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.8	14.8	14.8	14.8
30	14.7	14.7	14.7	14.7	---	14.7	14.7	14.7	14.8	14.8	14.8	14.8
31	14.7	---	14.7	14.7	---	14.7	---	14.7	---	14.8	14.8	---
MEAN	14.7	14.7	---	---	14.7	14.7	14.7	---	---	---	14.8	14.8
MAX	14.7	14.7	---	---	14.7	14.7	14.7	---	---	---	14.8	14.8
MIN	14.7	14.7	---	---	14.7	14.7	14.7	---	---	---	14.8	14.8



362226079410103 RK-245 DENR Upper Piedmont Research Station MW-S4D (Transition zone well)—Continued

DISSOLVED OXYGEN, WATER, UNFILTERED, MILLIGRAMS PER LITER  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	---	---	---
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	---	---	---
3	0.0	0.0	---	0.0	0.0	0.0	0.0	0.0	0.1	---	---	---
4	0.0	0.0	---	0.0	0.0	0.0	0.0	0.0	0.1	---	---	---
5	0.0	0.0	---	0.0	0.0	0.0	0.0	0.0	0.1	---	---	---
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	---	---	---
7	0.0	---	0.0	0.0	0.0	0.0	0.0	0.0	0.1	---	---	---
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	---	---	---
9	0.0	0.0	---	0.0	0.0	0.0	0.0	0.0	0.1	---	---	---
10	0.0	0.0	---	0.1	0.0	0.0	0.0	0.0	0.1	---	---	---
11	0.0	0.0	---	0.1	0.0	0.0	0.0	0.0	---	---	---	---
12	0.0	0.0	---	0.0	0.0	0.0	0.0	0.0	---	---	---	---
13	0.0	0.0	---	0.0	0.0	0.0	0.0	0.0	---	---	---	---
14	0.0	0.0	---	0.0	0.0	0.0	0.0	0.0	---	---	---	---
15	0.0	0.0	---	0.0	0.0	0.0	0.0	0.0	---	---	---	---
16	0.0	0.0	---	0.0	0.0	0.0	0.0	0.0	---	---	---	---
17	0.0	0.0	---	0.0	0.0	0.0	0.0	0.0	---	---	---	---
18	0.0	0.0	---	0.0	0.0	0.0	0.0	0.0	---	---	---	---
19	0.0	0.0	---	0.0	0.0	0.0	0.0	0.0	---	---	---	---
20	0.0	0.0	---	0.0	0.0	0.0	0.0	0.0	---	---	---	---
21	0.0	0.0	---	0.0	0.0	0.0	0.0	0.0	---	---	---	---
22	0.0	0.0	0.1	---	0.0	0.0	0.0	0.0	---	---	---	---
23	0.0	0.0	0.1	---	0.0	0.0	0.0	0.0	---	---	---	---
24	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	---	---	---	---
25	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	---	---	---	---
26	0.0	0.0	0.1	0.1	0.0	0.0	0.0	---	---	---	---	---
27	0.0	0.0	0.1	0.1	0.1	0.0	0.0	---	---	---	---	---
28	0.0	0.0	0.0	0.1	0.0	0.0	0.0	---	---	---	---	---
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	---	---	---
30	0.0	0.0	0.0	0.0	---	0.0	0.0	---	---	---	---	---
31	0.0	---	0.0	0.0	---	0.0	---	---	---	---	---	---
MEAN	0.0	---	---	---	0.0	0.0	0.0	---	---	---	---	---
MAX	0.0	---	---	---	0.1	0.0	0.0	---	---	---	---	---
MIN	0.0	---	---	---	0.0	0.0	0.0	---	---	---	---	---

362226079410103 RK-245 DENR Upper Piedmont Research Station MW-S4D (Transition zone well)—Continued

DISSOLVED OXYGEN, WATER, UNFILTERED, PERCENT OF SATURATION  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	0	0	0	0	0	0	0	1	---	---	---
2	0	0	0	0	0	0	0	0	1	---	---	---
3	0	0	---	0	0	0	0	0	1	---	---	---
4	0	0	---	0	0	0	0	0	1	---	---	---
5	0	0	---	0	0	0	0	0	1	---	---	---
6	0	0	0	0	0	0	0	0	1	---	---	---
7	0	---	0	0	0	0	0	0	1	---	---	---
8	0	0	0	0	0	0	0	0	1	---	---	---
9	0	0	---	0	0	0	0	0	1	---	---	---
10	0	0	---	0	0	0	0	0	1	---	---	---
11	0	0	---	1	0	0	0	0	---	---	---	---
12	0	0	---	0	0	0	0	0	---	---	---	---
13	0	0	---	0	0	0	0	0	---	---	---	---
14	0	0	---	0	0	0	0	0	---	---	---	---
15	0	0	---	0	0	0	0	0	---	---	---	---
16	0	0	---	0	0	0	0	0	---	---	---	---
17	0	0	---	0	0	0	0	0	---	---	---	---
18	0	0	---	0	0	0	0	0	---	---	---	---
19	0	0	---	0	0	0	0	0	---	---	---	---
20	0	0	---	0	0	0	0	0	---	---	---	---
21	0	0	---	0	0	0	0	0	---	---	---	---
22	0	0	1	---	0	0	0	0	---	---	---	---
23	0	0	1	---	0	0	0	0	---	---	---	---
24	0	0	0	1	0	0	0	0	---	---	---	---
25	0	0	0	1	0	0	0	0	---	---	---	---
26	0	0	1	1	0	0	0	---	---	---	---	---
27	0	0	0	1	0	0	0	---	---	---	---	---
28	0	0	0	0	0	0	0	---	---	---	---	---
29	0	0	0	0	0	0	0	---	---	---	---	---
30	0	0	0	0	---	0	0	---	---	---	---	---
31	0	---	0	0	---	0	---	---	---	---	---	---
MEAN	0	---	---	---	0	0	0	---	---	---	---	---
MAX	0	--	--	--	0	0	0	--	--	---	---	---
MIN	0	--	--	--	0	0	0	--	--	---	---	---

ROCKINGHAM COUNTY--Continued

362334079421701. County number, RK-252; DENR Upper Piedmont Research Station PZ-2.

LOCATION.--Lat 36°23'34", long 79°42'17", Hydrologic Unit 03010103, .6 mi north of Wentworth St, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 24 ft, diameter 2 in., cased to 14 ft, screened interval from 14 ft to 24 ft, sand filter packed from 12 ft to 24 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 673.02 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.63 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--June 2003 to September 2004.

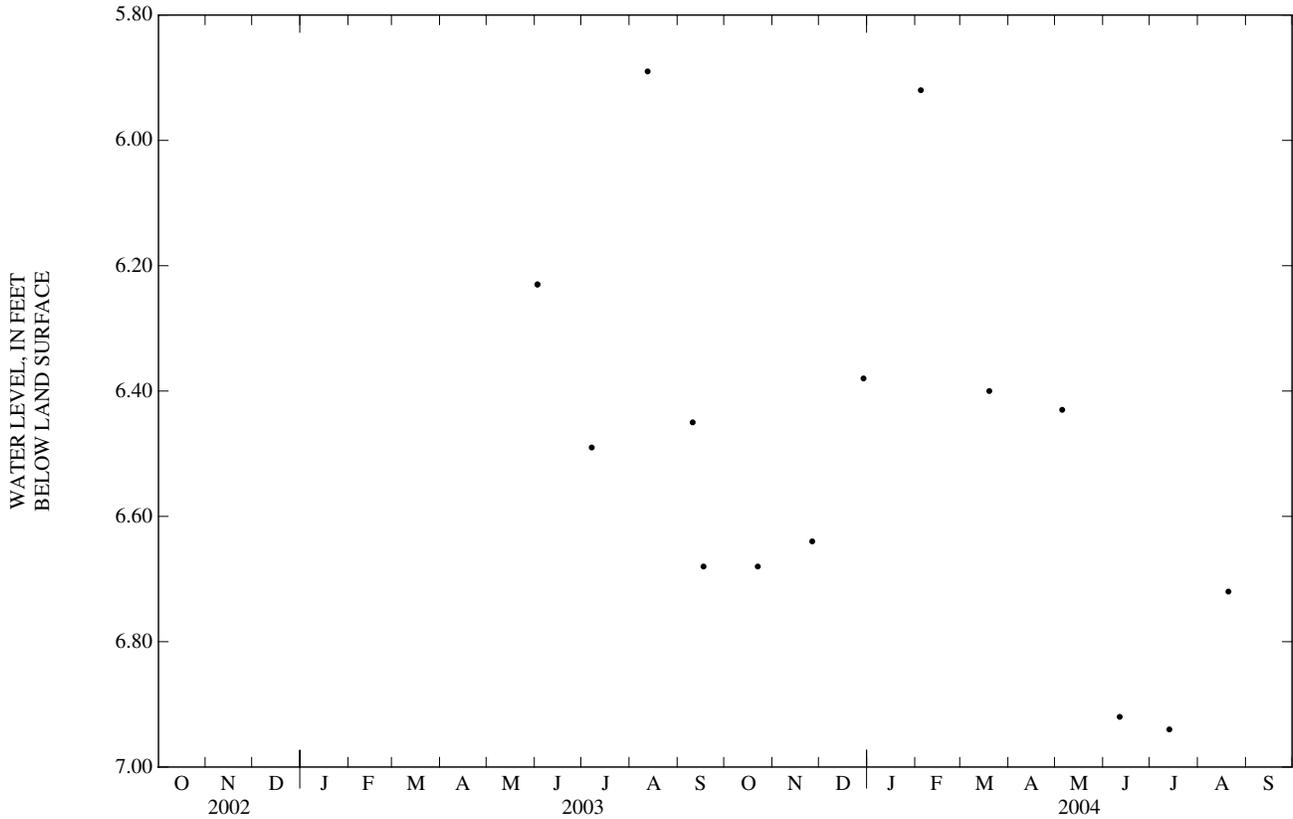
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.89 ft below land-surface datum, Aug. 12, 2003; lowest water level measured 6.94 ft below land-surface datum, July 13, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DATE	WATER LEVEL										
JUN 02	6.23	JUN 02	6.23	JUL 07	6.49	AUG 12	5.89	SEP 10	6.45	SEP 17	6.68

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL								
OCT 22	6.68	DEC 29	6.38	MAR 19	6.40	JUN 11	6.92	AUG 20	6.72
NOV 26	6.64	FEB 04	5.92	MAY 05	6.43	JUL 13	6.94		



GROUND-WATER LEVELS  
ROCKINGHAM COUNTY--Continued

362334079421703. County number, RK-253; DENR Upper Piedmont Research Station PZ-3.

LOCATION.--Lat 36°23'34", long 79°42'16", Hydrologic Unit 03010103, .6 mi north of Wentworth St, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 39 ft, diameter 2 in., cased to 29 ft, screened interval from 29 ft to 39 ft, sand filter packed from 27 ft to 39 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 672.17 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.33 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--June 2003 to September 2004.

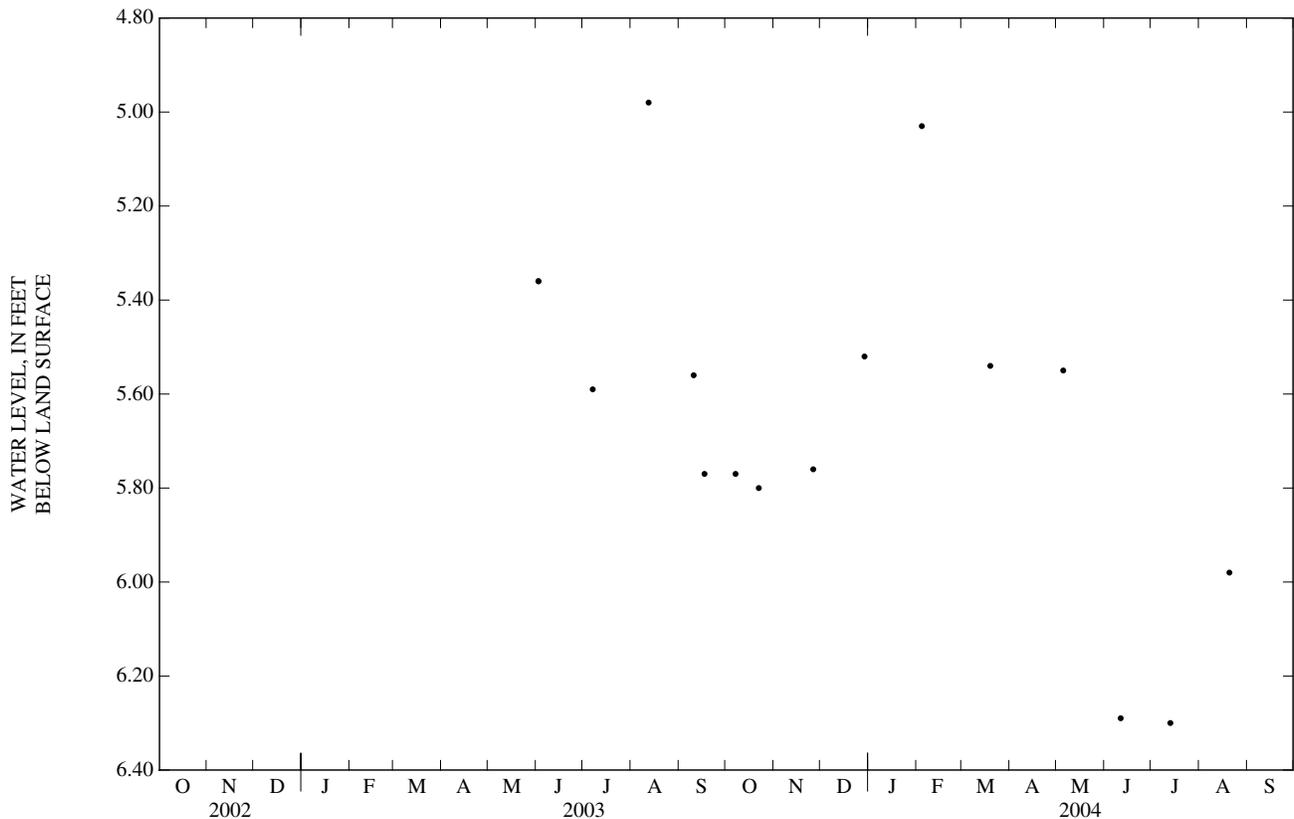
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.98 ft below land-surface datum, Aug. 12, 2003; lowest water level measured 6.30 ft below land-surface datum, July 13, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DATE	WATER LEVEL										
JUN 02	5.36	JUN 02	5.36	JUL 07	5.59	AUG 12	4.98	SEP 10	5.56	SEP 17	5.77

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL								
OCT 07	5.77	NOV 26	5.76	FEB 04	5.03	MAY 05	5.55	JUL 13	6.30
22	5.80	DEC 29	5.52	MAR 19	5.54	JUN 11	6.29	AUG 20	5.98



ROCKINGHAM COUNTY--Contineud

362334079421704. County number, RK-254; DENR Upper Piedmont Research Station PZ-4.

LOCATION.--Lat 36°23'34", long 79°42'17", Hydrologic Unit 03010103, .6 mi north of Wentworth St, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 31 ft, diameter 2 in., cased to 21 ft, screened interval from 21 ft to 31 ft, sand filter packed from 19 ft to 31 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 672.25 ft above NGVD of 1929. Measuring point: Top of protective steel casing, -0.22 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--June 2003 to September 2004.

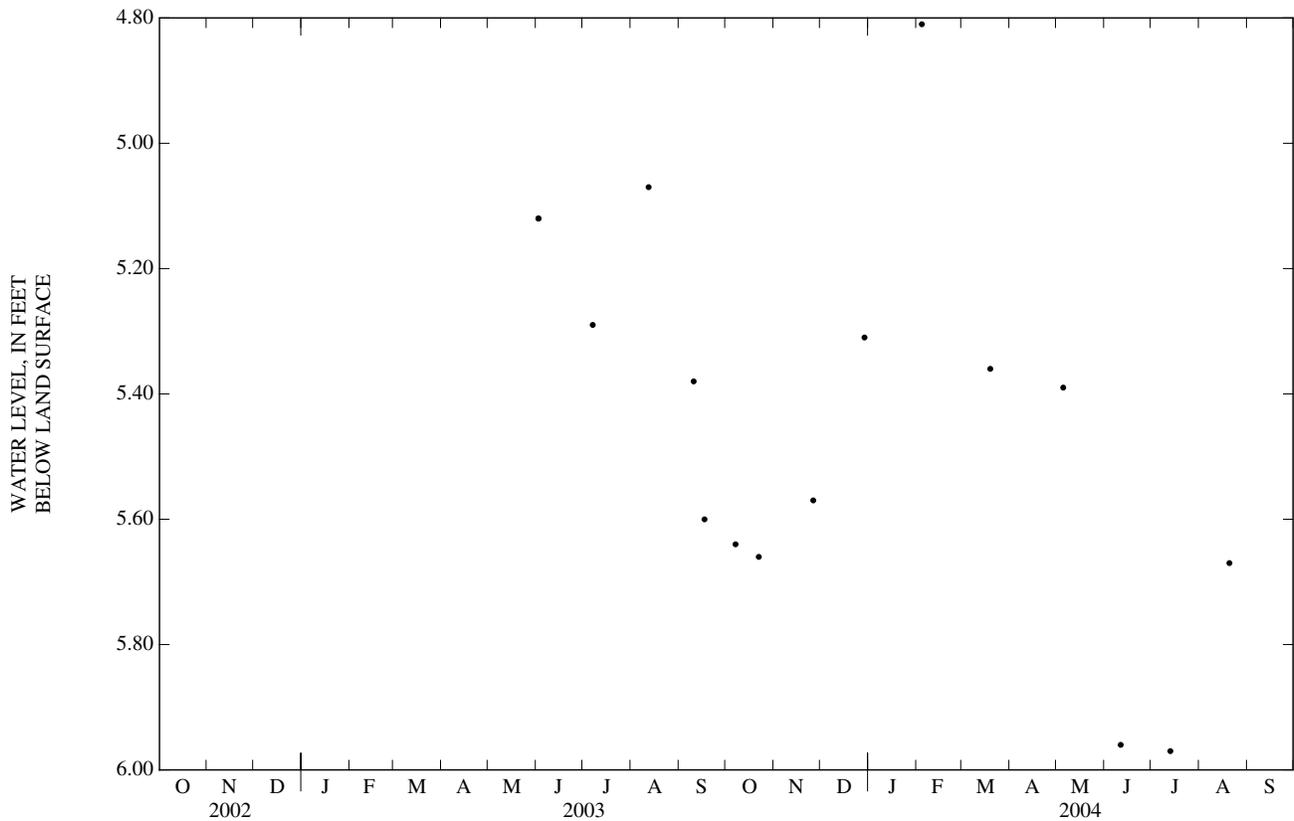
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.81 ft below land-surface datum, Feb. 4, 2004; lowest water level measured 5.97 ft below land-surface datum, July 13, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DATE	WATER LEVEL										
JUN 02	5.12	JUN 02	5.12	JUL 07	5.29	AUG 12	5.07	SEP 10	5.38	SEP 17	5.60

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL								
OCT 07	5.64	NOV 26	5.57	FEB 04	4.81	MAY 05	5.39	JUL 13	5.97
22	5.66	DEC 29	5.31	MAR 19	5.36	JUN 11	5.96	AUG 20	5.67



GROUND-WATER LEVELS

ROCKINGHAM COUNTY--Continued

362332079421601. County number, RK-255; DENR Upper Piedmont Research Station PZ-5.

LOCATION.--Lat 36°23'32", long 79°42'17", Hydrologic Unit 03010103, .6 mi north of Wentworth St, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 26 ft, diameter 2 in., cased to 16 ft, screened interval from 16 ft to 26 ft, sand filter packed from 14 ft to 26 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 671.62 ft above NGVD of 1929. Measuring point: Top of protective steel casing, -0.23 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--June 2003 to September 2004.

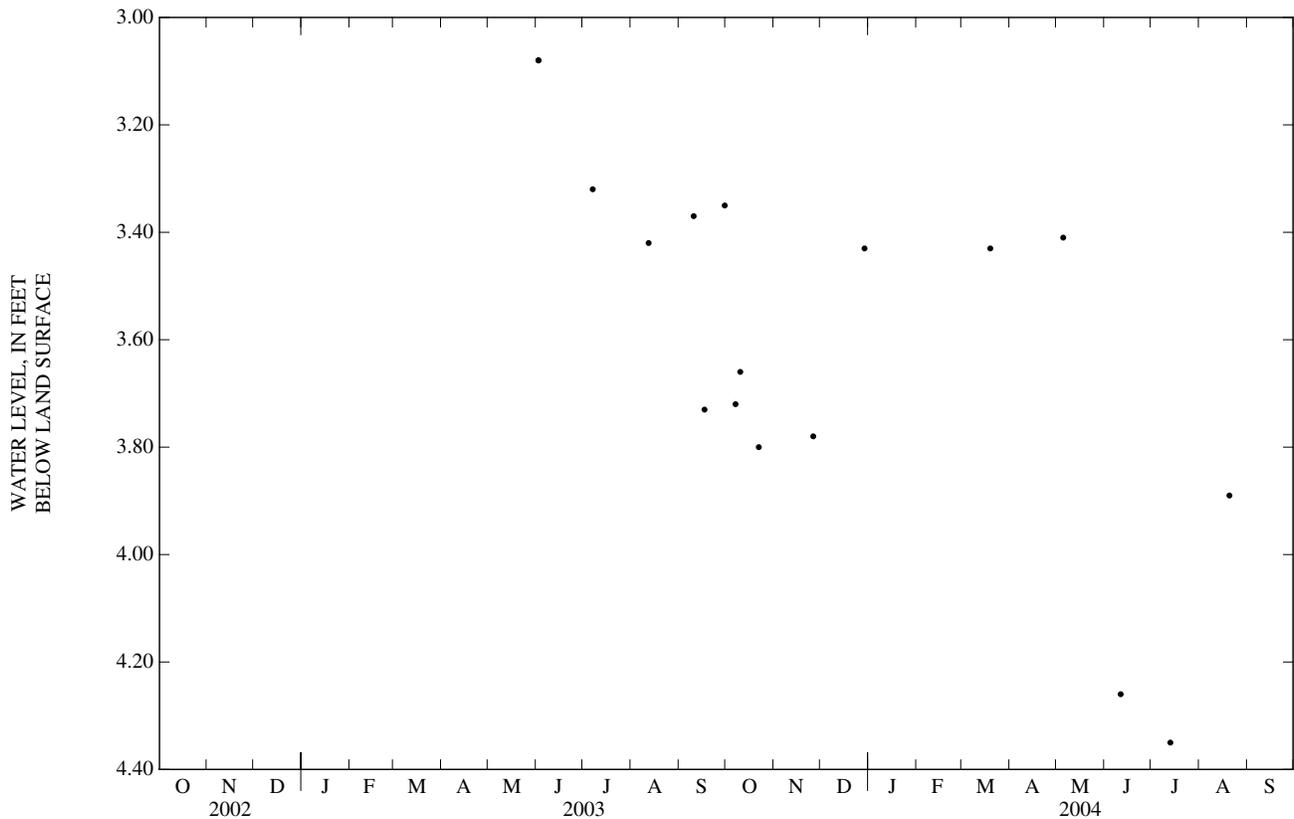
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.08 ft below land-surface datum, June 2, 2003; lowest water level measured 4.35 ft below land-surface datum, July 13, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DATE	WATER LEVEL						
JUN 02	3.08	JUL 07	3.32	SEP 10	3.37	SEP 30	3.35
02	3.08	AUG 12	3.42	17	3.73		

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL								
OCT 07	3.72	OCT 22	3.80	DEC 29	3.43	MAY 05	3.41	JUL 13	4.35
10	3.66	NOV 26	3.78	MAR 19	3.43	JUN 11	4.26	AUG 20	3.89



ROCKINGHAM COUNTY--Continued

362332079421602. County number, RK-256; DENR Upper Piedmont Research Station PZ-5I.

LOCATION.--Lat 36°23'32", long 79°42'17", Hydrologic Unit 03010103, .6 mi north of Wentworth St, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 40 ft, diameter 2 in., cased to 30 ft, screened interval from 30 ft to 40 ft, sand filter packed from 27 ft to 40 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 671.79 ft above NGVD of 1929. Measuring point: Top of protective steel casing, -0.33 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--September 2003 to September 2004.

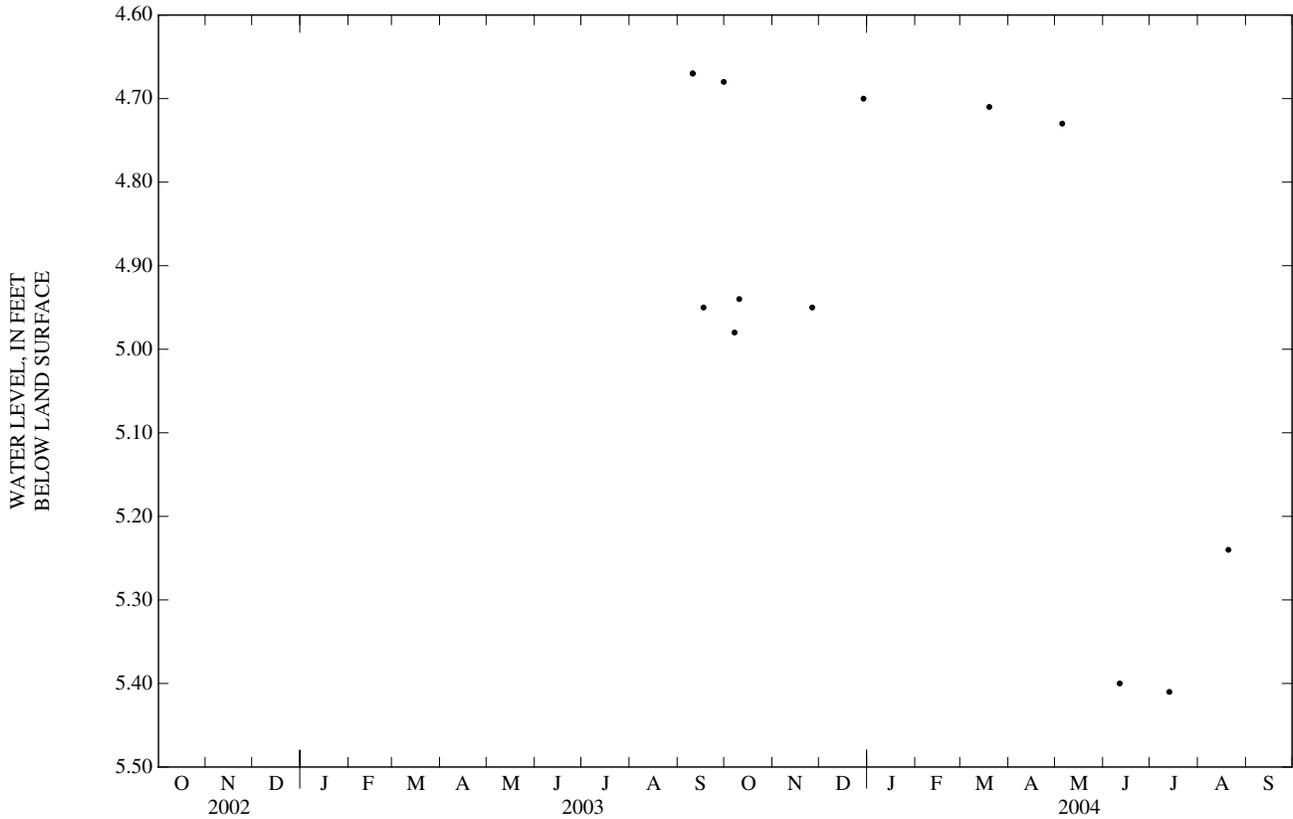
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.67 ft below land-surface datum, Sept. 10, 2003; lowest water level measured 5.41 ft below land-surface datum, July 13, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DATE	WATER LEVEL						
SEP 10	4.67	SEP 10	4.67	SEP 17	4.95	SEP 30	4.68

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL								
OCT 07	4.98	NOV 26	4.95	MAR 19	4.71	JUN 11	5.40	AUG 20	5.24
10	4.94	DEC 29	4.70	MAY 05	4.73	JUL 13	5.41		



GROUND-WATER LEVELS

ROCKINGHAM COUNTY--Continued

362332079421603. County number, RK-257; DENR Upper Piedmont Research Station PZ-5D.

LOCATION.--Lat 36°23'32", long 79°42'17", Hydrologic Unit 03010103, .6 mi north of Wentworth St, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 90 ft, diameter 2 in., cased to 70 ft, screened interval from 70 ft to 90 ft, sand filter packed from 67 ft to 90 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 671.72 ft above NGVD of 1929. Measuring point: Top of protective steel casing, -0.51 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--September 2003 to September 2004.

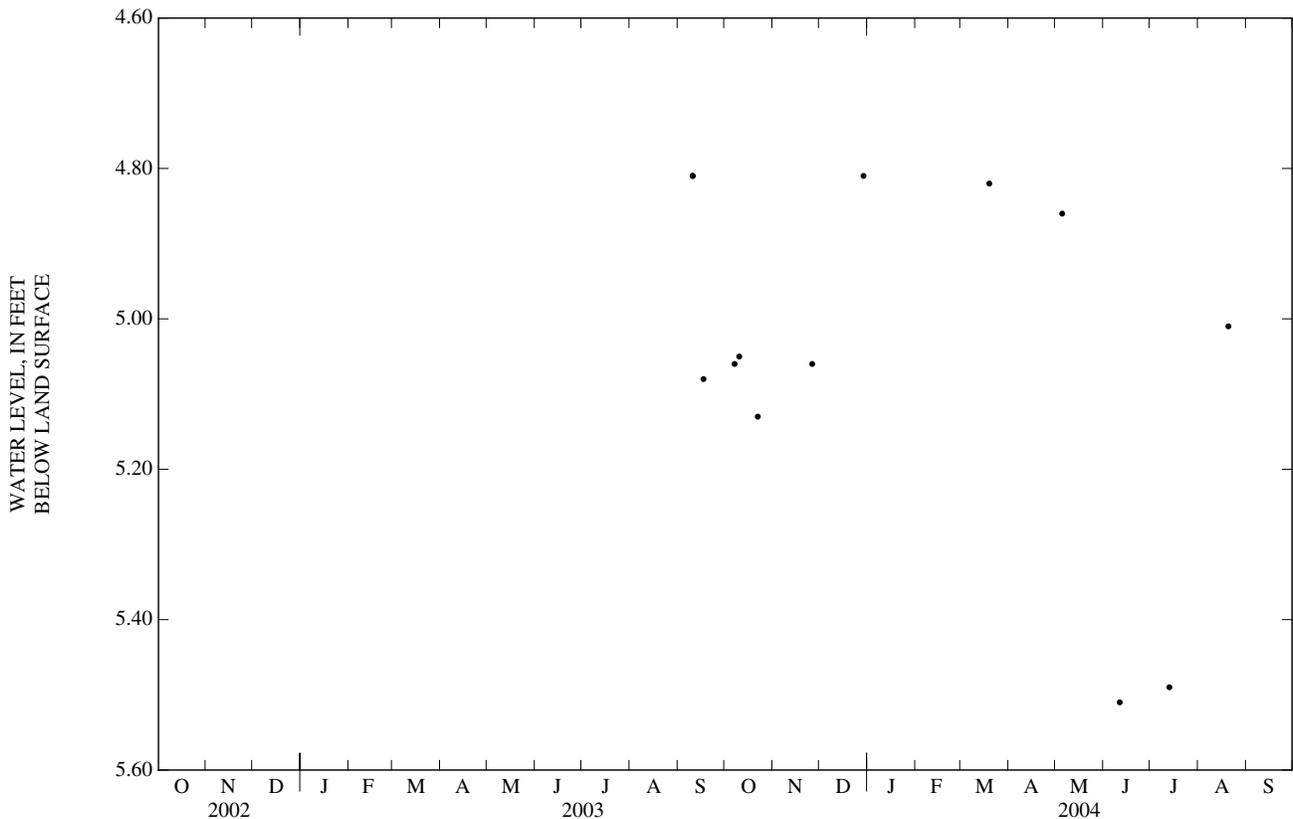
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.81 ft below land-surface datum, Sept. 10, 2003; lowest water level measured 5.51 ft below land-surface datum, June 11, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
SEP 10	4.81	SEP 10	4.81	SEP 17	5.08

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL								
OCT 07	5.06	OCT 22	5.13	DEC 29	4.81	MAY 05	4.86	JUL 13	5.49
10	5.05	NOV 26	5.06	MAR 19	4.82	JUN 11	5.51	AUG 20	5.01



ROCKINGHAM COUNTY--Continued

362331079421701. County number, RK-258; DENR Upper Piedmont Research Station PZ-6.

LOCATION.--Lat 36°23'32", long 79°42'17", Hydrologic Unit 03010103, .6 mi north of Wentworth St, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 13 ft, diameter 2 in., cased to 8 ft, screened interval from 8 ft to 13 ft, sand filter packed from 6 ft to 13 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 672.91 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.40 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--June 2003 to September 2004.

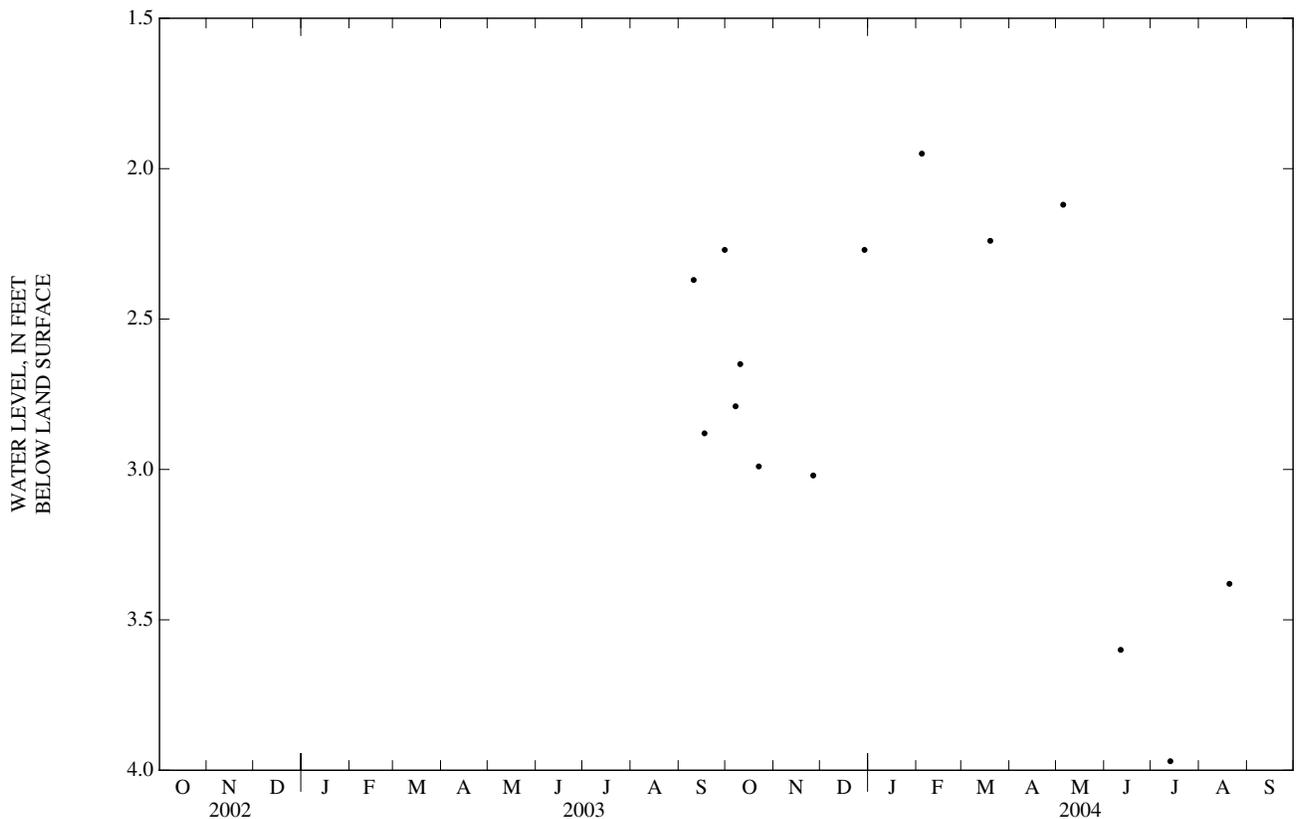
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.16 ft below land-surface datum, Aug. 12, 2003; lowest water level measured 3.97 ft below land-surface datum, July 13, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DATE	WATER LEVEL						
JUN 02	1.93	JUL 07	2.22	SEP 10	2.37	SEP 30	2.27
02	1.93	AUG 12	1.16	17	2.88		

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 07	2.79	OCT 22	2.99	DEC 29	2.27	MAR 19	2.24	JUN 11	3.60	AUG 20	3.38
10	2.65	NOV 26	3.02	FEB 04	1.95	MAY 05	2.12	JUL 13	3.97		



GROUND-WATER LEVELS

ROCKINGHAM COUNTY--Continued

362331079421702. County number, RK-259; DENR Upper Piedmont Research Station PZ-6I.

LOCATION.--Lat 36°23'32", long 79°42'17", Hydrologic Unit 03010103, .6 mi north of Wentworth St, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 40 ft, diameter 2 in., cased to 30 ft, screened interval from 30 ft to 40 ft, sand filter packed from 4 ft to 15 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 673.02 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.35 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--September 2003 to September 2004.

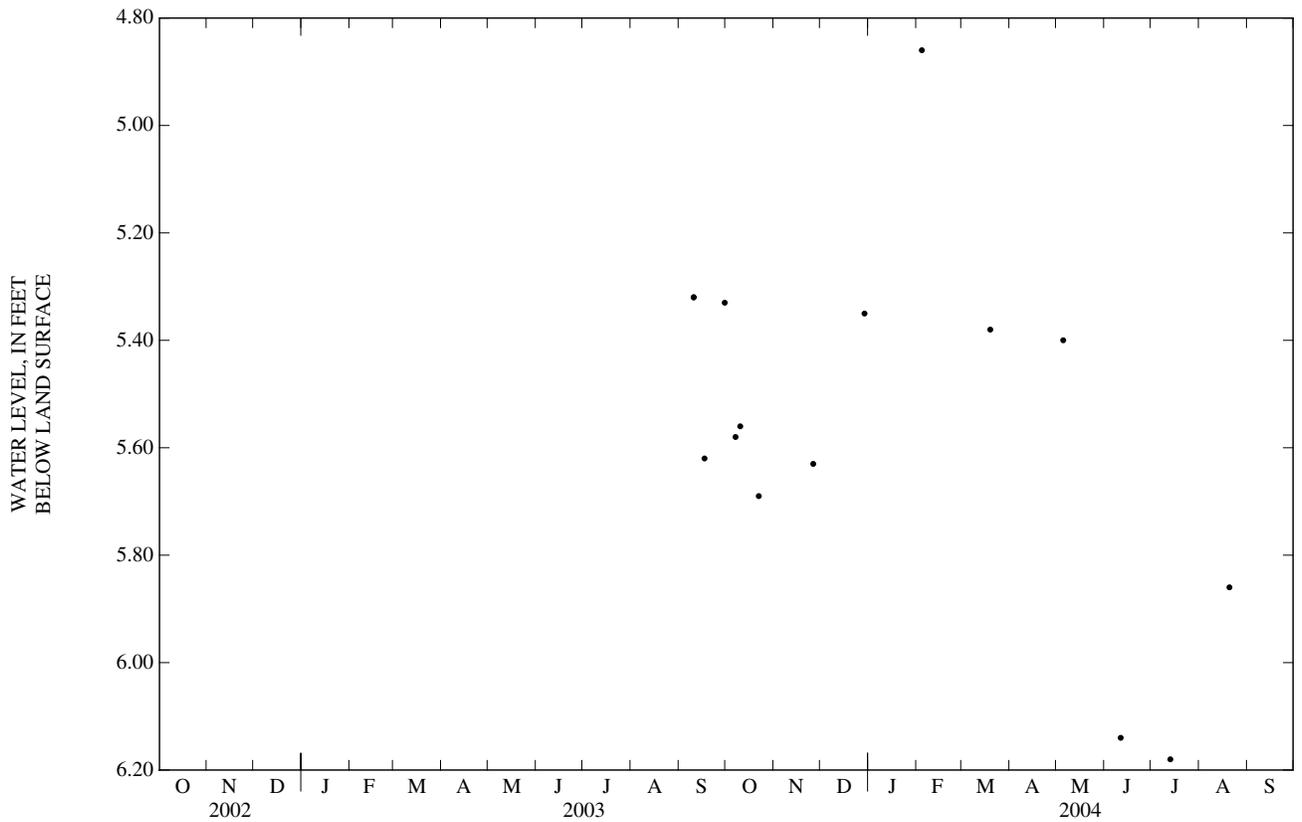
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.86 ft below land-surface datum, Feb. 4, 2004; lowest water level measured 6.18 ft below land-surface datum, July 13, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DATE	WATER LEVEL						
SEP 10	5.32	SEP 10	5.32	SEP 17	5.62	SEP 30	5.33

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 07	5.58	OCT 22	5.69	DEC 29	5.35	MAR 19	5.38	JUN 11	6.14	AUG 20	5.86
10	5.56	NOV 26	5.63	FEB 04	4.86	MAY 05	5.40	JUL 13	6.18		



ROCKINGHAM COUNTY--Continued

362331079421703. County number, RK-260; DENR Upper Piedmont Research Station PZ-6D.

LOCATION.--Lat 36°23'32", long 79°42'17", Hydrologic Unit 03010103, .6 mi north of Wentworth St, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 90 ft, diameter 2 in., cased to 70 ft, screened interval from 70 ft to 90 ft, sand filter packed from 67 ft to 90 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 673.04 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.34 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--August 2003 to September 2004.

