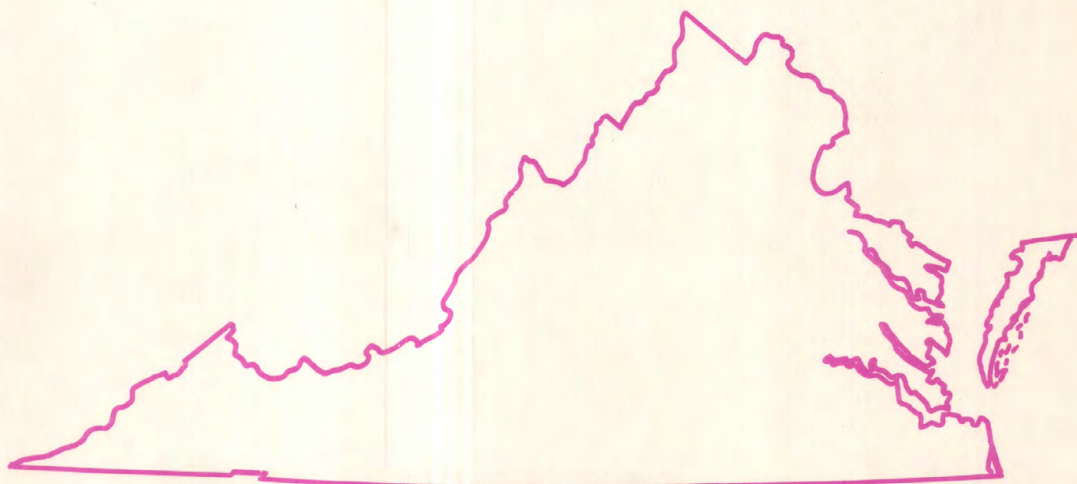
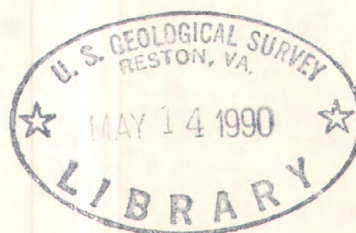


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Water Resources Data Virginia Water Year 1989



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT VA-89-1
Prepared in cooperation with the State of Virginia
and with other agencies

CALENDAR FOR WATER YEAR 1989

1988

OCTOBER

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Water Resources Data Virginia Water Year 1989

by Byron J. Prugh, Jr., Fred J. Easton, and Donna L. Belval



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT VA-89-1
Prepared in cooperation with the State of Virginia
and with other agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

MANUEL LUJAN, JR., Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

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Charlottesville, Virginia 22903

1990

PREFACE

The annual hydrologic data report of Virginia is one of a series of annual reports that document hydrologic data gathered from the U.S. Geological Survey's surface- and ground-water data-collection networks in each State, Puerto Rico, and the Trust Territories. These records of streamflow, ground-water levels, and quality of water provide the hydrologic information needed by State, local, and Federal agencies, and the private sector for developing and managing our Nation's land and water resources.

This report is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey and the Virginia Water Control Board 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 offices contributed significantly to the preparation and completion of this report:

U.S. Geological Survey, Richmond, VA
U.S. Geological Survey, Marion, VA
U.S. Geological Survey, Charlottesville, VA
Virginia Water Control Board, Charlottesville, VA

This report was prepared in cooperation with the State of Virginia and with other agencies under the general supervision of Herbert J. Freiburger, Chief of the Mid-Atlantic District, and Gary S. Anderson, Chief, Virginia Office.

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FOR WHICH RECORDS ARE PUBLISHED

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as designated by the Virginia Water Control Board]

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WATER RESOURCES DATA - VIRGINIA, 1989

INTRODUCTION

The Water Resources Division of the U.S. Geological Survey, in cooperation with State agencies, obtains a large amount of data pertaining to the water resources of Virginia each water year. These data, accumulated during many water years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make these data readily available to interested parties outside the Geological Survey, the data are published annually in this report series entitled "Water Resources Data - Virginia."

This report series includes records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels and water quality of ground-water wells. This volume contains records for water discharge at 168 gaging stations; stage only at 1 gaging station; stage and contents at 10 lakes and reservoirs; water quality at 47 gaging stations and 55 wells; and water levels at 337 observation wells. Also included are data for 93 crest-stage partial-record stations. Locations of these sites are shown on figures 7, 8, 9, 10, 11, and 12. Miscellaneous hydrologic data were collected at 63 measuring sites and 49 water-quality sampling sites not involved in the systematic data-collection program. The data in this report represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in Virginia.

This series of annual reports for Virginia began with the 1961 water year with a report that contained only data relating to the quantities of surface water. For the 1964 water year, a similar report was introduced that contained only data relating to water quality. Beginning with the 1975 water year, the report format was changed to present, in one volume, data on quantities of surface water, quality of surface and ground water, and ground-water levels.

Prior to introduction of this series and for several water years concurrent with it, water-resources data for Virginia were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "Surface-Water Supply of the United States, Parts 6A and 6B." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." The above mentioned Water-Supply Papers may be consulted in the libraries of the principal cities of the United States and may be purchased from U.S. Geological Survey, Books and Open-File Reports, Federal Center, Bldg. 41, Box 25425, Denver, CO 80225.

Publications similar to this report are published annually by the Geological Survey for all States. These official Survey reports have 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 volume is identified as "U.S. Geological Survey Water-Data Report VA-89-1." For archiving and general distribution, the reports for 1971-74 water years also are identified as water-data reports. These water-data reports are for sale in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161.

Additional information, including current prices, for ordering specific reports may be obtained from the Office Chief at the address given on the back of the title page or by telephone (804) 771-2427.

COOPERATION

The U.S. Geological Survey and agencies of the State of Virginia have had joint funding agreements for the collection of water-resource records since 1930. Organizations that assisted in collecting the data in this report through joint funding agreements with the Survey are:

Virginia Water Control Board, Richard N. Burton, executive director.
 Virginia Department of Transportation, Ray O. Pethtel, commissioner.
 Accomack County, Arthur K. Fisher, county administrator.
 Henrico County, Pat Brady, director of public utilities.
 James City County, David B. Norman, county administrator.
 Northampton County, R. Keith Bull, county administrator.
 York County, Daniel M. Stuck, county administrator.
 City of Alexandria, Vola Lawson, city manager.
 City of Newport News, C. C. Crowder, director, Department of Public Utilities.
 City of Roanoke, Kit B. Kiser, director, Utilities and Operations.
 City of Virginia Beach, Thomas M. Leahy, III, P.E., water resources engineer.
 City of Williamsburg, Frank Force, city manager.
 Mount Rogers Planning District Commission, Thomas G. Taylor, executive director.
 Northern Virginia Planning District Commission, G. Mark Gibb, executive director.
 Southeastern Virginia Planning District Commission, Arthur L. Collins, executive director.
 James City Service Authority, Chris Dawson, environmental engineer.
 Southeastern Public Service Authority, Durwood S. Curling, executive director.
 University of Virginia, Dr. James N. Galloway.
 Prince William Health District, Jared E. Florence, M.D., director.
 Rappahannock-Rapidan Planning District Commission, Richard B. Stroemple, executive director.

Assistance with funds or services was given by the U.S. Army Corps of Engineers in collecting records for 59 gaging stations and 4 water-quality stations throughout the State.

Under a cooperative agreement covering the Tennessee River basin, the Tennessee Valley Authority provided financial assistance for the operation of 5 gaging stations, the records for which are published herein. Assistance was also provided by the Water Quality Office, Environmental Protection Agency. Agencies that aided in collecting records are the Appalachian Power Company, Virginia Power, City of Danville, City of Radford, and Dan River, Inc.

Organizations that provided data are acknowledged in station descriptions.

RECORDS COLLECTED BY THE STATE OF VIRGINIA

In addition to data collected by the U.S. Geological Survey, there are included herein records for 79 gaging stations and 186 index wells operated by the Virginia Water Control Board. These records are published as provided and are acknowledged in the "COOPERATION" paragraph of each individual station. The Virginia Water Control Board is under the direction of Richard N. Burton, executive director. Published material for the gaging-station records and the ground-water wells is supplied, respectively, through the Division of Water Resources Planning and Management, William L. Woodfin, Jr., deputy executive director of operations.

SUMMARY OF HYDROLOGIC CONDITIONS

Surface Water

The 1989 water year in Virginia was characterized by a transition from predominantly below-average streamflows in the first half of the year to above-average flows during the second half of the year. More than 25 stream gages recorded new monthly high flows for the year while gages at 7 sites recorded new monthly low flows. New instantaneous peak flows were recorded at two sites.

Annual flows were mostly in the normal range. About 60 percent of the stream gages recorded above-average flows and 40 percent below-average flows. The below-average flows occurred in the Holston, New, upper Roanoke, Rappahannock, York, and lower Shenandoah River basins, while the above-average flows occurred in the James, Chowan, and lower Roanoke River basins. The greatest departure below normal was observed in the lower Shenandoah and upper Rappahannock River basins where flows were about 20 percent below normal. At the opposite extreme, annual flows in the Nottoway and Meherrin River basins in the southeastern corner of the State and in the Powell River and Russell Fork basins in the southwestern part of the State were about 25 percent above normal. Figure 1 compares the annual mean discharge for the 1989 water year with the annual mean discharges for the period of record at four streamflow gages representative of selected areas of the State.

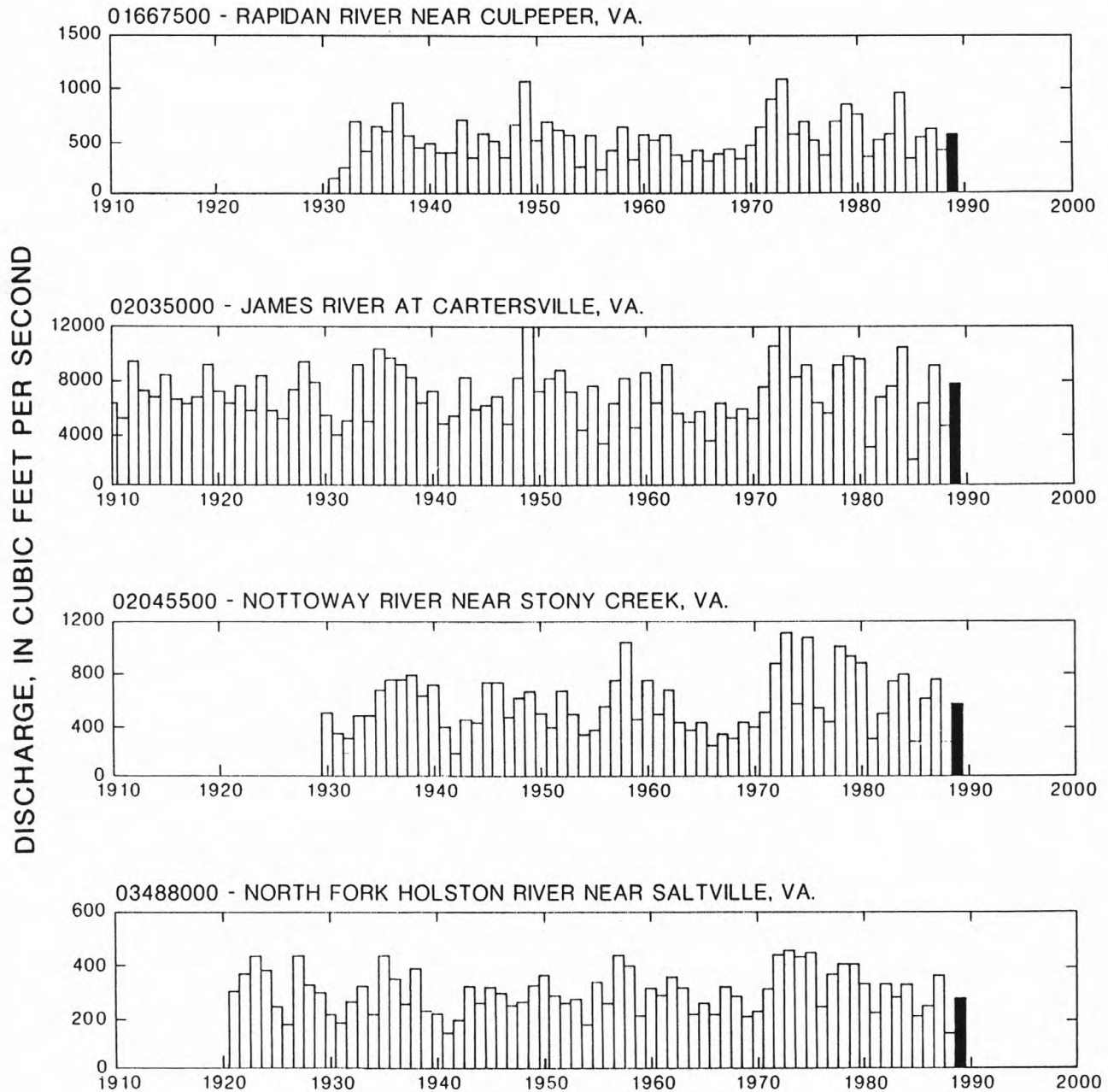


Figure 1.--Annual mean discharge at selected gaging stations.

Annual mean flow during 1989 water year at eight representative gaging stations

Gaging Station	Part of State	Annual mean flow for 1989, in cubic feet per second	Percentage of median annual flow	Length of record, in years
S.F. Shenandoah River near Strasburg, Va.	Northwestern	414	71	64
Rappahannock River near Fredericksburg, Va.	Northeastern	1,485	90	81
Slate River near Aronia, Va.	Central	247	111	63
James River at Buchanan, Va.	Western	2,880	121	91
N.F. Holston River near Saltville, Va.	Southwestern	270	92	70
Russell Fork at Haysi, Va.	Southwestern	401	123	63
Dan River at Danville, Va.	Southern	2,420	105	55
Nottoway River near Stony Creek, Va.	Southeastern	596	119	60

Figure 2 shows the monthly mean flows at four representative gaging stations during the 1989 water year and highlights the below-normal flow trend that occurred early in the year and the above-normal trend observed later in the year. Also visible are the period of high flows in southeastern Virginia streams (Nottoway River) in the spring, the Statewide high flows in May, and the unseasonably high flows in the southwestern part of the State (North Fork Holston River) in September as a result of runoff from Hurricane Hugo and other storms.

The 1989 water year began with a continuation of the record-low monthly flows observed in September. Statewide streamflows averaged 51 percent below normal for October. The annual minimum daily flows for most of the streams in the State also occurred during the month. Five gaging stations in the Tennessee and New River basins recorded new low monthly flows. On the New River at Glen Lyn, average monthly flow was the lowest for October since 1928.

Streamflows increased in November but averaged 27 percent below normal for the month. Streamflow in the North Fork Holston River continued below average for the 18th consecutive month. New low monthly flows were recorded at two stations in the Tennessee and New River basins. In contrast, streamflows in southeastern Virginia were above average for the first time in 4 months.

Average streamflows decreased to 64 percent below normal during December--the greatest departure from normal since the drought of 1981. New record-low monthly flows were again observed at gaging stations on the Middle Fork Holston River and on Glade Creek at Grahams Forge. Annual minimum daily flows for most streams in the New River basin were recorded during the month.

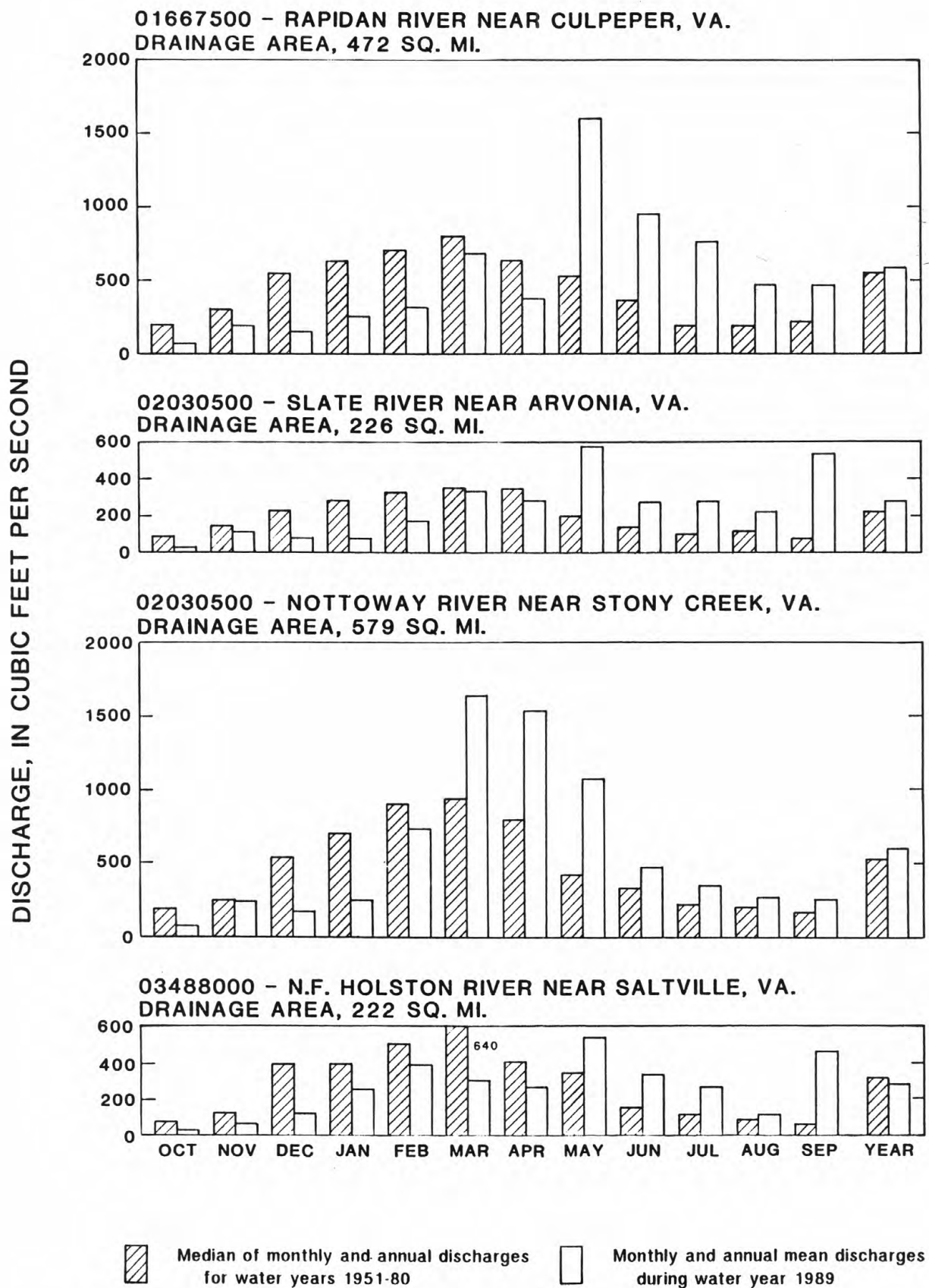


Figure 2.--Monthly and annual mean discharge during 1989 water year compared with median of monthly and annual mean discharge for 1951-80 at four representative streamflow-gaging stations.

Streamflows increased during January but continued below normal across most of the State. Average flows were 55 percent below normal. In the North Fork Holston River, flows were below average for the 20th consecutive month. New monthly low flows were recorded in two streams in the New River basin. The greatest departure from normal conditions continued to be in the southern and southwestern areas of the State.

Streamflows rose again in February but remained below normal over most of the State, averaging 44 percent below normal for the month. Flows in many streams in the James, Roanoke, and Tennessee River basins were the lowest for February since the last major drought in 1981. New low monthly flows were again recorded on Glade Creek and Chestnut Creek in the New River basin and in the Rappahannock River at Remington. In sharp contrast, the Blackwater and Nottoway Rivers in southeastern Virginia were near bankfull at monthend as a result of runoff from two major snowstorms and other precipitation events.

Streamflows increased during March and averaged 6 percent above normal for the month. This was only the second time in 14 months that monthly streamflows were above normal. Strong contrasts in flow conditions were observed across the State. Gages on many streams in Tidewater and on the Eastern Shore recorded monthly flows in the upper 25 percent of historical flows for the month, while streamflows in the Tennessee and New River basins remained below normal. A new record-high monthly flow was recorded in the Blackwater River near Franklin, breaking the previous record set in 1975. Gages on two streams in the upper Potomac River basin at the extreme northern tip of the State reached annual maximum flows during the month.