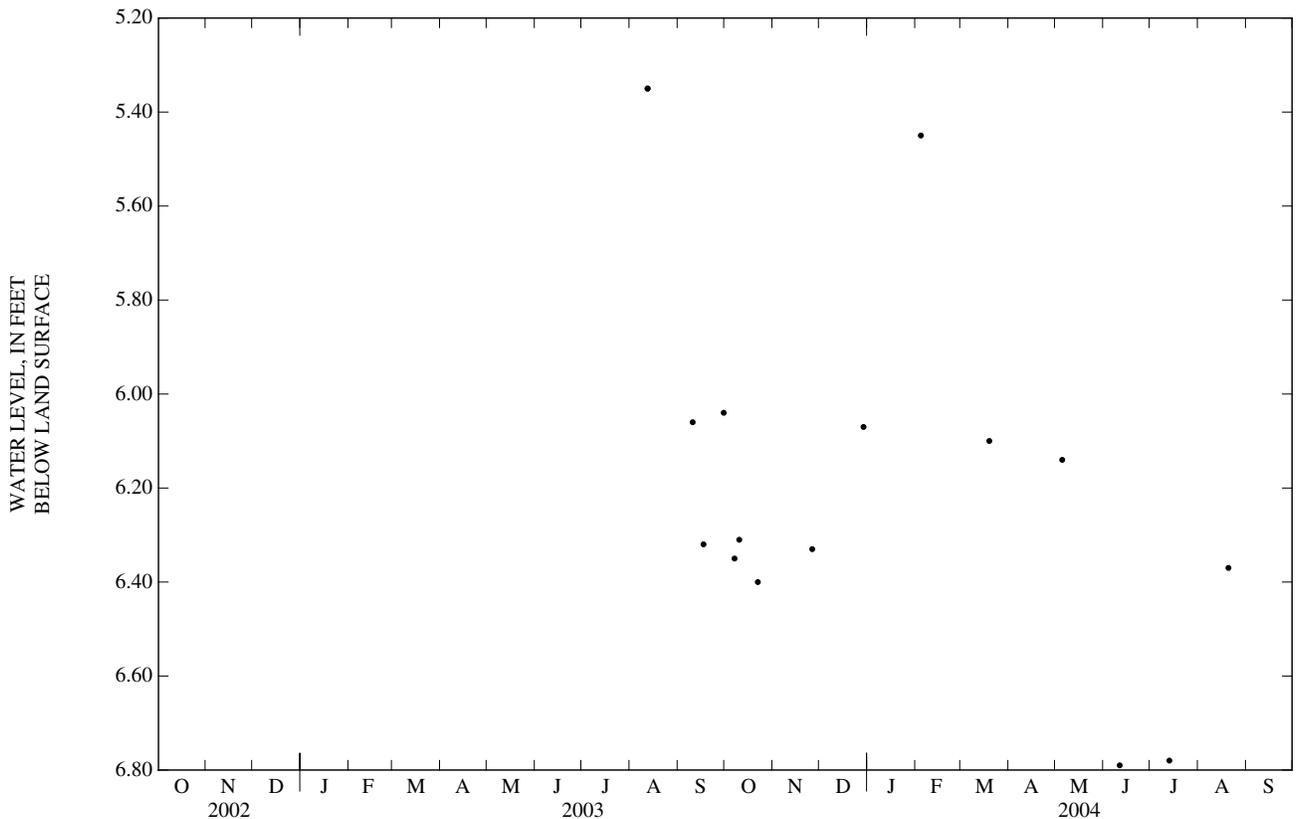
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.35 ft below land-surface datum, Aug. 12, 2003; lowest water level measured 6.79 ft below land-surface datum, June 11, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DATE	WATER LEVEL								
AUG 12	5.35	AUG 12	5.35	SEP 10	6.06	SEP 17	6.32	SEP 30	6.04

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 07	6.35	OCT 22	6.40	DEC 29	6.07	MAR 19	6.10	JUN 11	6.79	AUG 20	6.37
10	6.31	NOV 26	6.33	FEB 04	5.45	MAY 05	6.14	JUL 13	6.78		



GROUND-WATER LEVELS  
ROCKINGHAM COUNTY--Continued

362332079421604. County number, RK-261; DENR Upper Piedmont Research Station PZ-7.

LOCATION.--Lat 36°23'32", long 79°42'16", Hydrologic Unit 03010103, .6 mi north of Wentworth St, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 19 ft, diameter 2 in., cased to 14 ft, screened interval from 14 ft to 19 ft, sand filter packed from 12 ft to 19 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 671.43 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.19 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--June 2003 to September 2004.

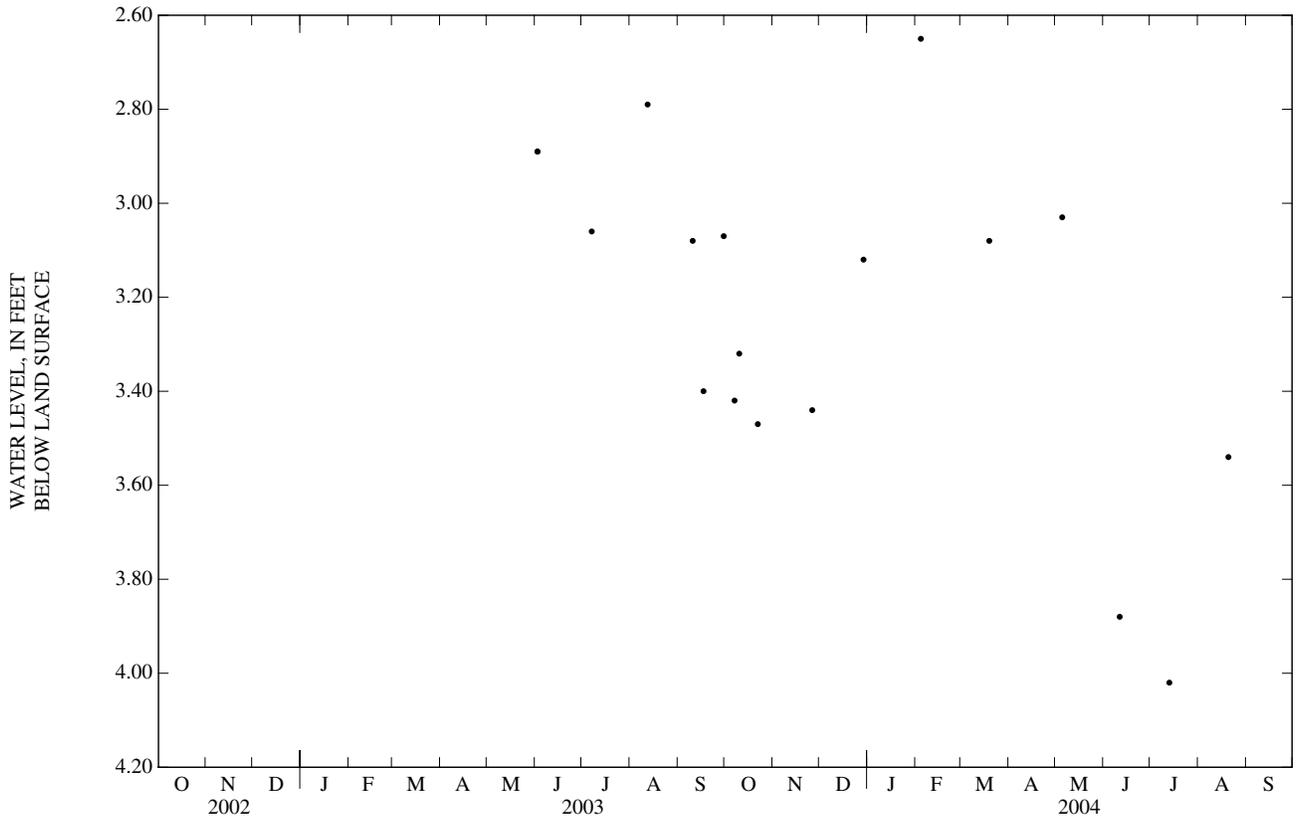
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.65 ft below land-surface datum, Feb. 4, 2004; lowest water level measured 4.02 ft below land-surface datum, July 13, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DATE	WATER LEVEL						
JUN 02	2.89	JUL 07	3.06	SEP 10	3.08	SEP 30	3.07
02	2.89	AUG 12	2.79	17	3.40		

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 07	3.42	OCT 22	3.47	DEC 29	3.12	MAR 19	3.08	JUN 11	3.88	AUG 20	3.54
10	3.32	NOV 26	3.44	FEB 04	2.65	MAY 05	3.03	JUL 13	4.02		



ROCKINGHAM COUNTY--Continued

362331079421501. County number, RK-262; DENR Upper Piedmont Research Station PZ-7I.

LOCATION.--Lat 36°23'32", long 79°42'16", Hydrologic Unit 03010103, .6 mi north of Wentworth St, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 40 ft, diameter 2 in., cased to 30 ft, screened interval from 30 ft to 40 ft, sand filter packed from 26 ft to 30 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 671.28 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.33 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--September 2003 to September 2004.

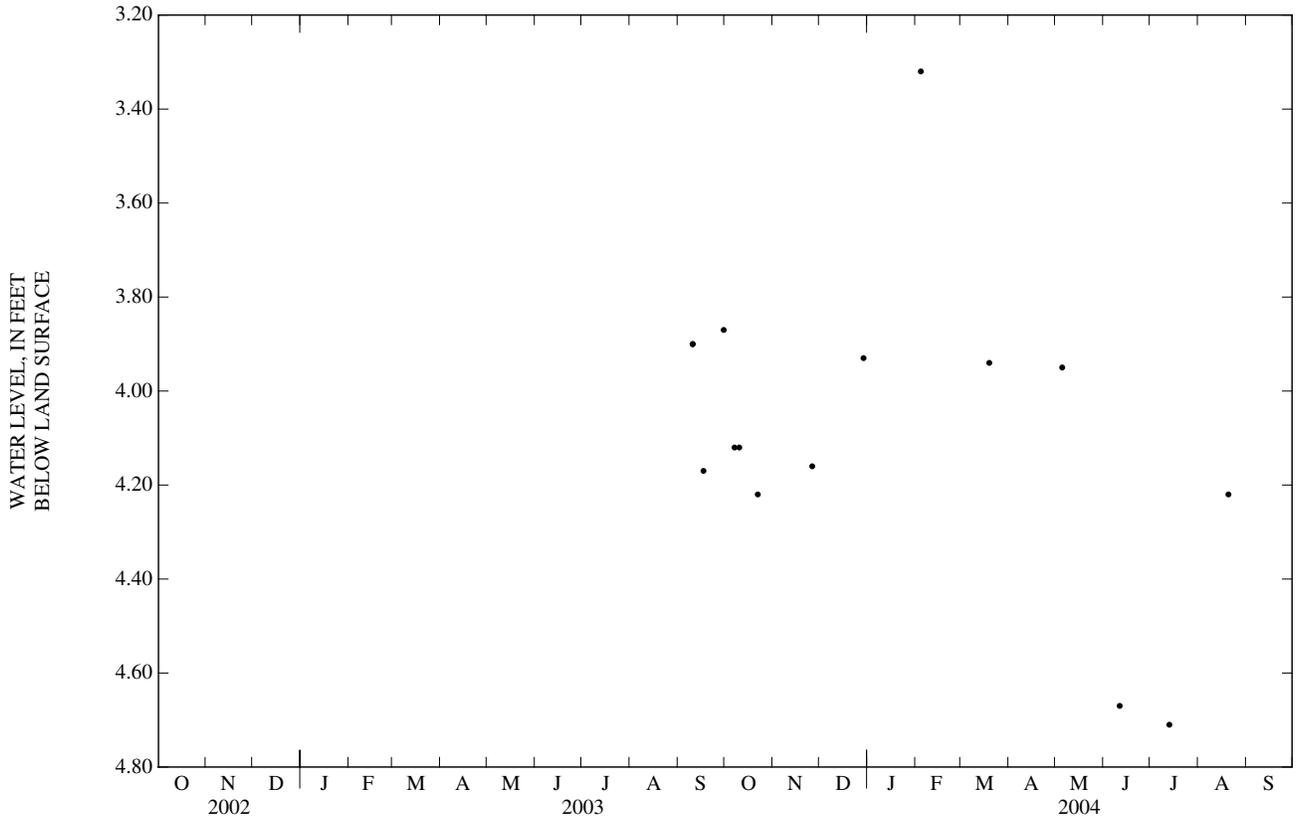
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.32 ft below land-surface datum, Feb. 4, 2004; lowest water level measured 4.71 ft below land-surface datum, July 13, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DATE	WATER LEVEL						
SEP 10	3.90	SEP 10	3.90	SEP 17	4.17	SEP 30	3.87

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 07	4.12	OCT 22	4.22	DEC 29	3.93	MAR 19	3.94	JUN 11	4.67	AUG 20	4.22
10	4.12	NOV 26	4.16	FEB 04	3.32	MAY 05	3.95	JUL 13	4.71		



GROUND-WATER LEVELS

ROCKINGHAM COUNTY--Continued

362331079421502. County number, RK-263; DENR Upper Piedmont Research Station PZ-7D.

LOCATION.--Lat 36°23'32", long 79°42'16", Hydrologic Unit 03010103, .6 mi north of Wentworth St, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 95 ft, diameter 2 in., cased to 75 ft, screened interval from 75 ft to 95 ft, sand filter packed from 71 ft to 95 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 671.48 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.22 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--August 2003 to September 2004.

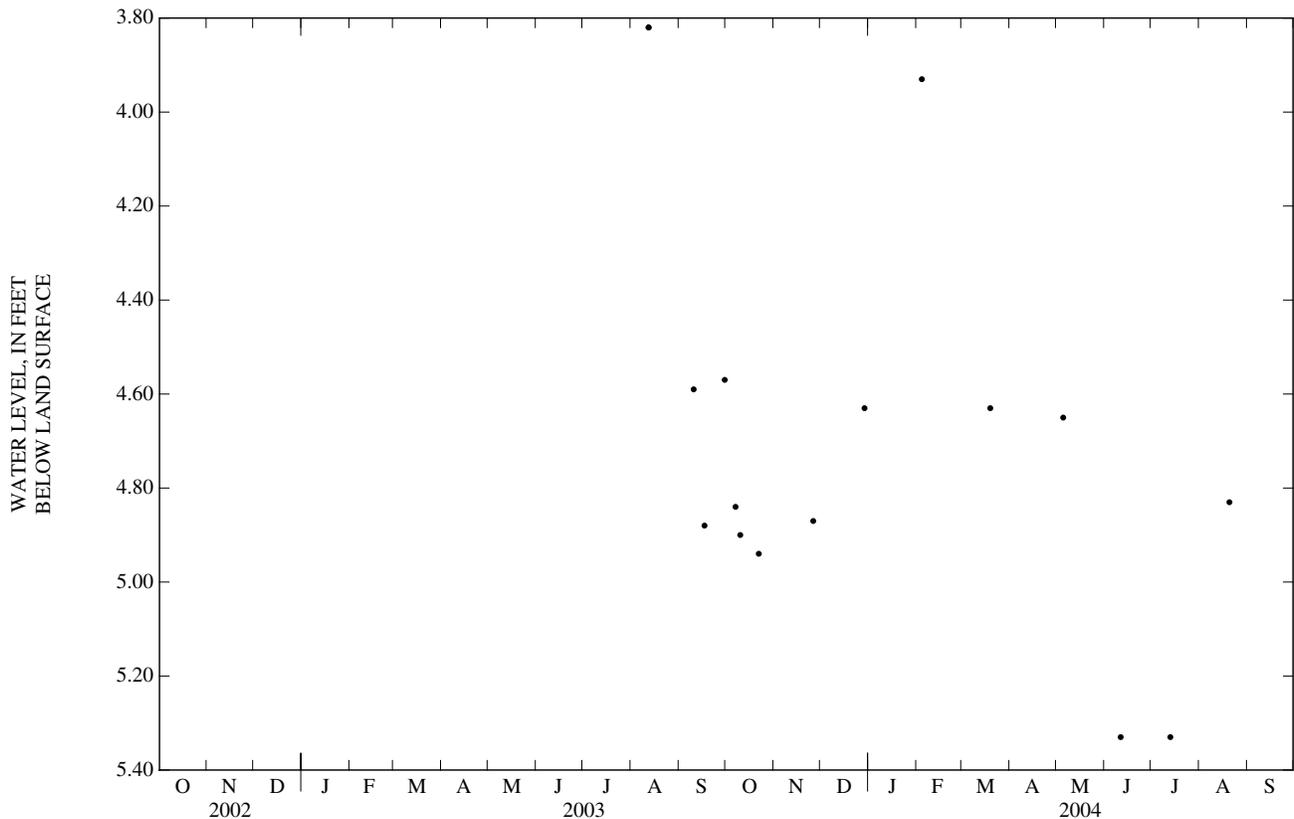
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.82 ft below land-surface datum, Aug. 12, 2003; lowest water level measured 5.33 ft below land-surface datum, June 11, July 13, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DATE	WATER LEVEL								
AUG 12	3.82	AUG 12	3.82	SEP 10	4.59	SEP 17	4.88	SEP 30	4.57

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 07	4.84	OCT 22	4.94	DEC 29	4.63	MAR 19	4.63	JUN 11	5.33	AUG 20	4.83
10	4.90	NOV 26	4.87	FEB 04	3.93	MAY 05	4.65	JUL 13	5.33		



ROCKINGHAM COUNTY--Continued

362332079421605. County number, RK-264; DENR Upper Piedmont Research Station PZ-8.

LOCATION.--Lat 36°23'32", long 79°42'17", Hydrologic Unit 03010103, .6 mi north of Wentworth St, .6 mi west of Secondary Road 1993 on North Carolina State University Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Biotite Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 24 ft, diameter 2 in., cased to 14 ft, screened interval from 14 ft to 24 ft, sand filter packed from 12 ft to 24 ft.

INSTRUMENTATION.--Measured periodically with electric tape by DENR.

DATUM.--Land-surface datum is 677.21 ft above NGVD of 1929. Measuring point: Top of protective steel casing, 2.34 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--June 2003 to September 2004.

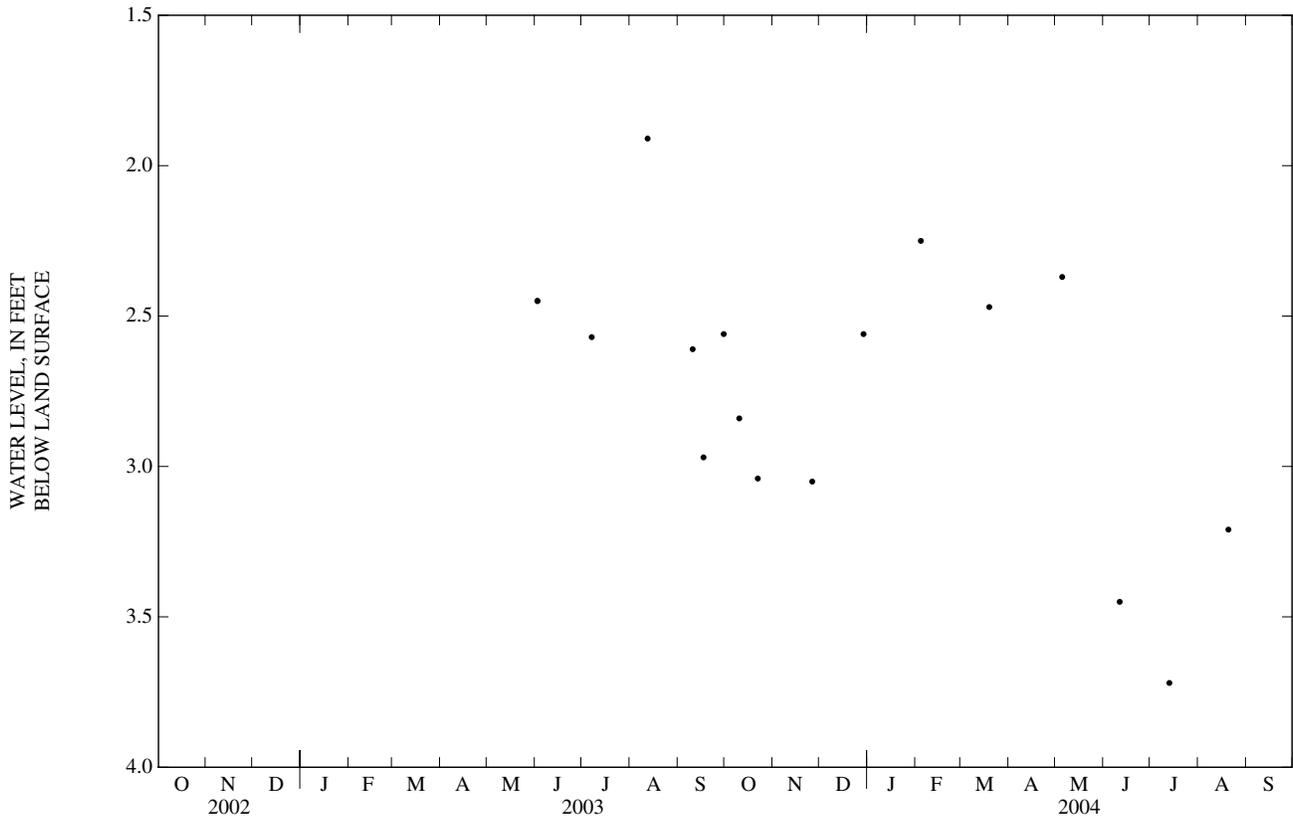
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.91 ft below land-surface datum, Aug. 12, 2003; lowest water level measured 3.72 ft below land-surface datum, July 13, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003

DATE	WATER LEVEL						
JUN 02	2.45	JUL 07	2.57	SEP 10	2.61	SEP 30	2.56
02	2.45	AUG 12	1.91	17	2.97		

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL								
OCT 10	2.84	NOV 26	3.05	FEB 04	2.25	MAY 05	2.37	JUL 13	3.72
22	3.04	DEC 29	2.56	MAR 19	2.47	JUN 11	3.45	AUG 20	3.21



## GROUND-WATER LEVELS

## ROWAN COUNTY

354057080362601. Local number, NC-193; DENR Piedmont Research Station well L63t1; County number, RO-149.

LOCATION.--Lat 35°40'58", long 80°36'25", Hydrologic Unit 03040102, 0.75 mi south of Secondary Road 1526 on Piedmont Research Station road, 2.75 mi south of Barber. Owner: North Carolina Department of Agriculture.

## WATER-LEVEL RECORDS

AQUIFER.--Unconfined alluvial silt.

WELL CHARACTERISTICS.--Drilled observation well, drilled to 24 ft, diameter 4 in., cased to 9 ft, screened interval from 9 to 19 ft, sand filter pack from 7.2 to 24 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 678 ft above NGVD of 1929 (from topographic map). Measuring point: Two saw cuts in top of casing, 3.30 ft above land-surface datum.

REMARKS.--Well is part of climatic-effects network.

PERIOD OF RECORD.--November 1989 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 4.97 ft below land-surface datum, Mar. 30, 1993; lowest water level recorded, 11.15 ft below land-surface datum, Sept. 14, 15, 16, 2002.

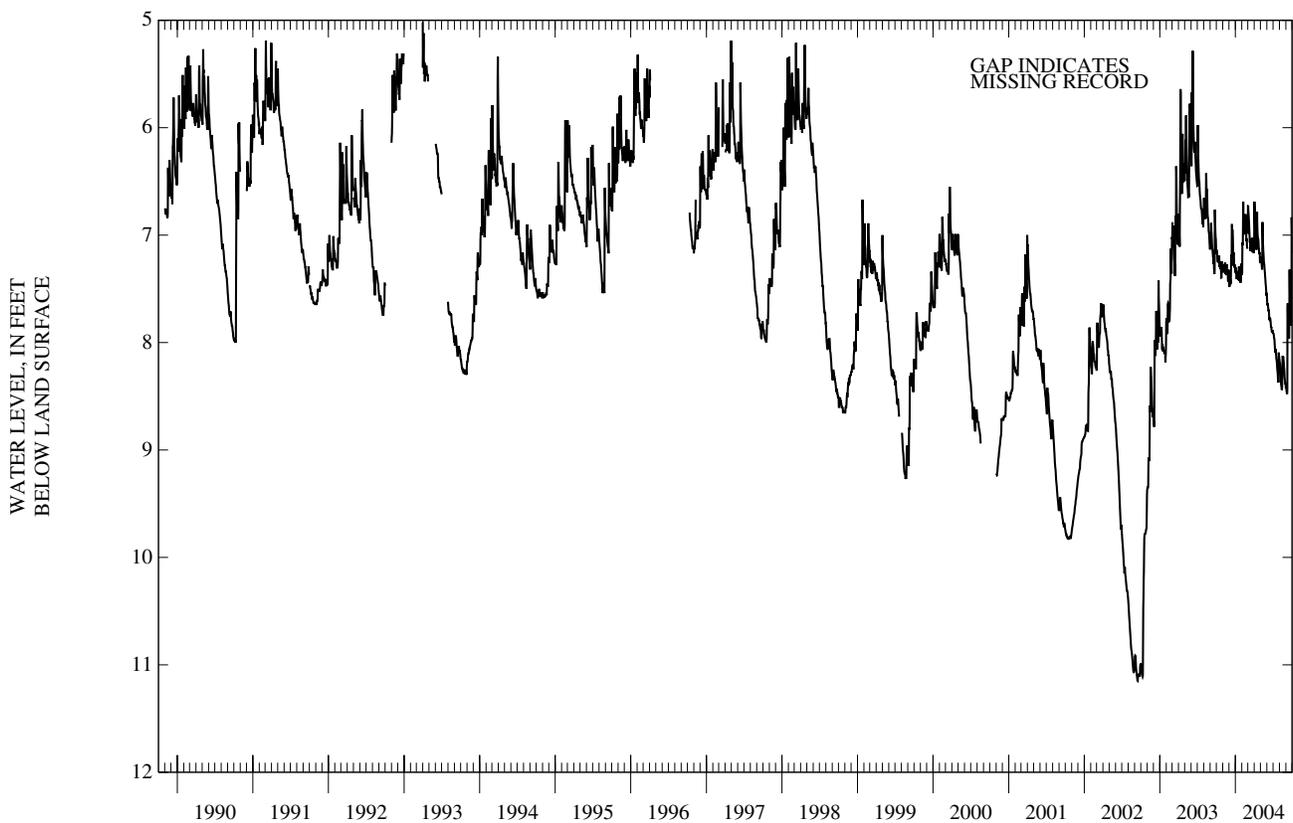
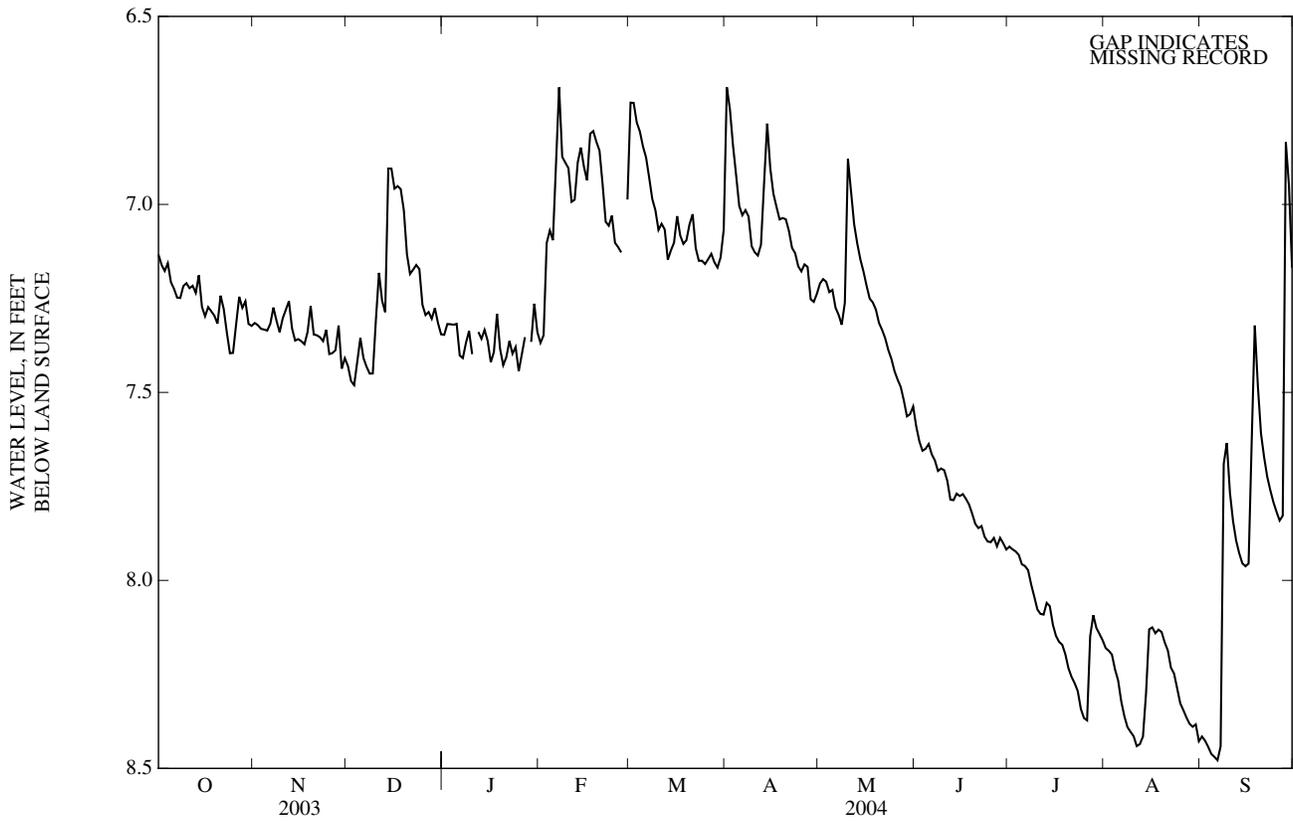
DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.13	7.32	7.43	7.35	7.37	6.73	6.69	7.21	7.59	7.91	8.18	8.42
2	7.16	7.32	7.47	7.32	7.35	6.73	6.75	7.20	7.63	7.92	8.19	8.43
3	7.18	7.33	7.48	7.32	7.10	6.78	6.84	7.21	7.66	7.92	8.20	8.44
4	7.16	7.33	7.42	7.32	7.07	6.81	6.92	7.23	7.65	7.93	8.24	8.46
5	7.21	7.34	7.36	7.32	7.10	6.85	7.00	7.23	7.64	7.96	8.27	8.47
6	7.22	7.32	7.41	7.40	6.89	6.88	7.03	7.27	7.66	7.96	8.32	8.48
7	7.25	7.27	7.43	7.41	6.69	6.93	7.02	7.29	7.68	7.97	8.36	8.44
8	7.25	7.31	7.45	7.37	6.87	6.99	7.03	7.32	7.71	8.01	8.39	7.69
9	7.22	7.34	7.45	7.34	6.89	7.02	7.11	7.26	7.70	8.04	8.40	7.63
10	7.21	7.30	7.31	7.40	6.90	7.07	7.13	6.88	7.71	8.08	8.41	7.77
11	7.22	7.28	7.18	---	6.99	7.05	7.14	6.97	7.74	8.09	8.44	7.84
12	7.22	7.26	7.26	7.34	6.99	7.07	7.11	7.05	7.79	8.09	8.44	7.89
13	7.24	7.33	7.29	7.36	6.89	7.15	6.94	7.10	7.79	8.06	8.42	7.93
14	7.19	7.36	6.90	7.33	6.85	7.12	6.79	7.15	7.77	8.07	8.30	7.95
15	7.27	7.36	6.90	7.36	6.90	7.10	6.90	7.18	7.78	8.12	8.13	7.96
16	7.30	7.36	6.96	7.42	6.94	7.03	6.97	7.22	7.77	8.15	8.12	7.96
17	7.27	7.37	6.95	7.39	6.81	7.08	7.01	7.25	7.78	8.16	8.14	7.63
18	7.28	7.34	6.96	7.29	6.80	7.11	7.04	7.26	7.80	8.17	8.13	7.32
19	7.30	7.27	7.02	7.38	6.83	7.10	7.04	7.28	7.82	8.20	8.14	7.48
20	7.32	7.35	7.13	7.43	6.86	7.05	7.04	7.32	7.85	8.23	8.16	7.61
21	7.24	7.35	7.18	7.41	6.95	7.03	7.07	7.33	7.86	8.26	8.19	7.67
22	7.28	7.35	7.17	7.36	7.05	7.12	7.12	7.36	7.86	8.27	8.23	7.72
23	7.34	7.36	7.16	7.40	7.06	7.15	7.13	7.39	7.88	8.29	8.25	7.76
24	7.40	7.33	7.17	7.38	7.03	7.15	7.16	7.41	7.90	8.34	8.29	7.79
25	7.39	7.40	7.27	7.44	7.10	7.16	7.18	7.44	7.90	8.37	8.33	7.82
26	7.32	7.40	7.29	7.40	7.11	7.15	7.16	7.47	7.89	8.37	8.35	7.84
27	7.25	7.39	7.29	7.35	7.13	7.13	7.17	7.49	7.91	8.15	8.36	7.83
28	7.28	7.32	7.30	---	---	7.15	7.25	7.52	7.89	8.09	8.38	6.83
29	7.26	7.44	7.28	7.37	6.99	7.17	7.26	7.56	7.90	8.13	8.39	6.95
30	7.32	7.41	7.32	7.26	---	7.14	7.24	7.56	7.92	8.14	8.38	7.17
31	7.32	---	7.35	7.34	---	7.07	---	7.54	---	8.16	8.43	---

WTR YR 2004 MEAN 7.47 HIGH 6.69 LOW 8.48

ROWAN COUNTY—Continued

354057080362601. Local number, NC-193; DENR Piedmont Research Station well L63t1; County number, RO-149.



354057080362601 Local number, NC-193; DENR Piedmont Research Station well L63t1; County number, RO-149—Continued

PRECIPITATION RECORDS

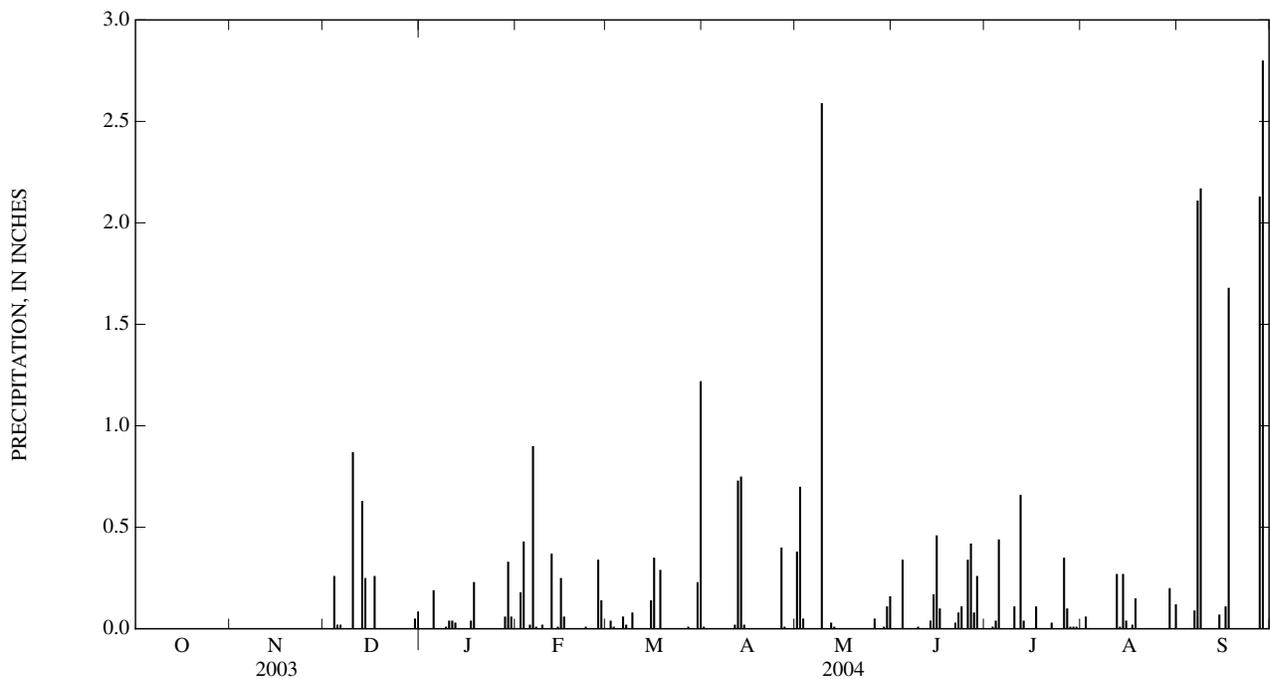
PERIOD OF RECORD.--April 1996 to current year.

GAGE.--Tipping-bucket raingage and electronic datalogger. Satellite telemetry at station.

REMARKS.--Gage is operated as part of climatic-effects network. Precipitation data collected during freezing periods may not be accurately reflected in daily record; consequently, winter record is poor.

PRECIPITATION, TOTAL, INCHES  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	0.00	0.00	0.00	0.01	0.38	0.00	0.00	0.00	0.00
2	---	---	---	0.00	0.18	0.04	0.00	0.70	0.00	0.00	0.06	0.00
3	---	---	0.00	0.00	0.43	0.01	0.00	0.05	0.00	0.01	0.00	0.00
4	---	---	0.26	0.00	0.00	0.00	0.00	0.00	0.34	0.04	0.00	0.00
5	---	---	0.02	0.19	0.02	0.00	0.00	0.00	0.00	0.44	0.00	0.00
6	---	---	0.02	0.00	0.90	0.06	0.00	0.00	0.00	0.00	0.00	0.09
7	---	---	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.00	2.11
8	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.17
9	---	---	0.00	0.01	0.02	0.08	0.00	2.59	0.01	0.00	0.00	0.00
10	---	---	0.87	0.04	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00
11	---	---	0.00	0.04	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
12	---	---	0.00	0.03	0.37	0.00	0.73	0.03	0.00	0.66	0.27	0.00
13	---	---	0.63	0.00	0.00	0.00	0.75	0.01	0.04	0.04	0.01	0.00
14	---	---	0.25	0.00	0.01	0.00	0.02	0.00	0.17	0.00	0.27	0.07
15	---	---	0.00	0.00	0.25	0.14	0.00	0.00	0.46	0.00	0.04	0.00
16	---	---	0.00	0.00	0.06	0.35	0.00	0.00	0.10	0.00	0.00	0.11
17	---	---	0.26	0.04	0.00	0.00	0.00	0.00	0.00	0.11	0.02	1.68
18	---	---	0.00	0.23	0.00	0.29	0.00	0.00	0.00	0.00	0.15	0.00
19	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00
22	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.03	0.00	0.00
23	---	---	0.00	0.00	0.01	0.00	0.00	0.00	0.11	0.00	0.00	0.00
24	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	---	---	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00
26	---	---	0.00	0.00	0.00	0.00	0.40	0.05	0.42	0.35	0.00	0.00
27	---	---	0.00	0.00	0.34	0.01	0.01	0.00	0.08	0.10	0.00	2.13
28	---	---	0.00	0.06	0.14	0.00	0.00	0.00	0.26	0.01	0.00	2.80
29	---	---	0.00	0.33	0.00	0.00	0.00	0.01	0.00	0.01	0.20	0.00
30	---	---	0.05	0.06	---	0.23	0.00	0.11	0.00	0.01	0.00	0.00
31	---	---	0.00	0.00	---	1.22	---	0.16	---	0.00	0.12	---
TOTAL	---	---	---	1.03	2.74	2.45	1.94	4.09	2.44	1.92	1.14	11.16



## SCOTLAND COUNTY

345812079313401. Local number, NC-194; County number, SC-080.

LOCATION.--Lat 34°58'13.9", long 79°31'41.5", Hydrologic Unit 03040204, in Sandhills Game Management Area, 0.15 mi west of Secondary Road 1328, 3.4 mi east of Marston, 4.8 mi south of Hoffman, and 6.1 mi southwest of Silver Hill. Owner: U.S. Geological Survey.