Streamflows decreased in April, but the dichotomy in flow conditions--above normal in southeastern Virginia and below normal in the Tennessee and New River basins--continued. The extremes in flow conditions almost balanced, and Statewide streamflows averaged only 7 percent below normal for the month. Two new monthly low-flow records were again recorded on Glade and Chestnut Creeks in the New River basin, while a new monthly high flow was recorded in the Blackwater River near Franklin. The period of record on Chestnut Creek and the Blackwater River dates from 1944. Annual maximum flows were observed at stream gages along the Blackwater River and along the western side of Chesapeake Bay.

Streamflows increased dramatically during May, and flows in most streams in the State, except those immediately in or adjacent to the New River basin, reached their annual maximums during the month. The Statewide average of streamflows for the month was 196 percent above normal--the largest departure from normal since September 1987. Gages on two streams in the upper James River basin--Johns Creek at New Castle and Dunlap Creek near Covington (with more than 60 years of prior data collection)--recorded new records for monthly high flows. Two significant storms occurred early in the month that produced major amounts of runoff. The larger of the two, on May 6-7, resulted in peaks with a recurrence interval of less than 2 years on most gaged streams. Peaks locally were more severe, especially in the central and northern piedmont where a new maximum peak for the period of record (1951-89) at the stream gage on the South Fork Quantico Creek near Independent Hill had a recurrence interval of 60 years. The corresponding peak at the nearby gage on Accotink Creek near Annandale had a 30-year recurrence interval.

Streamflows declined during June but continued above normal over most of the State. No new records were established, but flows were the highest for June since 1982. The Statewide average of 104 percent of normal for streamflows had declined significantly from the previous month. By monthend, flows in most streams had declined to near normal.

Streamflows in July averaged 258 percent above normal, but in about half of the streams, declines in actual flows from the previous month were recorded. Flows in the Rappahannock and New River basins were the highest for July since 1949, while flows were the highest for the month in the upper James and Shenandoah River basins since the aftermath of Hurricane Agnes in 1972. July was the third consecutive month with above-average flows and the longest period of above-average flow since the spring of 1987. Two gaging stations in the Holston River and one in the New River basin recorded new monthly high flows in July. Gages at a number of streams in the York, lower Rappahannock, and Dan River basins recorded annual maximum flows during the month.

Streamflows generally declined during August but still averaged 123 percent above normal. No new extremes were recorded during the month. The greatest departure from normal streamflows was in the Shenandoah River basin where flows averaged nearly 4 times normal for August. There was severe flooding in the vicinity of Williamsburg in response to runoff from intense rainfall (12 inches in 24 hours) on August 17-18, but the areal extent of the flooding was limited. The peak at the nearest stream gage, 6 miles northwest of Williamsburg, had a recurrence interval of 10 years.

Streamflows increased everywhere in the State in September except in the Chowan River basin, and averaged 388 percent above normal for the month. September was the fifth consecutive month with above-average flows. This 5-month period was the longest consecutive period of above-average flow since 1985 (fig. 3).

The remnants of Hurricane Hugo passed over the southwestern part of the State on September 22. In addition to extensive wind damage, some localized flooding occurred around Roanoke and along the New River, but high-water conditions were not as severe as those observed with Hurricanes Juan in 1985, Agnes in 1972, or Camille in 1969. The recurrence interval of flood peaks on the main stem New River in Virginia, upstream from Claytor Lake, was about 35 years but only 10 years downstream. Flood peaks on smaller tributaries to the New River and in the upper Tennessee River basin had recurrence intervals of 2 to 20 years. New record-high monthly flows were observed at 27 gaging stations in the upper James, upper Roanoke, New, and upper Tennessee River basins.

At the end of September, streams in the southern part of the State were rising in response to runoff from heavy rains on September 30, but falling elsewhere.

In summary, the 1989 water year was a transitional period when streamflows terminated 3 years of predominately below-average conditions and began a period of predominantly above-average conditions. The above-average trend continued into the 1990 water year.

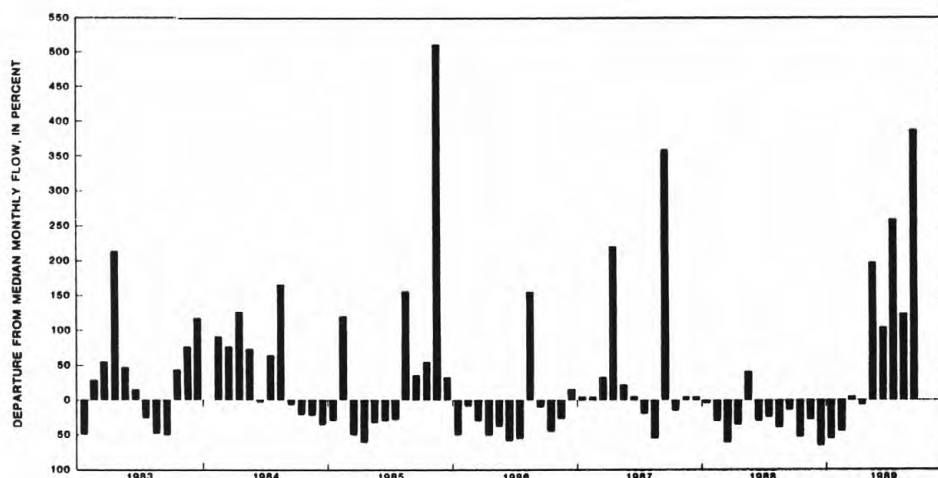


Figure 3.--Monthly departure of actual streamflow from median streamflow.

 New record-high monthly mean flows recorded at selected gaging stations in September 1989

Gaging Station	Basin	Monthly mean flow for September 1989, in cubic feet per second	Previous record		Length of record, in years
			Flow, in cubic feet per second	Year	
New River near Galax, Va	New	4,830	4,140	1945	60
Reed Creek at Grahams Forge, Va	New	488	374	1928	70
Big Reed Island near Allisonia, Va.	New	970	868	1979	58
New River at Allisonia, Va.	New	8,450	6,480	1979	60
Little River at Graysonton, Va	New	988	939	1979	61
Wolf Creek near Narrows, Va.	New	576	248	1945	59
Bluestone River near Falls Mills, Va.	Kanawha	113	26.2	1986	9
Russell Fork at Haysi, Va.	Big Sandy	608	345	1966	63
S.F. Holston River near Chilhowie, Va	Tennessee	254	216	1928	58
M.F. Holston River near Meadowview, Va.	Tennessee	357	173	1979	35
N.F. Holston River near Saltville, Va.	Tennessee	474	458	1924	70
Clinch River at Cleveland, Va.	Tennessee	1,003	919	1924	69
Johns Creek at New Castle, Va.	James	353	242	1979	63
Roanoke River at Lafayette, Va.	Roanoke	570	529	1979	46

Peak discharges at selected gaging stations resulting from runoff from Hurricane Hugo

Gaging Station	Basin	Drainage area, in square miles	Peak flow, in cubic feet per second	Recurrence frequency, in years
Roanoke River at Roanoke, Va.	Roanoke	395	11,800	5
New River near Galax, Va.	New	1,131	54,000	33
Cripple Creek at Cedar Springs, Va.	New	11.3	870	12
Chestnut Creek near Galax, Va.	New	39.4	4,190	5
New River at Allisonia, Va.	New	2,202	98,910	38
Little River near Graysonton, Va.	New	300	15,400	20
New River at Radford, Va.*	New	2,748	92,300	10
New River at Glen Lyn, Va.*	New	3,768	102,200	12
Russell Fork at Haysi, Va.	Big Sandy	286	5,600	<2
S.F. Holston River near Damascus, Va.	Tennessee	301	7,375	2
M.F. Holston River at Seven Mile Ford, Va.	Tennessee	132	4,860	4
N.F. Holston River near Saltville, Va.	Tennessee	222	4,830	<2

* Flows regulated by Claytor Lake Dam.

Ground Water

Ground-water levels were below normal in the shallow water-table aquifers across most of the State at the beginning of the water year. The exceptions were in the extreme southwestern and extreme northern parts of the State where levels in observation wells in Buchanan County, the city of Christiansburg, and at Leesburg in Loudoun County were above normal. The below-normal conditions continued until March when recharge from heavy rains on the southeastern Piedmont and Coastal Plain resulted in above-normal levels in these areas (fig. 4, Brinkley well).

From May through September, rainfall was well above average in Virginia, and progressively larger numbers of observation wells in the State registered above-normal ground-water levels. By August, levels in observation wells were below normal only in the Shenandoah Valley. Recharge from very heavy rains associated with Hurricane Hugo in September led to record-breaking levels in the southwestern quadrant of the State. At the end of the water year, the water-table aquifers averaged several feet above normal and were continuing to rise in an unseasonal manner (fig. 4).

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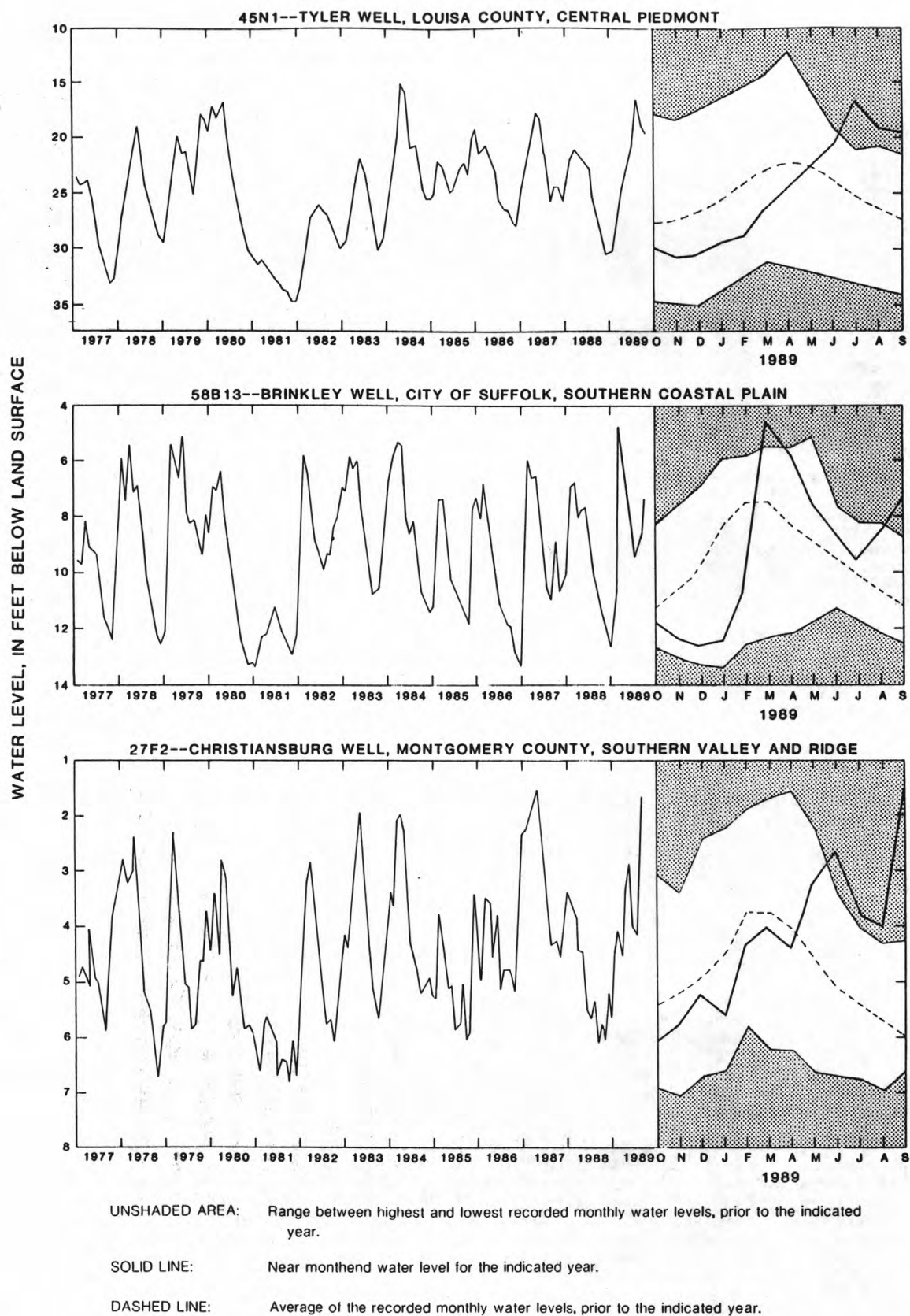


Figure 4.--Monthly ground-water levels at key observation wells.

Water Quality

The median concentration of total phosphorus (P) at the 10 National Stream Quality Accounting Network (NASQAN) stations in Virginia from regularly scheduled sampling was 0.05 mg/L (milligrams per liter) in water year 1989. The median concentration of dissolved orthophosphorus was 0.015 mg/L. The highest median concentrations of total phosphorus and dissolved orthophosphorus were 0.27 and 0.18 mg/L, respectively, in the James River at Cartersville. The high total phosphorus concentration in the James River appears to be related, at least partly, to recent changes in point-source discharges and (or) agricultural activities in the basin. As seen in figure 5, and verified with a flow-adjusted Kendall test, total phosphorus concentration in the James River at Cartersville has increased about sixfold since 1974.

The median concentration of total nitrogen (N) at the 10 NASQAN stations was 0.7 mg/L in water year 1989. The highest median concentration, 1.2 mg/L, was found in the New River at Glen Lyn. A high concentration of 2.16 mg/L total nitrogen (N) was measured on March 25 on the Rappahannock River near Fredericksburg during an unscheduled peak-flow sampling. The lowest median concentration, 0.43 mg/L, was found in the Appomattox River at Matoaca. The median concentration of dissolved nitrate (N) in the New River at Glen Lyn was 0.74 mg/L. This concentration accounted for nearly 60 percent of the total nitrogen in the river.

Dissolved-oxygen concentrations measured during routine sampling at NASQAN stations in water year 1989 averaged 89 percent of saturation while the mean concentration was 9.3 mg/L. Of the 56 dissolved-oxygen measurements made during NASQAN sampling throughout the year, only one value below 5.0 mg/L was recorded. On August 16, a dissolved-oxygen concentration of 4.7 mg/L was recorded in the Blackwater River near Franklin.

The concentrations of trace elements, including arsenic, barium, cadmium, chromium, lead, mercury, silver, and selenium, collected from NASQAN sampling were well below the U.S. Environmental Protection Agency (USEPA) regulations for safe drinking water. In most cases, concentrations were less than one-tenth of the established regulation. However, concentrations of dissolved iron and dissolved manganese reached relatively high concentrations at three of the stations. Dissolved-iron concentrations greater than 1,000 ug/L (micrograms per liter) were measured on May 18 in the Blackwater River near Franklin, and on May 19 in the Nottoway River near Sebrell. A dissolved-manganese concentration greater than 100 ug/L was measured on August 22 in the Meherrin River at Emporia. Although these concentrations of iron and manganese in water exceed USEPA secondary drinking-water regulations, they are not a threat to human health; however, they can produce an objectionable taste and stain laundered clothing.

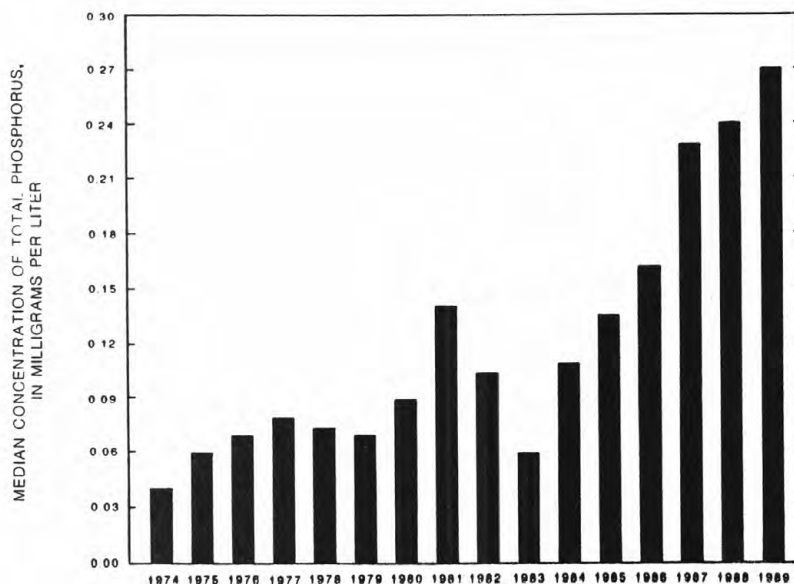


Figure 5.--Annual median concentration of total phosphorus for 1974-89 in James River at Cartersville, Va.

The median counts of fecal coliform and fecal streptococcal bacteria at the 10 NASQAN stations were 55 and 56 col/100 mL (colonies per 100 milliliters), respectively. The Dan River at Paces had the highest median count of fecal coliform and fecal streptococcal bacteria--222 and 790 col/100 mL, respectively. On June 13, during a high peak flow on the Dan River at Paces, the count of fecal coliform bacteria was 20,000 col/100 mL, and the count of fecal streptococcal bacteria was 15,000 col/100 mL. The lowest median count of fecal coliform bacteria, 15 col/100 mL, was found at the station on the Appomattox River at Matoaca, whereas the lowest median count of fecal streptococcal bacteria during the 1989 water year, 21 col/100 mL, was found in the James River at Cartersville.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Bench-Mark Network is a network of 57 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the activities of man.

National Stream-Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in natural or regional water-quality planning and management. The 500 or so sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objectives of NASQAN are (1) to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting such that the data may be used for, (2) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (3) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) providing a nationally consistent data base useful for water-quality assessment and hydrologic research.

The National Trends Network (NTN) is a 150-station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

Radiochemical Program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Tritium Network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

EXPLANATION OF THE RECORDS

The surface-water, quality-of-water, and ground-water records published in this report are for the 1989 water year that began October 1, 1988, and ended September 30, 1989. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, water-quality data for surface and ground water, and ground-water-level data. The locations of the stations and wells where the data were collected are shown in figures 6, 7, 8, 9, 10, 11, and 12. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

Station Identification Numbers

Each data station, whether streamsite or well, in this report is assigned a unique identification number. This number is unique in that it applies specifically to a given station and to no other. The number usually is assigned when a station is first established and is retained for that station indefinitely. The systems used by the U.S. Geological Survey to assign identification numbers for surface-water stations and for ground-water well sites differ, but both are based on geographic location. The "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is used for wells and, in Virginia, for surface-water stations where only miscellaneous measurements are made.

Downstream Order System

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

The station-identification number is assigned according to downstream order. In assigning station numbers, 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 made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete eight-digit number for each station, such as 02027500, which appears just to the left of the station name, includes the two-digit Part number "02" plus the six-digit downstream-order number "027500." The Part number designates the major river basin; for example, Part "02" is the James River basin.

Latitude-Longitude System

The identification numbers for wells and miscellaneous surface-water sites are assigned according to the grid system of latitude and longitude. The number consists of 15 digits. The first six digits denote the degrees, minutes, and seconds of latitude, the next seven digits denote degrees, minutes, and seconds of longitude, and the last two digits (assigned sequentially) identify the wells or other sites within a 1-second grid. This site-identification number, once assigned, is a pure number and has no locational significance. In the rare instance where the initial determination of latitude and longitude are found to be in error, the station will retain its initial identification number; however, its true latitude and longitude will be listed in the LOCATION paragraph of the station description.

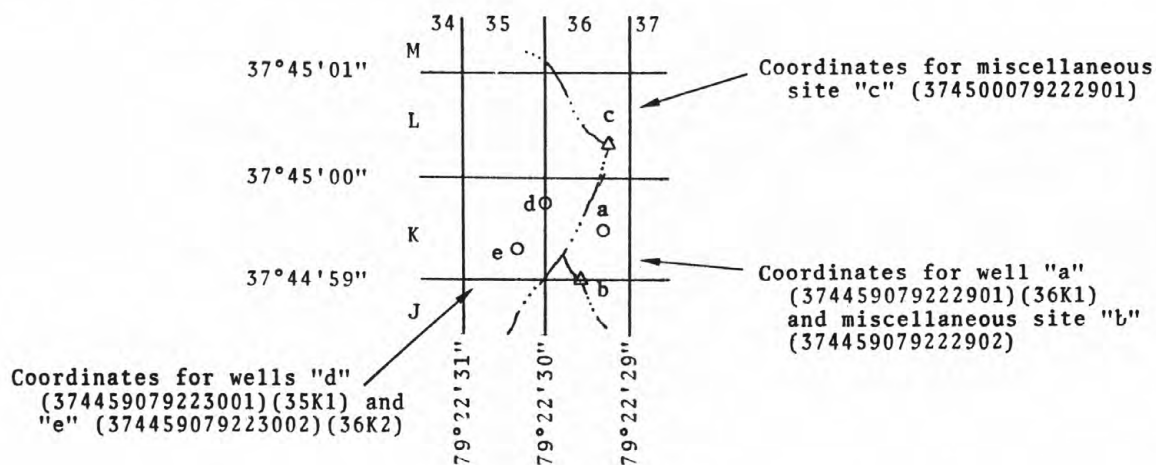


Figure 6. System for numbering wells and miscellaneous sites

A second well-numbering system used in Virginia utilizes 7 1/2-minute quadrangles within the State. The quadrangles are numbered from west to east, and lettered from south to north, omitting the letters "I" and "O." The designation for each quadrangle is determined by the method "Read Right, Up." Wells are numbered serially within each quadrangle. This local well number is shown immediately after the primary well number.