## WATER-LEVEL RECORDS

AQUIFER.--Unconfined sands in the upper Black Creek aquifer.

WELL CHARACTERISTICS.--Drilled observation well, depth 35.6 ft, diameter 4 in., cased to 30.5 ft, screened interval from 30.6 to 35.6 ft. Annular space filled with native clayey sand from 0 to 30 ft below land surface.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 433 ft above NGVD of 1929 (from topographic map). Measuring point: Shelter floor, 2.93 ft above land-surface datum.

REMARKS.--Well is part of terrane-effects network.

PERIOD OF RECORD.--September 1987 to current year.

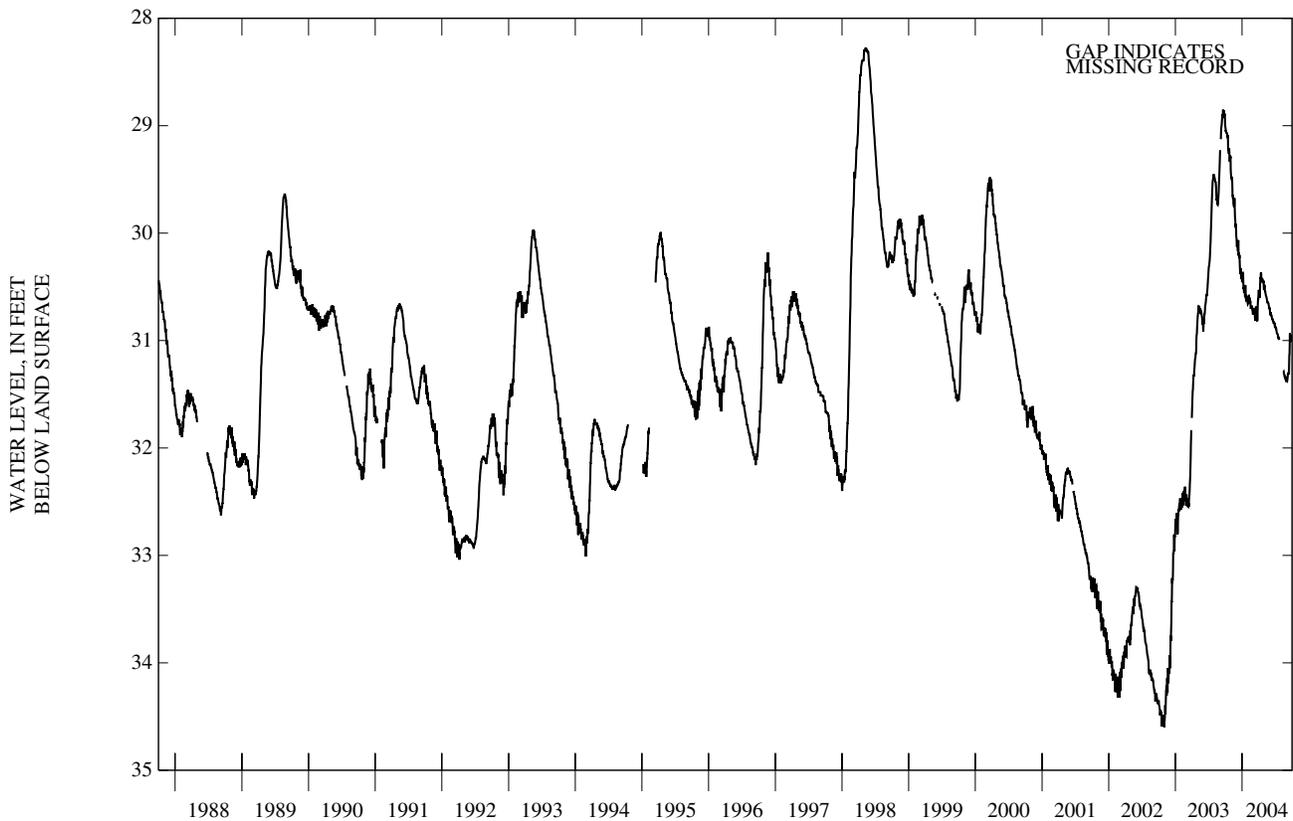
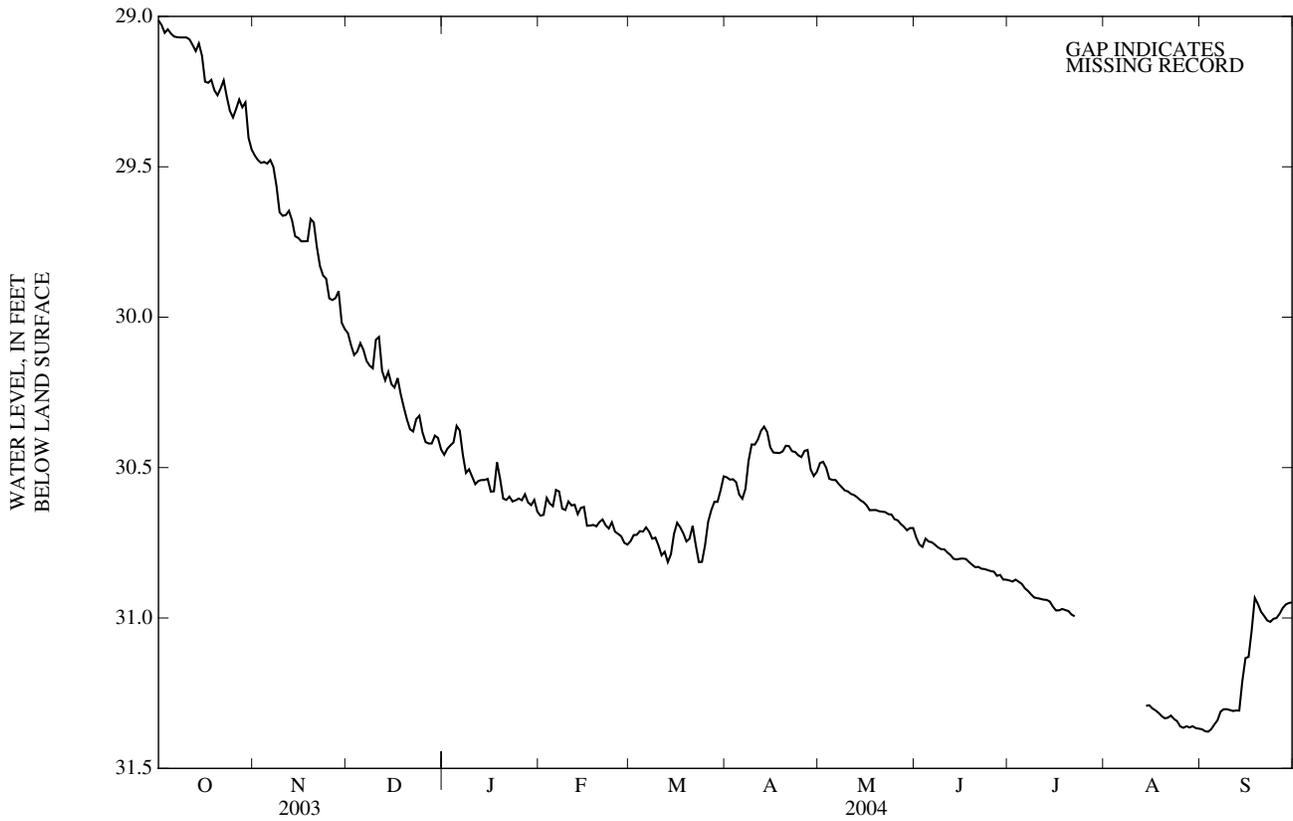
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 28.28 ft below land-surface datum, May 7-12, 1998; lowest water level recorded, 34.67 ft below land-surface datum, Oct. 18, 2002.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	
1	29.01	29.46	30.05	30.46	30.66	30.74	30.53	30.49	30.73	30.88	---	31.37	
2	29.03	29.48	30.09	30.44	30.66	30.72	30.54	30.48	30.76	30.88	---	31.38	
3	29.05	29.49	30.13	30.43	30.60	30.72	30.54	30.50	30.76	30.87	---	31.38	
4	29.04	29.48	30.11	30.42	30.62	30.71	30.55	30.54	30.74	30.88	---	31.37	
5	29.06	29.49	30.09	30.36	30.63	30.71	30.59	30.54	30.75	30.89	---	31.35	
6	29.07	29.48	30.11	30.38	30.57	30.70	30.60	30.54	30.75	30.90	---	31.34	
7	29.07	29.50	30.15	30.46	30.58	30.71	30.57	30.55	30.76	30.91	---	31.31	
8	29.07	29.56	30.16	30.52	30.64	30.74	30.48	30.57	30.77	30.92	---	31.30	
9	29.07	29.65	30.17	30.51	30.64	30.73	30.42	30.58	30.77	30.93	---	31.30	
10	29.07	29.66	30.07	30.53	30.61	30.76	30.42	30.58	30.77	30.93	---	31.31	
11	29.08	29.66	30.07	30.56	30.63	30.79	30.41	30.59	30.78	30.94	---	31.31	
12	29.10	29.65	30.18	30.54	30.62	30.78	30.38	30.59	30.79	30.94	---	31.31	
13	29.12	29.68	30.21	30.54	30.65	30.81	30.36	30.60	30.80	30.94	---	31.31	
14	29.09	29.73	30.18	30.54	30.63	30.79	30.38	30.61	30.81	30.95	31.29	31.21	
15	29.13	29.74	30.22	30.54	30.63	30.72	30.43	30.61	30.80	30.96	31.29	31.13	
16	29.22	29.75	30.23	30.58	30.69	30.68	30.45	30.63	30.80	30.97	31.30	31.13	
17	29.22	29.75	30.20	30.58	30.69	30.70	30.45	30.64	30.80	30.97	31.31	31.04	
18	29.21	29.75	30.26	30.48	30.69	30.72	30.45	30.64	30.81	30.97	31.32	30.93	
19	29.25	29.67	30.30	30.54	30.70	30.75	30.45	30.64	30.82	30.97	31.33	30.95	
20	29.26	29.69	30.34	30.60	30.68	30.74	30.43	30.64	30.83	30.98	31.33	30.98	
21	29.24	29.77	30.37	30.61	30.67	30.69	30.43	30.65	30.83	30.99	31.33	30.99	
22	29.21	29.83	30.38	30.60	30.69	30.76	30.45	30.65	30.84	30.99	31.32	31.01	
23	29.27	29.86	30.34	30.61	30.70	30.81	30.45	30.65	30.84	---	31.34	31.01	
24	29.31	29.87	30.33	30.61	30.68	30.81	30.46	30.66	30.84	---	31.34	31.00	
25	29.34	29.94	30.38	30.60	30.71	30.76	30.47	30.67	30.84	---	31.36	31.00	
26	29.31	29.94	30.41	30.61	30.72	30.68	30.44	30.68	30.85	---	31.37	30.99	
27	29.28	29.94	30.42	30.59	30.73	30.64	30.44	30.69	30.86	---	31.36	30.97	
28	29.30	29.91	30.42	30.62	30.75	30.61	30.51	30.70	30.86	---	31.36	30.95	
29	29.29	30.02	30.39	30.62	30.76	30.61	30.53	30.71	30.87	---	31.36	30.95	
30	29.40	30.04	30.40	30.61	---	30.58	30.51	30.70	30.87	---	31.37	30.95	
31	29.44	---	30.44	30.65	---	30.53	---	30.70	---	---	31.37	---	
WTR YR	2004	MEAN	30.49	HIGH	29.01	LOW	31.38						

GROUND-WATER LEVELS  
SCOTLAND COUNTY—Continued

345812079313401. Local number, NC-194; County number, SC-080.



345812079313401 Local number, NC-194; County number, SC-080--Continued

PRECIPITATION RECORDS

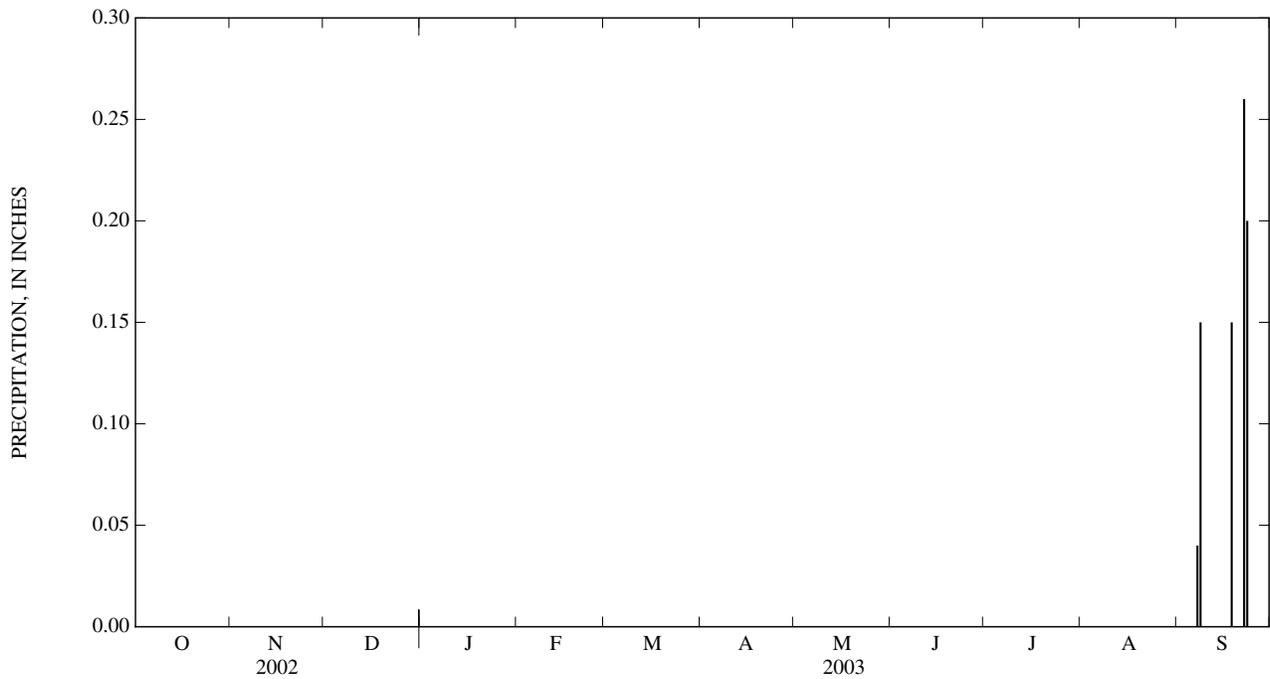
PERIOD OF RECORD.--September 2003 to September 2004.

GAGE.--Tipping-bucket raingage and electronic datalogger. Satellite telemetry at station.

REMARKS.--Gage is operated as part of a U.S. Geological Survey Ground-water Resources Program recharge study. Precipitation data collected during freezing periods may not be accurately reflected in daily record; consequently, winter record is poor.

PRECIPITATION, TOTAL, INCHES  
WATER YEAR OCTOBER 2002 TO SEPTEMBER 2003  
DAILY SUM VALUES

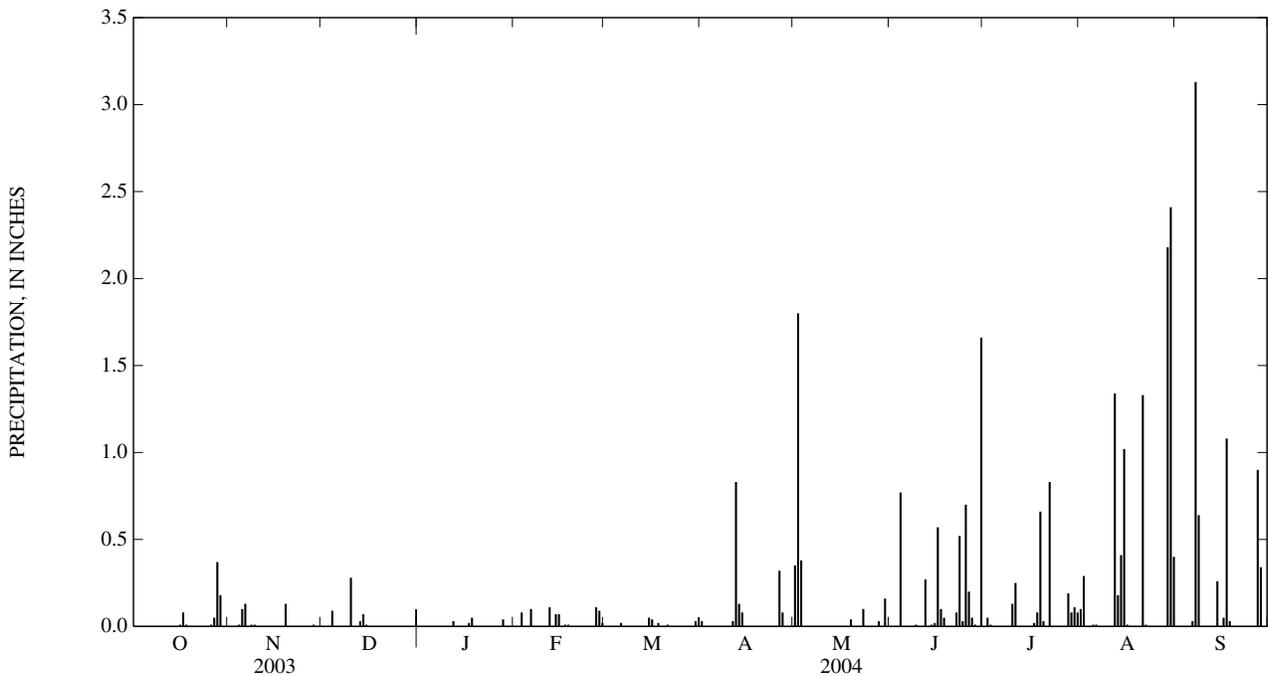
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	0.00
7	---	---	---	---	---	---	---	---	---	---	---	0.04
8	---	---	---	---	---	---	---	---	---	---	---	0.15
9	---	---	---	---	---	---	---	---	---	---	---	0.00
10	---	---	---	---	---	---	---	---	---	---	---	0.00
11	---	---	---	---	---	---	---	---	---	---	---	0.00
12	---	---	---	---	---	---	---	---	---	---	---	0.00
13	---	---	---	---	---	---	---	---	---	---	---	0.00
14	---	---	---	---	---	---	---	---	---	---	---	0.00
15	---	---	---	---	---	---	---	---	---	---	---	0.00
16	---	---	---	---	---	---	---	---	---	---	---	0.00
17	---	---	---	---	---	---	---	---	---	---	---	0.00
18	---	---	---	---	---	---	---	---	---	---	---	0.15
19	---	---	---	---	---	---	---	---	---	---	---	0.00
20	---	---	---	---	---	---	---	---	---	---	---	0.00
21	---	---	---	---	---	---	---	---	---	---	---	0.00
22	---	---	---	---	---	---	---	---	---	---	---	0.26
23	---	---	---	---	---	---	---	---	---	---	---	0.20
24	---	---	---	---	---	---	---	---	---	---	---	0.00
25	---	---	---	---	---	---	---	---	---	---	---	0.00
26	---	---	---	---	---	---	---	---	---	---	---	0.00
27	---	---	---	---	---	---	---	---	---	---	---	0.00
28	---	---	---	---	---	---	---	---	---	---	---	0.00
29	---	---	---	---	---	---	---	---	---	---	---	0.00
30	---	---	---	---	---	---	---	---	---	---	---	0.00
31	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---



345812079313401 Local number, NC-194; County number, SC-080—Continued

PRECIPITATION, TOTAL, INCHES  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0.00	0.00	0.00	---	0.00	0.00	0.03	0.35	0.00	0.00	0.10	0.00
2	0.00	0.00	0.00	---	0.00	0.00	0.00	1.80	0.00	0.05	0.29	0.00
3	0.00	0.00	0.00	---	0.08	0.00	0.00	0.38	0.00	0.01	0.00	0.00
4	0.00	0.01	0.09	---	0.00	0.00	0.00	0.00	0.77	0.00	0.00	0.00
5	0.00	0.10	0.00	---	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
6	0.00	0.13	0.00	---	0.10	0.02	0.00	0.00	0.00	0.00	0.01	0.03
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.13
8	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64
9	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
10	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.25	0.00	0.00
12	0.00	0.00	0.00	0.03	0.11	0.00	0.83	0.00	0.27	0.00	1.34	0.00
13	0.00	0.00	0.03	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.18	0.00
14	0.00	0.00	0.07	0.00	0.07	0.00	0.08	0.00	0.01	0.00	0.41	0.26
15	0.00	0.00	0.01	0.00	0.07	0.05	0.00	0.00	0.02	0.00	1.02	0.00
16	0.01	0.00	---	0.00	0.00	0.04	0.00	0.00	0.57	0.00	0.01	0.05
17	0.08	0.00	---	0.02	0.01	0.00	0.00	0.00	0.10	0.02	0.00	1.08
18	0.01	0.00	---	0.05	0.01	0.02	0.00	---	0.05	0.08	---	0.03
19	0.00	0.13	---	0.00	0.00	0.00	0.00	0.04	0.00	0.66	0.00	0.00
20	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00
21	0.00	0.00	---	0.00	0.00	0.01	0.00	0.00	0.00	0.00	1.33	0.00
22	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00	0.08	0.83	0.01	0.00
23	0.00	0.00	---	0.00	0.00	0.00	0.00	0.10	0.52	---	0.00	0.00
24	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00	0.03	---	0.00	0.00
25	0.00	0.00	---	0.00	0.00	0.00	0.00	0.00	0.70	---	0.00	0.00
26	0.01	0.00	---	0.00	0.00	0.00	0.32	0.00	0.20	---	0.00	0.00
27	0.05	0.00	---	0.00	0.11	0.00	0.08	0.00	0.05	---	0.00	0.90
28	0.37	0.01	---	0.04	0.09	0.00	0.00	0.03	0.01	0.19	0.00	0.34
29	0.18	0.00	---	0.00	0.02	0.00	0.00	0.00	0.00	0.08	2.18	0.00
30	0.00	0.00	---	0.00	---	0.03	---	0.16	1.66	0.11	2.41	0.00
31	0.00	---	---	0.00	---	0.05	---	0.00	---	0.08	0.40	---
TOTAL	0.71	0.40	---	---	0.67	0.22	---	---	5.05	---	---	6.46



SWAIN COUNTY

352519083272401. Local number, NC-219; County number, SW-036.

LOCATION.--Lat 35°25'19", long 83°27'24", Hydrologic Unit 06010203, in Bryson City, 0.75 mi southwest of intersection Fontana Dam road and Tuskasegee River. Owner: Wallace Company of North Carolina.

AQUIFER.--Felsic Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 555 ft, diameter 10 in.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 1,719.00 ft above NGVD of 1929 (levels by DENR). Measuring point: Top of instrument shelf, 6.90 ft above land-surface datum.

REMARKS.--Well is part of terrane-effects network.

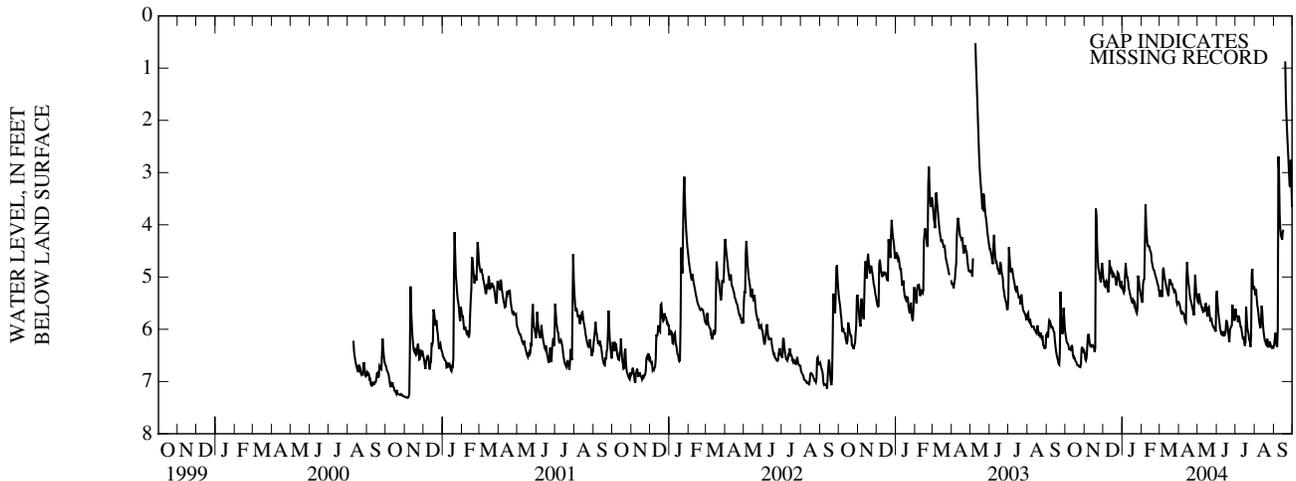
PERIOD OF RECORD.--August 2000 to current year. Records from February 1965 to March 1999 are unpublished and available in the files of the Division of Water Quality, DENR.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 0.86 ft above land-surface datum, Sept. 18, 2004; lowest water level recorded, 7.31 ft below land-surface datum, Nov. 4-7, 2000.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.09	6.45	5.02	5.19	5.45	5.38	5.49	5.47	5.27	5.61	5.28	6.31
2	6.17	6.57	5.08	5.27	5.49	5.34	5.54	5.49	5.49	5.72	5.35	6.21
3	6.24	6.60	5.17	5.30	5.13	5.25	5.59	5.31	5.64	5.75	5.23	6.07
4	6.27	6.54	5.18	5.26	5.06	5.34	5.67	5.38	5.77	5.75	5.39	6.10
5	6.28	6.37	5.10	4.96	5.04	5.38	5.69	5.46	5.86	5.87	5.54	6.30
6	6.32	6.14	5.07	4.73	4.35	4.86	5.67	5.51	5.98	5.74	5.61	6.34
7	6.38	6.09	5.12	4.90	3.60	4.82	5.68	5.56	6.04	5.78	5.72	6.00
8	6.38	6.15	5.23	5.00	4.00	4.95	5.69	5.60	6.09	5.86	5.84	2.69
9	6.37	6.28	5.29	5.01	4.22	5.03	5.72	5.56	6.10	5.95	5.91	3.00
10	6.42	6.32	5.10	5.09	4.36	5.09	5.80	5.66	6.04	5.96	5.98	3.80
11	6.30	6.30	4.68	5.21	4.41	5.16	5.85	5.65	6.09	6.04	5.85	4.07
12	6.33	6.33	4.81	5.26	4.41	5.21	5.87	5.65	6.14	6.12	5.55	4.22
13	6.50	6.32	4.89	5.33	4.41	5.27	5.02	5.62	6.08	6.20	5.65	4.23
14	6.54	6.31	4.86	5.38	4.48	5.33	4.71	5.50	6.12	6.15	5.90	4.29
15	6.53	6.34	4.93	5.43	4.51	5.36	4.95	5.58	6.04	6.24	6.03	4.14
16	6.57	6.35	5.01	5.47	4.55	5.12	5.08	5.70	5.83	6.32	6.13	4.09
17	6.60	6.44	4.93	5.51	4.70	5.04	5.19	5.76	5.85	6.24	6.21	---
18	6.62	6.36	4.95	5.43	4.76	5.12	5.31	5.60	5.91	5.56	6.23	---
19	6.65	3.69	4.98	5.46	4.83	5.10	5.41	5.58	6.04	5.79	6.29	0.87
20	6.68	3.85	5.01	5.54	4.86	5.14	5.46	5.68	6.15	5.98	6.30	1.54
21	6.68	4.38	5.07	5.52	4.88	5.14	5.51	5.79	6.25	6.04	6.18	1.92
22	6.69	4.65	5.16	5.61	4.93	5.21	5.57	5.85	6.01	6.09	6.24	2.21
23	6.72	4.83	5.09	5.66	4.98	5.23	5.61	5.78	5.97	6.21	6.35	2.47
24	6.72	4.90	4.91	5.69	5.02	5.28	5.67	5.88	5.95	6.23	6.32	2.71
25	6.72	4.96	4.92	5.60	5.05	5.25	5.73	5.92	5.93	6.34	6.24	2.99
26	6.66	5.05	4.96	4.97	5.11	5.27	5.32	5.95	5.53	6.15	6.27	3.24
27	6.37	5.11	5.08	5.04	5.15	5.32	4.95	5.96	5.71	4.94	6.35	3.28
28	6.34	4.86	5.17	5.17	5.21	5.46	5.19	6.00	5.76	4.84	6.31	2.76
29	6.42	4.73	5.19	5.24	5.28	5.51	5.34	6.00	5.82	5.18	6.36	3.29
30	6.43	4.88	5.08	5.31	---	5.48	5.41	6.05	5.82	5.23	6.36	3.66
31	6.41	---	5.15	5.40	---	5.47	---	5.37	---	5.18	6.36	---

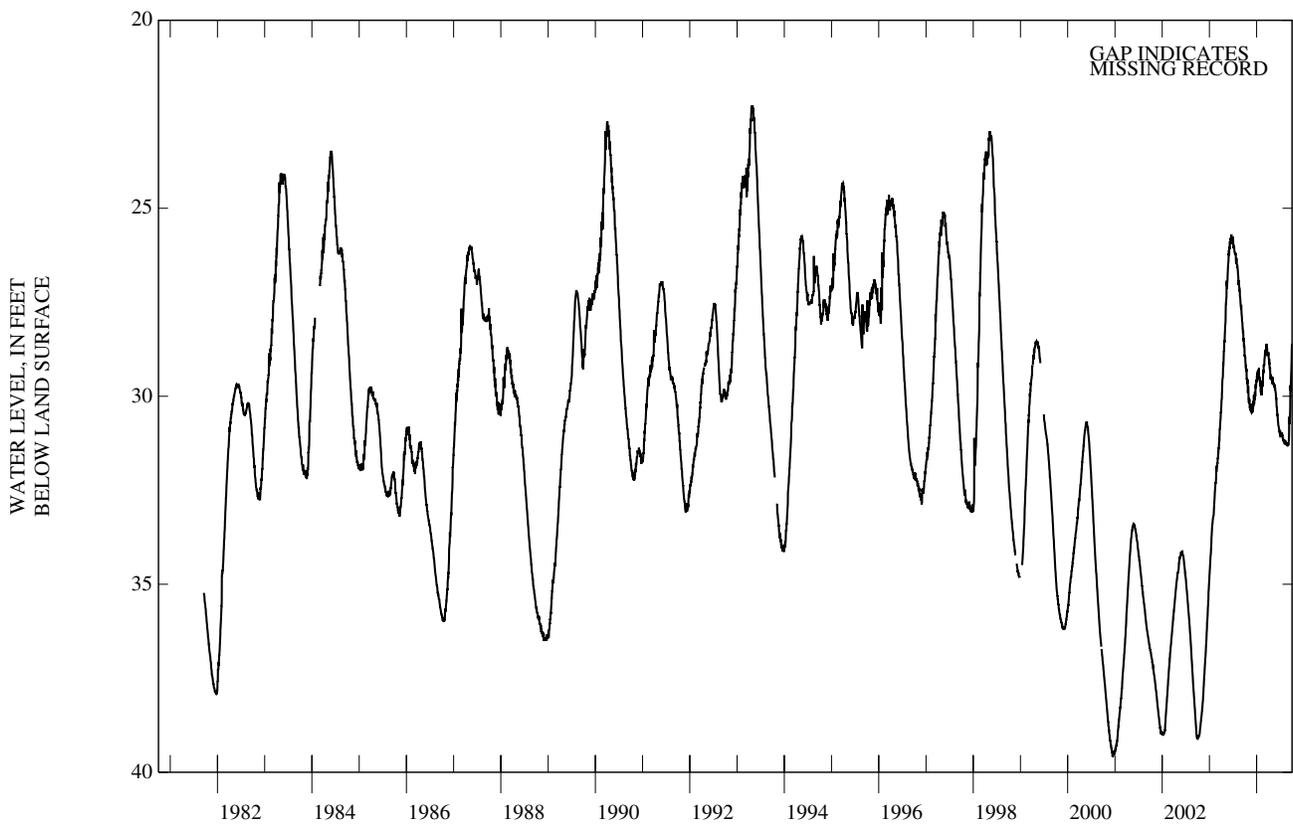
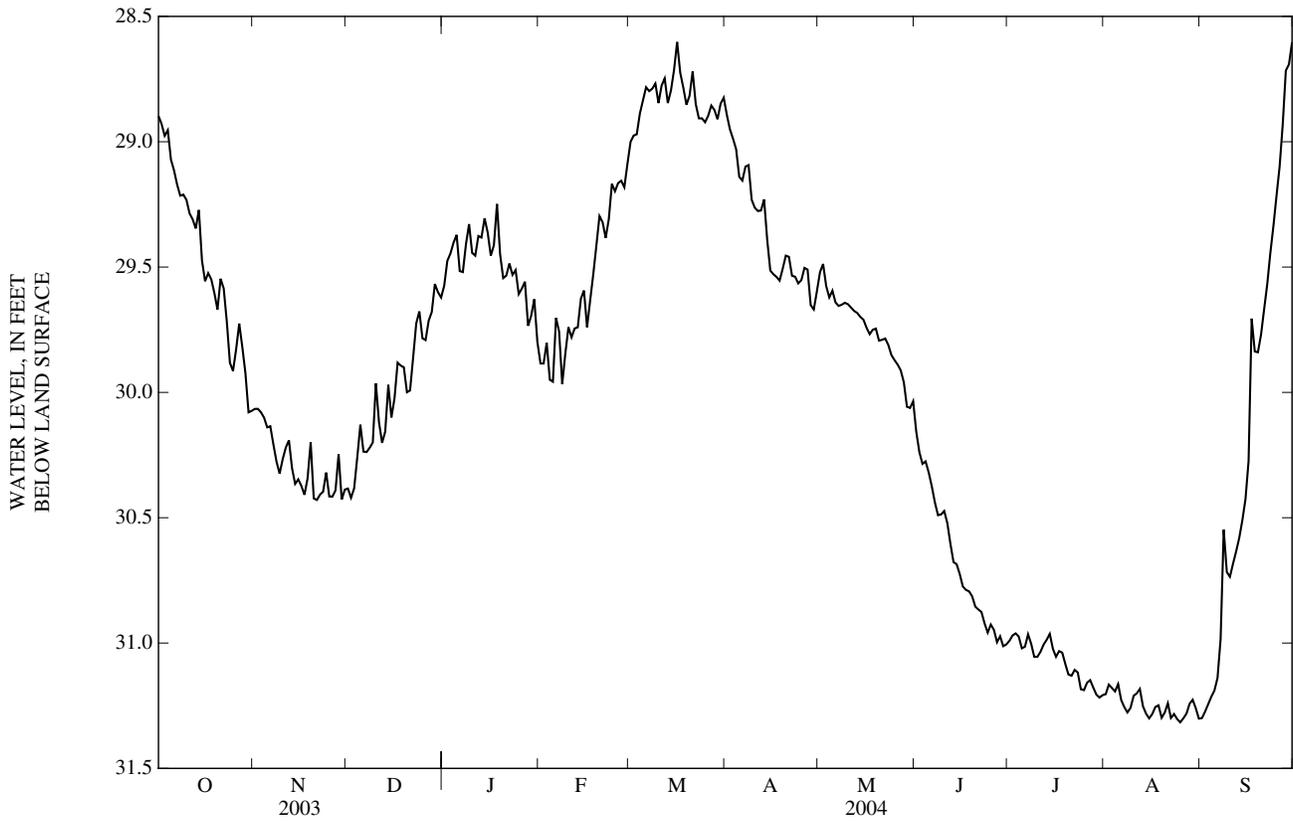
WTR YR 2004 MEAN 5.45 HIGH 0.87 LOW 6.72





TRANSYLVANIA COUNTY—Continued

351808082374302. Local number NC-144; County number, TR-065.



## GROUND-WATER LEVELS

## TRANSYLVANIA COUNTY—Continued

351709082434101. Local number, NC-147; County number, TR-066.

LOCATION.--Lat 35°17'09", long 82°43'41", Hydrologic Unit 06010105, 3.5 mi north of Brevard on U.S. Highway 276, 700 ft northwest of U.S. Forest Service Ranger Station in Pisgah National Forest. Owner: U.S. Geological Survey.

AQUIFER.--Unconfined alluvial sand.

WELL CHARACTERISTICS.--Drilled observation well, drilled to 25 ft, diameter 4 in., cased to 11.6 ft, screened interval from 11.6 to 21.6 ft; measured depth 22.9 ft, June 1985.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 2,176.70 ft above NGVD of 1929. Measuring point: Top of casing, 2.24 ft above land-surface datum.

REMARKS.--Well is part of climatic-effects network.

PERIOD OF RECORD.--June 1985 to current year.