Well records furnished by the State of Virginia also include the well number that is based on an indexing system used by the Virginia Water Control Board.

Records of Stage and Water Discharge

Records of stage and water discharge may be complete or partial. Complete records of discharge are those obtained using a continuous stage-recording device through which either instantaneous or mean daily discharges may be computed for any time, or any period of time, during the period of record. Complete records of lake or reservoir content, similarly, are those for which stage or content may be computed or estimated with reasonable accuracy for any time, or period of time. They may be obtained using a continuous stage-recording device, but need not be. Because daily mean discharges and end-of-day contents commonly are published for such stations, they are referred to as "daily stations."

By contrast, partial records are obtained through discrete measurements without using a continuous stage-recording device, and pertain only to a few flow characteristics, or perhaps only one. The nature of the partial record is indicated by table titles such as "Crest-stage partial records," or "Low-flow partial records." Records of miscellaneous discharge measurements or of measurements from special studies, such as low-flow seepage studies, may be considered as partial records, but they are presented separately in this report. Location of all complete-record and crest-stage partial-record stations for which data are given in this report are shown in figures 7 and 8.

Data Collection and Computation

The data obtained at a complete-record gaging station on a stream or canal consist of a continuous record of stage, individual measurements of discharge throughout a range of stages, and notations regarding factors that may affect the relationships between stage and discharge. These data, together with supplemental information, such as weather records, are used to compute daily discharges. The data obtained at a complete-record gaging station on a lake or reservoir consist of a record of stage and of notations regarding factors that may affect the relationship between stage and lake content. These data are used with stage-area and stage-capacity curves or tables to compute water-surface areas and lake storage.

Continuous records of stage are obtained with analog recorders that trace continuous graphs of stage or with digital recorders that punch stage values on paper tapes at selected time intervals. Measurements of discharge are made with current meters using methods adopted by the Geological Survey as a result of experience accumulated since 1880. These methods are described in standard textbooks, in Water-Supply Paper 2175, and in U.S. Geological Survey Techniques of Water-Resources Investigations, Book 3, Chapter A6.

In computing discharge records, results of individual measurements are plotted against the corresponding stages, and stage-discharge relation curves are then constructed. From these curves, rating tables indicating the approximate discharge for any stage within the range of the measurements are prepared. If it is necessary to define extremes of discharge outside the range of the current-meter measurements, the curves are extended using: (1) logarithmic plotting; (2) velocity-area studies; (3) results of indirect measurements of peak discharge, such as slope-area or contracted-opening measurements, and computations of flow over dams or weirs; or (4) step-backwater techniques.

Daily mean discharges are computed by applying the daily mean stages (gage heights) to the stage-discharge curves or tables. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on the individual discharge measurements and notes of the personnel making the measurements are applied to the gage heights before the discharges are determined from the curves or tables. This shifting-control method also is used if the stage-discharge relation is changed temporarily because of aquatic growth or debris on the control. For some stations, formation of ice in the winter may so obscure the stage-discharge relations that daily mean discharges must be estimated from other information such as temperature and precipitation records, notes of observations, and records for other stations in the same or nearby basins for comparable periods.

At some stream-gaging stations, the stage-discharge relation is affected by the backwater from reservoirs, tributary streams, or other sources. This 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 set at some distance from the base gage. At some stations the 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.

In computing records of lake or reservoir contents, it is necessary to have available from surveys, curves or tables defining the relationship of stage and content. The application of stage to the stage-content curves or tables gives the contents from which daily, monthly, or yearly changes then are determined. If the stage-content relationship changes because of deposition of sediment in a lake or reservoir, periodic resurveys may be necessary to redefine the relationship. Even when this is done, the contents computed may become increasingly in error as the lapsed time since the last survey increases. Discharges over lake or reservoir spillways are computed from stage-discharge relationships much as other stream discharges are computed.

For some gaging stations, there are periods when no gage-height record is obtained, or the recorded gage height is so faulty that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods, the daily discharges are estimated from the recorded range in stage, previous or following record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise, daily contents may be estimated from operator's logs, previous or following record, inflow-outflow studies, and other information. Information explaining how estimated daily-discharge values are identified in station records is included in the next two sections, "Data Presentation" (REMARKS paragraph) and "Identifying Estimated Daily Discharge."

Data Presentation

The records published for each gaging station consist of two parts, the manuscript or station description and the data table for the current water year. The manuscript provides, under various headings, descriptive information, such as station location; period of record; average discharge; historical extremes; 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 to follow clarify information presented under the various headings of the station description.

LOCATION.--Information on locations is obtained from the most accurate maps available. The location of the gage 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 indicates the period for which there are published records 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 records from it can reasonably be considered equivalent with records from the present station.

REVISED RECORDS.--Published records, because of new information, occasionally are found to be incorrect, and revisions are printed in later reports. Listed under this heading are all the reports in which revisions have been published for the station and the water years to which the revisions apply. If a revision did not include daily, monthly, or annual figures of discharge, that fact is noted after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" that only peak discharges were revised. If the drainage area has been revised, the report in which the most recently revised figure was first published is given.

GAGE.--The type of gage in current use, the datum of the current gage referred to National Geodetic Vertical Datum of 1929 (see glossary), 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 record will either be identified by date in this paragraph of the station description for water-discharge stations or flagged in the daily-discharge table. (See next section, "Identifying Estimated Daily Discharge.") If a remarks statement is used to identify estimated record, the paragraph will begin with this information presented as the first entry. The paragraph is also used to present information relative to the accuracy of the records, to special methods of computation, to conditions that affect natural flow at the station and, possibly, to other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir.

COOPERATION.--Records provided by a cooperating organization or obtained for the Geological Survey by a cooperating organization are identified here.

AVERAGE DISCHARGE.--The discharge value given is the arithmetic mean of the water-year mean discharges. It is computed only for stations having at least 5 water years of complete record, and only water years of complete record are included in the computation. It is not computed for stations where diversions, storage, or other water-use practices cause the value to be meaningless. If water developments significantly altering flow at a station are put into use after the station has been in operation for a period of years, a new average is computed as soon as 5 water years of record have accumulated following the development. The median of yearly mean discharges also is given under this heading for stations having 10 or more water years of record if the median differs from the average given by more than 10 percent.

EXTREMES FOR PERIOD OF RECORD.--Extremes may include maximum and minimum stages and maximum and minimum discharges or content. Unless otherwise qualified, the maximum discharge or content is the instantaneous maximum corresponding to the highest stage that occurred. The highest stage may have been obtained from a graphic or digital recorder, a crest-stage gage, or by direct observation of a nonrecording gage. If the maximum stage did not occur on the same day as the maximum discharge or content, it is given separately. Similarly, the minimum is the instantaneous minimum discharge, unless otherwise qualified, and was determined and is reported in the same manner as the maximum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Included here is information concerning 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 U.S. Geological Survey.

EXTREMES FOR CURRENT YEAR.--Extremes given here are similar to those for the period of record, except the peak discharge listing may include secondary peaks. For stations meeting certain criteria, all peak discharges and stages occurring during the water year and equal to or greater than a selected base discharge are presented under this heading. The peaks equal to or greater than the base discharge, excluding the highest one, are referred to as secondary peaks. Peak discharges are not published for canals, ditches, drains, or streams for which the peaks are subject to substantial control by man. The time of occurrence for peaks is expressed in 24-hour local standard time. For example, 12:30 a.m. is 0030, and 1:30 p.m. is 1330. The minimum for the current water year appears below the table of peak data.

REVISIONS.--If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscript published 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 offices whose addresses are given on the back of the title page of this report to determine if the published records were ever revised after the station was discontinued. Of course, if the data were obtained by computer retrieval, the data would be current and there would be no need to check because 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 skeleton stage-capacity table when daily contents are given.

The daily table for stream-gaging stations gives mean discharge for each day and is followed by monthly and yearly summaries. In the monthly summary below the daily table, the line headed "TOTAL" gives the sum of the daily figures. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX" and "MIN" give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also is usually 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"). Figures for cubic feet per second per square mile and runoff in inches are omitted if there is extensive regulation or diversion or if the drainage area includes large noncontributing areas. In the yearly summary below the monthly summary, the figures shown are the appropriate discharges for the calendar and water years. At some stations monthly and (or) yearly observed discharges are adjusted for reservoir storage or diversion, or diversions or reservoir contents are given. These figures are identified by a symbol and corresponding footnote.

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 is a table of annual maximum stage and discharge at crest-stage stations, and the second is a table of 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 generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some 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 either by flagging individual daily values with the letter symbol "e" and printing a table footnote, "e Estimated," or by listing the dates of the estimated record in the REMARKS paragraph of the station description.

Accuracy of the Records

The accuracy of streamflow records 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 measurements of stage, measurements of discharge, and interpretation of records.

The accuracy attributed to the records is indicated under "REMARKS." "Excellent" means that about 95 percent of the daily discharges are within 5 percent of their true values; "good," within 10 percent; and "fair," within 15 percent. Records that do not meet the criteria mentioned are rated "poor." Different accuracies may be attributed to different parts of a given record.

Daily mean discharges in this report are given to the nearest hundredth of a cubic foot per second for values less than 1 ft³/s; to the nearest tenth between 1.0 and 10 ft³/s; to whole numbers between 10 and 1,000 ft³/s; and to 3 significant figures for more than 1,000 ft³/s. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

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, figures 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 Records Available

Information used in the preparation of the records in this publication, such as discharge-measurement notes, gage-height records, temperature measurements, and rating tables is on file in the Virginia Office of the Mid-Atlantic District. Also, most of the daily mean discharges are in computer-readable form and have been analyzed statistically. Information on the availability of the unpublished information or on the results of statistical analyses of the published records may be obtained from the offices whose addresses are given on the back of the title page of this report.