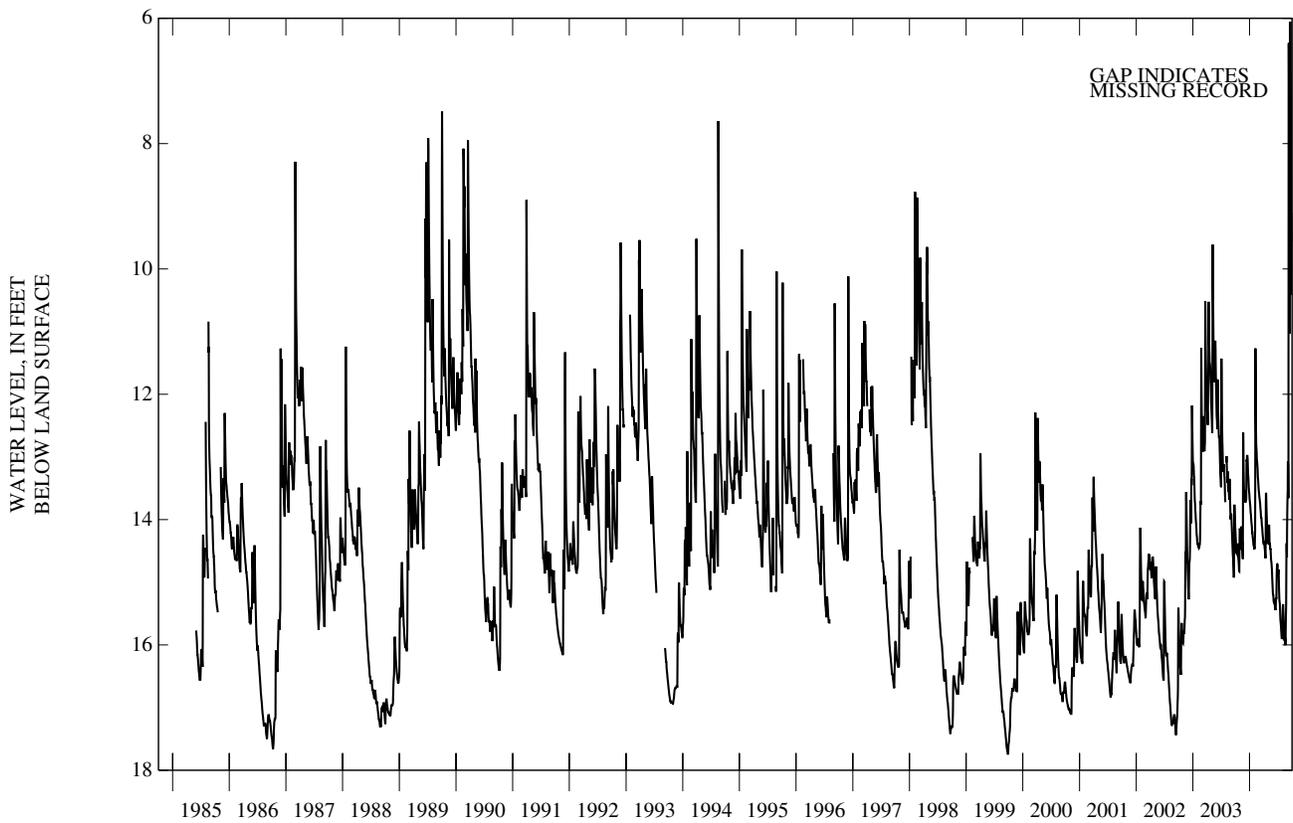
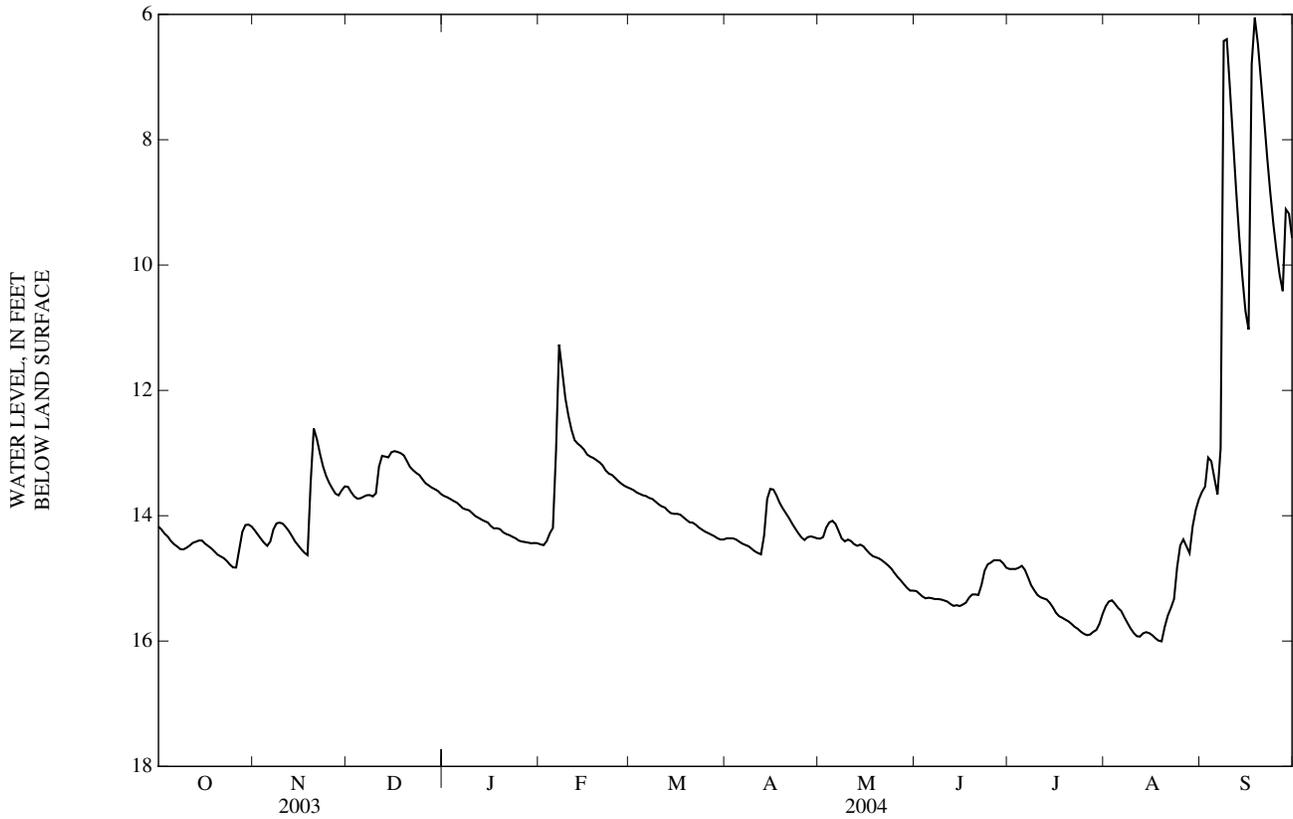
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 5.97 ft below land-surface datum, Sept. 18, 2004; lowest water level recorded, 17.75 ft below land-surface datum, Sept. 26, 27, 28, 1999.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	
1	14.17	14.23	13.54	13.69	14.46	13.57	14.36	14.37	15.20	14.85	15.45	13.62	
2	14.22	14.30	13.62	13.71	14.47	13.59	14.36	14.34	15.24	14.85	15.37	13.54	
3	14.29	14.37	13.69	13.73	14.41	13.63	14.36	14.19	15.29	14.85	15.35	13.07	
4	14.33	14.43	13.73	13.76	14.28	13.65	14.38	14.11	15.32	14.83	15.41	13.13	
5	14.40	14.48	13.72	13.79	14.19	13.67	14.41	14.08	15.31	14.80	15.47	13.40	
6	14.45	14.41	13.70	13.83	12.97	13.69	14.45	14.13	15.32	14.87	15.52	13.66	
7	14.49	14.22	13.67	13.88	11.27	13.72	14.47	14.24	15.33	14.98	15.62	12.93	
8	14.53	14.12	13.67	13.90	11.69	13.73	14.49	14.36	15.33	15.11	15.71	6.42	
9	14.54	14.11	13.69	13.91	12.12	13.77	14.53	14.41	15.34	15.19	15.80	6.40	
10	14.51	14.13	13.64	13.96	12.41	13.82	14.57	14.38	15.35	15.26	15.87	7.18	
11	14.48	14.18	13.22	14.00	12.63	13.85	14.60	14.40	15.37	15.30	15.92	7.99	
12	14.43	14.25	13.04	14.03	12.80	13.87	14.62	14.45	15.41	15.32	15.93	8.81	
13	14.42	14.33	13.06	14.06	12.85	13.92	14.32	14.48	15.44	15.34	15.88	9.55	
14	14.40	14.41	13.07	14.09	12.89	13.96	13.73	14.46	15.43	15.39	15.86	10.19	
15	14.40	14.47	12.99	14.11	12.94	13.97	13.57	14.49	15.44	15.46	15.87	10.73	
16	14.45	14.54	12.97	14.16	13.02	13.97	13.58	14.55	15.42	15.55	15.91	11.03	
17	14.48	14.59	12.98	14.20	13.06	13.98	13.68	14.60	15.39	15.60	15.96	6.80	
18	14.52	14.63	13.00	14.20	13.08	14.02	13.79	14.64	15.31	15.63	15.99	6.05	
19	14.57	13.47	13.04	14.22	13.11	14.07	13.88	14.66	15.26	15.66	16.00	6.47	
20	14.62	12.61	13.13	14.27	13.15	14.10	13.96	14.68	15.26	15.69	15.77	7.06	
21	14.65	12.78	13.22	14.29	13.20	14.11	14.04	14.71	15.27	15.73	15.59	7.67	
22	14.68	13.01	13.27	14.31	13.28	14.14	14.12	14.75	15.10	15.77	15.47	8.29	
23	14.72	13.22	13.32	14.34	13.33	14.19	14.20	14.80	14.88	15.80	15.33	8.85	
24	14.78	13.37	13.35	14.36	13.35	14.22	14.28	14.85	14.78	15.85	14.82	9.35	
25	14.82	13.48	13.42	14.40	13.40	14.25	14.34	14.92	14.75	15.89	14.47	9.78	
26	14.83	13.57	13.48	14.41	13.45	14.28	14.39	14.98	14.71	15.91	14.38	10.16	
27	14.54	13.65	13.52	14.42	13.49	14.30	14.34	15.03	14.71	15.90	14.49	10.42	
28	14.26	13.67	13.55	14.43	13.52	14.33	14.33	15.09	14.71	15.85	14.60	9.11	
29	14.15	13.60	13.58	14.44	13.55	14.36	14.34	15.15	14.76	15.82	14.17	9.18	
30	14.14	13.53	13.61	14.44	---	14.38	14.36	15.19	14.83	15.72	13.91	9.57	
31	14.17	---	13.66	14.44	---	14.38	---	15.20	---	15.57	13.74	---	
WTR YR	2004	MEAN	13.97	HIGH	6.05	LOW	16.00						

TRANSYLVANIA COUNTY—Continued

351709082434101. Local number, NC-147; County number, TR-066.



GROUND-WATER LEVELS

WAKE COUNTY

354356078403501. County number, WK-277; DENR Lake Wheeler Research Station MW-1S (Regolith well).

LOCATION.--Lat 35°43'57", long 78°40'35", Hydrologic Unit 03020201, .6 mi south of Tryon Road, .2 mi east of Lake Wheeler Road on NCSU Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

WATER-LEVEL RECORDS

AQUIFER.--Regolith (saprolitic Raleigh Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 20 ft, diameter 4 in., cased to 5 ft, screened interval from 5 to 20 ft, sand filter packed from 5 to 20 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Measured periodically with electric tape (by DENR and USGS).

DATUM.--Land-surface datum is 334.38 ft above NGVD of 1929. Measuring point: Top of 4-inch casing, 1.97. Instrument shelter removed June 17, 2004.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--July 2001 to current year. Continuous record December 2001 to June 2004. Periodic water level measurements made by DENR and USGS, July 2001 to August 2004.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, -0.38 ft below land-surface datum, July 2, 2003; lowest water level recorded 2.71 ft below land-surface datum, Aug. 13, 2002.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.05	1.03	1.28	---	---	1.17	1.32	1.47	1.60	---	---	---
2	1.08	1.05	1.30	---	---	1.20	1.36	1.35	1.63	---	---	---
3	1.09	1.08	1.32	---	---	1.24	1.37	1.21	1.65	---	---	---
4	1.06	1.07	1.24	---	---	1.25	1.38	1.37	1.53	---	---	---
5	1.07	1.09	---	---	---	1.26	1.40	1.40	1.51	---	---	---
6	1.10	1.07	---	---	---	1.26	1.40	1.45	1.55	---	---	---
7	1.11	1.09	---	---	---	1.27	1.38	1.47	1.55	---	---	---
8	1.07	1.09	---	---	---	1.28	1.39	1.49	1.55	---	---	---
9	1.03	1.14	---	---	---	1.29	1.43	1.50	1.50	---	---	---
10	1.02	---	---	---	---	1.29	1.42	1.52	1.48	---	---	---
11	1.04	---	---	---	---	1.30	1.42	---	1.54	---	---	---
12	1.07	---	---	---	---	1.32	1.32	1.54	1.56	---	---	---
13	1.10	1.18	---	---	---	1.36	1.30	1.52	1.57	---	---	---
14	1.04	1.21	---	---	1.15	1.34	1.35	1.53	1.54	---	---	---
15	1.05	1.20	---	---	1.13	1.25	1.42	1.56	1.56	---	---	---
16	1.12	1.20	---	---	1.05	1.07	---	1.57	1.57	---	---	---
17	1.11	1.20	---	---	1.09	1.04	---	1.58	---	---	---	---
18	1.09	1.20	---	---	1.11	1.10	---	1.58	---	---	---	---
19	1.12	1.03	---	---	1.15	1.06	---	1.57	---	---	---	---
20	1.14	1.07	---	---	1.18	1.15	---	1.53	---	---	---	---
21	1.10	1.15	---	---	1.20	1.19	---	1.56	---	---	---	---
22	1.13	1.18	---	---	1.26	1.27	---	1.59	---	---	---	---
23	1.16	1.20	---	---	1.27	1.30	---	1.60	---	---	---	---
24	1.19	1.19	---	---	1.25	1.31	1.51	1.61	---	---	---	---
25	1.17	1.24	---	---	1.31	1.32	1.51	1.64	---	---	---	---
26	1.12	1.24	---	---	1.30	1.32	1.47	1.65	---	---	---	---
27	1.10	1.24	---	---	1.24	1.32	1.44	1.66	---	---	---	---
28	1.06	1.20	---	---	1.10	1.34	1.52	1.68	---	---	---	---
29	0.74	1.28	---	---	1.10	1.35	1.53	1.70	---	---	---	---
30	0.95	1.27	---	---	---	1.33	1.52	1.54	---	---	---	---
31	1.00	---	---	---	---	1.30	---	1.53	---	---	---	---

WTR YR 2004 MEAN 1.30 HIGH 0.74 LOW 1.70

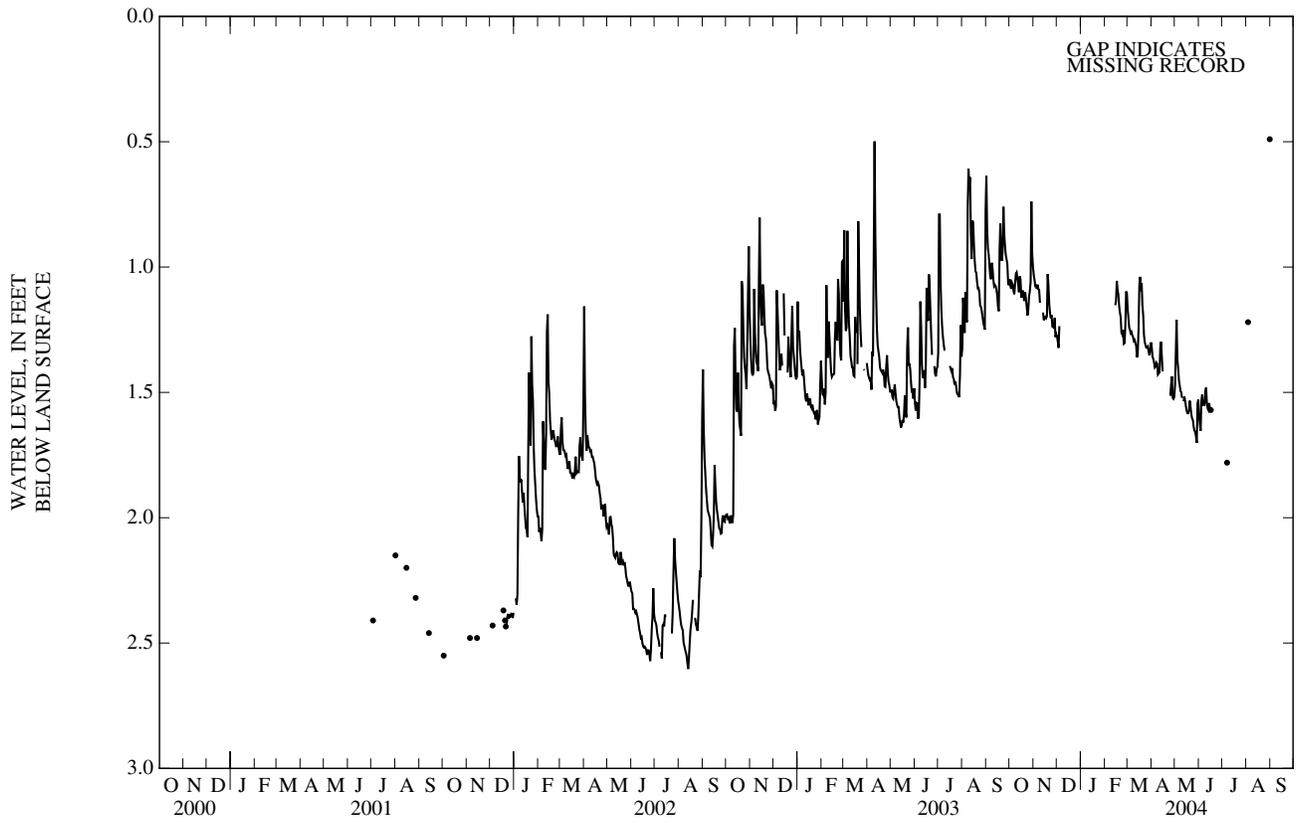
WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JUL 07	1.78*	AUG 07	31.22*	AUG 13	31.49*

DENR measurement

WAKE COUNTY—Continued

354356078403501. County number, WK-277; DENR Lake Wheeler Research Station MW-1S (Regolith well).



354356078403501 WK-277 DENR Lake Wheeler Research Station MW-1S (Regolith Well)—Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 2002 to June 2004 (discontinued).

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: December 2001 to June 2004.

pH: December 2001 to June 2004.

WATER TEMPERATURE: December 2001 to June 2004.

DISSOLVED OXYGEN: December 2001 to June 2004.

DISSOLVED OXYGEN, PERCENT SATURATION: December 2001 to June 2004.

INSTRUMENTATION.-- Water-quality monitor with satellite telemetry from December 2001 to June 2004.

REMARKS.--Station operated in cooperation with North Carolina Department of Environment and Natural Resources, Water Resources Division as part of the Piedmont/Mountains ground-water study. Dissolved oxygen, percent saturation, is computed using a barometric pressure of 760 mm Hg.

EXTREMES FOR PERIOD OF DAILY RECORD.--

CONSTITUENT	MAXIMUM RECORDED	MINIMUM RECORDED
SPECIFIC CONDUCTANCE, microsiemens	288, September 1, 2002	109, August 25, 26, 2002
pH, standard units	6.1, September 1, 2002	4.7, on many days during the period
WATER TEMPERATURE, °C	17.4, October 11, 21, 28, 2002	13.6, February 22, 2003
DISSOLVED OXYGEN, mg/L	4.1, February 4-11, 13, 15-16, 2002	1.4, September 1, 2002
DISSOLVED OXYGEN, PERCENT SATURATION, %	40, on many days during the period	14, September 1, 2002

EXTREMES FOR CURRENT YEAR.--

CONSTITUENT	MAXIMUM RECORDED	MINIMUM RECORDED
SPECIFIC CONDUCTANCE, microsiemens	171, October 21	142, October 1-4, 20, 21, 29, 30, November 19, 20
pH, standard units	5.1, October 21	4.7, on many days during the year
WATER TEMPERATURE, °C	16.7, October 20	14.3, February 28
DISSOLVED OXYGEN, mg/L	3.4, December 5	2.2, October 21
DISSOLVED OXYGEN, PERCENT SATURATION, %	35, December 5	23, October 21, May 15-20

354356078403501 WK-277 DENR Lake Wheeler Research Station MW-1S (Regolith Well)—Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Dis- solved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	Specif. conduc- tance, wat unf uS/cm 25 degC (00095)	Temper- ature, water, deg C (00010)	Hard- ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes- ium, water, fltrd, mg/L (00925)	Potas- sium, water, fltrd, mg/L (00935)	Sodium, water, fltrd, mg/L (00930)	ANC, wat unf incrm. titr., field, mg/L as CaCO3 (00419)	Bromide water, fltrd, mg/L (71870)	Chlor- ide, water, fltrd, mg/L (00940)
DEC 05...	1330	2.6	5.5	149	16.5	33	8.35	2.96	3.81	14.5	24	.06	11.6
Date		Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue on evap. at 180degC wat flt mg/L (70300)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Arsenic water, fltrd, ug/L (01000)	Boron, water, fltrd, ug/L (01020)	Iron, water, fltrd, ug/L (01046)	Mangan- ese, water, fltrd, ug/L (01056)	
DEC 05...		27.4	1.0	110	E.02	6.76	<.008	.022	<2	E5.5	11	10.6	

Remark codes used in this table:  
 < -- Less than  
 E -- Estimated value

354356078403501 WK-277 DENR Lake Wheeler Research Station MW-1S (Regolith Well)—Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	142	143	144	145	143	146	150	152	152	---	---	---
2	142	143	144	145	143	147	150	152	152	---	---	---
3	142	143	143	145	143	147	150	152	151	---	---	---
4	142	143	143	145	143	147	150	152	151	---	---	---
5	144	143	149	145	143	147	150	153	151	---	---	---
6	144	143	153	145	143	147	150	153	151	---	---	---
7	144	143	146	145	143	147	150	153	151	---	---	---
8	144	143	144	145	143	147	150	153	151	---	---	---
9	143	143	143	145	143	147	150	153	151	---	---	---
10	143	---	143	145	---	148	150	153	151	---	---	---
11	143	---	---	145	---	148	150	153	151	---	---	---
12	144	---	---	145	---	148	151	153	151	---	---	---
13	144	144	---	145	---	148	151	153	151	---	---	---
14	144	144	---	145	145	148	151	153	151	---	---	---
15	144	144	---	145	145	148	151	153	151	---	---	---
16	143	144	---	145	144	148	---	153	151	---	---	---
17	143	144	---	145	144	148	---	152	---	---	---	---
18	143	144	---	145	145	148	---	152	---	---	---	---
19	143	143	---	145	145	148	---	152	---	---	---	---
20	143	142	---	145	145	149	---	152	---	---	---	---
21	153	143	---	145	145	149	---	152	---	---	---	---
22	144	143	---	145	145	149	---	152	---	---	---	---
23	143	143	145	145	145	149	---	152	---	---	---	---
24	143	143	145	145	145	149	152	152	---	---	---	---
25	143	143	145	145	146	149	152	152	---	---	---	---
26	143	143	145	144	146	149	152	152	---	---	---	---
27	143	143	145	144	146	149	152	152	---	---	---	---
28	143	143	145	144	146	149	152	152	---	---	---	---
29	142	143	145	144	146	149	152	152	---	---	---	---
30	143	144	145	143	---	150	152	152	---	---	---	---
31	143	---	145	143	---	150	---	152	---	---	---	---
MEAN	143	---	---	145	---	148	---	152	---	---	---	---
MAX	153	--	--	145	--	150	--	153	--	---	---	---
MIN	142	--	--	143	--	146	--	152	--	---	---	---

354356078403501 WK-277 DENR Lake Wheeler Research Station MW-1S (Regolith Well)—Continued

PH, WATER, UNFILTERED, FIELD, STANDARD UNITS  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	4.8	4.8	4.8	4.8	4.7	4.8	4.8	4.8	---	---	---
2	4.8	4.8	4.9	4.8	4.8	4.7	4.8	4.8	4.8	---	---	---
3	4.8	4.8	4.9	4.8	4.8	4.7	4.8	4.8	4.8	---	---	---
4	4.8	4.8	4.9	4.8	4.8	4.7	4.8	4.8	4.8	---	---	---
5	4.8	4.8	4.9	4.8	4.8	4.7	4.8	4.8	4.8	---	---	---
6	4.8	4.8	5.0	4.8	4.8	4.7	4.8	4.8	4.8	---	---	---
7	4.8	4.8	4.9	4.8	4.8	4.7	4.8	4.8	4.8	---	---	---
8	4.8	4.8	4.8	4.8	4.8	4.7	4.8	4.8	4.8	---	---	---
9	4.8	4.8	4.8	4.8	4.8	4.7	4.8	4.8	4.8	---	---	---
10	4.8	---	4.8	4.8	---	4.7	4.8	4.8	4.8	---	---	---
11	4.8	---	---	4.8	---	4.7	4.8	4.8	4.8	---	---	---
12	4.8	---	---	4.8	---	4.7	4.8	4.8	4.8	---	---	---
13	4.8	4.8	---	4.8	---	4.8	4.8	4.8	4.8	---	---	---
14	4.8	4.8	---	4.8	4.8	4.8	4.8	4.8	4.8	---	---	---
15	4.9	4.8	---	4.8	4.7	4.8	4.8	4.8	4.8	---	---	---
16	4.9	4.8	---	4.8	4.7	4.8	---	4.8	4.8	---	---	---
17	4.9	4.8	---	4.8	4.7	4.8	---	4.8	---	---	---	---
18	4.9	4.8	---	4.8	4.7	4.8	---	4.8	---	---	---	---
19	4.9	4.8	---	4.8	4.7	4.8	---	4.8	---	---	---	---
20	4.9	4.8	---	4.8	4.7	4.8	---	4.8	---	---	---	---
21	5.0	4.8	---	4.8	4.7	4.8	---	4.8	---	---	---	---
22	4.9	4.8	---	4.8	4.7	4.8	---	4.8	---	---	---	---
23	4.8	4.8	4.8	4.8	4.7	4.8	---	4.8	---	---	---	---
24	4.8	4.8	4.8	4.8	4.7	4.8	4.8	4.8	---	---	---	---
25	4.8	4.8	4.8	4.8	4.7	4.8	4.8	4.8	---	---	---	---
26	4.8	4.8	4.8	4.8	4.7	4.8	4.8	4.8	---	---	---	---
27	4.8	4.8	4.8	4.8	4.7	4.8	4.8	4.8	---	---	---	---
28	4.8	4.8	4.8	4.8	4.7	4.8	4.8	4.8	---	---	---	---
29	4.8	4.8	4.8	4.8	4.7	4.8	4.8	4.8	---	---	---	---
30	4.8	4.8	4.8	4.8	---	4.8	4.8	4.8	---	---	---	---
31	4.8	---	4.8	4.8	---	4.8	---	4.8	---	---	---	---
MEAN	4.8	---	---	4.8	---	4.8	---	4.8	---	---	---	---
MAX	5.0	---	---	4.8	---	4.8	---	4.8	---	---	---	---
MIN	4.8	---	---	4.8	---	4.7	---	4.8	---	---	---	---

354356078403501 WK-277 DENR Lake Wheeler Research Station MW-1S (Regolith Well)—Continued

TEMPERATURE, WATER, DEGREES CELSIUS  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.4	16.5	16.5	15.8	15.0	14.6	14.8	15.1	15.4	---	---	---
2	16.4	16.5	16.5	15.7	15.0	14.7	14.8	15.1	15.4	---	---	---
3	16.4	16.5	16.5	15.7	14.9	14.7	14.9	15.1	15.4	---	---	---
4	16.4	16.5	16.5	15.7	14.9	14.7	14.9	15.2	15.5	---	---	---
5	16.4	16.5	16.4	15.7	14.8	14.7	14.9	15.2	15.5	---	---	---
6	16.4	16.5	16.4	15.7	14.8	14.8	14.9	15.2	15.5	---	---	---
7	16.4	16.5	16.4	15.7	14.7	14.8	14.9	15.2	15.5	---	---	---
8	16.4	16.5	16.4	15.7	14.8	14.8	14.9	15.2	15.5	---	---	---
9	16.5	16.5	16.3	15.7	14.8	14.8	14.9	15.2	15.5	---	---	---
10	16.5	---	16.3	15.6	---	14.8	14.9	15.2	15.5	---	---	---
11	16.5	---	---	15.6	---	14.8	14.9	15.2	15.5	---	---	---
12	16.5	---	---	15.5	---	14.8	14.9	15.2	15.5	---	---	---
13	16.5	16.5	---	15.5	---	14.8	14.9	15.2	15.6	---	---	---
14	16.5	16.5	---	15.5	14.7	14.8	14.9	15.2	15.6	---	---	---
15	16.5	16.5	---	15.5	14.7	14.7	14.9	15.3	15.6	---	---	---
16	16.5	16.5	---	15.4	14.6	14.7	---	15.3	15.6	---	---	---
17	16.5	16.5	---	15.4	14.6	14.7	---	15.3	---	---	---	---
18	16.5	16.5	---	15.3	14.6	14.8	---	15.3	---	---	---	---
19	16.5	16.5	---	15.3	14.6	14.7	---	15.3	---	---	---	---
20	16.5	16.5	---	15.3	14.6	14.8	---	15.3	---	---	---	---
21	16.4	16.5	---	15.3	14.6	14.8	---	15.3	---	---	---	---
22	16.4	16.5	---	15.3	14.6	14.8	---	15.3	---	---	---	---
23	16.4	16.5	15.9	15.3	14.6	14.8	---	15.3	---	---	---	---
24	16.4	16.5	15.9	15.2	14.6	14.8	15.1	15.4	---	---	---	---
25	16.5	16.5	15.9	15.2	14.6	14.8	15.1	15.4	---	---	---	---
26	16.5	16.5	15.9	15.2	14.6	14.8	15.1	15.4	---	---	---	---
27	16.5	16.5	15.8	15.1	14.6	14.8	15.1	15.4	---	---	---	---
28	16.5	16.5	15.8	15.1	14.4	14.8	15.1	15.4	---	---	---	---
29	16.5	16.5	15.8	15.0	14.5	14.8	15.1	15.4	---	---	---	---
30	16.5	16.5	15.8	15.0	---	14.8	15.1	15.4	---	---	---	---
31	16.5	---	15.8	15.0	---	14.8	---	15.4	---	---	---	---
MEAN	16.5	---	---	15.4	---	14.8	---	15.3	---	---	---	---
MAX	16.5	---	---	15.8	---	14.8	---	15.4	---	---	---	---
MIN	16.4	---	---	15.0	---	14.6	---	15.1	---	---	---	---

354356078403501 WK-277 DENR Lake Wheeler Research Station MW-1S (Regolith Well)—Continued

DISSOLVED OXYGEN, WATER, UNFILTERED, MILLIGRAMS PER LITER  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	2.9	3.0	3.1	3.2	---	---	2.5	2.5	---	---	---
2	3.0	2.9	3.0	3.1	3.2	---	---	2.5	2.5	---	---	---
3	3.0	2.9	3.0	3.1	3.2	---	---	2.5	2.5	---	---	---
4	---	2.9	3.0	3.1	---	---	---	2.5	2.5	---	---	---
5	---	2.9	3.0	3.1	---	---	---	2.5	2.5	---	---	---
6	---	2.9	3.0	3.1	---	---	---	2.5	2.5	---	---	---
7	---	2.9	3.2	3.1	---	---	---	2.5	2.5	---	---	---
8	---	2.9	3.3	3.1	---	---	---	2.5	2.5	---	---	---
9	---	2.9	3.3	3.1	---	---	---	2.5	2.5	---	---	---
10	---	---	3.3	3.1	---	---	---	2.4	2.5	---	---	---
11	---	---	---	3.1	---	---	---	2.4	2.6	---	---	---
12	---	---	---	3.1	---	---	---	2.4	2.6	---	---	---
13	---	3.0	---	3.1	---	---	---	2.4	2.6	---	---	---
14	---	3.0	---	3.1	---	---	---	2.4	2.6	---	---	---
15	---	3.0	---	3.1	---	---	---	2.3	2.6	---	---	---
16	---	3.0	---	3.1	---	---	---	2.3	2.6	---	---	---
17	---	3.0	---	3.1	---	---	---	2.3	---	---	---	---
18	---	3.0	---	3.1	---	---	---	2.3	---	---	---	---
19	---	3.0	---	3.1	---	---	---	2.3	---	---	---	---
20	---	3.0	---	3.1	---	---	---	2.4	---	---	---	---
21	2.4	3.0	---	3.1	---	---	---	2.4	---	---	---	---
22	2.6	3.0	---	3.1	---	---	---	2.4	---	---	---	---
23	2.8	3.0	3.2	3.1	---	---	---	2.4	---	---	---	---
24	2.9	3.0	3.2	3.1	---	---	2.5	2.4	---	---	---	---
25	2.9	3.0	3.2	3.1	---	---	2.5	2.4	---	---	---	---
26	2.9	3.0	3.2	3.1	---	---	2.5	2.4	---	---	---	---
27	2.9	3.0	3.1	3.1	---	---	2.5	2.4	---	---	---	---
28	2.9	3.0	3.1	3.2	---	---	2.5	2.4	---	---	---	---
29	2.8	3.0	3.1	3.2	---	---	2.5	2.5	---	---	---	---
30	2.9	3.0	3.1	3.2	---	---	2.5	2.5	---	---	---	---
31	2.9	---	3.1	3.2	---	---	---	2.5	---	---	---	---
MEAN	---	---	---	3.1	---	---	---	2.4	---	---	---	---
MAX	---	---	---	3.2	---	---	---	2.5	---	---	---	---
MIN	---	---	---	3.1	---	---	---	2.3	---	---	---	---

354356078403501 WK-277 DENR Lake Wheeler Research Station MW-1S (Regolith Well)—Continued

DISSOLVED OXYGEN, WATER, UNFILTERED, PERCENT OF SATURATION  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	30	31	31	32	---	---	25	25	---	---	---
2	31	30	31	31	32	---	---	25	25	---	---	---
3	31	30	31	31	32	---	---	25	25	---	---	---
4	---	30	31	31	---	---	---	25	25	---	---	---
5	---	30	31	31	---	---	---	25	25	---	---	---
6	---	30	31	31	---	---	---	25	25	---	---	---
7	---	30	33	31	---	---	---	25	25	---	---	---
8	---	30	34	31	---	---	---	25	25	---	---	---
9	---	30	34	31	---	---	---	25	25	---	---	---
10	---	---	34	31	---	---	---	24	25	---	---	---
11	---	---	---	31	---	---	---	24	26	---	---	---
12	---	---	---	31	---	---	---	24	26	---	---	---
13	---	30	---	31	---	---	---	24	26	---	---	---
14	---	31	---	31	---	---	---	24	26	---	---	---
15	---	31	---	31	---	---	---	23	26	---	---	---
16	---	31	---	31	---	---	---	23	26	---	---	---
17	---	31	---	31	---	---	---	23	---	---	---	---
18	---	31	---	31	---	---	---	23	---	---	---	---
19	---	31	---	31	---	---	---	23	---	---	---	---
20	---	31	---	31	---	---	---	24	---	---	---	---
21	25	31	---	31	---	---	---	24	---	---	---	---
22	27	31	---	31	---	---	---	24	---	---	---	---
23	29	31	32	31	---	---	---	24	---	---	---	---
24	30	31	32	31	---	---	25	24	---	---	---	---
25	30	31	32	31	---	---	25	24	---	---	---	---
26	30	31	32	31	---	---	25	24	---	---	---	---
27	30	31	32	31	---	---	25	24	---	---	---	---
28	30	31	31	32	---	---	25	24	---	---	---	---
29	29	31	31	32	---	---	25	25	---	---	---	---
30	30	31	31	32	---	---	25	25	---	---	---	---
31	30	---	31	32	---	---	---	25	---	---	---	---
MEAN	---	---	---	31	---	---	---	24	---	---	---	---
MAX	--	--	--	32	--	---	--	25	--	---	---	---
MIN	--	--	--	31	--	---	--	23	--	---	---	---

## WAKE COUNTY—Continued

354356078403502. County number, WK-278; DENR Lake Wheeler Research Station MW-11 (Transition zone well).

LOCATION.--Lat 35°43'56", long 78°40'35", Hydrologic Unit 03020201, .6 mi south of Tryon Road, .2 mi east of Lake Wheeler Road on NCSU Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

## WATER-LEVEL RECORDS

AQUIFER.--Regolith (saprolitic Raleigh Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 41.5 ft, diameter 4 in., cased to 31.5 ft, screened interval from 31.5 to 41.5 ft, sand filter packed from 26.5 to 42 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 335.36 ft above NGVD of 1929. Measuring point: Top of 4-inch casing, 1.91 ft above land-surface datum. Instrument shelter removed June 17, 2004.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--July 2001 to current year. Continuous record December 2001 to June 2004. Periodic water level measurements made by DENR.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 0.56 ft below land-surface datum, July 2, 2003; lowest water level recorded 3.57 ft below land-surface datum, Aug. 13, 2002.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

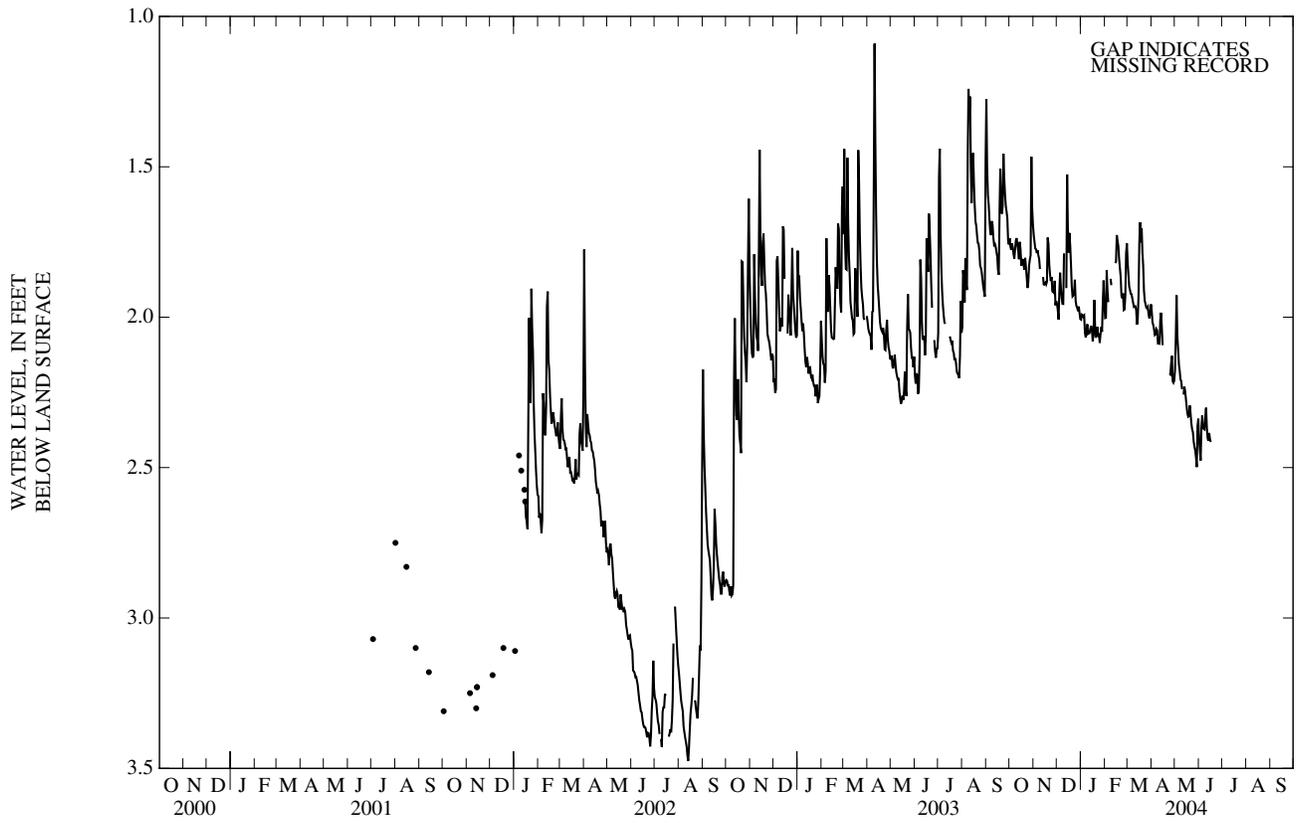
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.74	1.73	1.96	2.01	2.00	1.82	1.98	2.17	2.41	---	---	---
2	1.77	1.75	1.98	1.99	2.00	1.86	2.02	2.07	2.45	---	---	---
3	1.78	1.77	2.01	1.99	1.84	1.90	2.03	1.93	2.48	---	---	---
4	1.75	1.77	1.92	2.00	1.91	1.91	2.04	2.06	2.37	---	---	---
5	1.77	1.79	1.85	1.99	1.95	1.92	2.06	2.11	2.33	---	---	---
6	1.79	1.78	1.90	2.05	---	1.92	2.06	2.16	2.37	---	---	---
7	1.81	1.79	1.94	2.07	---	1.94	2.04	2.18	2.37	---	---	---
8	1.77	1.81	1.96	2.05	1.87	1.95	2.04	2.21	2.37	---	---	---
9	1.74	1.84	1.96	2.02	1.89	1.97	2.09	2.21	2.33	---	---	---
10	1.74	---	1.79	2.06	---	1.96	2.09	2.24	2.30	---	---	---
11	1.76	---	---	2.05	---	1.96	2.09	---	2.37	---	---	---
12	1.78	---	---	2.05	---	1.98	2.01	2.26	2.40	---	---	---
13	1.81	1.87	1.90	2.04	---	2.02	1.99	2.23	2.41	---	---	---
14	1.75	1.89	1.53	2.03	1.82	2.00	2.03	2.25	2.38	---	---	---
15	1.77	1.89	1.71	2.04	1.81	1.93	2.09	2.27	2.40	---	---	---
16	1.83	1.88	1.78	2.08	1.73	1.75	---	2.30	2.42	---	---	---
17	1.81	1.89	1.72	2.06	1.75	1.68	---	2.32	---	---	---	---
18	1.81	1.88	1.76	1.94	1.76	1.75	---	2.33	---	---	---	---
19	1.83	1.74	1.82	2.03	1.81	1.70	---	2.33	---	---	---	---
20	1.84	1.76	1.90	2.07	1.84	1.78	---	2.29	---	---	---	---
21	1.80	1.83	1.93	2.06	1.87	1.83	---	2.32	---	---	---	---
22	1.83	1.86	1.93	2.03	1.93	1.91	---	2.35	---	---	---	---
23	1.87	1.88	1.92	2.06	1.94	1.95	---	2.37	---	---	---	---
24	1.90	1.87	1.88	2.05	1.92	1.96	2.19	2.38	---	---	---	---
25	1.88	1.91	1.95	2.09	1.98	1.97	2.19	2.41	---	---	---	---
26	1.83	1.92	1.96	2.06	1.97	1.97	2.15	2.43	---	---	---	---
27	1.81	1.92	1.97	2.03	1.93	1.97	2.13	2.44	---	---	---	---
28	1.79	1.88	1.98	2.05	1.79	1.99	2.21	2.47	---	---	---	---
29	1.47	1.96	1.96	1.95	1.75	2.00	2.22	2.50	---	---	---	---
30	1.64	1.95	1.99	1.88	---	1.98	2.21	2.36	---	---	---	---
31	1.69	---	2.01	1.96	---	1.96	---	2.34	---	---	---	---

WTR YR 2004 MEAN 1.99 HIGH 1.47 LOW 2.50

GROUND-WATER LEVELS

WAKE COUNTY—Continued

354356078403502. County number, WK-278; DENR Lake Wheeler Research Station MW-II (Transition zone well).



354356078403502 WK-278 DENR Lake Wheeler Research Station MW-II (Transition zone well)—Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 2002 to June 2004 (discontinued).

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: December 2001 to August 2002, October 2002 to June 2004.

pH: December 2001 to August 2002, October 2002 to June 2004.

WATER TEMPERATURE: December 2001 to August 2002, October 2002 to June 2004.

DISSOLVED OXYGEN: January to August 2002, October 2002 to June 2004.

DISSOLVED OXYGEN, PERCENT SATURATION: January to August 2002, October 2002 to June 2004.

INSTRUMENTATION.-- Water-quality monitor with satellite telemetry from December 2001 to August 2002, October 2002 to June 2004.

REMARKS.--Station operated in cooperation with North Carolina Department of Environment and Natural Resources, Water Resources Division as part of the Piedmont/Mountains ground-water study. Dissolved oxygen, percent saturation, is computed using a barometric pressure of 760 mm Hg.

EXTREMES FOR PERIOD OF DAILY RECORD.--

CONSTITUENT	MAXIMUM RECORDED	MINIMUM RECORDED
SPECIFIC CONDUCTANCE, microsiemens	215, November 25, 2003	118, January 17, 2002
pH, standard units	5.8, October 14, 15, 2002	4.9, May 20, 21, 23, 2004
WATER TEMPERATURE, °C	16.2, on several days during the period	15.9, on many days during the period
DISSOLVED OXYGEN, mg/L	3.8, November 14, 2002	1.2, September 18, 2003
DISSOLVED OXYGEN, PERCENT SATURATION, %	39, November 14, 2002	12, September 18, 2003

EXTREMES FOR CURRENT YEAR.--

CONSTITUENT	MAXIMUM RECORDED	MINIMUM RECORDED
SPECIFIC CONDUCTANCE, microsiemens	215, November 25	180, February 8, 9, 10
pH, standard units	5.1, on many days during the year	4.9, May 20, 21, 23
WATER TEMPERATURE, °C	16.2, February 3	16.0, on many days during the year
DISSOLVED OXYGEN, mg/L	3.1, February 14, 15	1.8, on many days during the year
DISSOLVED OXYGEN, PERCENT SATURATION, %	32, February 14, 15	18, on many days during the year

354356078403502 WK-278 DENR Lake Wheeler Research Station MW-II (Transition zone well)—Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

Date	Time	Dis- solved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	Specif. conduc- tance, wat unf uS/cm 25 degC (00095)	Temper- ature, water, deg C (00010)	Hard- ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes- ium, water, fltrd, mg/L (00925)	Potas- sium, water, fltrd, mg/L (00935)	Sodium, water, fltrd, mg/L (00930)	ANC, wat unf incrm. titr., field, mg/L as CaCO3 (00419)	Bromide water, fltrd, mg/L (71870)	Chlor- ide, water, fltrd, mg/L (00940)
DEC 12...	1610	2.4	5.7	184	16.6	40	11.6	2.72	3.38	14.3	24	.05	15.2
Date		Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue on evap. at 180degC wat flt mg/L (70300)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Arsenic water, fltrd, ug/L (01000)	Boron, water, fltrd, ug/L (01020)	Iron, water, fltrd, ug/L (01046)	Mangan- ese, water, fltrd, ug/L (01056)	
DEC 12...		30.3	2.9	113	<.04	6.35	<.008	.040	<2	E4.8	<6	41.0	

Remark codes used in this table:

&lt; -- Less than

E -- Estimated value

354356078403502 WK-278 DENR Lake Wheeler Research Station MW-II (Transition zone well)—Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	203	204	207	188	186	187	193	193	198	---	---	---
2	203	204	206	187	186	187	193	192	198	---	---	---
3	204	205	205	188	186	187	194	192	198	---	---	---
4	203	205	205	188	186	187	194	192	199	---	---	---
5	204	206	205	188	186	188	194	192	199	---	---	---
6	202	206	204	187	185	188	193	193	199	---	---	---
7	202	206	205	187	182	188	193	193	199	---	---	---
8	203	206	205	186	181	189	194	193	200	---	---	---
9	206	206	206	187	181	189	193	193	199	---	---	---
10	207	---	206	187	---	189	193	192	199	---	---	---
11	206	---	---	186	---	189	193	192	199	---	---	---
12	206	---	---	186	---	189	193	192	200	---	---	---
13	206	207	---	187	---	190	193	192	200	---	---	---
14	206	207	---	186	183	190	193	192	200	---	---	---
15	206	208	---	186	183	190	193	193	200	---	---	---
16	207	208	---	186	183	190	---	194	200	---	---	---
17	207	208	---	186	184	190	---	194	---	---	---	---
18	207	208	---	186	184	190	---	195	---	---	---	---
19	208	209	---	185	185	190	---	195	---	---	---	---
20	---	207	---	186	186	191	---	195	---	---	---	---
21	208	206	---	185	186	192	---	196	---	---	---	---
22	208	206	---	185	186	192	---	196	---	---	---	---
23	208	206	186	185	186	192	---	196	---	---	---	---
24	207	207	187	185	187	192	195	196	---	---	---	---
25	207	207	188	185	187	192	195	196	---	---	---	---
26	207	207	188	185	187	192	194	196	---	---	---	---
27	207	207	188	185	186	193	194	196	---	---	---	---
28	207	207	187	185	186	193	194	197	---	---	---	---
29	206	207	188	185	187	193	194	197	---	---	---	---
30	205	207	188	185	---	193	194	197	---	---	---	---
31	204	---	187	185	---	193	---	197	---	---	---	---
MEAN	---	---	---	186	---	190	---	194	---	---	---	---
MAX	--	--	--	188	--	193	--	197	--	---	---	---
MIN	--	--	--	185	--	187	--	192	--	---	---	---

354356078403502 WK-278 DENR Lake Wheeler Research Station MW-II (Transition zone well)—Continued

PH, WATER, UNFILTERED, FIELD, STANDARD UNITS  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	5.1	5.1	5.0	5.0	5.0	5.0	5.0	5.0	---	---	---
2	5.0	5.1	5.1	5.0	5.0	5.0	5.0	5.0	5.0	---	---	---
3	5.0	5.1	5.1	5.0	5.0	5.0	5.0	5.0	5.0	---	---	---
4	5.0	5.1	5.1	5.0	5.0	5.0	5.0	5.0	5.0	---	---	---
5	5.0	5.1	5.1	5.0	5.0	5.0	5.0	5.0	5.0	---	---	---
6	5.0	5.1	5.1	5.0	5.0	5.1	5.0	5.0	5.0	---	---	---
7	5.0	5.1	5.1	5.0	5.1	5.1	5.0	5.0	5.0	---	---	---
8	5.0	5.1	5.1	5.0	5.1	5.1	5.0	5.0	5.0	---	---	---
9	5.1	5.1	5.1	5.0	5.1	5.1	5.0	5.0	5.0	---	---	---
10	5.1	---	5.1	5.0	---	5.1	5.0	5.0	5.0	---	---	---
11	5.1	---	---	5.0	---	5.1	5.0	5.1	5.0	---	---	---
12	5.1	---	---	5.0	---	5.1	5.0	5.1	5.0	---	---	---
13	5.1	5.0	---	5.0	---	5.1	5.0	5.1	5.0	---	---	---
14	5.1	5.0	---	5.0	5.0	5.1	5.0	5.1	5.0	---	---	---
15	5.1	5.0	---	5.0	5.0	5.1	5.0	5.0	5.0	---	---	---
16	5.1	5.0	---	5.0	5.0	5.0	---	5.0	5.0	---	---	---
17	5.1	5.0	---	5.0	5.0	5.0	---	5.0	---	---	---	---
18	5.1	5.0	---	5.0	5.0	5.0	---	5.0	---	---	---	---
19	5.1	5.0	---	5.0	5.0	5.0	---	5.0	---	---	---	---
20	5.1	5.0	---	5.0	5.0	5.0	---	5.0	---	---	---	---
21	5.1	5.0	---	5.0	5.0	5.0	---	5.0	---	---	---	---
22	5.1	5.0	---	5.0	5.0	5.0	---	5.0	---	---	---	---
23	5.1	5.0	5.1	5.0	5.0	5.0	---	5.0	---	---	---	---
24	5.1	5.0	5.1	5.0	5.0	5.0	5.0	5.0	---	---	---	---
25	5.1	5.0	5.1	5.0	5.0	5.0	5.0	5.0	---	---	---	---
26	5.1	5.0	5.1	5.0	5.0	5.0	5.0	5.0	---	---	---	---
27	5.1	5.0	5.1	5.0	5.0	5.0	5.0	5.0	---	---	---	---
28	5.1	5.0	5.1	5.0	5.0	5.0	5.0	5.0	---	---	---	---
29	5.1	5.0	5.0	5.0	5.0	5.0	5.0	5.0	---	---	---	---
30	5.1	5.1	5.0	5.0	---	5.0	5.0	5.0	---	---	---	---
31	5.1	---	5.0	5.0	---	5.0	---	5.0	---	---	---	---
MEAN	5.1	---	---	5.0	---	5.0	---	5.0	---	---	---	---
MAX	5.1	---	---	5.0	---	5.1	---	5.1	---	---	---	---
MIN	5.0	---	---	5.0	---	5.0	---	5.0	---	---	---	---

354356078403502 WK-278 DENR Lake Wheeler Research Station MW-II (Transition zone well)—Continued

TEMPERATURE, WATER, DEGREES CELSIUS  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.0	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.0	---	---	---
2	16.0	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.0	---	---	---
3	16.0	16.1	16.1	16.1	16.1	16.1	16.0	16.1	16.0	---	---	---
4	16.0	16.1	16.1	16.1	16.1	16.1	16.0	16.1	16.0	---	---	---
5	16.0	16.1	16.1	16.1	16.1	16.1	16.0	16.1	16.0	---	---	---
6	16.0	16.1	16.1	16.1	16.1	16.1	16.0	16.1	16.0	---	---	---
7	16.0	16.1	16.1	16.1	16.1	16.1	16.0	16.1	16.0	---	---	---
8	16.0	16.1	16.1	16.1	16.1	16.1	16.0	16.1	16.0	---	---	---
9	16.1	16.1	16.1	16.1	16.1	16.1	16.0	16.1	16.0	---	---	---
10	16.1	---	16.1	16.1	---	16.1	16.0	16.1	16.0	---	---	---
11	16.1	---	---	16.1	---	16.1	16.0	16.1	16.0	---	---	---
12	16.1	---	---	16.1	---	16.1	16.1	16.1	16.0	---	---	---
13	16.1	16.1	---	16.1	---	16.1	16.0	16.1	16.0	---	---	---
14	16.1	16.1	---	16.1	16.1	16.1	16.0	16.0	16.0	---	---	---
15	16.1	16.1	---	16.1	16.1	16.1	16.0	16.0	16.0	---	---	---
16	16.1	16.1	---	16.1	16.1	16.1	---	16.0	16.0	---	---	---
17	16.1	16.1	---	16.1	16.1	16.1	---	16.0	---	---	---	---
18	16.1	16.1	---	16.1	16.1	16.1	---	16.0	---	---	---	---
19	16.1	16.1	---	16.1	16.1	16.1	---	16.0	---	---	---	---
20	16.1	16.1	---	16.1	16.1	16.1	---	16.0	---	---	---	---
21	16.1	16.1	---	16.1	16.1	16.1	---	16.0	---	---	---	---
22	16.1	16.1	---	16.1	16.1	16.1	---	16.0	---	---	---	---
23	16.1	16.1	16.1	16.1	16.1	16.1	---	16.0	---	---	---	---
24	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.0	---	---	---	---
25	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.0	---	---	---	---
26	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.0	---	---	---	---
27	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.0	---	---	---	---
28	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.0	---	---	---	---
29	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.0	---	---	---	---
30	16.1	16.1	16.1	16.1	---	16.1	16.1	16.0	---	---	---	---
31	16.1	---	16.1	16.1	---	16.1	---	16.0	---	---	---	---
MEAN	16.1	---	---	16.1	---	16.1	---	16.0	---	---	---	---
MAX	16.1	---	---	16.1	---	16.1	---	16.1	---	---	---	---
MIN	16.0	---	---	16.1	---	16.1	---	16.0	---	---	---	---

354356078403502 WK-278 DENR Lake Wheeler Research Station MW-II (Transition zone well)—Continued

DISSOLVED OXYGEN, WATER, UNFILTERED, MILLIGRAMS PER LITER  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	1.9	2.0	2.5	2.6	2.8	2.4	2.3	2.0	---	---	---
2	1.8	1.9	2.0	2.5	2.6	2.8	2.4	2.3	2.0	---	---	---
3	1.8	1.9	2.0	2.5	2.6	2.7	2.4	2.3	1.9	---	---	---
4	1.8	1.9	2.0	2.5	2.7	2.8	2.4	2.3	1.9	---	---	---
5	1.8	1.9	2.0	2.5	2.7	2.7	2.4	2.2	1.8	---	---	---
6	1.9	1.9	2.0	2.5	2.8	2.7	2.4	2.2	---	---	---	---
7	1.9	1.9	2.0	2.6	2.9	2.7	2.4	2.2	---	---	---	---
8	1.9	1.9	2.0	2.6	2.9	2.6	2.4	2.2	---	---	---	---
9	1.8	1.9	2.0	2.6	2.9	2.6	2.4	2.2	---	---	---	---
10	1.8	---	2.0	2.6	---	2.6	2.4	2.2	---	---	---	---
11	1.9	---	---	2.6	---	2.6	2.4	2.2	---	---	---	---
12	2.0	---	---	2.6	---	2.6	2.4	2.2	---	---	---	---
13	2.0	1.9	---	2.6	---	2.6	2.4	2.2	---	---	---	---
14	2.0	1.9	---	2.6	3.0	2.6	2.4	2.2	---	---	---	---
15	2.0	1.9	---	2.6	3.0	2.6	2.3	2.2	---	---	---	---
16	2.0	1.9	---	2.6	3.0	2.6	---	2.1	---	---	---	---
17	1.9	1.9	---	2.6	3.0	2.6	---	2.1	---	---	---	---
18	1.9	1.9	---	2.6	2.9	2.5	---	2.1	---	---	---	---
19	1.9	1.9	---	2.6	2.9	2.5	---	2.1	---	---	---	---
20	1.9	2.0	---	2.6	2.8	2.5	---	2.1	---	---	---	---
21	1.8	2.0	---	2.6	2.8	2.5	---	2.1	---	---	---	---
22	1.8	1.9	---	2.6	2.8	2.5	---	2.1	---	---	---	---
23	1.8	1.9	2.5	2.6	2.8	2.5	---	2.1	---	---	---	---
24	1.8	1.9	2.5	2.6	2.8	2.5	2.2	2.1	---	---	---	---
25	1.8	1.9	2.5	2.7	2.8	2.5	2.2	2.1	---	---	---	---
26	1.8	1.9	2.5	2.7	2.8	2.5	2.3	2.1	---	---	---	---
27	1.8	1.9	2.5	2.7	2.8	2.5	2.3	2.1	---	---	---	---
28	1.8	1.9	2.5	2.7	2.8	2.4	2.3	2.1	---	---	---	---
29	1.8	1.9	2.5	2.7	2.8	2.4	2.3	2.1	---	---	---	---
30	1.9	2.0	2.5	2.7	---	2.4	2.3	2.1	---	---	---	---
31	1.9	---	2.5	2.7	---	2.4	---	2.0	---	---	---	---
MEAN	1.9	---	---	2.6	---	2.6	---	2.2	---	---	---	---
MAX	2.0	---	---	2.7	---	2.8	---	2.3	---	---	---	---
MIN	1.8	---	---	2.5	---	2.4	---	2.0	---	---	---	---

354356078403502 WK-278 DENR Lake Wheeler Research Station MW-II (Transition zone well)—Continued

DISSOLVED OXYGEN, WATER, UNFILTERED, PERCENT OF SATURATION  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	19	20	25	26	28	24	23	20	---	---	---
2	18	19	20	25	26	28	24	23	20	---	---	---
3	18	19	20	25	26	27	24	23	19	---	---	---
4	18	19	20	25	27	28	24	23	19	---	---	---
5	18	19	20	25	27	27	24	22	18	---	---	---
6	19	19	20	26	28	27	24	22	---	---	---	---
7	19	19	20	26	29	27	24	22	---	---	---	---
8	19	19	20	26	30	26	24	22	---	---	---	---
9	18	19	20	26	30	26	24	22	---	---	---	---
10	18	---	20	26	---	26	24	22	---	---	---	---
11	19	---	---	26	---	26	24	22	---	---	---	---
12	20	---	---	26	---	26	24	22	---	---	---	---
13	20	19	---	26	---	26	24	22	---	---	---	---
14	20	19	---	26	31	26	24	22	---	---	---	---
15	20	19	---	26	31	26	23	22	---	---	---	---
16	20	19	---	26	31	26	---	21	---	---	---	---
17	19	19	---	26	31	26	---	21	---	---	---	---
18	19	19	---	26	30	25	---	21	---	---	---	---
19	19	19	---	26	29	25	---	21	---	---	---	---
20	19	20	---	26	29	25	---	21	---	---	---	---
21	18	20	---	26	28	25	---	21	---	---	---	---
22	18	19	---	26	28	25	---	21	---	---	---	---
23	18	19	25	26	28	25	---	21	---	---	---	---
24	18	19	25	26	28	25	22	21	---	---	---	---
25	18	19	25	27	28	25	22	21	---	---	---	---
26	18	19	25	27	28	25	23	21	---	---	---	---
27	18	19	25	27	28	25	23	21	---	---	---	---
28	18	19	25	27	28	24	23	21	---	---	---	---
29	18	19	25	27	28	24	23	21	---	---	---	---
30	19	20	25	27	---	24	23	21	---	---	---	---
31	19	---	25	27	---	24	---	20	---	---	---	---
MEAN	19	---	---	26	---	26	---	22	---	---	---	---
MAX	20	--	--	27	--	28	--	23	--	---	---	---
MIN	18	--	--	25	--	24	--	20	--	---	---	---

## GROUND-WATER LEVELS

## WAKE COUNTY—Continued

354356078403503. County number, WK-279; DENR Lake Wheeler Research Station MW-1D (Bedrock well).

LOCATION.--Lat 35°43'56", long 78°40'34", Hydrologic Unit 03020201, .6 mi south of Tryon Road, .2 mi east of Lake Wheeler Road on NCSU Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

## WATER-LEVEL RECORDS

AQUIFER.--Raleigh Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 302 ft, diameter 6 in., cased to 47 ft, open hole from 47 ft to 302 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 358.62 ft above NGVD of 1929. Measuring point: Top of 6-inch PVC, 1.84 ft above land-surface datum. Instrument shelter removed June 17, 2004.

REMARKS.--Well is part of Piedmont/Mountains ground-water study. Inflatable packer installed on July 16, 2001 and water-level records stored as 354356078403504 (WK-279A) and 354356078403505 (WK279B). Packer set at 75 ft below land surface. Packer removed Nov. 13, 2003.

PERIOD OF RECORD.--June 2001 to July 2002, November 2003 to current year. Continuous record December 2001 to July 2002, November 2003 to June 2004. Periodic measurements made by DENR and U.S. Geological Survey, June 2001 to August 2004.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.28 ft below land-surface datum, Aug. 31, 2004; lowest water level recorded 5.94 ft below land-surface datum, July 10, 2002.

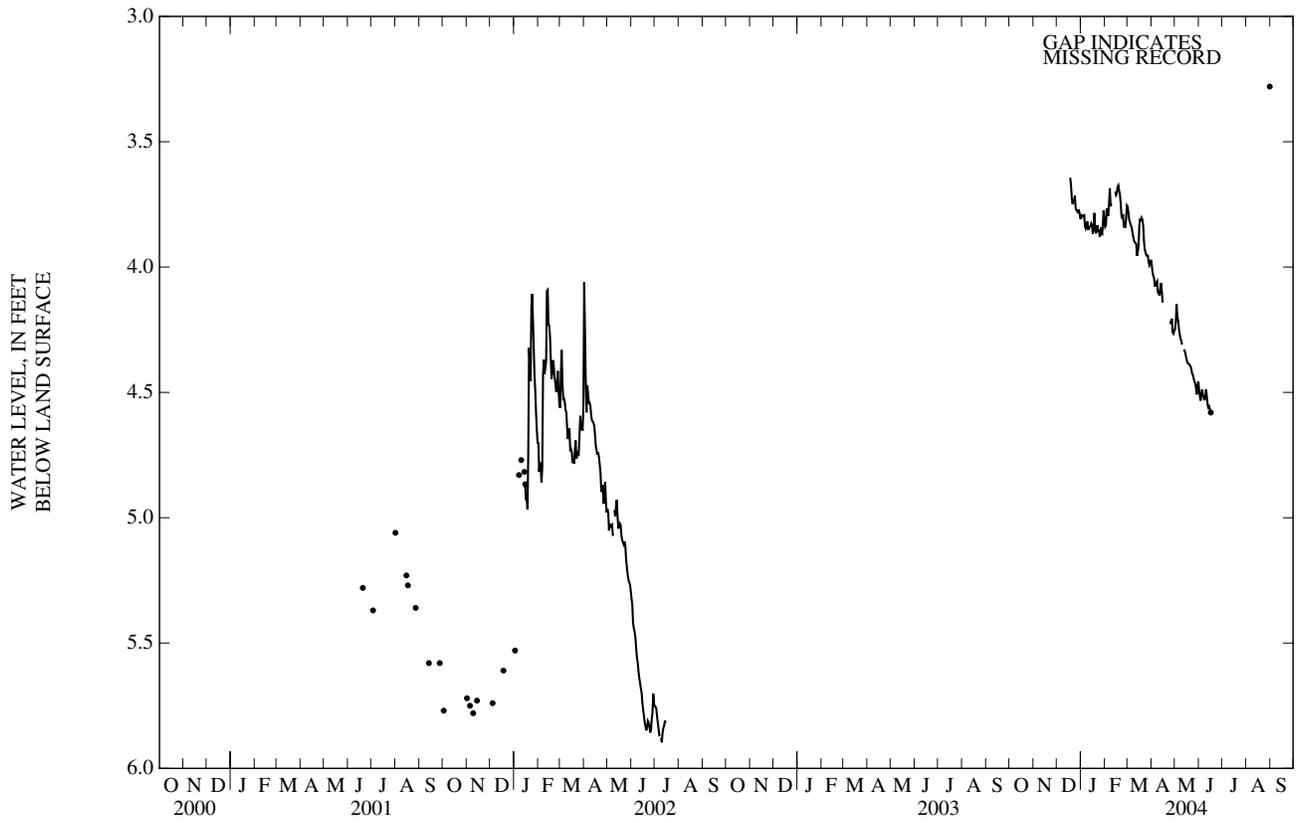
DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	3.81	3.84	3.76	3.99	4.25	4.49	---	---	---
2	---	---	---	3.79	3.83	3.78	4.02	4.22	4.51	---	---	---
3	---	---	---	3.80	3.77	3.81	4.04	4.15	4.53	---	---	---
4	---	---	---	3.80	3.79	3.82	4.04	4.20	4.50	---	---	---
5	---	---	---	3.79	3.80	3.83	4.07	4.21	4.49	---	---	---
6	---	---	---	3.84	3.75	3.84	4.07	4.25	4.51	---	---	---
7	---	---	---	3.85	3.69	3.86	4.06	4.27	4.52	---	---	---
8	---	---	---	3.83	3.76	3.88	4.06	4.29	4.53	---	---	---
9	---	---	---	3.82	3.75	3.89	4.10	4.29	4.52	---	---	---
10	---	---	---	3.85	---	3.90	4.11	4.31	4.49	---	---	---
11	---	---	---	3.85	---	3.90	4.11	---	4.52	---	---	---
12	---	---	---	3.84	---	3.91	4.09	4.33	4.55	---	---	---
13	---	---	---	3.84	---	3.96	4.06	4.33	4.56	---	---	---
14	---	---	---	3.83	3.70	3.94	4.10	4.34	4.56	---	---	---
15	---	---	---	3.83	3.71	3.92	4.14	4.36	4.57	---	---	---
16	---	---	---	3.87	3.71	3.84	---	4.37	4.58	---	---	---
17	---	---	---	3.85	3.68	3.81	---	4.38	---	---	---	---
18	---	---	3.64	3.78	3.67	3.82	---	4.39	---	---	---	---
19	---	---	3.67	3.84	3.70	3.80	---	4.39	---	---	---	---
20	---	---	3.72	3.87	3.71	3.81	---	4.39	---	---	---	---
21	---	---	3.75	3.86	3.74	3.83	---	4.39	---	---	---	---
22	---	---	3.74	3.83	3.79	3.90	---	4.41	---	---	---	---
23	---	---	3.73	3.86	3.81	3.93	---	4.42	---	---	---	---
24	---	---	3.72	3.85	3.79	3.94	4.22	4.43	---	---	---	---
25	---	---	3.76	3.88	3.84	3.95	4.22	4.44	---	---	---	---
26	---	---	3.77	3.86	3.84	3.96	4.21	4.46	---	---	---	---
27	---	---	3.77	3.84	3.84	3.95	4.21	4.46	---	---	---	---
28	---	---	3.79	3.87	3.81	3.98	4.26	4.48	---	---	---	---
29	---	---	3.77	3.83	3.75	3.99	4.27	4.51	---	---	---	---
30	---	---	3.78	3.77	---	3.99	4.26	4.47	---	---	---	---
31	---	---	3.81	3.82	---	3.97	---	4.46	---	---	---	---

WTR YR 2004 MEAN 4.02 HIGH 3.64 LOW 4.58

WAKE COUNTY—Continued

354356078403503. County number, WK-279; DENR Lake Wheeler Research Station MW-1D (Bedrock well).



354356078403503 WK-279 DENR Lake Wheeler Research Station MW-1D (Bedrock Well)—Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 2002, December 2003 to June 2004 (discontinued).

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: December 2001 to July 2002, December 2003 to June 2004.

pH: December 2001 to July 2002, December 2003 to June 2004.

WATER TEMPERATURE: December 2001 to July 2002, December 2003 to June 2004.

DISSOLVED OXYGEN: December 2001 to July 2002, December 2003 to June 2004.

DISSOLVED OXYGEN, PERCENT SATURATION: December 2001 to July 2002, December 2003 to June 2004.

INSTRUMENTATION.-- Water-quality monitor with satellite telemetry from December 2001 to July 2002, December 2003 to June 2004.

REMARKS.--Station operated in cooperation with North Carolina Department of Environment and Natural Resources, Water Resources Division as part of the Piedmont/Mountains ground-water study. Dissolved oxygen, percent saturation, is computed using a barometric pressure of 760 mm Hg.

EXTREMES FOR PERIOD OF DAILY RECORD.--

CONSTITUENT	MAXIMUM RECORDED	MINIMUM RECORDED
SPECIFIC CONDUCTANCE, microsiemens	758, May 3, 2004	620, April 1, 2002
pH, standard units	6.3, December 22-25, 27-31, 2003, January 1, 2004	5.5, on many days during the period
WATER TEMPERATURE, °C	16.1, on many days during the period	16.1, on many days during the period
DISSOLVED OXYGEN, mg/L	1.1, April 1, 2002	0.2, on many days during the period
DISSOLVED OXYGEN, PERCENT SATURATION,%	11, April 1, 2002	2, on many days during the period

EXTREMES FOR CURRENT PERIOD.--

CONSTITUENT	MAXIMUM RECORDED	MINIMUM RECORDED
SPECIFIC CONDUCTANCE, microsiemens	758, May 3	671, February 28
pH, standard units	6.3, December 22-25, 27-31, January 1	5.7, May 29-31, June 15-17
WATER TEMPERATURE, °C	16.1, on many days during the period	16.1, on many days during the period
DISSOLVED OXYGEN, mg/L	0.8, February 7, 28	0.2, January 13-15, 18-20, April 8, 9, 11, 12, 24
DISSOLVED OXYGEN, PERCENT SATURATION,%	8, February 7, 28	2, January 13-15, April 8, 9, 11, 12, 24

354356078403503 WK-279 DENR Lake Wheeler Research Station MW-1D (Bedrock Well)—Continued

SPECIFIC CONDUCTANCE, WATER, UNFILTERED, MICROSIEMENS PER CENTIMETER AT 25 DEGREES CELSIUS  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	718	699	706	731	749	751	---	---	---
2	---	---	---	720	703	708	730	749	752	---	---	---
3	---	---	---	720	702	709	727	752	751	---	---	---
4	---	---	---	723	696	711	724	751	751	---	---	---
5	---	---	---	725	699	711	724	748	750	---	---	---
6	---	---	---	716	710	713	732	744	750	---	---	---
7	---	---	---	716	687	713	737	743	750	---	---	---
8	---	---	---	717	691	715	743	742	748	---	---	---
9	---	---	---	720	700	716	742	741	749	---	---	---
10	---	---	---	711	---	715	741	742	749	---	---	---
11	---	---	---	709	---	718	739	742	748	---	---	---
12	---	---	---	717	---	722	737	742	747	---	---	---
13	---	---	---	725	---	714	736	739	746	---	---	---
14	---	---	---	728	696	716	735	739	747	---	---	---
15	---	---	---	727	700	719	728	739	745	---	---	---
16	---	---	---	712	684	720	---	741	744	---	---	---
17	---	---	---	706	695	716	---	742	---	---	---	---
18	---	---	---	716	703	722	---	744	---	---	---	---
19	---	---	---	719	707	719	---	746	---	---	---	---
20	---	---	---	720	711	724	---	744	---	---	---	---
21	---	---	---	714	715	726	---	746	---	---	---	---
22	---	---	---	716	707	721	---	747	---	---	---	---
23	---	---	724	710	703	722	---	747	---	---	---	---
24	---	---	730	711	708	721	748	748	---	---	---	---
25	---	---	728	703	704	721	749	748	---	---	---	---
26	---	---	725	702	705	722	750	749	---	---	---	---
27	---	---	722	708	706	725	748	750	---	---	---	---
28	---	---	721	700	692	724	747	751	---	---	---	---
29	---	---	721	693	694	723	745	752	---	---	---	---
30	---	---	726	698	---	728	748	753	---	---	---	---
31	---	---	717	699	---	731	---	753	---	---	---	---
MEAN	---	---	---	714	---	718	---	746	---	---	---	---
MAX	---	---	--	728	--	731	--	753	--	---	---	---
MIN	---	---	--	693	--	706	--	739	--	---	---	---

354356078403503 WK-279 DENR Lake Wheeler Research Station MW-1D (Bedrock Well)—Continued

PH, WATER, UNFILTERED, FIELD, STANDARD UNITS  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	6.2	6.0	5.9	5.8	5.8	5.8	---	---	---
2	---	---	---	6.2	6.0	5.9	5.8	5.8	5.8	---	---	---
3	---	---	---	6.2	6.0	5.9	5.8	5.8	5.8	---	---	---
4	---	---	---	6.2	5.9	5.9	5.8	5.8	5.8	---	---	---
5	---	---	---	6.2	5.9	5.9	5.8	5.8	5.8	---	---	---
6	---	---	---	6.2	5.9	5.9	5.8	5.8	5.8	---	---	---
7	---	---	---	6.2	5.9	5.9	5.8	5.8	5.8	---	---	---
8	---	---	---	6.1	5.9	5.9	5.8	5.8	5.8	---	---	---
9	---	---	---	6.1	5.9	5.9	5.8	5.8	5.8	---	---	---
10	---	---	---	6.2	---	5.9	5.9	5.8	5.8	---	---	---
11	---	---	---	6.2	---	5.9	5.9	5.8	5.8	---	---	---
12	---	---	---	6.2	---	5.8	5.9	5.8	5.8	---	---	---
13	---	---	---	6.2	---	5.8	5.9	5.8	5.8	---	---	---
14	---	---	---	6.2	5.9	5.8	5.9	5.8	5.8	---	---	---
15	---	---	---	6.1	5.9	5.8	5.9	5.8	5.8	---	---	---
16	---	---	---	6.1	5.9	5.8	---	5.8	5.7	---	---	---
17	---	---	---	6.1	5.9	5.8	---	5.8	---	---	---	---
18	---	---	---	6.1	5.9	5.8	---	5.8	---	---	---	---
19	---	---	---	6.1	5.9	5.8	---	5.8	---	---	---	---
20	---	---	---	6.1	5.9	5.8	---	5.8	---	---	---	---
21	---	---	---	6.0	5.9	5.9	---	5.8	---	---	---	---
22	---	---	---	6.0	5.9	5.9	---	5.8	---	---	---	---
23	---	---	6.3	6.0	5.8	5.9	---	5.8	---	---	---	---
24	---	---	6.3	6.0	5.8	5.9	5.9	5.8	---	---	---	---
25	---	---	6.3	6.0	5.8	5.9	5.8	5.8	---	---	---	---
26	---	---	6.2	6.0	5.8	5.9	5.8	5.8	---	---	---	---
27	---	---	6.3	6.1	5.8	5.9	5.8	5.8	---	---	---	---
28	---	---	6.3	6.0	5.8	5.9	5.8	5.8	---	---	---	---
29	---	---	6.3	6.0	5.8	5.9	5.8	5.8	---	---	---	---
30	---	---	6.3	6.0	---	5.9	5.8	5.7	---	---	---	---
31	---	---	6.3	6.0	---	5.8	---	5.8	---	---	---	---
MEAN	---	---	---	6.1	---	5.9	---	5.8	---	---	---	---
MAX	---	---	---	6.2	---	5.9	---	5.8	---	---	---	---
MIN	---	---	---	6.0	---	5.8	---	5.7	---	---	---	---

354356078403503 WK-279 DENR Lake Wheeler Research Station MW-1D (Bedrock Well)—Continued

TEMPERATURE, WATER, DEGREES CELSIUS  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---
2	---	---	---	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---
3	---	---	---	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---
4	---	---	---	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---
5	---	---	---	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---
6	---	---	---	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---
7	---	---	---	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---
8	---	---	---	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---
9	---	---	---	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---
10	---	---	---	16.1	---	16.1	16.1	16.1	16.1	---	---	---
11	---	---	---	16.1	---	16.1	16.1	16.1	16.1	---	---	---
12	---	---	---	16.1	---	16.1	16.1	16.1	16.1	---	---	---
13	---	---	---	16.1	---	16.1	16.1	16.1	16.1	---	---	---
14	---	---	---	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---
15	---	---	---	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---
16	---	---	---	16.1	16.1	16.1	---	16.1	16.1	---	---	---
17	---	---	---	16.1	16.1	16.1	---	16.1	---	---	---	---
18	---	---	---	16.1	16.1	16.1	---	16.1	---	---	---	---
19	---	---	---	16.1	16.1	16.1	---	16.1	---	---	---	---
20	---	---	---	16.1	16.1	16.1	---	16.1	---	---	---	---
21	---	---	---	16.1	16.1	16.1	---	16.1	---	---	---	---
22	---	---	---	16.1	16.1	16.1	---	16.1	---	---	---	---
23	---	---	16.1	16.1	16.1	16.1	---	16.1	---	---	---	---
24	---	---	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---
25	---	---	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---
26	---	---	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---
27	---	---	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---
28	---	---	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---
29	---	---	16.1	16.1	16.1	16.1	16.1	16.1	---	---	---	---
30	---	---	16.1	16.1	---	16.1	16.1	16.1	---	---	---	---
31	---	---	16.1	16.1	---	16.1	---	16.1	---	---	---	---
MEAN	---	---	---	16.1	---	16.1	---	16.1	---	---	---	---
MAX	---	---	---	16.1	---	16.1	---	16.1	---	---	---	---
MIN	---	---	---	16.1	---	16.1	---	16.1	---	---	---	---

354356078403503 WK-279 DENR Lake Wheeler Research Station MW-1D (Bedrock Well)—Continued

DISSOLVED OXYGEN, WATER, UNFILTERED, MILLIGRAMS PER LITER  
 WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	0.4	0.6	0.5	0.3	0.4	0.3	---	---	---
2	---	---	---	0.4	0.5	0.5	0.3	0.4	0.4	---	---	---
3	---	---	---	0.4	0.6	0.5	0.4	0.3	0.4	---	---	---
4	---	---	---	0.4	0.6	0.4	0.4	0.4	0.4	---	---	---
5	---	---	---	0.3	0.6	0.4	0.4	0.4	0.4	---	---	---
6	---	---	---	0.4	0.5	0.4	0.4	0.4	0.4	---	---	---
7	---	---	---	0.4	0.7	0.4	0.3	0.3	0.4	---	---	---
8	---	---	---	0.4	0.6	0.4	0.3	0.4	0.4	---	---	---
9	---	---	---	0.4	0.6	0.4	0.3	0.4	0.4	---	---	---
10	---	---	---	0.4	---	0.4	0.3	0.4	0.4	---	---	---
11	---	---	---	0.5	---	0.4	0.3	0.4	0.4	---	---	---
12	---	---	---	0.4	---	0.4	0.3	0.4	0.4	---	---	---
13	---	---	---	0.3	---	0.4	0.3	0.4	0.4	---	---	---
14	---	---	---	0.3	0.6	0.4	0.3	0.4	0.4	---	---	---
15	---	---	---	0.3	0.5	0.4	0.3	0.5	0.4	---	---	---
16	---	---	---	0.3	0.7	0.4	---	0.4	0.4	---	---	---
17	---	---	---	0.4	0.6	0.4	---	0.4	---	---	---	---
18	---	---	---	0.3	0.5	0.4	---	0.4	---	---	---	---
19	---	---	---	0.3	0.4	0.4	---	0.4	---	---	---	---
20	---	---	---	0.3	0.4	0.4	---	0.4	---	---	---	---
21	---	---	---	0.4	0.4	0.3	---	0.4	---	---	---	---
22	---	---	---	0.3	0.5	0.3	---	0.4	---	---	---	---
23	---	---	0.5	0.4	0.5	0.3	---	0.4	---	---	---	---
24	---	---	0.4	0.4	0.4	0.3	0.3	0.4	---	---	---	---
25	---	---	0.4	0.5	0.5	0.4	0.3	0.4	---	---	---	---
26	---	---	0.4	0.5	0.5	0.3	0.4	0.3	---	---	---	---
27	---	---	0.4	0.4	0.5	0.3	0.4	0.3	---	---	---	---
28	---	---	0.4	0.5	0.6	0.4	0.4	0.3	---	---	---	---
29	---	---	0.4	0.6	0.6	0.4	0.4	0.3	---	---	---	---
30	---	---	0.4	0.6	---	0.3	0.4	0.3	---	---	---	---
31	---	---	0.4	0.5	---	0.3	---	0.3	---	---	---	---
MEAN	---	---	---	0.4	---	0.4	---	0.4	---	---	---	---
MAX	---	---	---	0.6	---	0.5	---	0.5	---	---	---	---
MIN	---	---	---	0.3	---	0.3	---	0.3	---	---	---	---