Records of Surface-Water Quality

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because interpretation of records of surface-water quality nearly always requires corresponding discharge data. Records of surface-water quality in this report may 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 continuing-record station is a site where data are collected on a regularly scheduled basis. Frequency may be once 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 continuing or partial-record station where random 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 "continuing records", as used in this report, and "continuous recordings," which refers to a continuous graph or a series of discrete values punched at short intervals on a paper tape. 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. Locations of stations for which records on the quality of surface water appear in this report are shown in figure 7.

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 needs to be assuring that the data obtained represent the in situ quality of the water. To assure this, certain measurements, such as water temperature, pH, and dissolved oxygen, need to be made onsite when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures need to 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 onsite measurements and for collecting, treating, and shipping samples are given in publications on "Techniques of Water-Resources Investigations," Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4. All of these references are listed under "PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS" which appears at the end of the introductory text. Detailed information on collecting, treating, and shipping samples may be obtained from the Virginia Office of the Mid-Atlantic District.

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 through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load. All samples obtained for the National Stream Quality Accounting Network (see definitions) are obtained from at least several verticals. Whether samples are obtained from the centroid of flow or from several verticals depends on flow conditions and other factors which must be evaluated by the collector.

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, minimum, and mean values for each constituent measured and are based upon hourly punches beginning at 0100 hours and ending at 2400 hours for the day of record. More detailed records (hourly values) may be obtained from the Virginia Office of the Mid-Atlantic District whose address is given on the back of the title page of 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 Virginia Office of the Mid-Atlantic District.

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 sections.

During periods of rapidly changing flow or rapidly changing concentration, samples may have been 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 were collected periodically at many verticals in the stream cross section. Although data collected periodically may represent conditions only at the time of observations, 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

Sediment samples, samples for biochemical-oxygen demand (BOD), samples for indicator bacteria, and daily samples for specific conductance are analyzed locally. All other samples are analyzed in the Geological Survey laboratory in Arvada, Colorado. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chap. C1. Methods used by the Geological Survey laboratory are given in TWRI, Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4.

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, as appropriate, 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 under "Records of Stage and Water Discharge;" same comments apply.

DRAINAGE AREA.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

PERIOD OF RECORD.--This indicates the periods for which there are published water-quality records for the station. 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 Geological Survey by a cooperating organization are identified here.

EXTREMES.--Maximums and minimums are given only for parameters measured daily or more frequently. None are given for parameters measured weekly or less frequently, because the true maximums or minimums may not have been sampled. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.--If errors in published water-quality records are discovered after publication, appropriate updates are made to the Water-Quality File in the U.S. Geological Survey's computerized data system, WATSTORE, and subsequently by monthly transfer of update transactions to the U.S. Environmental Protection Agency's STORET system. Because the usual volume of updates makes it impractical to document individual changes in the State data-report series or elsewhere, potential users of U.S. Geological Survey water-quality data are encouraged to obtain all required data from the appropriate computer file to insure the most recent updates.

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 report:

PRINTED OUTPUT	REMARK
E	Estimated value
>	Actual value is known to be greater than the value shown
<	Actual value is known to be less than the value shown
K	Results based on colony count outside the acceptance range (non-ideal colony count)
L	Biological organism count less than 0.5 percent (organism may be observed rather than counted)
D	Biological organism count equal to or greater than 15 percent (dominant)
&	Biological organism estimated as dominant

Records of Ground-Water Levels

Only water-level data from a national network of observation wells are given in this report. These data are intended to provide a sampling and historical record of water-level changes in the Nation's most important aquifers. Locations of the observation wells in this network in Virginia are shown in figures 9, 10, 11, and 12.

Data Collection and Computation

Measurements of water levels are made in many types of wells under varying conditions, but the methods of measurement are standardized to the extent possible. The equipment and measuring techniques used at each observation well ensure that measurements at each well are of consistent accuracy and reliability.

Tables of water-level data are presented by counties arranged in alphabetical order. The prime identification number for a given well is the 15-digit number that appears in the upper left corner of the table. The secondary identification number is the local well number, an alphanumeric number, derived from the 7 1/2-minute topographic map quadrangles within the State. (See page 13 for a more detailed explanation.)

Water-level records are obtained from direct measurements with a steel tape or from the graph or punched tape of a water-stage recorder. The 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 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 to water of several hundred feet, the error of 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 to a tenth of a foot or a larger unit.

Data Presentation

Each well record consists of two parts, the station description and the data table of water levels observed during the water year. The description of the well is presented first through use of descriptive headings preceding the tabular data. The comments to follow clarify information presented under the various headings.

LOCATION.--This paragraph follows the well-identification number and reports the latitude and longitude (given in degrees, minutes, and seconds); the hydrologic-unit number; the distance and direction from a geographic point of reference; and the owner's name.

AQUIFER.--This entry designates by name (if a name exists) and geologic age the aquifer(s) open to the well.

WELL CHARACTERISTICS.--This entry describes the well in terms of depth, diameter, casing depth and/or screened interval, method of construction, use, and additional information such as casing breaks, collapsed screen, and other 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 weekly, monthly, or some other frequency of measurement.

DATUM.--This entry describes both the measuring point and the land-surface elevation at the well. The measuring point is described physically (such as top of collar, notch in top of casing, plug in pump base and so on), 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 (or below) National Geodetic Vertical Datum of 1929 (NGVD of 1929); 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. It should identify wells that also are water-quality observation wells and may be used to acknowledge the assistance of local (non-Survey) observers.

PERIOD OF RECORD.--This entry indicates the period for which there are published records for the well. It reports the month and year of the start of publication of water-level records by the U.S. Geological Survey and the words "to current year" if the records are to be continued into the following year. Periods for which water-level records are available, but are not published by the Geological Survey, may be noted.

EXTREMES FOR PERIOD OF RECORD.--This entry contains the highest and lowest water levels of the period of published record, with respect to land-surface datum, and the dates of their occurrence.

A table of water levels follows the station description for each well. Water levels are reported in feet below land-surface datum and all taped measurements of water level are listed. For wells equipped with recorders, only abbreviated tables are published; generally, only water-level lows are listed for every fifth day and at the end of the month (eom). The highest and lowest water levels of the water year and their dates of occurrence are shown on a line below the abbreviated table. Because all values are not published for wells with recorders, the extremes may be values that are not listed in the table. Missing records are indicated by dashes in place of the water level.

Records of Ground-Water Quality

Records of ground-water quality in this report differ from other types of records in that, for most sampling sites, they consist of only one set of measurements for the water year. The quality of ground water ordinarily changes only slowly; therefore, for most general purposes, one annual sampling, or only a few samples taken at infrequent intervals during the year, is sufficient. Frequent measurement of the same constituents is not necessary unless one is concerned with a particular problem, such as monitoring for trends in nitrate concentration. In the special cases where the quality of ground water may change more rapidly, more frequent measurements are made to identify the nature of the changes.

Data Collection and Computation

The records of ground-water quality in this report were obtained mostly as a part of special studies in specific areas. Consequently, a number of chemical analyses are presented for some counties but none are presented for others. As a result, the records for this year, by themselves, do not provide a balanced view of ground-water quality Statewide. Such a view can be attained only by considering records for this year in context with similar records obtained for these and other counties in earlier years.

Most methods for collecting and analyzing water samples are described in the "U.S. Geological Survey Techniques of Water-Resources Investigations" manuals listed at the end of the introductory text. The values reported in this report represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. All samples were obtained by trained personnel. The wells sampled were pumped long enough to assure 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.

Data Presentation

The records of ground-water quality are published in a section titled **QUALITY OF GROUND WATER** immediately following the ground-water-level records. Data for quality of ground water are listed alphabetically by County and are identified by well number. The prime identification number for wells sampled is the 15-digit number derived from the latitude-longitude locations. No descriptive statements are given for ground-water-quality records; however, the well number, depth of well, date of sampling, and other pertinent data are given in the table containing the chemical analyses of the ground water. The REMARK codes listed for surface-water-quality records are also applicable to ground-water-quality records.

ACCESS TO WATSTORE DATA

The National **W**ater **D**ata **S**Torage and **R**etrieval System (WATSTORE) was established for handling water data collected through the activities of the U.S. Geological Survey and to provide for more effective and efficient means of releasing the data to the public. The system is operated and maintained on the central computer facilities of the Survey at its National Center in Reston, Virginia.

WATSTORE can provide a variety of useful products ranging from simple data tables to complex statistical analyses. A minimal fee, plus the actual computer cost incurred in producing a desired product, is charged to the requester. Information about the availability of specific types of data, the acquisition of data or products, and user charges can be obtained locally from the offices whose addresses are given on the back of the title page.

General inquiries about WATSTORE may be directed to:

Chief Hydrologist
U.S. Geological Survey
437 National Center
Reston, Virginia 22092

DEFINITION OF TERMS

Terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. See also table for converting English units to International System (SI) Units on the inside of the back cover.

Acre-foot (AC-FT, acre-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.

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

Algae are mostly aquatic single-celled, colonial, or multi-celled plants, containing chlorophyll and lacking roots, stems, and leaves.

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.

Aquifer is a geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Artesian means confined and is used to describe a well in which the water level stands above the top of the aquifer tapped by the well. A flowing artesian well is one in which the water level is above the land surface.

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, while 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.

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which 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 mL of sample.

Fecal coliform bacteria are bacteria that are present in the intestine or feces of warm-blooded animals. They are often 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.

Fecal streptococcal bacteria are bacteria found also in the intestine of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which 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.

Bed material is the sediment mixture of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

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 the mass per unit area or volume of habitat.

Ash mass is the mass or amount of residue present after the residue from the dry mass determination has been ashed in a muffle furnace at a temperature of 500°C for 1 hour. The ash mass values of zooplankton and phytoplankton are expressed in grams per cubic meter (g/m³), and periphyton and benthic organisms in grams per square meter (g/m²).

Dry mass refers to the mass of residue present after drying in an oven at 105°C for zooplankton and periphyton, 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.

Organic mass or volatile mass of the living substance is the difference between the dry mass and ash mass and represents the actual mass of the living matter. The organic mass is expressed in the same units as for ash mass and dry mass.

Wet mass is the mass of living matter plus contained water.

Bottom material: See Bed material.