354356078403503 WK-279 DENR Lake Wheeler Research Station MW-1D (Bedrock Well)—Continued

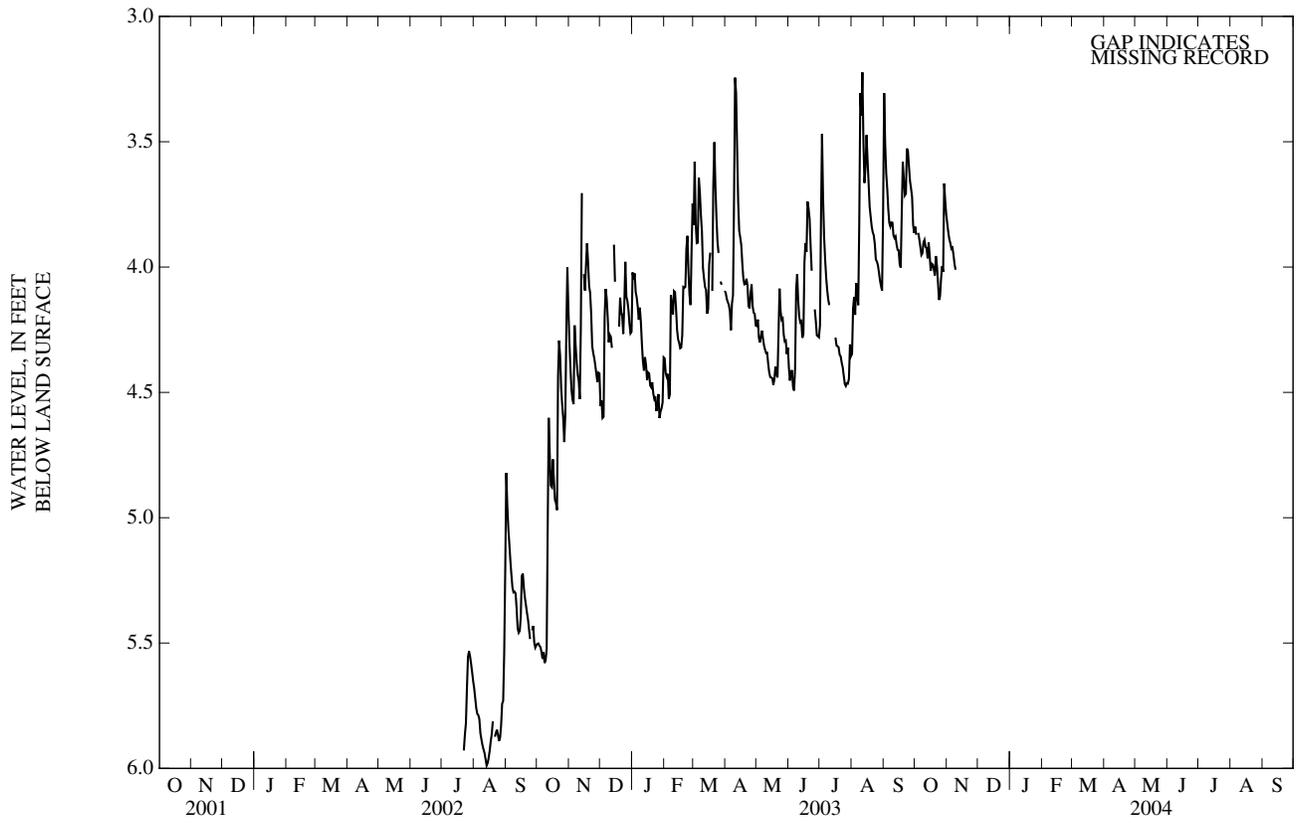
DISSOLVED OXYGEN, WATER, UNFILTERED, PERCENT OF SATURATION  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	4	6	5	3	4	3	---	---	---
2	---	---	---	4	5	5	3	4	4	---	---	---
3	---	---	---	4	6	5	4	3	4	---	---	---
4	---	---	---	4	6	4	4	4	4	---	---	---
5	---	---	---	3	6	4	4	4	4	---	---	---
6	---	---	---	4	5	4	4	4	4	---	---	---
7	---	---	---	4	7	4	3	4	4	---	---	---
8	---	---	---	4	6	4	3	4	4	---	---	---
9	---	---	---	4	6	4	3	4	4	---	---	---
10	---	---	---	4	---	4	3	4	4	---	---	---
11	---	---	---	5	---	4	3	4	4	---	---	---
12	---	---	---	4	---	4	3	4	4	---	---	---
13	---	---	---	3	---	4	3	4	4	---	---	---
14	---	---	---	3	6	4	3	4	4	---	---	---
15	---	---	---	3	5	4	3	5	4	---	---	---
16	---	---	---	3	7	4	---	4	4	---	---	---
17	---	---	---	4	6	4	---	4	---	---	---	---
18	---	---	---	3	5	4	---	4	---	---	---	---
19	---	---	---	3	4	4	---	4	---	---	---	---
20	---	---	---	3	4	4	---	4	---	---	---	---
21	---	---	---	4	4	3	---	4	---	---	---	---
22	---	---	---	3	5	3	---	4	---	---	---	---
23	---	---	5	4	5	3	---	4	---	---	---	---
24	---	---	4	4	4	3	3	4	---	---	---	---
25	---	---	4	5	5	4	3	4	---	---	---	---
26	---	---	4	5	5	3	4	3	---	---	---	---
27	---	---	4	4	5	3	4	3	---	---	---	---
28	---	---	4	5	6	4	4	3	---	---	---	---
29	---	---	4	6	6	4	4	3	---	---	---	---
30	---	---	4	6	---	3	4	3	---	---	---	---
31	---	---	4	5	---	3	---	3	---	---	---	---
MEAN	---	---	---	4	---	4	---	4	---	---	---	---
MAX	---	---	---	6	---	5	---	5	---	---	---	---
MIN	---	---	---	3	---	3	---	3	---	---	---	---



WAKE COUNTY—Continued

354356078403504. County number, WK-279A; DENR Lake Wheeler Research Station MW-1D Upper Zone (Bedrock well).



GROUND-WATER LEVELS  
WAKE COUNTY—Continued

354356078403505. County number, WK-279B; DENR Lake Wheeler Research Station MW-1D Lower Zone (Bedrock well).

LOCATION.--Lat 35°43'56", long 78°40'34", Hydrologic Unit 03020201, .6 mi south of Tryon Road, .2 mi east of Lake Wheeler Road on NCSU Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Raleigh Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 302 ft, diameter 6 in., cased to 75 ft, open hole from 75 to 302 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Measured periodically with electric tape (by DENR and USGS).

DATUM.--Land-surface datum is 339.15 ft above NGVD of 1929. Measuring point: Top of 2-inch PVC casing, 3.10 ft above land-surface datum.

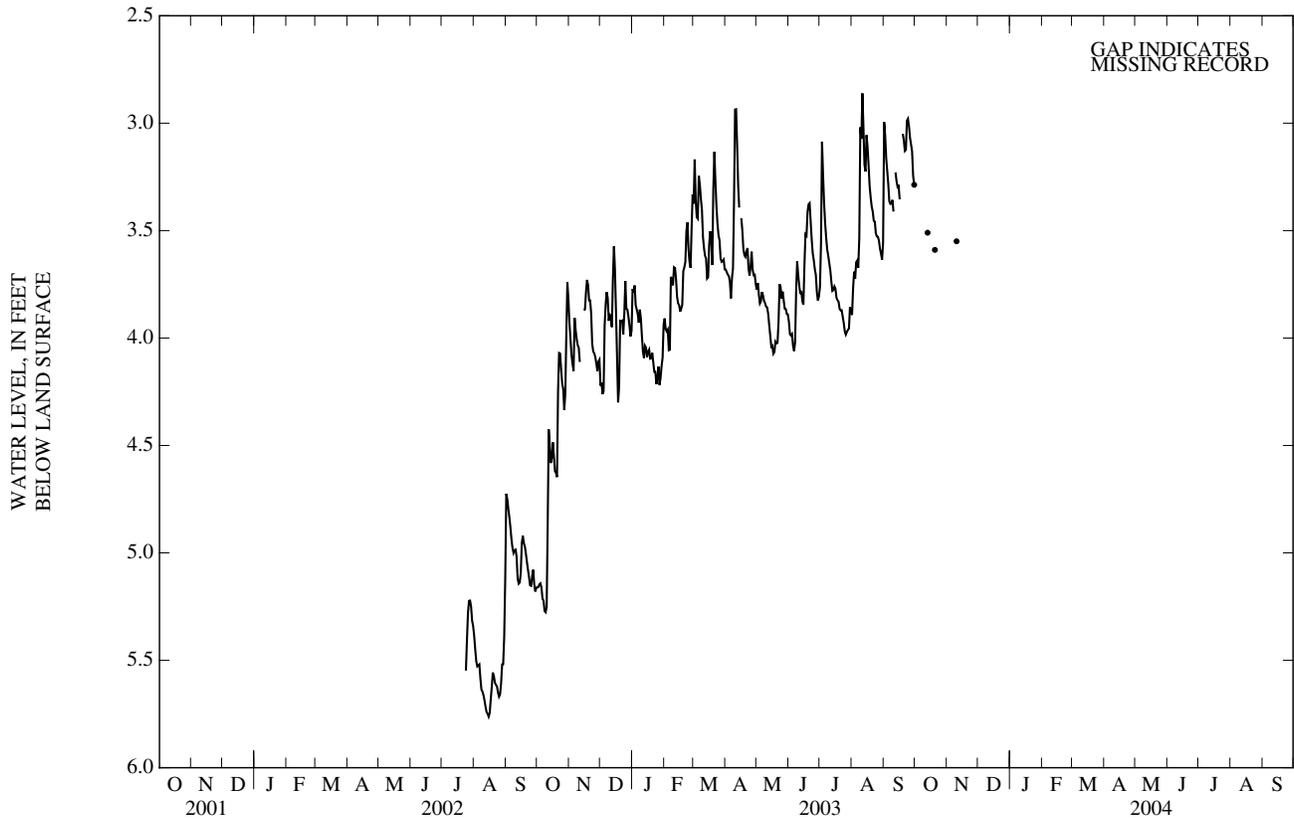
REMARKS.--Well is part of Piedmont/Mountains ground-water study. Inflatable packer installed on July 16, 2001. Packer set at 75 ft below land surface. Packer removed November 12, 2003. Well is lower zone of MW-1D (WK-279, station number 354356078403503).

PERIOD OF RECORD.--July 2002 to November 2003. Continuous record July 2002 to September 2003. Periodic water level measurements made by DENR and USGS, July 2002 to November 2003 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 2.80 ft below land-surface datum, Apr. 10, 2003; lowest water level recorded 5.79 ft below land-surface datum, Aug. 15, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	3.51	OCT 20	3.59	NOV 10	3.55



WAKE COUNTY—Continued

354359078403101. County number, WK-280; DENR Lake Wheeler Research Station MW-2S (Regolith well).

LOCATION.--Lat 35°44'00", long 78°40'31", Hydrologic Unit 03020201, .6 mi south of Tryon Road, .2 mi east of Lake Wheeler Road on NCSU Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Raleigh Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 40 ft, diameter 4 in., cased to 20 ft, screened interval from 20 to 40 ft, sand filter packed from 17 to 40 ft.

INSTRUMENTATION.--Measured periodically with electric tape (by DENR and USGS).

DATUM.--Land-surface datum is 362 ft above NGVD of 1929. Measuring point: Top of 4-inch casing, 1.81 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

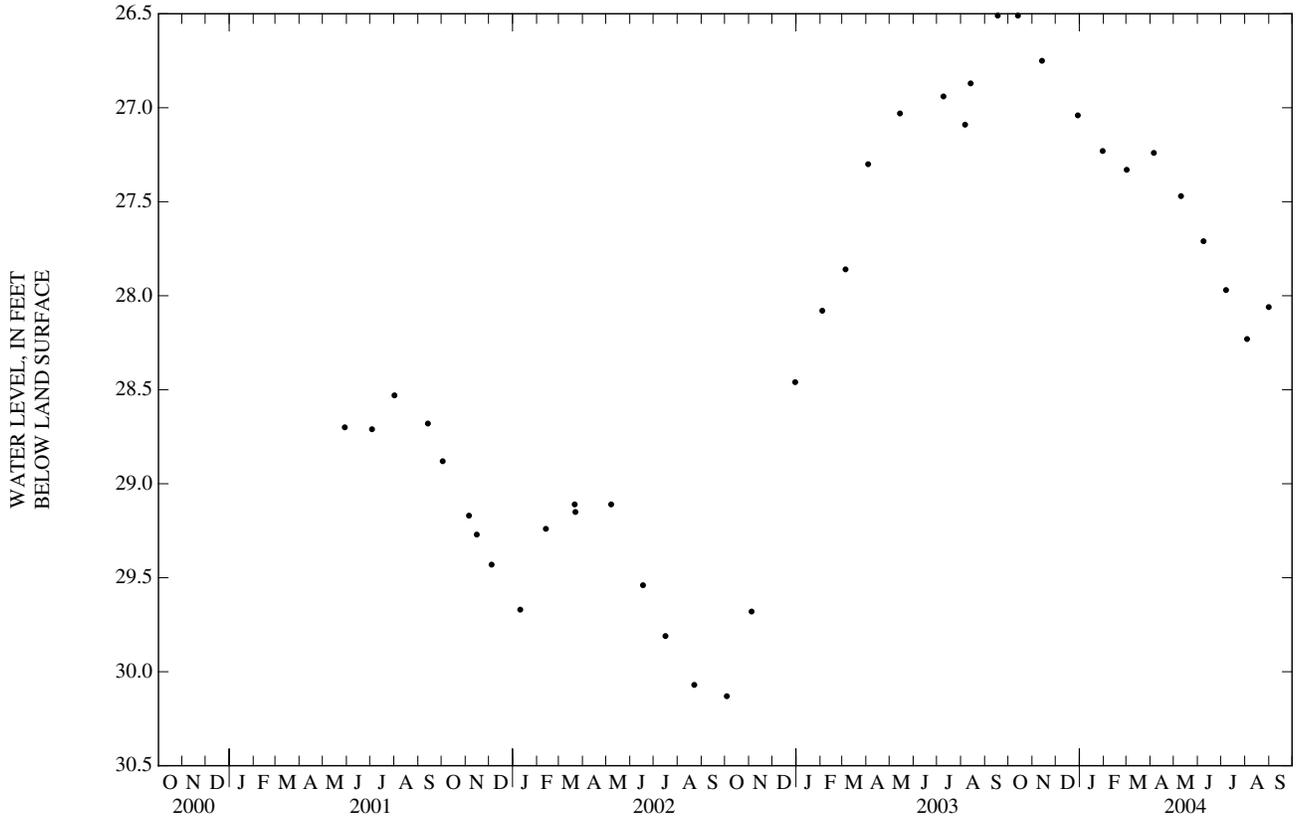
PERIOD OF RECORD.--May 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.51 ft below land-surface datum, Sept. 17, 2003; lowest water level measured 30.13 ft below land-surface datum, Oct. 3, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 13	26.51*	DEC 29	27.04*	MAR 01	27.33*	MAY 10	27.47*	JUL 07	27.97*	AUG 31	28.06*
NOV 13	26.75*	JAN 30	27.23*	APR 05	27.24*	JUN 08	27.71*	AUG 03	28.23*		

\*DENR measurement.



GROUND-WATER LEVELS

WAKE COUNTY—Continued

354359078403102. County number, WK-281; DENR Lake Wheeler Research Station MW-2I (Intermediate well).

LOCATION.--Lat 35°44'00", long 78°40'32", Hydrologic Unit 03020201, .6 mi south of Tryon Road, .2 mi east of Lake Wheeler Road on NCSU Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Transition zone (Raleigh Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 50 ft, diameter 4 in., cased to 40 ft, screened interval from 40 to 50 ft, sand filter packed from 38 to 50 ft.

INSTRUMENTATION.--Measured periodically with electric tape (by DENR and USGS).

DATUM.--Land-surface datum is 361.19 ft above NGVD of 1929. Measuring point: Top of 4-inch casing, 1.82 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

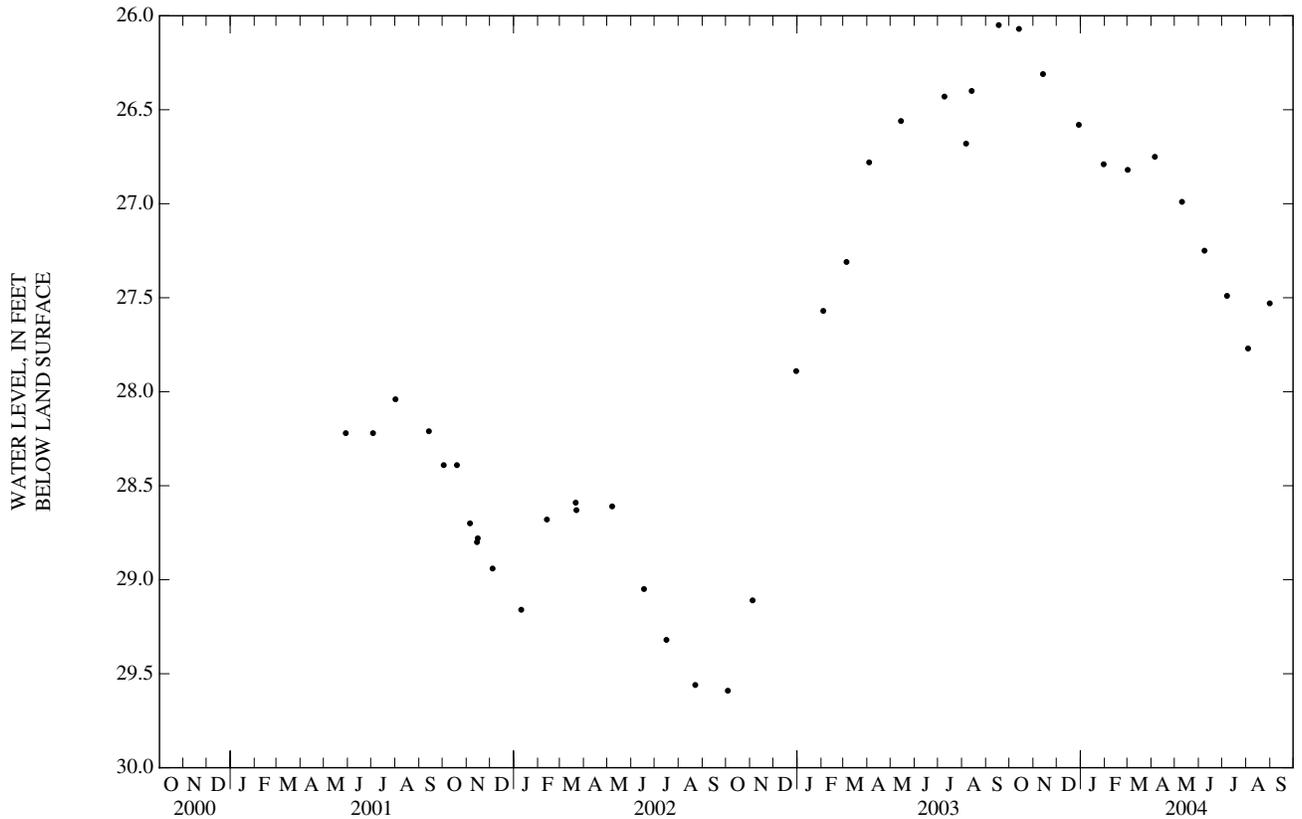
PERIOD OF RECORD.--May 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.05 ft below land-surface datum, Sept. 17, 2003; lowest water level measured 29.59 ft below land-surface datum, Oct. 3, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 13	26.07*	DEC 29	26.58*	MAR 01	26.82*	MAY 10	26.99*	JUL 07	27.49*	AUG 31	27.53*
NOV 13	26.31*	JAN 30	26.79*	APR 05	26.75*	JUN 08	27.25*	AUG 03	27.77*		

\*DENR measurement.



WAKE COUNTY—Continued

354359078403103. County number, WK-282; DENR Lake Wheeler Research Station MW-2T (Transition zone well).

LOCATION.--Lat 35°43'59", long 78°40'32", Hydrologic Unit 03020201, .6 mi south of Tryon Road, .2 mi east of Lake Wheeler Road on NCSU Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Transition zone (Raleigh Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 80 ft, diameter 6 in., cased to 50 ft, open hole from 50 to 80 ft.

INSTRUMENTATION.--Measured periodically with electric tape (by DENR and USGS).

DATUM.--Land-surface datum is 360.44 ft above NGVD of 1929. Measuring point: Top of 4-inch casing, 1.88 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

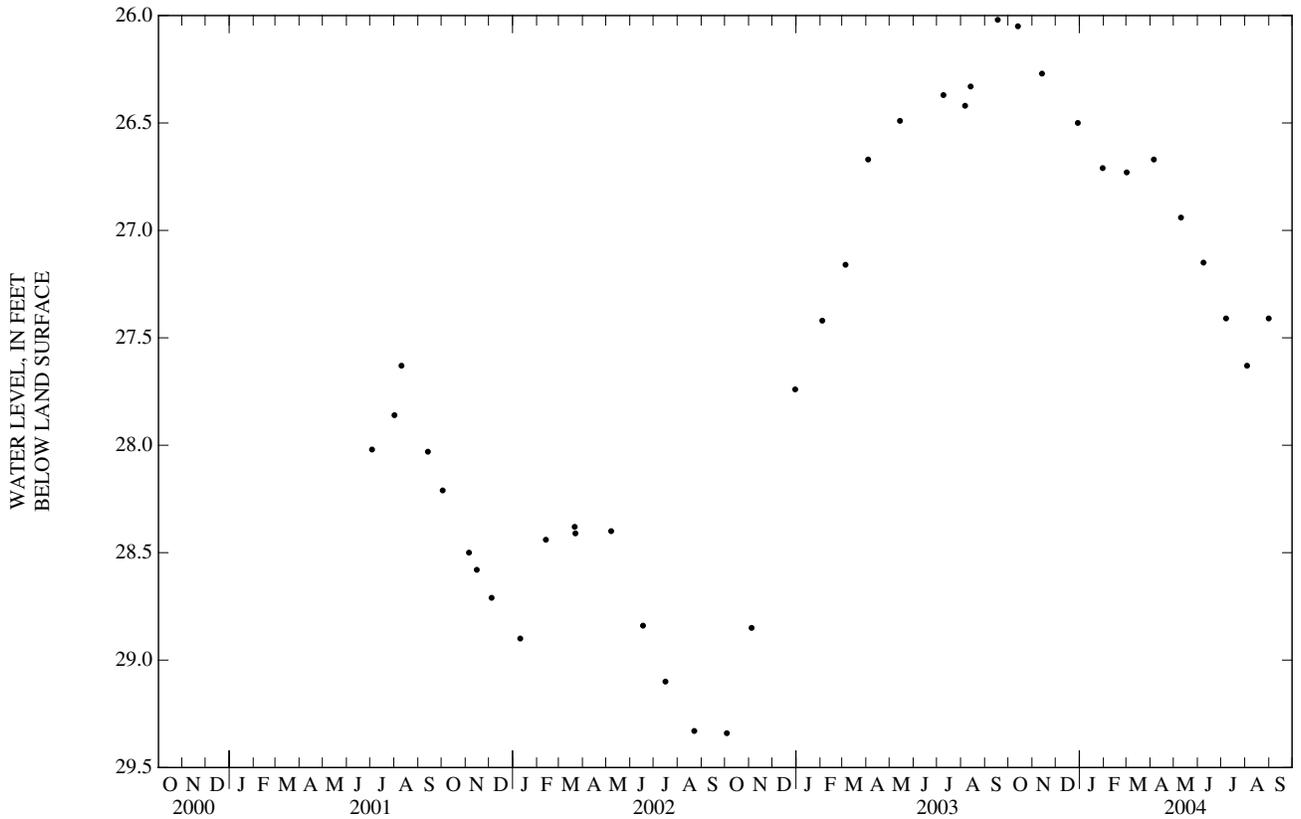
PERIOD OF RECORD.--July 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.02 ft below land-surface datum, Sept. 17, 2003; lowest water level measured 29.34 ft below land-surface datum, Oct. 3, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 13	26.05*	DEC 29	26.50*	MAR 01	26.73*	MAY 10	26.94*	JUL 07	27.41*	AUG 31	27.41*
NOV 13	26.27*	JAN 30	26.71*	APR 05	26.67*	JUN 08	27.15*	AUG 03	27.63*		

\*DENR measurement.,



GROUND-WATER LEVELS  
WAKE COUNTY—Continued

354359078403104. County number, WK-283; DENR Lake Wheeler Research Station MW-2D (Bedrock well).

LOCATION.--Lat 35°43'59", long 78°40'32", Hydrologic Unit 03020201, .6 mi south of Tryon Road, .2 mi east of Lake Wheeler Road on NCSU Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Raleigh Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 601 ft, diameter 6 in., cased to 80 ft, open hole from 80 to 447 ft, hole collapsed from 447 to 601 ft.

INSTRUMENTATION.--Measured periodically with electric tape (by DENR and USGS).

DATUM.--Land-surface datum is 359.77 ft above NGVD of 1929. Measuring point: Top of casing, 1.90 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

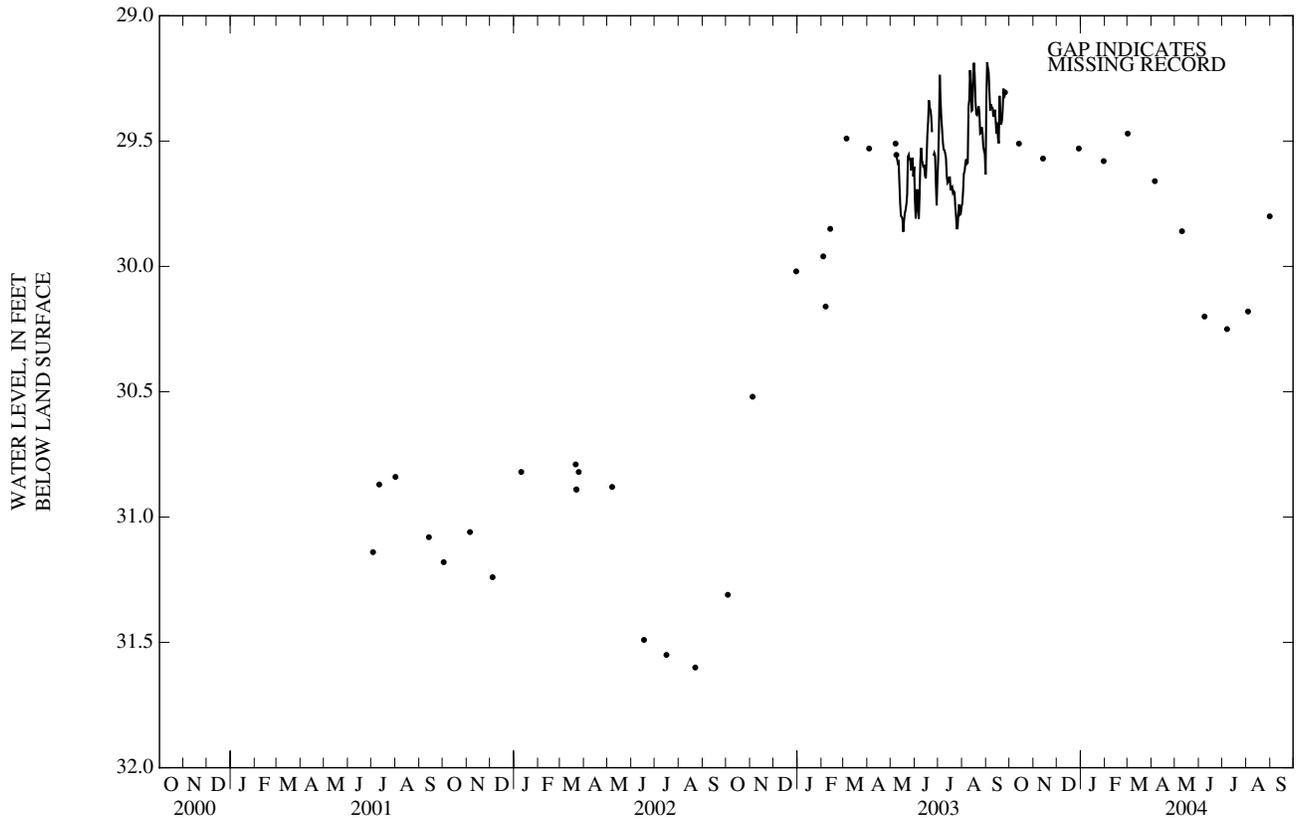
PERIOD OF RECORD.--July 2001 to current year. Continuous record May 2003 to September 2003.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 29.02 ft below land-surface datum, Sept. 18, 2003; lowest water level measured 31.60 ft below land-surface datum, Aug. 22, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 13	29.51*	DEC 29	29.53*	MAR 01	29.47*	MAY 10	29.86*	JUL 07	30.25*	AUG 31	29.80*
NOV 13	29.57*	JAN 30	29.58*	APR 05	29.66*	JUN 08	30.20*	AUG 03	30.18*		

\*DENR measurement.



WAKE COUNTY—Continued

354404078403101. County number, WK-284; DENR Lake Wheeler Research Station MW-3S (Regolith well).

LOCATION.--Lat 35°44'04", long 78°40'31", Hydrologic Unit 03020201, .6 mi south of Tryon Road, .2 mi east of Lake Wheeler Road on NCSU Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Raleigh Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 35 ft, diameter 4 in., cased to 20 ft, screened interval from 20 to 35 ft, sand filter packed from 17 to 35 ft.

INSTRUMENTATION.--Measured periodically with electric tape (by DENR and USGS).

DATUM.--Land-surface datum is 375.02 ft above NGVD of 1929. Measuring point: Top of 4-inch casing, 1.91 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

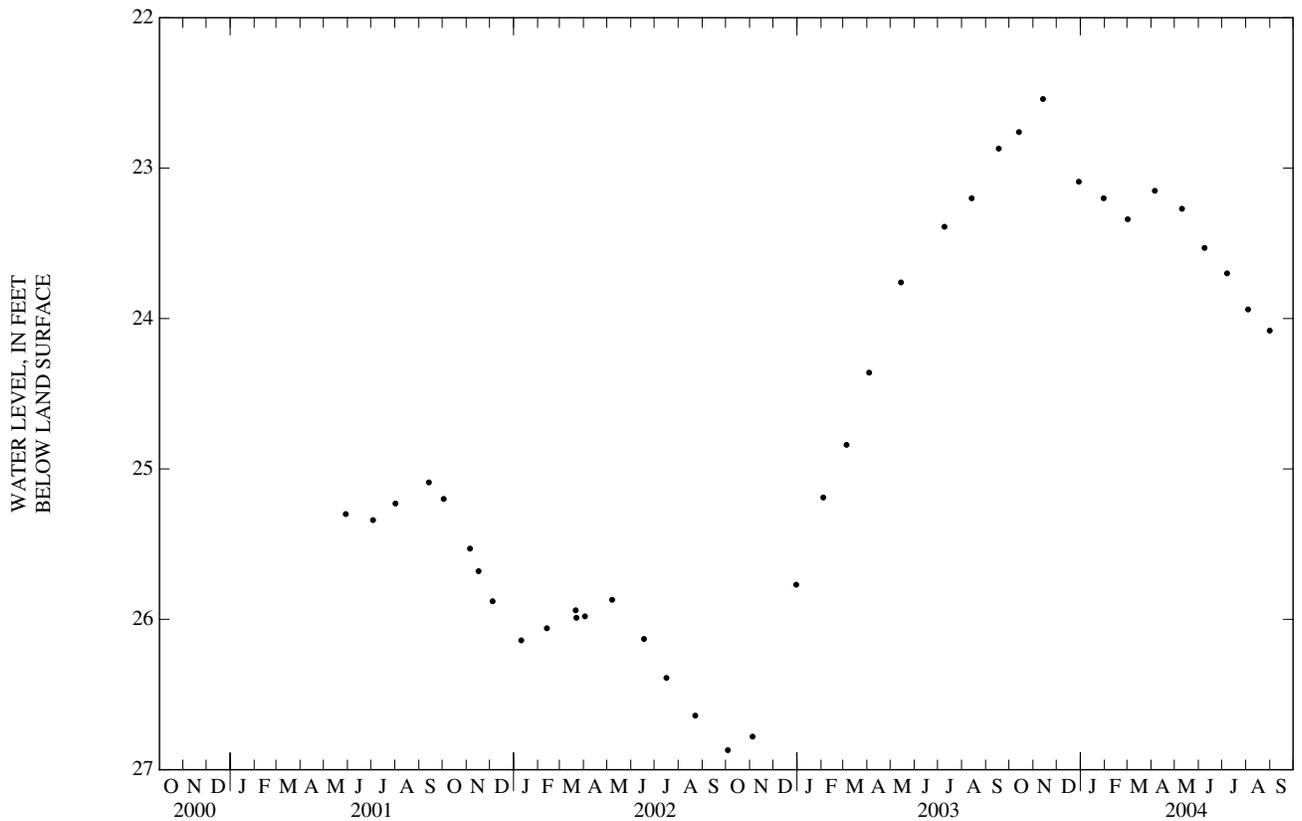
PERIOD OF RECORD.--May 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.54 ft below land-surface datum, Nov. 13, 2004; lowest water level recorded 26.87 ft below land-surface datum, Oct. 3, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 13	22.76*	DEC 29	23.09*	MAR 01	23.34*	MAY 10	23.27*	JUL 07	23.70*	AUG 31	24.08*
NOV 13	22.54*	JAN 30	23.20*	APR 05	23.15*	JUN 08	23.53*	AUG 03	23.94*		

\*DENR measurement.



GROUND-WATER LEVELS  
WAKE COUNTY—Continued

354404078403102. County number, WK-285; DENR Lake Wheeler Research Station MW-3I (Transition zone well).

LOCATION.--Lat 35°44'05", long 78°40'31", Hydrologic Unit 03020201, .6 mi south of Tryon Road, .2 mi east of Lake Wheeler Road on NCSU Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Transition zone (Raleigh Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 60 ft, diameter 4 in., cased to 45 ft, screened interval from 45 to 60 ft, sand filter packed from 33 to 60 ft.

INSTRUMENTATION.--Measured periodically with electric tape (by DENR and USGS).

DATUM.--Land-surface datum is 375.49 ft above NGVD of 1929. Measuring point: Top of 4-inch casing, 1.91 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

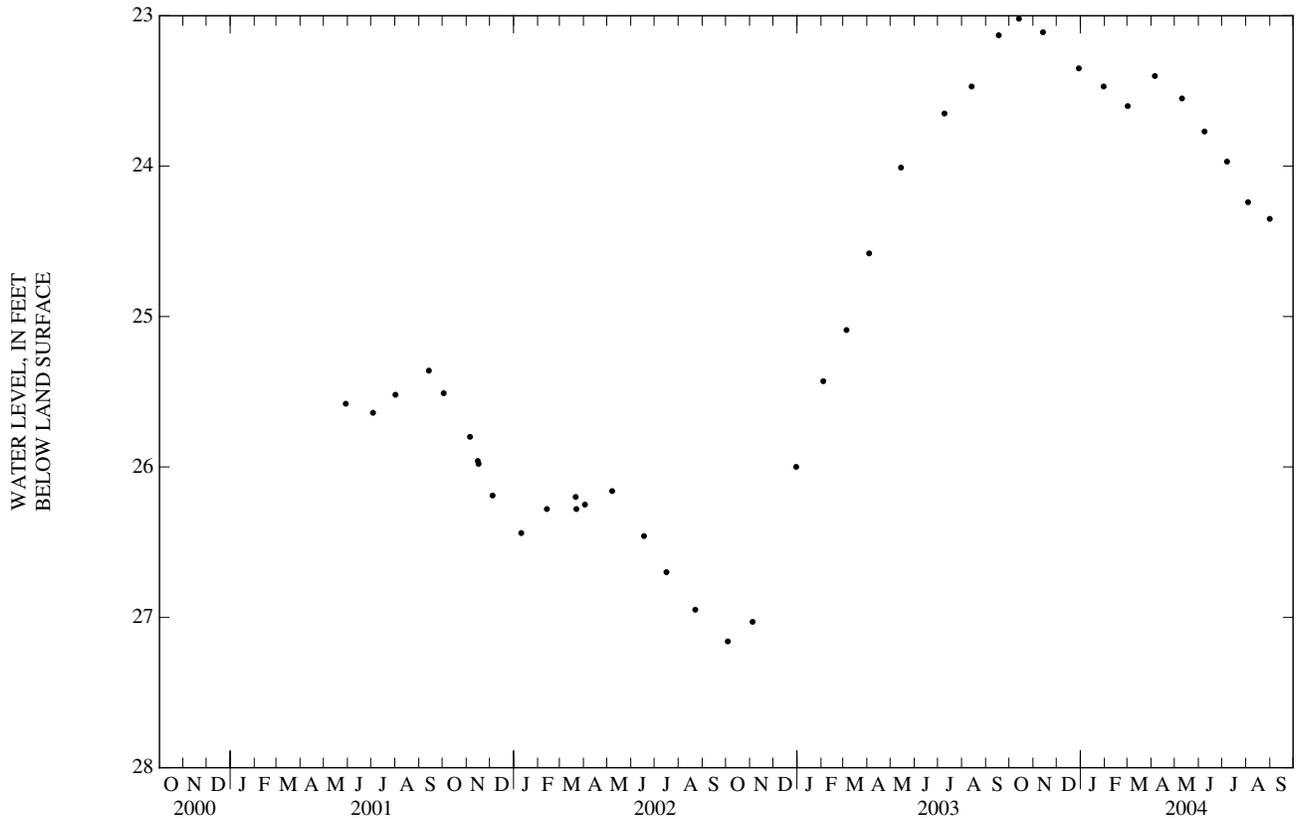
PERIOD OF RECORD.--May 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 23.02 ft below land-surface datum, Oct. 13, 2003; lowest water level measured 27.16 ft below land-surface datum, Oct. 3, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 13	23.02*	DEC 29	23.35*	MAR 01	23.60*	MAY 10	23.55*	JUL 07	23.97*	AUG 31	24.35*
NOV 13	23.11*	JAN 30	23.47*	APR 05	23.40*	JUN 08	23.77*	AUG 03	24.24*		

\*DENR measurement.



WAKE COUNTY—Continued

354404078403103. County number, WK-286; DENR Lake Wheeler Research Station MW-3D (Bedrock well).

LOCATION.--Lat 35°44'05", long 78°40'31", Hydrologic Unit 03020201, .6 mi south of Tryon Road, .2 mi east of Lake Wheeler Road on NCSU Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Raleigh Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 301 ft, diameter 6 in., cased to 66 ft, open hole from 66 to 301 ft.

INSTRUMENTATION.--Measured periodically with electric tape (by DENR and USGS).