Cells/volume refers to the number of cells of any organism which 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, usually milliliters (mL) or liters (L).

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 natural water color or with carbonaceous organic pollution from sewage or industrial wastes.

Chlorophyll refers to the green pigments of plants. Chlorophyll a and b are the two most common green pigments in plants.

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

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.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, 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 salt water.

Cubic feet per second per square mile [(ft³/s)/mi²] is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

Cubic foot per second (ft³/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meters per second.

Cubic-foot-per-second day 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, approximately 1.9835 acre-feet, about 646,000 gallons, or 2,445 cubic meters.

Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment) that passes a given point within a given period of time.

Mean discharge (MEAN) is the arithmetic mean of individual daily mean discharges during a specific period.

Instantaneous discharge is the discharge at a particular instant of time.

Dissolved refers to that material in a representative water sample which passes through a 0.45 μ m membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate.

Dissolved-solids concentration of water 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 of dissolved solids, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. Therefore, in the mathematical calculation of dissolved-solids concentration, the bicarbonate value, in milligrams per liter, is multiplied by 0.492 to reflect the change.

Drainage area of a stream at a specified location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the stream above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise specified.

Drainage basin is a part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

Gage height (G.H.) is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term "stage," although gage height is more appropriate when used with a reading on a gage.

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

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is computed as the sum of equivalents of polyvalent cations and is expressed as the equivalent concentration of calcium carbonate (CaCO_3).

Hydrologic Bench-Mark Network is a network of 57 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the activities of man.

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an eight-digit number.

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

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

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.

Methylene blue active substances (MBAS) are apparent detergents. 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) 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 liter (UG/L, ug/L) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Milligrams per liter (MG/L, mg/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represents the mass of solute per unit volume (liter) of water. Concentration of suspended sediment also is expressed in mg/L and is based on the mass of dry sediment per liter of water-sediment mixture.

National Geodetic Vertical Datum of 1929 (NGVD of 1929) is a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada. It was formerly called "Sea Level Datum of 1929" or "mean sea level" in this series of reports. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

National Stream Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in natural or regional water-quality planning and management. The 500 or so sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objectives of NASQAN are (1) to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting such that the data may be used for, (2) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (3) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) providing a nationally consistent data base useful for water-quality assessment and hydrologic research.

The National Trends Network (NTN) is a 150-station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

Organism is any living entity.

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 (m²), 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.

Total organism count is the total number of organisms collected and enumerated in any particular sample.

Parameter Code is a 5-digit number used in the U.S. Geological Survey computerized data system, WATSTORE, to uniquely identify a specific constituent. The codes used in WATSTORE are the same as those used in the U.S. Environmental Protection Agency data system, STORET. The Environmental Protection Agency assigns and approves all requests for new codes.

Partial-record station is a particular site where limited streamflow and/or water-quality data are collected systematically over a period of years for use in hydrologic analyses.

Particle size is the diameter, in millimeters (mm), of a particle determined by either sieve or sedimentation methods. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube) 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 used in this report agrees with the recommendation made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

<u>Classification</u>	<u>Size (mm)</u>	<u>Method of analysis</u>
Clay.....	0.00024 - 0.004	Sedimentation
Silt.....	.004 - .062	Sedimentation
Sand.....	.062 - 2.0	Sedimentation or sieve
Gravel.....	2.0 - 64.0	Sieve

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. 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.

Percent composition 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, mass, or volume.

Periphyton is the assemblage of microorganisms attached to and living upon submerged solid surfaces. While primarily consisting of algae, they also include bacteria, fungi, protozoa, rotifers, and other small organisms.

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

Picocurie (PC, pCi) is one trillionth (1×10^{-12}) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields 3.7×10^{10} disintegrations per second. A picocurie yields 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.

Phytoplankton is the plant part of the plankton. They are usually 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 are commonly known as algae.

Blue-green algae are a group of phytoplankton organisms having a blue pigment, in addition to the green pigment called chlorophyll. Blue-green algae often cause nuisance conditions in water.

Diatoms are the unicellular or colonial algae having a siliceous shell. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample.

Green algae have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algae mats or floating "moss" in lakes. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample.

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column and are often 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.

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 by the plants (carbon method).

Milligrams of carbon per area or volume per unit time [mg C/(m².time)] for periphyton and macrophytes and [mg C/(m³.time)] for phytoplankton are units for expressing primary productivity. They define 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 in unenriched waters. Unit time may be either the hour or day, depending on the incubation period.

Milligrams of oxygen per area or volume per unit time [$\text{mg O}_2/(\text{m}^2 \cdot \text{time})$] for periphyton and macrophytes and [$\text{mg O}_2/(\text{m}^3 \cdot \text{time})$] for phytoplankton are the units for expressing primary productivity. They define 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.

Radiochemical program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Recoverable from bottom material is the amount of a given constituent that is in solution after a representative sample of bottom material has been digested by a method (usually using an acid or mixture of acids) that results in dissolution of readily soluble substances. Complete dissolution of all bottom material is not achieved by the digestion treatment and thus the determination represents less than the total amount (that is, less than 95 percent) of the constituent in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Return period is the average time interval between occurrences of a hydrological event of a given or greater magnitude, usually expressed in years. May also be called recurrence interval.

Runoff in inches (IN., in.) shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water; it 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 influenced by environmental factors. Some major factors are degree of slope, length of slope, soil characteristics, land usage, and quantity and intensity of precipitation.

Bed load is the sediment that is transported in a stream by rolling, sliding, or skipping along the bed and very close to it. In this report, bed load is considered to consist of particles in transit within 0.25 ft of the streambed.

Bed load discharge (tons per day) is the quantity of bed load measured by dry weight that moves past a section as bed load in a given time.

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

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 ft above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L).

Mean concentration is the time-weighted concentration of suspended sediment passing a stream section during a 24-hour day.

Suspended-sediment discharge (tons/day) is the rate at which dry mass of sediment passes a section of a stream or is the quantity of sediment, as measured by dry mass or volume, that passes a section in a given time. It is calculated in units of tons per day as follows: concentration (mg/L) \times discharge (ft^3/s) \times 0.0027.

Suspended-sediment load is a general term that refers to material in suspension. It is not synonymous with either discharge or concentration.

Total sediment discharge (tons/day) is the sum of the suspended-sediment discharge and the bed-load discharge. It is the total quantity of sediment, as measured by dry mass or volume, that passes a section during a given time.

Total-sediment load or total load is a term which refers to the total sediment (bed load plus suspended-sediment load) that is in transport. It is not synonymous with total-sediment discharge.

7-day 10-year low flow ($7 Q_{10}$) is the discharge at the 10-year recurrence interval taken from a frequency curve of annual values of the lowest mean discharge for 7 consecutive days (the 7-day low flow).

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. Waters range in respect to sodium hazard from those which can be used for irrigation on almost all soils to those which are generally unsatisfactory for irrigation.

Solute is any substance that is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in microsiemens per centimeter at 25°C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 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.

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

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.

Natural substrate refers to any naturally occurring emersed or submersed solid surface, such as a rock or tree, upon which an organism lives.

Artificial substrate is a device which is purposely 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 taken. Examples of artificial substrates are basket samplers (made of wire cages filled with clean streamside rocks) and multiplate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton collection.

Surface area of a lake is that area outlined on the latest U.S.G.S. topographic map as the boundary of the lake and measured by a planimeter in acres. In localities not covered by topographic maps, the areas are computed from the best maps available at the time planimetered. All areas shown are those for the stage when the planimetered map was made.

Surficial bed material is the part (0.1 to 0.2 ft) of the bed material that is sampled using U.S. Series Bed-Material Samplers.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of undissolved material in a water-sediment mixture. It is associated with the 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 μ m membrane filter 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 the 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 sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Determinations of "suspended, recoverable" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent.

Suspended, total is the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45 μ m membrane filter. 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 determine when the results should be reported as "suspended, total."

Determinations of "suspended, total" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituent.

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.....	Hexagenia
Species.....	<u>Hexagenia limbata</u>

Thermograph is an instrument that continuously records variations of temperature on a chart. The more general term "temperature recorder" is used in the table headings 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 that would be contained in a vessel or reservoir that had received equal quantities of water from the stream each day for the year.

Tons per acre-foot indicates the dry mass of dissolved solids in 1 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) is the quantity of a substance in solution or suspension that passes a stream section during a 24-hour period.

Total is the total amount of a given constituent in a representative water-suspended sediment 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 all of the constituent in the sample.)

Total discharge is the total quantity of any individual constituent, as measured by dry mass or volume, that passes through a stream cross-section per unit of time. This term needs to be qualified, such as "total sediment discharge," "total chloride discharge," and so on.

Total, recoverable is the amount of a given constituent that is in solution after a representative water-suspended sediment 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, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Tritium Network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

Water year in Geological Survey 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, 1989, is called the "1989 water year."

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.

WSP is used as an abbreviation for "Water-Supply Paper" in reference to previously published reports.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

The U.S. Geological Survey publishes a series of manuals describing procedures for planning and conducting specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, Section A of Book 3 (Applications of Hydraulics) pertains to surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises.

The reports listed below are for sale by the U.S. Geological Survey, Books and Open-File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

- 1-D1. Water temperature--influential factors, field measurement, and data presentation, by H. H. Stevens, Jr., J. F. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.
- 1-D2. Guidelines for collection and field analysis of ground-water samples for selected unstable constituents, by W. W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.
- 2-D1. Application of surface geophysics to ground-water investigations, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.
- 2-E1. Application of borehole geophysics to water-resources investigations, by W. S. Keys and L. M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.
- 3-A1. General field and office procedures for indirect discharge measurements, by M. A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages.
- 3-A2. Measurement of peak discharge by the slope-area method, by Tate Dalrymple and M. A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages.
- 3-A3. Measurement of peak discharge at culverts by indirect methods, by G. L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages.
- 3-A4. Measurement of peak discharge at width contractions by indirect methods, by H. J. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 pages.
- 3-A5. Measurement of peak discharge at dams by indirect methods, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages.
- 3-A6. General procedure for gaging streams, by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.
- 3-A7. Stage measurements at gaging stations, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages.
- 3-A8. Discharge measurements at gaging stations, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.