DATUM.--Land-surface datum is 376.35 ft above NGVD of 1929. Measuring point: Top of 6-inch casing, 1.73 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

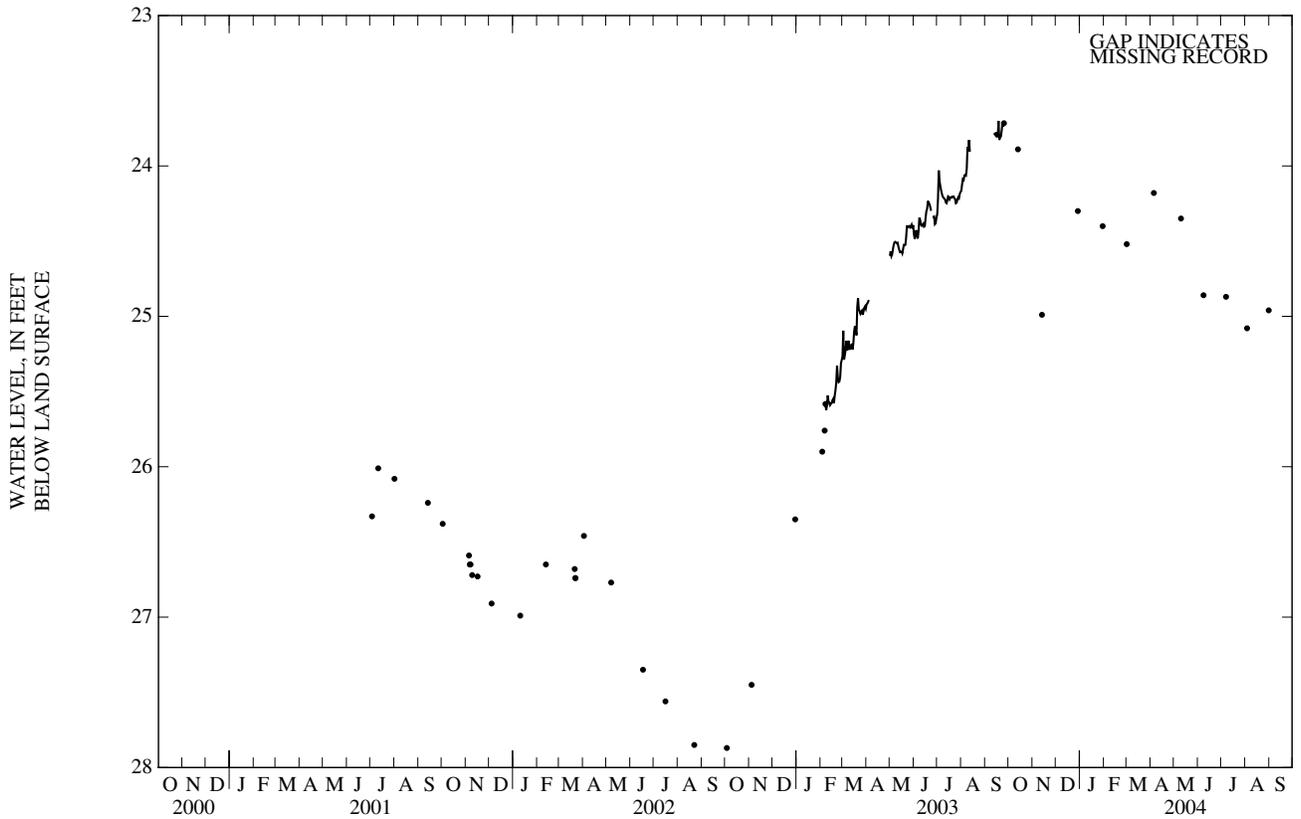
PERIOD OF RECORD.--July 2001 to current year. Continuous record February 2003 to September 2003.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 23.55 ft below land-surface datum, Sept. 18, 2003; lowest water level measured 27.87 ft below land-surface datum, Oct. 3, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 13	23.89*	DEC 29	24.30*	MAR 01	24.52*	MAY 10	24.35*	JUL 07	24.87*	AUG 31	24.96*
NOV 13	24.99*	JAN 30	24.40*	APR 05	24.18*	JUN 08	24.86*	AUG 03	25.08*		

\*DENR measurement.



GROUND-WATER LEVELS  
WAKE COUNTY—Continued

354401078403401. County number, WK-287; DENR Lake Wheeler Research Station PW-1.

LOCATION.--Lat 35°44'01", long 78°40'34", Hydrologic Unit 03020201, .6 mi south of Tryon Road, .2 mi east of Lake Wheeler Road on NCSU Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Raleigh Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, depth 302 ft, diameter 6 in., cased to 62.5 ft, open hole from 62.5 to 302 ft.

INSTRUMENTATION.--Measured periodically with electric tape (by DENR and USGS).

DATUM.--Land-surface datum is 358.07 ft above NGVD of 1929. Measuring point: Top of lower steel nipple, 0.89 ft above land-surface datum.

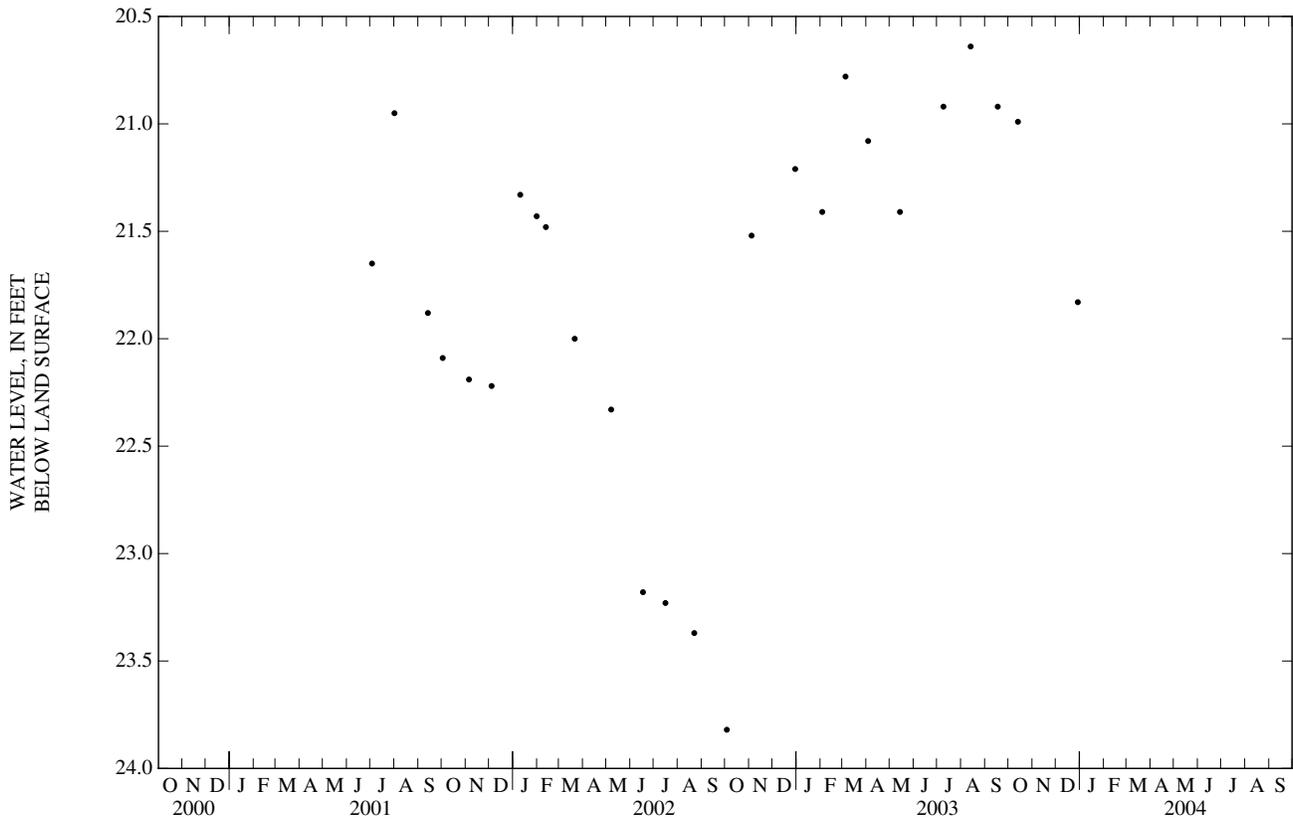
REMARKS.--Well is part of Piedmont/Mountains ground-water study.

PERIOD OF RECORD.--July 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.64 ft below land-surface datum, Aug. 13, 2003; lowest water level measured 23.82 ft below land-surface datum, Oct. 3, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	20.99	DEC 29	21.83



WAKE COUNTY—Continued

354400078403401. County number, WK-288; DENR Lake Wheeler Research Station PZ-1.

LOCATION.--Lat 35°44'00", long 78°40'34", Hydrologic Unit 03020201, .6 mi south of Tryon Road, .2 mi east of Lake Wheeler Road on NCSU Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Raleigh Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 50 ft, diameter 2 in., cased to 30 ft, screened interval from 30 to 50 ft.

INSTRUMENTATION.--Measured periodically with electric tape (by DENR and USGS).

DATUM.--Land-surface datum is 354.87 ft above NGVD of 1929. Measuring point: Top of 2-inch casing, 1.97 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

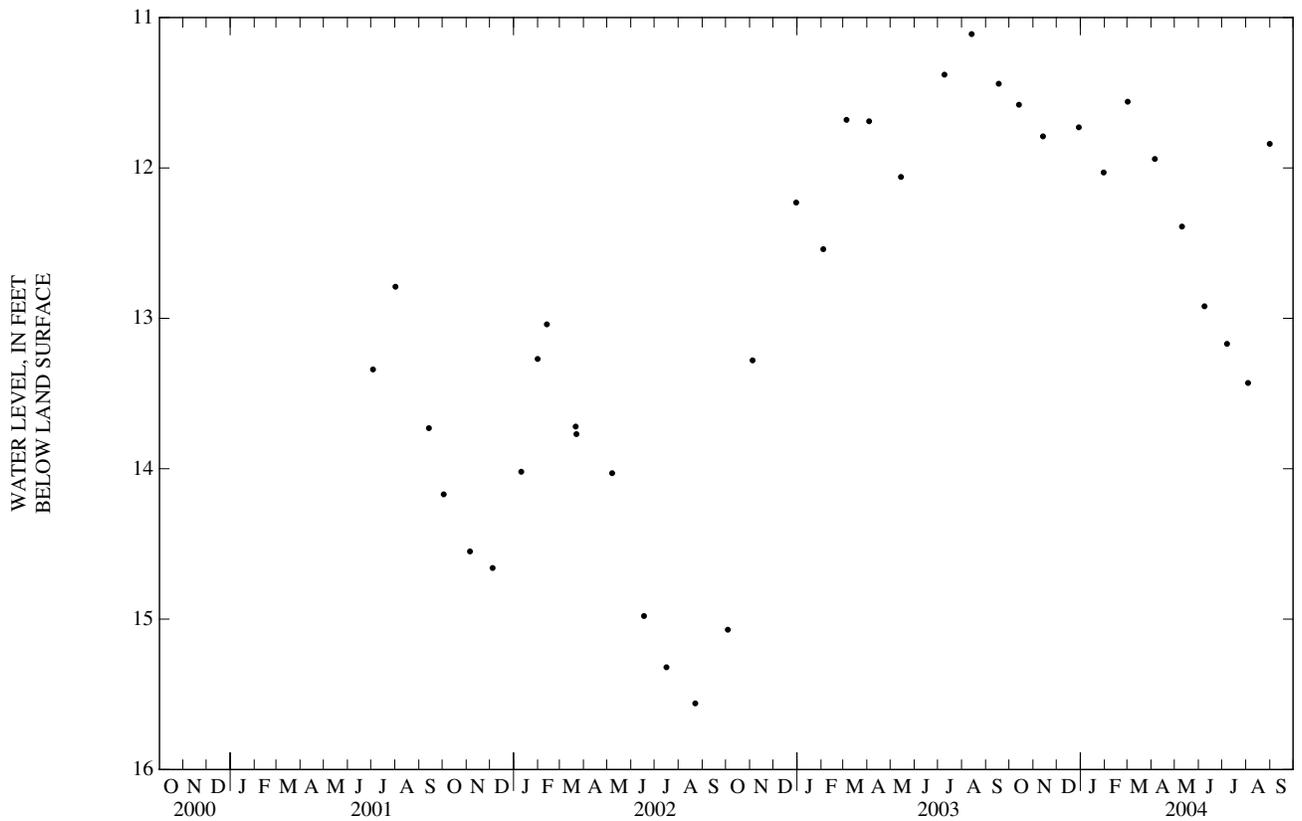
PERIOD OF RECORD.--July 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.11 ft below land-surface datum, Aug. 13, 2003; lowest water level measured 15.56 ft below land-surface datum, Aug. 22, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 13	11.58*	DEC 29	11.73*	MAR 01	11.56*	MAY 10	12.39*	JUL 07	13.17*	AUG 31	11.84*
NOV 13	11.79*	JAN 30	12.03*	APR 05	11.94*	JUN 08	12.92*	AUG 03	13.43*		

\*DENR measurement.



GROUND-WATER LEVELS  
WAKE COUNTY—Continued

354402078403401. County number, WK-289; DENR Lake Wheeler Research Station PZ-2.

LOCATION.--Lat 35°44'02", long 78°40'34", Hydrologic Unit 03020201, .6 mi south of Tryon Road, .2 mi east of Lake Wheeler Road on NCSU Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Raleigh Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 37 ft, diameter 2 in., cased to 17 ft, screened interval from 17 to 37 ft.

INSTRUMENTATION.--Measured periodically with electric tape (by DENR and USGS).

DATUM.--Land-surface datum is 359.09 ft above NGVD of 1929. Measuring point: Top of 2-inch casing, 1.75 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

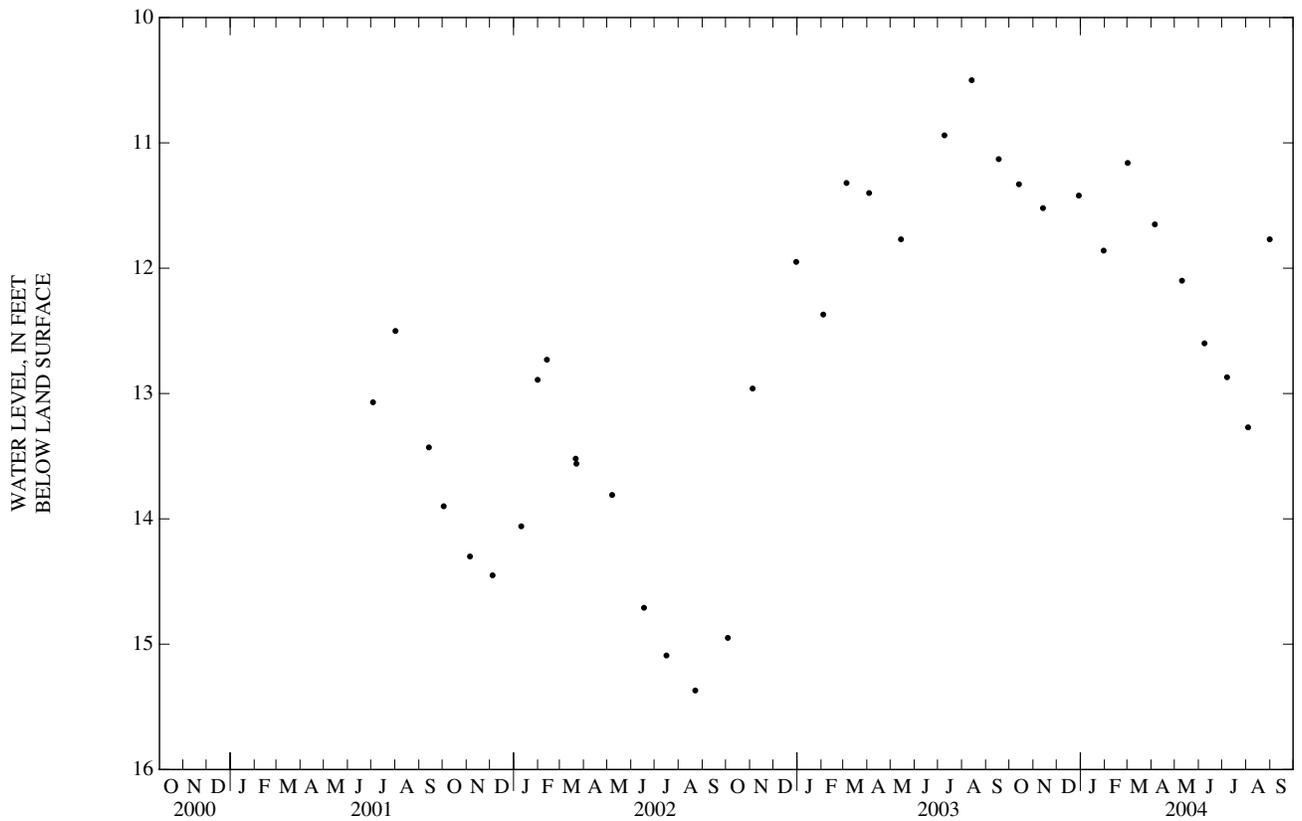
PERIOD OF RECORD.--July 2001 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.50 ft below land-surface datum, Aug. 13, 2003; lowest water level measured 15.37 ft below land-surface datum, Aug. 22, 2002.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 13	11.33*	DEC 29	11.42*	MAR 01	11.16*	MAY 10	12.10*	JUL 07	12.87*	AUG 31	11.77*
NOV 13	11.52*	JAN 30	11.86*	APR 05	11.65*	JUN 08	12.60*	AUG 03	13.27*		

\*DENR measurement.



WAKE COUNTY—Continued

354400078403301. County number, WK-290; DENR Lake Wheeler Research Station PZ-3.

LOCATION.--Lat 35°44'01", long 78°40'34", Hydrologic Unit 03020201, .6 mi south of Tryon Road, .2 mi east of Lake Wheeler Road on NCSU Research Farm. Owner: DENR (North Carolina Department of Environment and Natural Resources), Division of Water Quality.

AQUIFER.--Regolith (saprolitic Raleigh Gneiss).

WELL CHARACTERISTICS.--Drilled observation well, depth 47 ft, diameter 2 in., cased to 32 ft, screened interval from 32 to 47 ft.

INSTRUMENTATION.--Measured periodically with electric tape (by DENR and USGS).

DATUM.--Land-surface datum is 358.83 ft above NGVD of 1929. Measuring point: Top of 2-inch casing, 1.35 ft above land-surface datum.

REMARKS.--Well is part of Piedmont/Mountains ground-water study.

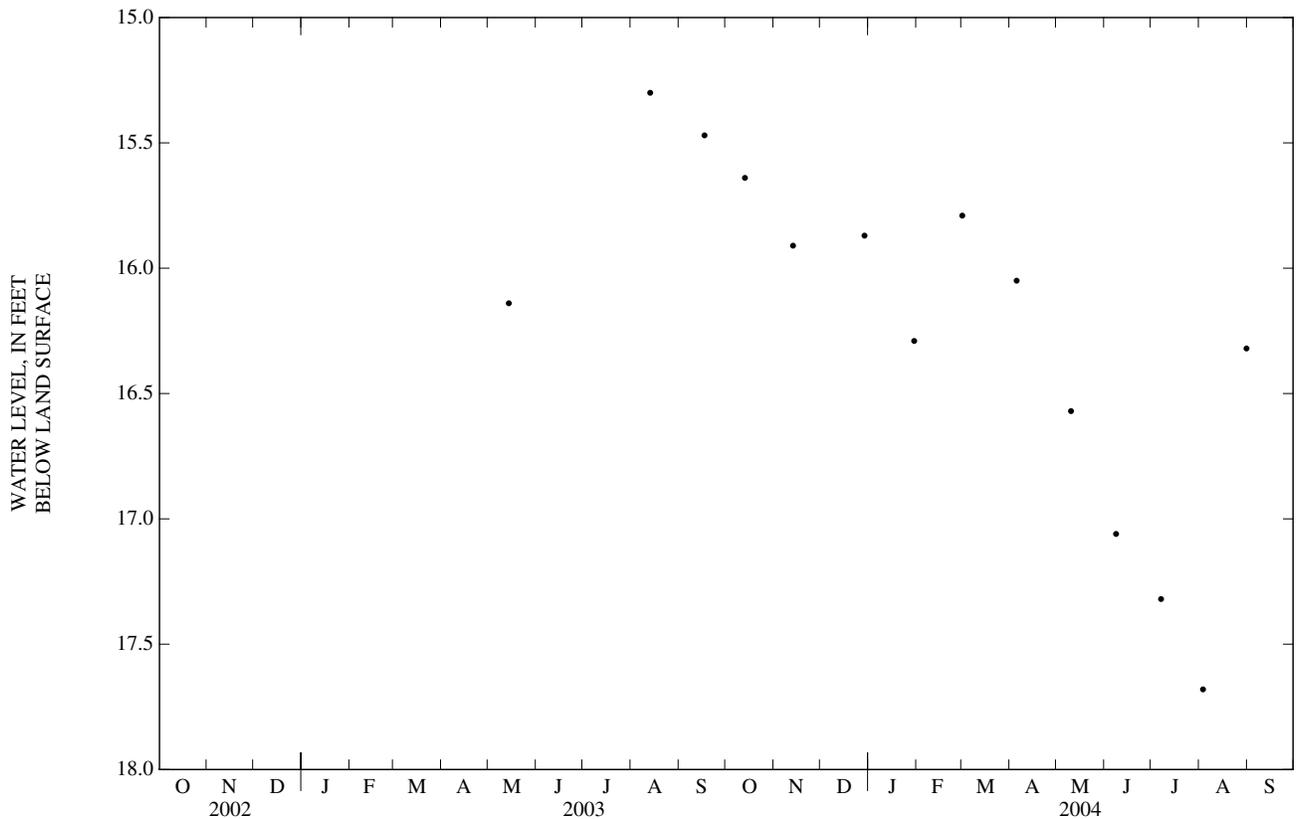
PERIOD OF RECORD.--May 2003 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.30 ft below land-surface datum, Aug. 13, 2003; lowest water level measured 17.68 ft below land-surface datum, Aug. 3, 2004.

WATER LEVELS IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004

DATE	WATER LEVEL										
OCT 13	15.64*	DEC 29	15.87*	MAR 01	15.79*	MAY 10	16.57*	JUL 07	17.32*	AUG 31	16.32*
NOV 13	15.91*	JAN 30	16.29*	APR 05	16.05*	JUN 08	17.06*	AUG 03	17.68*		

\*DENR measurement.



## GROUND-WATER LEVELS

## WASHINGTON COUNTY

354351076260502. Local number, NC-157; DENR Lake Phelps Research Station well L13i2; County number, WS-099.

LOCATION.--Lat 35°43'51", long 76°26'04", Hydrologic Unit 03010205, on south shore of Lake Phelps, south of Secondary Road 1126 on Secondary Road 1183. Owner: DENR (North Carolina Department of Environment and Natural Resources).

AQUIFER.--Yorktown aquifer of Pliocene and Miocene age.

WELL CHARACTERISTICS.--Drilled observation well, depth 120 ft, diameter 4 in., screened interval from 110 to 120 ft; measured depth 120.2 ft, October 1986.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 16.35 ft above NGVD of 1929 (levels by DENR). Measuring point: Top of instrument shelf, 2.84 ft above land-surface datum; revised from 3.20 ft above land-surface datum, October 1987.

REMARKS.--Well is part of areal-effects network.

PERIOD OF RECORD.--October 1980 to current year. Continuous record November 1986 to November 1990, February 2000 to current year. Records from October 1977 to September 1980 are unpublished and available in the files of the Groundwater Section, DENR. Records from October 1980 to July 1986 are from the files of the Division of Water Quality, DENR.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.89 ft below land-surface datum, May 10, 1993; lowest water level recorded, 9.52 ft below land-surface datum, Dec. 15, 16, 2001.

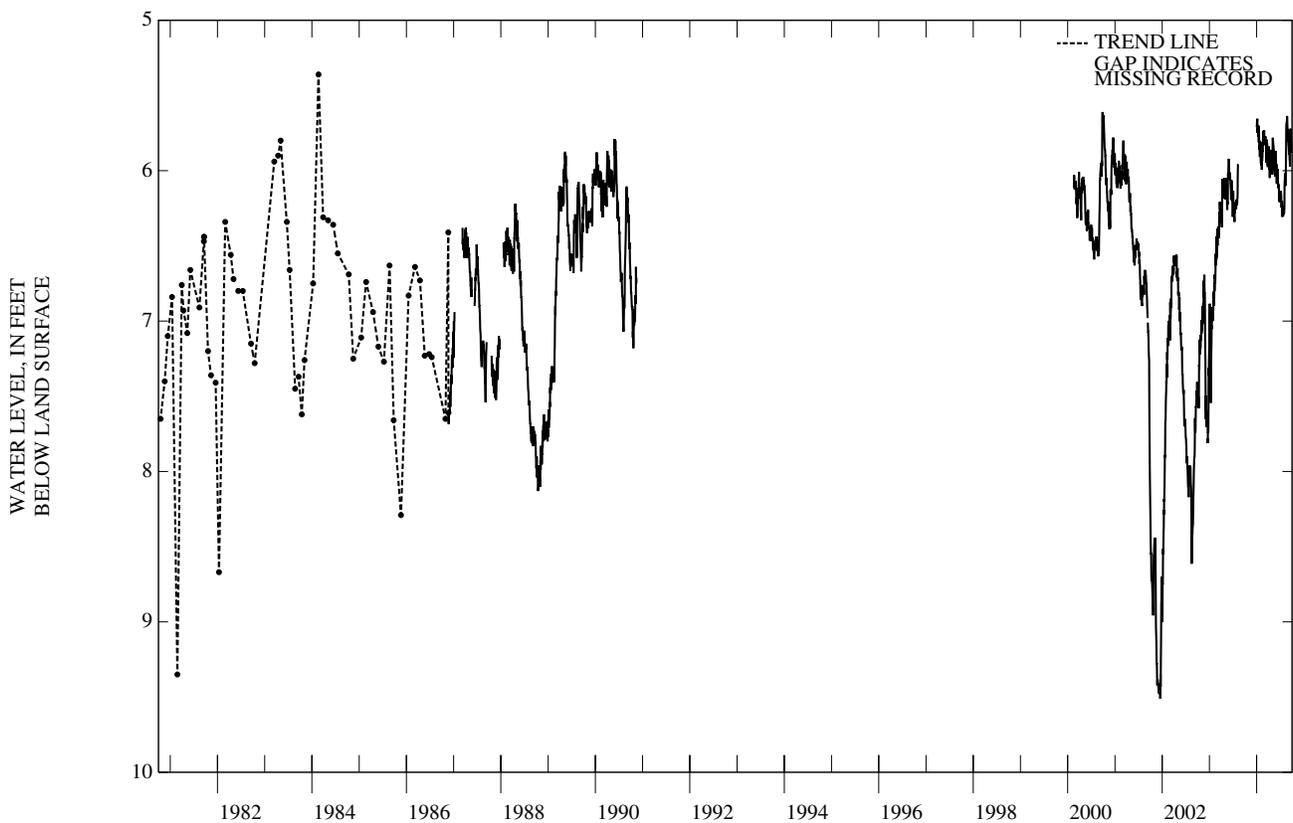
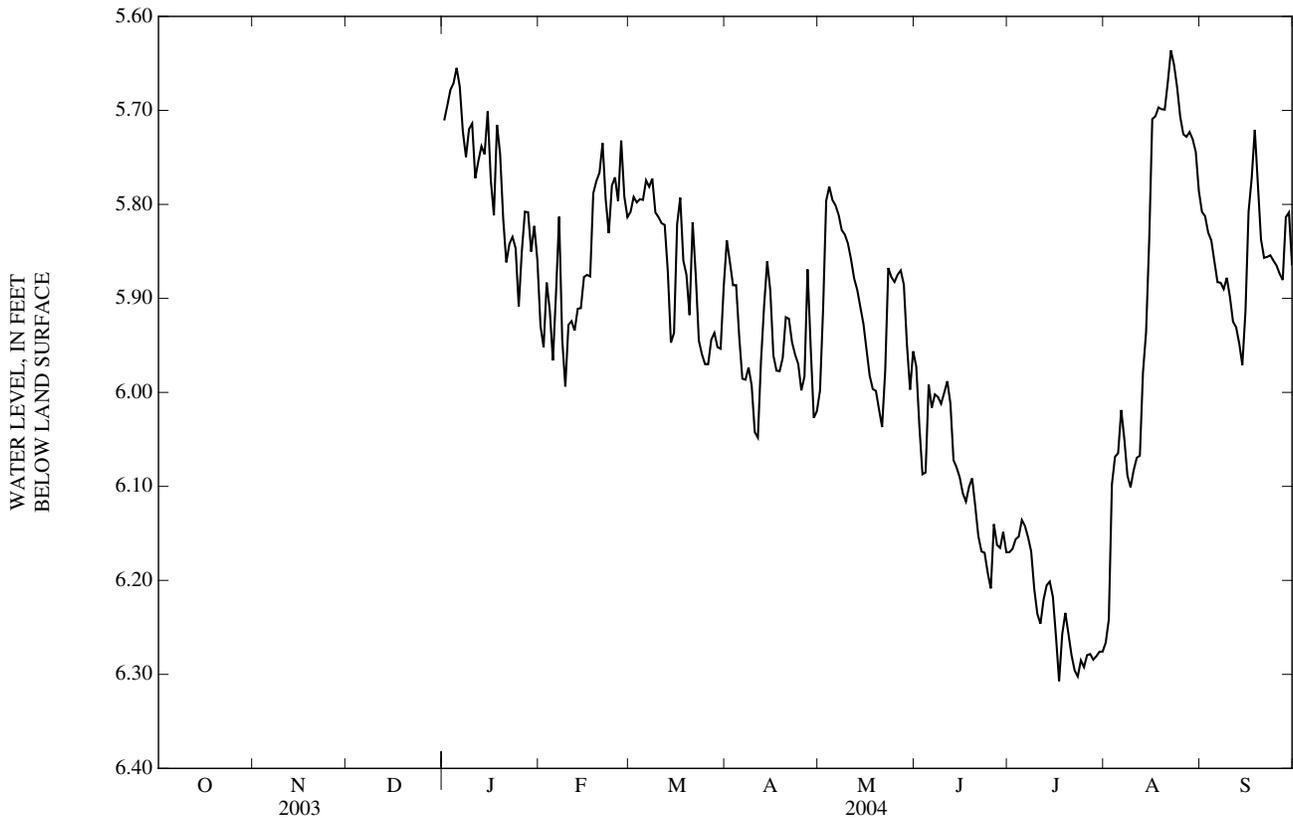
DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	5.71	5.93	5.81	5.84	6.00	5.97	6.17	6.27	5.81
2	---	---	---	5.69	5.95	5.79	5.86	5.91	6.04	6.17	6.24	5.81
3	---	---	---	5.68	5.88	5.80	5.89	5.80	6.09	6.16	6.10	5.83
4	---	---	---	5.67	5.91	5.79	5.89	5.78	6.09	6.15	6.07	5.84
5	---	---	---	5.65	5.97	5.80	5.94	5.80	5.99	6.14	6.06	5.86
6	---	---	---	5.67	5.89	5.77	5.99	5.80	6.02	6.14	6.02	5.88
7	---	---	---	5.72	5.81	5.78	5.99	5.81	6.00	6.15	6.05	5.88
8	---	---	---	5.75	5.94	5.77	5.97	5.83	6.00	6.17	6.09	5.89
9	---	---	---	5.72	5.99	5.81	5.99	5.83	6.01	6.21	6.10	5.88
10	---	---	---	5.71	5.93	5.81	6.04	5.84	6.00	6.24	6.08	5.90
11	---	---	---	5.77	5.92	5.82	6.05	5.86	5.99	6.25	6.07	5.92
12	---	---	---	5.75	5.93	5.82	5.97	5.88	6.01	6.22	6.07	5.93
13	---	---	---	5.74	5.91	5.87	5.91	5.89	6.07	6.21	5.98	5.95
14	---	---	---	5.75	5.91	5.95	5.86	5.91	6.08	6.20	5.94	5.97
15	---	---	---	5.70	5.88	5.94	5.89	5.93	6.09	6.22	5.84	5.91
16	---	---	---	5.77	5.88	5.82	5.96	5.96	6.11	6.26	5.71	5.81
17	---	---	---	5.81	5.88	5.79	5.98	5.98	6.12	6.31	5.71	5.77
18	---	---	---	5.72	5.79	5.86	5.98	6.00	6.10	6.26	5.70	5.72
19	---	---	---	5.75	5.78	5.87	5.96	6.00	6.09	6.23	5.70	5.78
20	---	---	---	5.82	5.77	5.92	5.92	6.02	6.12	6.26	5.70	5.84
21	---	---	---	5.86	5.73	5.82	5.92	6.04	6.15	6.28	5.67	5.86
22	---	---	---	5.84	5.79	5.88	5.95	5.98	6.17	6.30	5.64	5.86
23	---	---	---	5.83	5.83	5.95	5.96	5.87	6.17	6.30	5.65	5.85
24	---	---	---	5.85	5.78	5.96	5.97	5.88	6.19	6.29	5.68	5.86
25	---	---	---	5.91	5.77	5.97	6.00	5.88	6.21	6.29	5.71	5.87
26	---	---	---	5.85	5.80	5.97	5.98	5.87	6.14	6.28	5.73	5.87
27	---	---	---	5.81	5.73	5.94	5.87	5.87	6.16	6.28	5.73	5.88
28	---	---	---	5.81	5.79	5.94	5.95	5.89	6.17	6.28	5.72	5.81
29	---	---	---	5.85	5.81	5.95	6.03	5.95	6.15	6.28	5.73	5.81
30	---	---	---	5.82	---	5.95	6.02	6.00	6.17	6.28	5.74	5.86
31	---	---	---	5.86	---	5.89	---	5.96	---	6.28	5.79	---

WTR YR 2004 MEAN 5.93 HIGH 5.64 LOW 6.31

WASHINGTON COUNTY—Continued

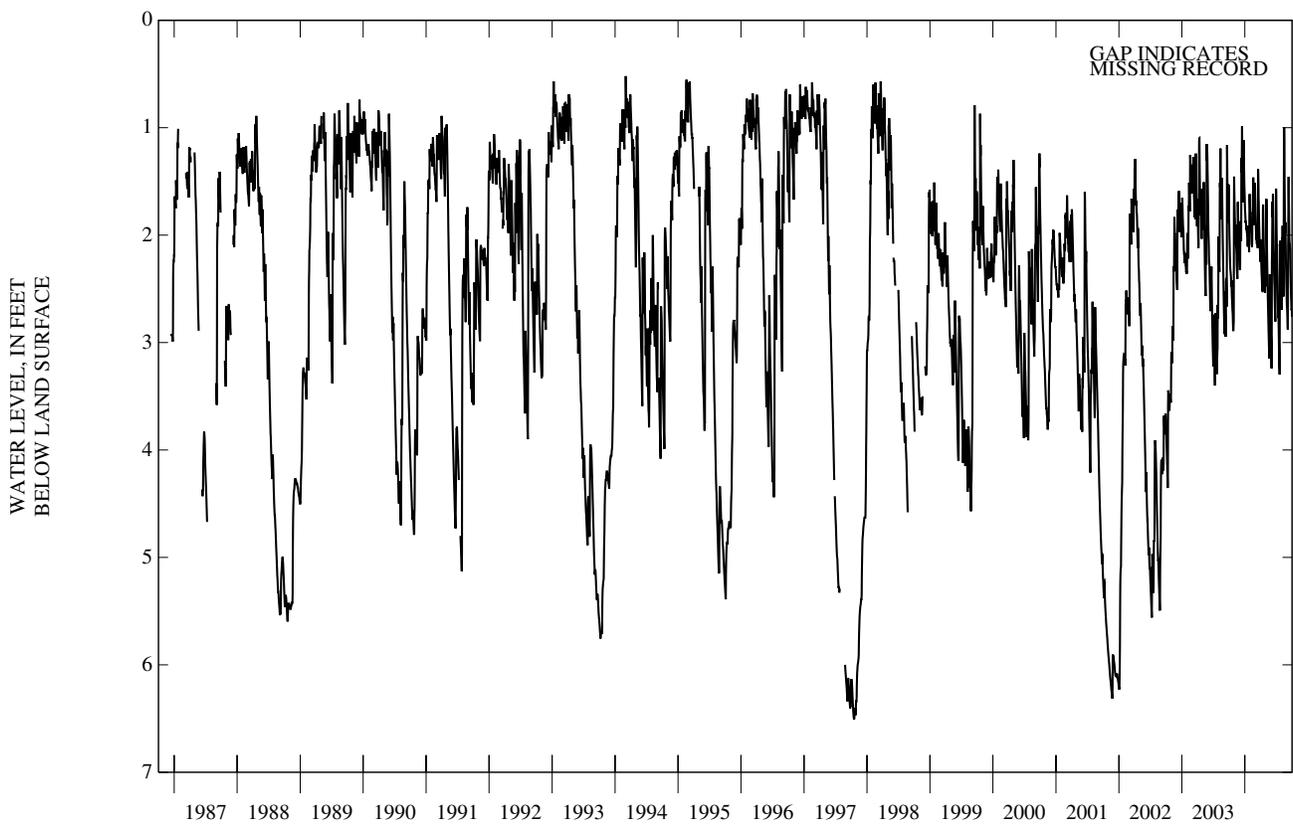
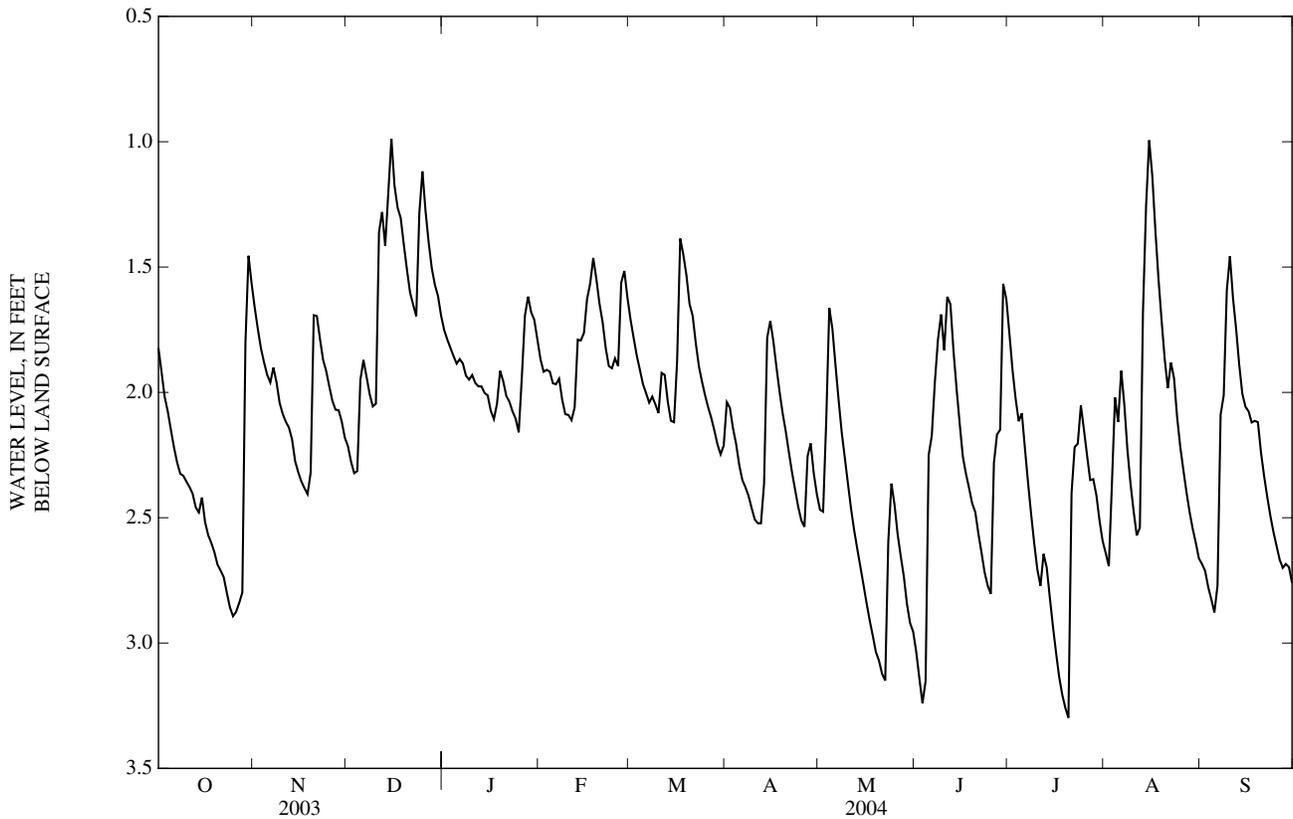
354351076260502. Local number, NC-157; DENR Lake Phelps Research Station well L13i2; County number, WS-099.





WASHINGTON COUNTY—Continued

354418076463601. Local number, NC-158; County number, WS-100.



## GROUND-WATER LEVELS

## WAYNE COUNTY

351849078163901. Local number, NC-148; County number, WA-154.

LOCATION.--Lat 35°18'35", long 78°16'22", Hydrologic Unit 03020201, 0.5 mi south of Johnston county line on Secondary Road 1009, and 6 mi west of Grantham. Owner: U.S. Geological Survey.

AQUIFER.--Surficial aquifer of post-Miocene age.

WELL CHARACTERISTICS.--Bored observation well, augered to 10.4 ft, diameter 3 in., cased to 5.4 ft, screened interval from 5.4 to 10.4 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals.

DATUM.--Land-surface datum is 190 ft above NGVD of 1929 (from topographic map). Measuring point: File cut on top of casing, 1.80 ft above land-surface datum.

REMARKS.--Well is part of climatic-effects network.

PERIOD OF RECORD.--February 1980 to current year. Records for June 17 to Sept. 30, 1987, published in Water Resources Data, North Carolina, NC-87-1, are unreliable and should not be used.

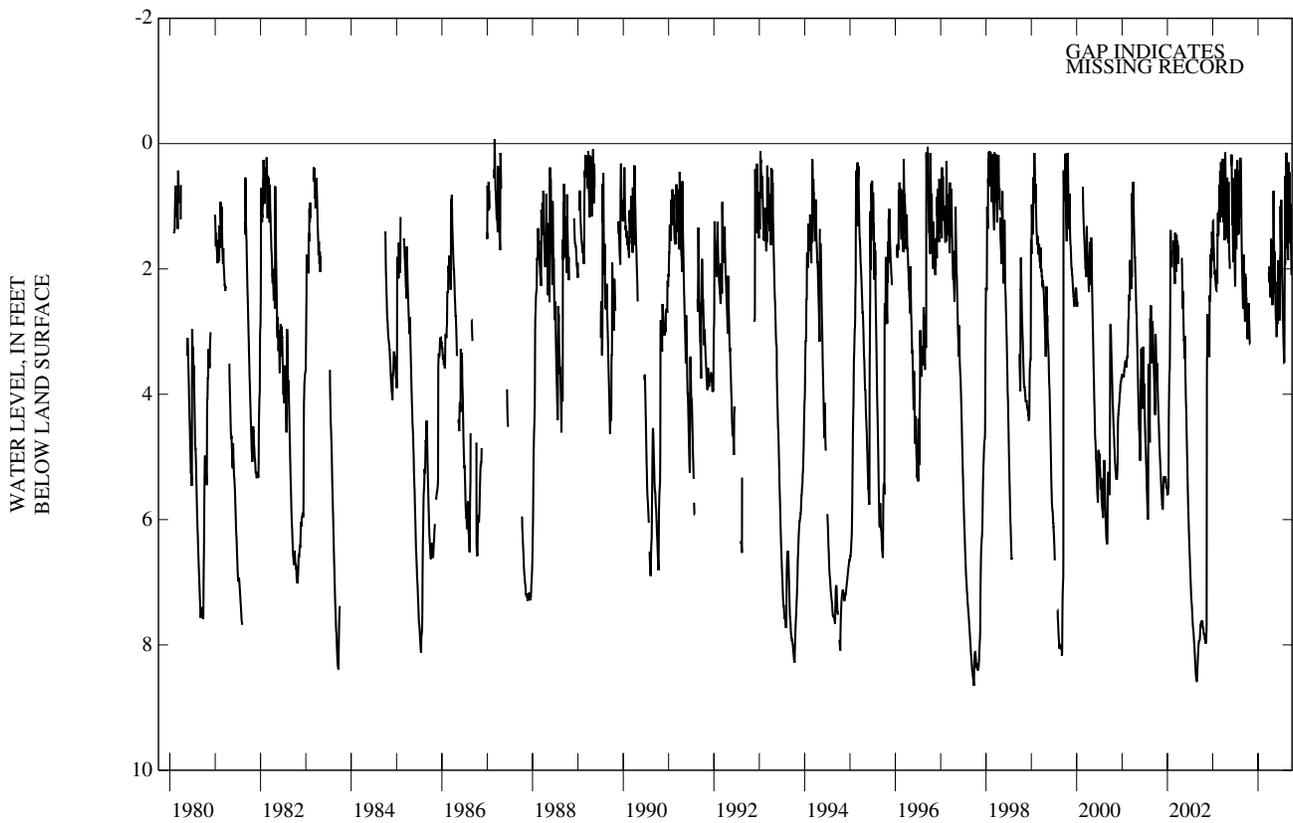
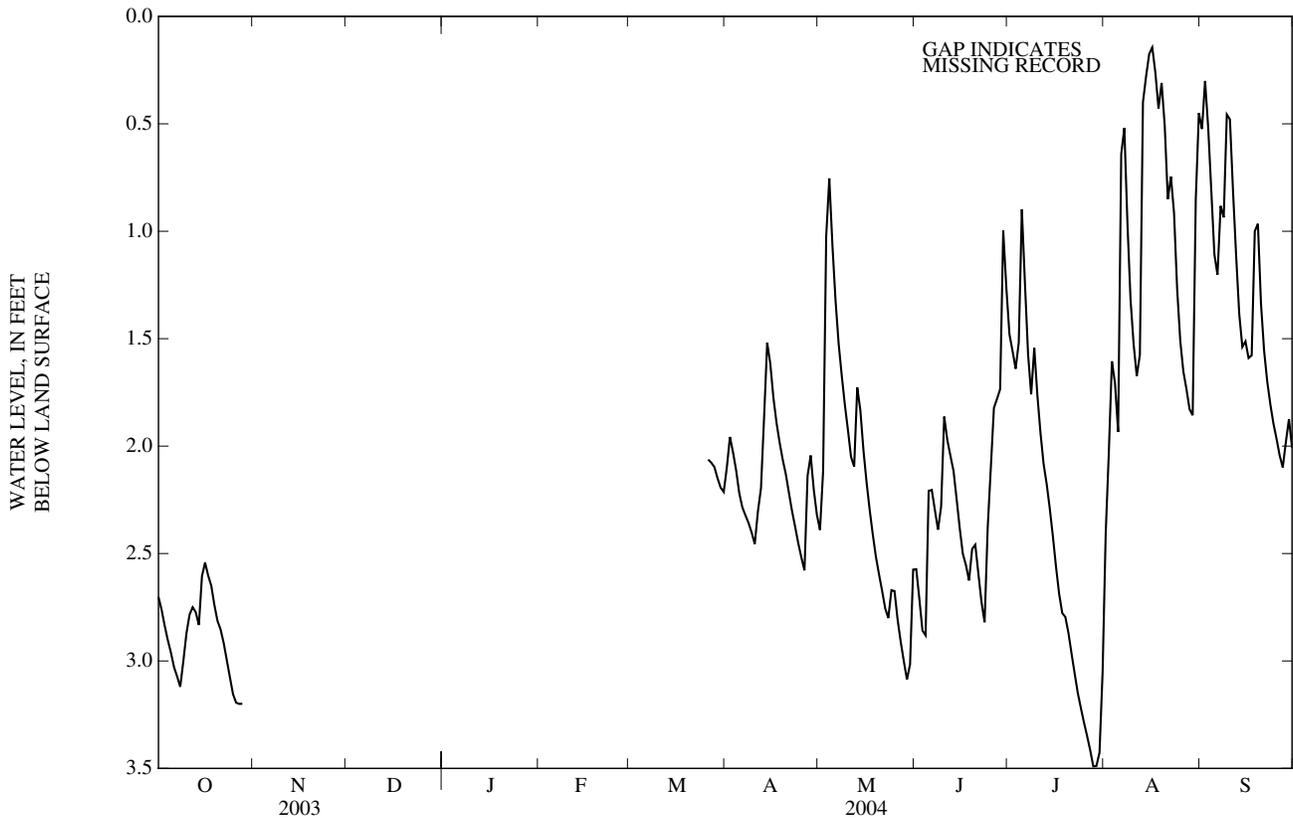
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 0.04 ft above land-surface datum, May 2, 1989; lowest water level recorded, 8.65 ft below land-surface datum, Sept. 24, 25, 1997.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.70	---	---	---	---	---	2.10	2.39	2.57	1.48	2.41	0.52
2	2.76	---	---	---	---	---	1.96	2.12	2.71	1.56	2.03	0.30
3	2.84	---	---	---	---	---	2.03	1.02	2.86	1.64	1.61	0.52
4	2.90	---	---	---	---	---	2.11	0.75	2.88	1.52	1.71	0.81
5	2.96	---	---	---	---	---	2.22	1.06	2.21	0.90	1.93	1.11
6	3.03	---	---	---	---	---	2.29	1.32	2.20	1.24	0.64	1.20
7	3.07	---	---	---	---	---	2.32	1.52	2.30	1.57	0.52	0.88
8	3.12	---	---	---	---	---	2.36	1.67	2.39	1.76	0.96	0.94
9	3.00	---	---	---	---	---	2.40	1.81	2.28	1.54	1.32	0.46
10	2.87	---	---	---	---	---	2.46	1.93	1.86	1.76	1.53	0.48
11	2.78	---	---	---	---	---	2.31	2.05	1.97	1.94	1.67	0.81
12	2.75	---	---	---	---	---	2.20	2.10	2.04	2.08	1.58	1.11
13	2.77	---	---	---	---	---	1.87	1.73	2.12	2.18	0.40	1.38
14	2.83	---	---	---	---	---	1.52	1.83	2.25	2.29	0.28	1.54
15	2.60	---	---	---	---	---	1.62	2.02	2.38	2.42	0.18	1.51
16	2.54	---	---	---	---	---	1.77	2.17	2.50	2.56	0.14	1.59
17	2.60	---	---	---	---	---	1.89	2.30	2.55	2.69	0.26	1.58
18	2.65	---	---	---	---	---	1.98	2.41	2.63	2.78	0.43	1.00
19	2.74	---	---	---	---	---	2.06	2.51	2.48	2.80	0.31	0.97
20	2.81	---	---	---	---	---	2.13	2.60	2.46	2.87	0.51	1.34
21	2.85	---	---	---	---	---	2.22	2.67	2.59	2.97	0.85	1.56
22	2.92	---	---	---	---	---	2.30	2.76	2.73	3.06	0.75	1.70
23	3.00	---	---	---	---	---	2.38	2.80	2.82	3.15	0.92	1.80
24	3.08	---	---	---	---	---	2.45	2.67	2.38	3.22	1.27	1.89
25	3.15	---	---	---	---	---	2.52	2.67	2.10	3.29	1.51	1.97
26	3.19	---	---	---	---	2.06	2.58	2.81	1.82	3.35	1.65	2.04
27	3.20	---	---	---	---	2.08	2.14	2.91	1.78	3.42	1.73	2.10
28	3.20	---	---	---	---	2.10	2.04	3.00	1.74	3.49	1.83	1.98
29	---	---	---	---	---	2.15	2.20	3.09	1.00	3.49	1.86	1.87
30	---	---	---	---	---	2.19	2.32	3.02	1.26	3.43	0.85	2.01
31	---	---	---	---	---	2.21	---	2.57	---	3.05	0.45	---
WTR YR	2004	MEAN 2.04	HIGH 0.14	LOW 3.49								

WAYNE COUNTY—Continued

351849078163901. Local number, NC-148; County number, WA-154.



GROUND-WATER LEVELS

YADKIN COUNTY

361307080293101. Local number NC-221; DENR East Bend Research Station well F61f3; County number, YD-200.

LOCATION.--Lat 36°13'08", long 80°29'32", Hydrologic Unit 03040101, near East Bend. Owner: DENR (North Carolina Department of Environment and Natural Resources.

AQUIFER.--Mafic Gneiss.

WELL CHARACTERISTICS.--Drilled observation well, drilled to 400 ft, diameter 6 in., cased to 54 ft.

INSTRUMENTATION.--Water-level recorder collecting data at 60-minute intervals. Satellite telemetry at station.

DATUM.--Land-surface datum is 1,009.00 ft above NGVD of 1929 (levels by DENR). Measuring point: Top of instrument shelf, 0.56 ft above land-surface datum.

REMARKS.--Well is part of terrane-effects network.

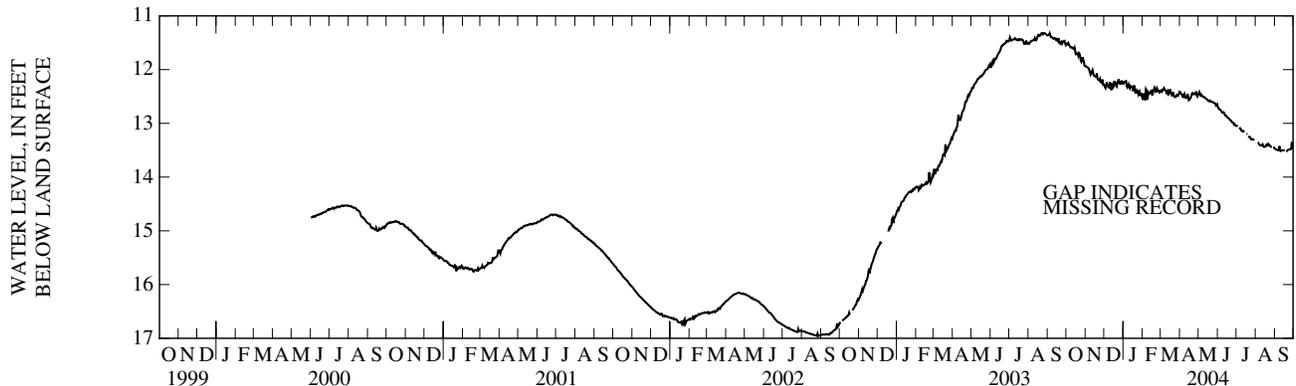
PERIOD OF RECORD.--June 2000 to current year. Records from June 1972 to May 2000 are unpublished and available in the files of the Division of Water Quality, DENR.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 11.30 ft below land-surface datum, Aug. 22, 23, 25, 26, 27, Sept. 4, 2003; lowest water level recorded, 16.97 ft below land-surface datum, Aug. 25, 2002.

DEPTH TO WATER LEVEL, FEET BELOW LAND SURFACE  
WATER YEAR OCTOBER 2003 TO SEPTEMBER 2004  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.52	11.93	12.29	12.26	12.55	12.40	12.41	12.44	12.70	13.05	---	13.47
2	11.52	11.94	12.33	12.23	12.54	12.39	12.44	12.41	12.72	13.05	---	13.48
3	11.53	11.95	12.35	12.23	12.44	12.41	12.45	12.45	12.74	13.06	---	13.49
4	11.51	11.96	12.30	12.22	12.55	12.38	12.46	12.48	12.74	---	13.36	13.49
5	11.54	11.97	12.24	12.21	12.55	12.37	12.50	12.46	12.75	13.08	13.36	13.50
6	11.55	11.98	12.29	12.30	12.37	12.34	12.51	12.48	12.77	13.09	13.38	13.50
7	11.58	12.02	12.31	12.33	12.39	12.37	12.47	12.49	12.79	13.09	13.40	13.49
8	11.59	12.06	12.33	12.31	12.56	12.38	12.45	12.51	12.80	13.11	13.41	13.42
9	11.59	12.09	12.34	12.28	12.50	12.40	12.51	12.50	12.80	13.14	13.41	13.51
10	11.59	12.07	12.24	12.33	12.43	12.43	12.53	12.51	12.79	13.15	13.41	13.52
11	11.60	12.04	12.29	12.35	12.45	12.41	12.53	12.52	12.81	13.15	13.41	13.50
12	11.60	12.01	12.37	12.31	12.44	12.40	12.52	12.54	12.84	13.14	13.39	13.50
13	11.61	12.06	12.37	12.32	12.43	12.47	12.45	12.54	12.86	13.15	13.42	13.50
14	11.59	12.11	12.25	12.31	12.40	12.46	12.50	12.55	12.86	13.15	13.44	13.50
15	11.65	12.11	12.33	12.32	12.39	12.43	12.57	12.56	12.87	---	13.44	13.50
16	11.71	12.12	12.31	12.39	12.48	12.37	12.57	12.57	12.89	---	13.43	13.49
17	11.69	12.14	12.21	12.38	12.45	12.42	12.54	12.59	12.89	13.20	13.42	---
18	11.70	12.13	12.24	12.29	12.40	12.45	12.53	12.58	12.90	---	13.40	---
19	11.71	12.07	12.24	12.39	12.37	12.48	12.49	12.58	12.91	---	13.41	13.52
20	11.74	12.17	12.30	12.43	12.33	12.47	12.45	12.60	12.93	13.24	13.41	13.52
21	11.69	12.19	12.32	12.42	12.35	12.42	12.44	12.59	12.94	13.25	13.39	13.50
22	11.70	12.19	12.26	12.39	12.41	12.48	12.46	12.59	12.95	13.25	13.41	13.49
23	11.75	12.20	12.21	12.42	12.41	12.51	12.45	12.60	12.96	13.26	13.40	13.49
24	11.83	12.17	12.18	12.41	12.36	12.51	12.46	12.61	12.98	13.29	13.42	13.49
25	11.86	12.23	12.24	12.47	12.39	12.51	12.45	12.62	12.99	13.30	13.44	13.48
26	11.82	12.24	12.26	12.44	12.40	12.49	12.43	12.62	12.99	13.30	13.44	13.48
27	11.77	12.24	12.24	12.41	12.39	12.47	12.42	12.63	13.02	13.29	13.43	13.47
28	11.82	12.18	12.25	12.47	12.43	12.47	12.49	12.63	13.02	13.30	---	13.35
29	11.85	12.28	12.22	12.47	12.42	12.48	12.50	12.67	13.04	13.32	---	13.46
30	11.93	12.27	12.22	12.44	---	12.46	12.47	12.67	13.04	---	13.43	13.45
31	11.94	---	12.26	12.52	---	12.41	---	12.65	---	---	13.47	---

WTR YR 2004 MEAN 12.58 HIGH 11.51 LOW 13.52



## PERIOD OF RECORD HIGH WATER LEVELS FOR SELECTED WELLS IN NORTH CAROLINA

The following wells reached period of record high water levels in the 2004 water year. Only wells having at least 5 years of record and currently operating are reported. Water levels are in feet below land surface datum. Page numbers are provided for convenience in viewing the entire record.

LOCAL IDENTIFIER	AQUIFER	NEW PERIOD OF RECORD HIGH	YEARS OF RECORD	PAGE NUMBER
<u>Climatic Effects Wells</u>				
HW-047 (NC-40) Blue Ridge Paper Products	Saprolite	0.13	50	147
TR-066 (NC-147) U.S. Geologicay Survey	Alluvium	5.97	20	314
<u>Terrane Effects Wells</u>				
AV-074 (NC-220) Linville RS H78d8	Bedrock	1.16	5	55
SW-036 (NC-219)	Bedrock	+0.86*	5	311
<u>Camp Lejeune Network</u>				
ON-291 Ragged Point	Castle Hayne	14.31	11	207
ON-292 Paradise Point	Castle Hayne	4.62	11	209
<u>Brunswick County Ground-water Study</u>				
BR-123 Calabash RS HH39j7	Surficial	23.12	6	71

\* above land-surface

## PERIOD OF RECORD LOW WATER LEVELS FOR SELECTED WELLS IN NORTH CAROLINA

The following wells reached period of record low water levels in the 2003 water year. Only wells having at least 5 years of record and currently operating are reported. Water levels are in feet below land surface datum. Page numbers are provided for convenience in viewing the entire record.

LOCAL IDENTIFIER	AQUIFER	NEW PERIOD OF RECORD HIGH	YEARS OF RECORD	PAGE NUMBER
<u>Areal Effects Wells</u>				
BR-081 (NC-197) Southport RS GG32t4	Peedee	43.60	35	79
HF-085 (NC-155) Como RS B20u6	Lower Cape Fear	162.53	24	149
<u>Local Effects Wells</u>				
BO-200 (NC-212) PCS Phosphate, Aurora Division	Castle Hayne	135.57	5	56
<u>Camp Lejeune Network</u>				
ON-293 Sneads Ferry Road	Castle Hayne	15.28	11	211
<u>Brunswick County Ground-water Study</u>				
BR-100 Brunswick County Water Supply well 15A	Castle Hayne/Peedee	51.04	5	64
BR-106 Bear Pen RS EE36k5	Black Creek	29.57	30	66
BR-079 (NC-181) Sunset Harbor RS GG34s6	Peedee	14.85	18	75
BR-080 (NC-182) Sunset Harbor RS GG34s7	Surficial	14.27	18	77

## WATER QUALITY DATA

## MISCELLANEOUS STATION ANALYSES

Ground-water-quality data presented in these tables were collected from the following sites in Wake County during the 2004 water year for the ongoing Piedmont/Mountains ground-water study in cooperation with the North Carolina Department of Environment and Natural Resources, Division of Water Quality, Groundwater Section. Well locations for these sites listed in the following table are shown in figure 6.

## MISCELLANEOUS STATION ANALYSES

Date	Time	Dis-solved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	Specif. conduc-tance, wat unfiltered, uS/cm 25 degC (00095)	Temper-ature, water, deg C (00010)	Hard-ness, water, mg/L as CaCO3 (00900)	Calcium water, mg/L fltrd, (00915)	Magnes-ium, water, mg/L fltrd, (00925)	Potas-sium, water, mg/L fltrd, (00935)	Sodium, water, mg/L fltrd, (00930)	ANC, wat unfiltered, titr., mg/L as CaCO3 (00419)	Bromide water, mg/L fltrd, (71870)	Chlor-ide, water, mg/L fltrd, (00940)
354356078403504 WK-279A LAKE WHEELER RS MW-1DUZ (LAT 35 43 56N LONG 078 40 34W)													
DEC 2003	1120	.7	6.4	686	15.5	120	30.0	11.6	23.8	24.8	231	.16	46.5
354356078403505 WK-279B LAKE WHEELER RS MW-1DLZ (LAT 35 43 56N LONG 078 40 34W)													
DEC 2003	1635	.1	7.8	695	17.3	300	114	4.23	1.06	27.1	63	.05	10.0
354359078403101 WK-280 LAKE WHEELER MW-2S (REGOLITH WELL) (LAT 35 44 00N LONG 078 40 31W)													
JAN 2004	1345	6.7	5.4	273	18.0	66	18.7	4.79	2.92	18.0	12	.03	15.4
354359078403103 WK-282 LAKE WHEELER RS MW-2T (TRANSITION ZONE WELL (LAT 35 43 59N LONG 078 40 32W)													
JAN 2004	1120	5.4	6.1	223	17.2	60	17.2	4.23	3.31	13.6	57	.03	13.0
354404078403101 WK-284 LAKE WHEELER RS MW-3S (REGOLITH WELL) (LAT 35 44 04N LONG 078 40 31W)													
DEC 2003	1000	7.3	5.3	110	17.1	15	1.42	2.67	2.09	11.7	2	.04	12.3
354404078403102 WK-285 LAKE WHEELER RS MW-3I (TRANSITION ZONE WELL (LAT 35 44 05N LONG 078 40 31W)													
DEC 2003	1045	7.1	6.4	64	16.9	15	4.11	1.20	1.96	7.42	19	.03	3.71
354404078403103 WK-286 LAKE WHEELER RS MW-3D (BEDROCK WELL) (LAT 35 44 05N LONG 078 40 31W)													
DEC 2003	1615	5.9	7.6	154	17.2	55	18.5	2.05	2.62	11.0	62	.02	3.30
DEC 2003	1345	.9	8.5	180	17.2	67	23.6	1.96	2.78	12.9	66	.03	3.26
354401078403401 WK-287 LAKE WHEELER RS PW-1 (LAT 35 44 01N LONG 078 40 34W)													
JAN 2004	1225	5.2	6.8	138	16.7	37	11.4	2.11	2.14	10.4	39	.03	6.21
JAN 2004	1300	M	8.3	192	14.9	76	24.8	3.29	2.19	10.1	85	.02	2.83

MISCELLANEOUS STATION ANALYSES—Continued

Date	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue on evap. at 180degC wat flt mg/L (70300)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Arsenic water, fltrd, ug/L (01000)	Boron, water, fltrd, ug/L (01020)	Iron, water, fltrd, ug/L (01046)	Mangan- ese, water, fltrd, ug/L (01056)
354356078403504 WK-279A LAKE WHEELER RS MW-1DUZ (LAT 35 43 56N LONG 078 40 34W)											
DEC 2003 03...	20.2	19.1	274	27.1	4.79	.023	.008	<2	E6.4	209	3,510
354356078403505 WK-279B LAKE WHEELER RS MW-1DLZ (LAT 35 43 56N LONG 078 40 34W)											
DEC 2003 09...	21.1	261	495	E.03	<.06	<.008	<.006	<2	59	13	48.4
354359078403101 WK-280 LAKE WHEELER MW-2S (REGOLITH WELL) (LAT 35 44 00N LONG 078 40 31W)											
JAN 2004 13...	18.1	E.1	185	<.04	23.8	<.008	<.006	<2	<7.0	E4	17.7
354359078403103 WK-282 LAKE WHEELER RS MW-2T (TRANSITION ZONE WELL) (LAT 35 43 59N LONG 078 40 32W)											
JAN 2004 13...	30.3	.4	165	<.04	15.1	<.008	.035	<2	<7.0	<6	6.3
354404078403101 WK-284 LAKE WHEELER RS MW-3S (REGOLITH WELL) (LAT 35 44 04N LONG 078 40 31W)											
DEC 2003 22...	9.72	.4	64	<.04	5.60	<.008	<.006	<2	E5.2	<6	35.5
354404078403102 WK-285 LAKE WHEELER RS MW-3I (TRANSITION ZONE WELL) (LAT 35 44 05N LONG 078 40 31W)											
DEC 2003 19...	26.9	2.0	32	<.04	2.23	<.008	.022	<2	E5.5	<6	24.3
354404078403103 WK-286 LAKE WHEELER RS MW-3D (BEDROCK WELL) (LAT 35 44 05N LONG 078 40 31W)											
DEC 2003 11...	33.8	5.4	120	<.04	1.65	<.008	.054	E1	11	7	1.2
15...	30.4	13.9	131	<.04	1.28	.137	.025	E1	13	E6	4.5
354401078403401 WK-287 LAKE WHEELER RS PW-1 (LAT 35 44 01N LONG 078 40 34W)											
JAN 2004 07...	34.1	1.6	107	<.04	4.32	<.008	.026	<2	E5.1	41	25.7
08...	27.1	6.5	122	<.04	<.06	<.008	<.007	<2	12	65	88.5

Remark codes used in this table:

- < -- Less than
- E -- Estimated value
- M-- Presence verified, not quantified

WATER QUALITY DATA  
MISCELLANEOUS STATION ANALYSES

Ground-water-quality data presented in these tables were collected from the following sites in Rockingham County during the 2004 water year for the ongoing Piedmont/Mountains ground-water study in cooperation with the North Carolina Department of Environment and Natural Resources, Division of Water Quality, Groundwater Section. Well locations for these sites listed in the following table are shown in figure 6.

Date	Time	Dis- solved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	Specif. conduc- tance, wat unf uS/cm 25 degC (00095)	Temper- ature, water, deg C (00010)	Hard- ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes- ium, water, fltrd, mg/L (00925)	Potas- sium, water, fltrd, mg/L (00935)	Sodium, water, fltrd, mg/L (00930)	ANC, wat unf incrm. titr., field, mg/L as CaCO3 (00419)	Bromide water, fltrd, mg/L (71870)	Chlor- ide, water, fltrd, mg/L (00940)	
362334079421601 RK-227 UPPER PIEDMONT RS MW-N1S (LAT 36 23 35N LONG 079 42 17W)														
APR 2004	07...	1135	.6	6.0	121	14.5	53	9.46	7.16	.86	4.60	38	E.01	3.57
362334079421602 RK-228 UPPER PIEDMONT RS MW-N1I (LAT 36 23 35N LONG 079 42 17W)														
APR 2004	21...	1510	2.4	6.5	215	16.5	65	14.2	7.20	1.54	19.4	84	.04	9.45
362334079421603 RK-229 UPPER PIEDMONT RS MW-N1D (LAT 36 23 35N LONG 079 42 17W)														
APR 2004	19...	1730	.1	8.1	251	17.7	95	29.2	5.35	.80	17.8	121	.02	3.21
	20...	1055	.1	8.1	250	16.0	94	28.9	5.30	.80	17.8	115	.02	3.60
362331079421601 RK-230 UPPER PIEDMONT RS MW-N2S (LAT 36 23 32N LONG 079 42 17W)														
APR 2004	06...	1720	.1	5.9	80	11.7	21	4.96	2.09	2.82	5.60	20	.03	4.54
362331079421602 RK-231 UPPER PIEDMONT RS MW-N2I (LAT 36 23 32N LONG 079 42 16W)														
APR 2004	06...	1505	.6	6.7	185	14.3	82	20.1	7.67	1.76	7.46	88	.02	4.16
362331079421603 RK-232 UPPER PIEDMONT RS MW-N2D (LAT 36 23 32N LONG 079 42 17W)														
MAR 2004	29...	1720	.2	6.9	241	14.3	110	29.1	8.17	1.84	7.86	111	.05	4.86
	30...	1045	.1	7.8	218	13.7	82	26.3	3.95	.92	15.8	94	E.01	2.47
	30...	1340	M	7.4	277	14.2	110	35.2	5.99	1.50	12.5	131	.05	3.67
362328079421701 RK-233 UPPER PIEDMONT RS MW-N3I (LAT 36 23 28N LONG 079 42 17W)														
APR 2004	29...	0905	1.6	6.6	462	13.1	120	25.1	14.1	4.98	28.8	143	.07	7.83
362328079421702 RK-234 UPPER PIEDMONT RS MW-N3D (LAT 36 23 28N LONG 079 42 17W)														
APR 2004	28...	1630	M	7.9	198	15.0	80	23.0	5.44	1.98	9.43	84	.03	3.04
362323079421201 RK-235 UPPER PIEDMONT RS MW-N4I (LAT 36 23 23N LONG 079 42 13W)														
APR 2004	15...	1355	9.2	5.5	161	16.7	41	9.04	4.59	4.95	7.49	7	.03	12.0
362323079421202 RK-236 UPPER PIEDMONT RS MW-N4D (LAT 36 23 23N LONG 079 42 13W)														
MAR 2004	24...	1305	5.6	6.3	178	16.1	43	7.11	6.18	.79	15.1	30	.07	11.7
362240079411801 RK-237 UPPER PIEDMONT RS MW-S1I (LAT 36 22 41N LONG 079 41 19W)														
FEB 2004	25...	1045	7.7	5.9	183	16.2	51	12.2	5.01	1.63	12.5	17	.02	10.5
362240079411802 RK-238 UPPER PIEDMONT RS MW-S1D (LAT 36 22 41N LONG 079 41 19W)														
MAR 2004	23...	1330	.1	7.9	311	15.8	120	32.7	9.52	4.44	13.7	84	.07	24.8

## MISCELLANEOUS STATION ANALYSES—Continued

Date	Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue on evap. at 180degC wat flt mg/L (70300)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Arsenic water, fltrd, ug/L (01000)	Boron, water, fltrd, ug/L (01020)	Iron, water, fltrd, ug/L (01046)	Mangan- ese, water, fltrd, ug/L (01056)
	362334079421601 RK-227 UPPER PIEDMONT RS MW-N1S (LAT 36 23 35N LONG 079 42 17W)										
APR 2004 07...	28.9	14.9	101	<.04	.06	<.008	.015	<2	<7.0	20	22.4
	362334079421602 RK-228 UPPER PIEDMONT RS MW-N1I (LAT 36 23 35N LONG 079 42 17W)										
APR 2004 21...	36.4	4.0	151	<.04	2.15	E.007	.033	<2	E4.8	E4	47.3
	362334079421603 RK-229 UPPER PIEDMONT RS MW-N1D (LAT 36 23 35N LONG 079 42 17W)										
APR 2004 19...	21.0	6.3	157	<.04	<.06	<.008	E.003	18	11	11	16.7
20...	20.9	6.3	152	<.04	<.06	.008	<.006	24	12	E5	9.6
	362331079421601 RK-230 UPPER PIEDMONT RS MW-N2S (LAT 36 23 32N LONG 079 42 17W)										
APR 2004 06...	18.0	8.7	62	<.04	E.04	<.008	<.006	<2	8.8	1,460	228
	362331079421602 RK-231 UPPER PIEDMONT RS MW-N2I (LAT 36 23 32N LONG 079 42 16W)										
APR 2004 06...	31.3	2.3	130	<.04	.07	<.008	.010	E1	<7.0	E4	1.2
	362331079421603 RK-232 UPPER PIEDMONT RS MW-N2D (LAT 36 23 32N LONG 079 42 17W)										
MAR 2004 29...	27.1	4.0	162	E.03	<.06	<.008	<.006	<2	E4.3	211	656
30...	18.1	7.8	146	<.04	<.06	<.008	<.006	4	12	66	298
30...	23.0	4.3	173	<.04	<.06	<.008	<.006	4	9.9	442	644
	362328079421701 RK-233 UPPER PIEDMONT RS MW-N3I (LAT 36 23 28N LONG 079 42 17W)										
APR 2004 29...	24.7	35.3	259	1.25	.28	.037	<.006	<2	28	4,080	2,760
	362328079421702 RK-234 UPPER PIEDMONT RS MW-N3D (LAT 36 23 28N LONG 079 42 17W)										
APR 2004 28...	28.1	9.3	136	<.04	E.04	<.008	<.006	8	E4.0	<6	153
	362323079421201 RK-235 UPPER PIEDMONT RS MW-N4I (LAT 36 23 23N LONG 079 42 13W)										
APR 2004 15...	28.0	11.1	134	<.04	8.00	<.008	<.006	<2	E7.0	9	199
	362323079421202 RK-236 UPPER PIEDMONT RS MW-N4D (LAT 36 23 23N LONG 079 42 13W)										
MAR 2004 24...	41.7	4.7	152	<.04	7.79	<.008	E.005	<2	<7.0	8	8.8
	362240079411801 RK-237 UPPER PIEDMONT RS MW-S1I (LAT 36 22 41N LONG 079 41 19W)										
FEB 2004 25...	32.7	16.1	143	<.04	8.04	<.008	<.006	<2	E6.0	10	20.6
	362240079411802 RK-238 UPPER PIEDMONT RS MW-S1D (LAT 36 22 41N LONG 079 41 19W)										
MAR 2004 23...	28.0	20.4	201	<.04	E.04	<.008	<.006	<2	9.8	76	230

## WATER QUALITY DATA

## MISCELLANEOUS STATION ANALYSES—Continued

Date	Time	Dis- solved oxygen, mg/L (00300)	pH, water, unfltrd field, std units (00400)	Specif. conduc- tance, wat unf uS/cm 25 degC (00095)	Temper- ature, water, deg C (00010)	Hard- ness, water, mg/L as CaCO3 (00900)	Calcium water, fltrd, mg/L (00915)	Magnes- ium, water, fltrd, mg/L (00925)	Potas- sium, water, fltrd, mg/L (00935)	Sodium, water, fltrd, mg/L (00930)	ANC, wat unf incrm. titr., field, mg/L as CaCO3 (00419)	Bromide water, fltrd, mg/L (71870)	Chlor- ide, water, fltrd, mg/L (00940)	
362231079410801 RK-239 UPPER PIEDMONT RS MW-S3S (LAT 36 22 31N LONG 079 41 08W)														
FEB 2004	25...	1455	6.6	5.8	145	15.4	25	6.50	2.07	2.24	18.3	18	.02	7.37
362231079310803 RK-241 UPPER PIEDMONT RS MW-S3LI (LAT 36 22 32N LONG 079 41 08W)														
MAR 2004	10...	1600	7.5	6.2	127	15.7	27	6.79	2.53	1.22	13.1	22	.02	5.98
362231079310804 RK-242 UPPER PIEDMONT RS MW-S3D (LAT 36 22 32N LONG 079 41 08W)														
MAR 2004	11...	1615	7.0	6.5	159	16.0	45	10.7	4.52	.88	13.0	31	.02	5.69
	15...	1510	2.8	7.0	227	15.9	77	21.6	5.61	.78	11.8	70	.03	5.96
	16...	1545	.6	7.6	260	15.5	99	30.8	5.44	1.17	12.3	86	.02	5.75
	17...	1140	.3	7.7	258	15.6	97	30.1	5.28	1.20	12.6	85	.02	5.44
Date		Silica, water, fltrd, mg/L (00955)	Sulfate water, fltrd, mg/L (00945)	Residue on evap. at 180degC wat flt mg/L (70300)	Ammonia water, fltrd, mg/L as N (00608)	Nitrite + nitrate water fltrd, mg/L as N (00631)	Nitrite water, fltrd, mg/L as N (00613)	Ortho- phos- phate, water, fltrd, mg/L as P (00671)	Arsenic water, fltrd, ug/L (01000)	Boron, water, fltrd, ug/L (01020)	Iron, water, fltrd, ug/L (01046)	Mangan- ese, water, fltrd, ug/L (01056)		
362231079410801 RK-239 UPPER PIEDMONT RS MW-S3S (LAT 36 22 31N LONG 079 41 08W)														
FEB 2004	25...	38.0	1.2	127	<.04	8.75	<.008	E.003	<2	8.3	<6	4.3		
362231079310803 RK-241 UPPER PIEDMONT RS MW-S3LI (LAT 36 22 32N LONG 079 41 08W)														
MAR 2004	10...	43.9	.2	122	<.04	7.83	<.008	.019	<2	E5.0	21	45.6		
362231079310804 RK-242 UPPER PIEDMONT RS MW-S3D (LAT 36 22 32N LONG 079 41 08W)														
MAR 2004	11...	44.5	1.4	142	<.04	9.46	<.008	.041	<2	<7.0	9	1.1		
	15...	36.1	4.8	174	<.04	8.17	.067	.013	<2	E3.5	13	16.9		
	16...	33.9	3.5	187	<.04	8.16	.373	.007	<2	E3.7	11	24.9		
	17...	32.8	3.7	180	<.04	7.71	.785	.007	<2	E4.5	9	18.5		

Remark codes used in this table:

&lt; -- Less than

E -- Estimated value

M-- Presence verified, not quantified

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## Conversion Factors

Multiply	By	To obtain
Length		
inch (in.)	$2.54 \times 10^1$	millimeter (mm)
	$2.54 \times 10^{-2}$	meter (m)
foot (ft)	$3.048 \times 10^{-1}$	meter (m)
mile (mi)	$1.609 \times 10^0$	kilometer (km)
Area		
acre	$4.047 \times 10^3$	square meter (m <sup>2</sup> )
	$4.047 \times 10^{-1}$	square hectometer (hm <sup>2</sup> )
	$4.047 \times 10^{-3}$	square kilometer (km <sup>2</sup> )
square mile (mi <sup>2</sup> )	$2.590 \times 10^0$	square kilometer (km <sup>2</sup> )
Volume		
gallon (gal)	$3.785 \times 10^0$	liter (L)
	$3.785 \times 10^{-3}$	cubic meter (m <sup>3</sup> )
	$3.785 \times 10^0$	cubic decimeter (dm <sup>3</sup> )
million gallons (Mgal)	$3.785 \times 10^3$	cubic meter (m <sup>3</sup> )
	$3.785 \times 10^{-3}$	cubic hectometer (hm <sup>3</sup> )
cubic foot (ft <sup>3</sup> )	$2.832 \times 10^{-2}$	cubic meter (m <sup>3</sup> )
	$2.832 \times 10^1$	cubic decimeter (dm <sup>3</sup> )
cubic-foot-per-second day [(ft <sup>3</sup> /s) d]	$2.447 \times 10^3$	cubic meter (m <sup>3</sup> )
	$2.447 \times 10^{-3}$	cubic hectometer (hm <sup>3</sup> )
acre-foot (acre-ft)	$1.233 \times 10^3$	cubic meter (m <sup>3</sup> )
	$1.233 \times 10^{-3}$	cubic hectometer (hm <sup>3</sup> )
	$1.233 \times 10^{-6}$	cubic kilometer (km <sup>3</sup> )
Flow		
cubic foot per second (ft <sup>3</sup> /s)	$2.832 \times 10^1$	liter per second (L/s)
	$2.832 \times 10^{-2}$	cubic meter per second (m <sup>3</sup> /s)
	$2.832 \times 10^1$	cubic decimeter per second (dm <sup>3</sup> /s)
gallon per minute (gal/min)	$6.309 \times 10^{-2}$	liter per second (L/s)
	$6.309 \times 10^{-5}$	cubic meter per second (m <sup>3</sup> /s)
	$6.309 \times 10^{-2}$	cubic decimeter per second (dm <sup>3</sup> /s)
million gallons per day (Mgal/d)	$4.381 \times 10^{-2}$	cubic meter per second (m <sup>3</sup> /s)
	$4.381 \times 10^1$	cubic decimeter per second (dm <sup>3</sup> /s)
Mass		
ton (short)	$9.072 \times 10^{-1}$	megagram (Mg) or metric ton

Temperature in degrees Celsius (°C) may be converted to degrees Fahrenheit (°F) as follows:

$$^{\circ}\text{F} = (1.8 \times ^{\circ}\text{C}) + 32$$