- 3-A9. Measurement of time of travel and dispersion in streams by dye tracing, by E. F. Hubbard, F. A. Kilpatrick, L. A. Martens, and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1982. 44 pages.
- 3-A10. Discharge ratings at gaging stations, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 pages.
- 3-A11. Measurement of discharge by moving-boat method, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages.
- 3-A12. Fluorometric procedures for dye tracing, by J. F. Wilson, Jr., E. D. Cobb, and F. A. Kilpatrick: USGS--TWRI Book 3, Chapter A12. 1986. 41 pages.
- 3-A13. Computation of continuous records of streamflow, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.
- 3-A14. Use of flumes in measuring discharge, by F. A. Kilpatrick and V. R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 pages.
- 3-A15. Computation of water-surface profiles in open channels, by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 pages.
- 3-A16. Measurement of discharge using tracers, by F. A. Kilpatrick and E. D. Cobb: USGS--TWRI Book 3, Chapter A16. 1985. 52 pages.
- 3-A17. Acoustic velocity meter systems, by Antonius Laenen: USGS--TWRI Book 3, Chapter A17. 1985. 38 pages.
- 3-B1. Aquifer-test design, observation, and data analysis, by R. W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages.
- 3-B2. Introduction to ground-water hydraulics, a programed test for self-instruction, by G. D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.
- 3-B3. Type curves for selected problems of flow to wells in confined aquifers, by J. E. Reed: USGS--TWRI Book 3, Chapter B3. 1980. 106 pages.
- 3-B5. Definition of boundary and initial conditions in the analysis of saturated ground-water flow systems--An introduction, by O. L. Franke, T. E. Reilly, and G. D. Bennett: USGS--TWRI Book 3, Chapter B5. 1987. 15 pages.
- 3-B6. The principle of superposition and its application in ground-water hydraulics, by T. E. Reilly, O. L. Franke, and G. D. Bennett: USGS--TWRI Book 3, Chapter B6. 1987. 28 pages.
- 3-C1. Fluvial sediment concepts, by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.
- 3-C2. Field methods for measurement of fluvial sediment, by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 pages.
- 3-C3. Computation of fluvial-sediment discharge, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.
- 4-A1. Some statistical tools in hydrology, by H. C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.
- 4-A2. Frequency curves, by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.
- 4-B1. Low-flow investigations, by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.
- 4-B2. Storage analyses for water supply, by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.
- 4-B3. Regional analyses of streamflow characteristics, by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages.
- 4-D1. Computation of rate and volume of stream depletion by wells, by C. T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages.

- 5-A1. Methods for determination of inorganic substances in water and fluvial sediments, by M. W. Skougstad and others, editors: USGS--TWRI Book 5, Chapter A1. 1979. 626 pages.
- 5-A2. Determination of minor elements in water by emission spectroscopy, by P. R. Barnett and E. C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages.
- 5-A3. Methods for analysis of organic substances in water, by D. F. Goerlitz and Eugene Brown: USGS--TWRI Book 5, Chapter A3. 1972. 40 pages.
- 5-A4. Methods for collection and analysis of aquatic biological and microbiological samples, edited by P. E. Greeson, T. A. Ehlke, G. A. Irwin, B. W. Lium, and K. V. Slack: USGS--TWRI Book 5, Chapter A4. 1977. 332 pages.
- 5-A5. Methods for determination of radioactive substances in water and fluvial sediments, by L. L. Thatcher, V. J. Janzer, and K. W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 pages.
- 5-A6. Quality assurance practices for the chemical and biological analyses of water and fluvial sediments, by L. C. Friedman and D. E. Erdmann: USGS--TWRI Book 5, Chapter A6. 1982. 181 pages.
- 5-C1. Laboratory theory and methods for sediment analysis, by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages.
- 6-A1. A modular three-dimensional finite-difference ground-water flow model, by M. G. McDonald and A. W. Harbaugh: USGS--TWRI Book 6, Chapter A1. 1988. 586 pages.
- 7-C1. Finite difference model for aquifer simulation in two dimensions with results of numerical experiments, by P. C. Trescott, G. F. Pinder, and S. P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages.
- 7-C2. Computer model of two-dimensional solute transport and dispersion in ground water, by L. F. Konikow and J. D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1978. 90 pages.
- 7-C3. A model for simulation of flow in singular and interconnected channels, by R. W. Schaffranek, R. A. Baltzer, and D. E. Goldberg: USGS--TWRI Book 7, Chapter C3. 1981. 110 pages.
- 8-A1. Methods of measuring water levels in deep wells, by M. S. Garber and F. C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages.
- 8-A2. Installation and service manual for U.S. Geological Survey manometers, by J. D. Craig: USGS--TWRI Book 8, Chapter A2. 1983. 57 pages.
- 8-B2. Calibration and maintenance of vertical-axis type current meters, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages.

SELECTED U.S. GEOLOGICAL SURVEY REPORTS ON WATER RESOURCES IN VIRGINIA

Listed below is a selection of reports on water resources in Virginia which are available through the Virginia Office of the Mid-Atlantic District at the U.S. Geological Survey, WRD, 3600 West Broad Street, Room 606, Richmond, Virginia 23230.

An index of geophysical logging in Virginia by the U.S. Geological Survey, by J. D. Mulheren, J. D. Larson, and H. T. Hopkins: U.S. Geological Survey Open-File Report 82-432. 1982. 34 pages.

Availability and quality of ground water in the Piedmont Province of Virginia, by J. D. Powell and J. M. Abe: U.S. Geological Survey Water-Resources Investigations Report 85-4235. 1985. 33 pages.

Effects of fracturing on well yields in the coalfield areas of Wise and Dickenson Counties, southwestern Virginia, by W. G. Wright: U.S. Geological Survey Water-Resources Investigations Report 85-4061. 1985. 21 pages.

Flood of November 1985 in West Virginia, Pennsylvania, Maryland, and Virginia, by Joseph B. Lescinsky: U.S. Geological Survey Open-File Report 86-486. 1987. 33 pages.

Ground-water availability along the Blue Ridge Parkway, Virginia, by H. T. Hopkins: U.S. Geological Survey Water-Resources Investigations Report 84-4168. 1984. 154 pages.

Guide to obtaining U.S. Geological Survey information, by K. Dodd, H. K. Fuller, and P. F. Clarke: U.S. Geological Survey Circular 900. 1985. 35 pages.

Hydrogeology and analysis of the ground-water flow system in the coastal plain of southeastern Virginia, by P. A. Hamilton and J. D. Larson: U.S. Geological Survey Water-Resources Investigations Report 87-4240. 1988. 175 pages.

Hydrologic conditions and trends in Shenandoah National Park, Virginia, 1983-84, by D. D. Lynch: U.S. Geological Survey Water-Resources Investigations Report 87-4131. 1987. 115 pages.

Hydrology and effects of mining in the upper Russell Fork basin, Buchanan and Dickenson Counties, Virginia, by J. D. Larson and J. D. Powell: U.S. Geological Survey Water-Resources Investigations Report 85-4238. 1986. 63 pages.

Hydrology of Area 16, Eastern Coal Province, Virginia and Tennessee, by P. W. Hufschmidt and others: U.S. Geological Survey Water-Resources Investigations Report 81-204. 1981. 67 pages.

Low flow of streams in Fairfax County, Virginia, by E. H. Mohler, Jr., and G. F. Hagan: U.S. Geological Survey Open-File Report 81-63. 1981. 30 pages.

Quality of ground water in southern Buchanan County, Virginia, by S. M. Rogers and J. D. Powell: U.S. Geological Survey Water-Resources Investigations 82-4022. 1983. 36 pages.

Relation between ground-water quality and mineralogy in the coal-producing Norton Formation of Buchanan County, Virginia, by J. D. Powell and J. D. Larson: U.S. Geological Survey Water-Supply Paper 2274. 1985. 30 pages.

Selected hydrologic data for the Powell River basin in Wise County, Virginia, by J. D. Larson: U.S. Geological Survey Open-File Report 85-186. 1985. 22 pages.

Selected publications on the water resources of Virginia, by N. R. Carrington: U.S. Geological Survey Open-File Report 86-418. 1986. 34 pages.

Sensitivity of stream basins in Shenandoah National Park to acid deposition, by D. D. Lynch and N. B. Dise: U.S. Geological Survey Water-Resources Investigations Report 85-4115. 1985. 61 pages.

Water-level hydrographs for observation wells in Virginia, by S. Farrington, N. R. Carrington, and W. V. Daniels: U.S. Geological Survey Open-File Report 84-134. 1984. 167 pages.

DISCONTINUED GAGING STATIONS

The following continuous-record streamflow stations in Virginia have been discontinued or converted to partial-record stations. Daily streamflow records were collected and published for the period of record shown for each station.

Discontinued gaging stations			
STATION NUMBER	STATION NAME	DRAINAGE AREA (mi ²)	PERIOD OF RECORD
POTOMAC RIVER BASIN			
01613900*	Hogue Creek near Hayfield, VA	15.0	1960-86
01615500	Abrams Creek at Winchester, VA	5.6	1946-49
01621000	Dry River at Rawley Springs, VA	72.6	1946-48
01621500	Cooks Creek at Mt. Crawford, VA	42	1905-06
01622500	Castle Spring near Churchville, VA	-	1949-56
01623000	Bell Creek at St. Pauls Chapel, near Staunton, VA	.61	1948-55
01623500	Bell Creek near Staunton, VA	3.8	1948-55
01624000	Bell Creek at Franks Mill, near Staunton, VA	9.6	1948-56
01624300	Middle River near Verona, VA	178	1967-86
01624500	Lewis Creek near Staunton, VA	18	1905-06
01625500	North River at Port Republic, VA	804	1895-99
01625900	Back Creek near Lyndhurst, VA	40.9	1974-77
01626500	South River at Waynesboro, VA	133	1905-06, 1928-52
01628000	South River at Port Republic, VA	248	1895-99
01629000	Elk Run at Elkton, VA	17	1901-06
01630000	Hawksbill Creek near Luray, VA	52	1905-06
01630500	Yagers Spring near Luray, VA	-	1949-56
01632500	Plains Mill Spring near New Market, VA	-	1949-56
01633500	Stony Creek at Columbia Furnace, VA	79.4	1947-56
01635000	Marlboro Spring at Marlboro, VA	-	1949-56
01636000	North Fork Shenandoah River near Riverton, VA	1,040	1899-1906
01636210	Happy Creek at Front Royal, VA	14.0	1948-77
01643610	Big Spring near Leesburg, VA	.03	1968-69
01644290	Stave Run at Reston, VA	.05	1966-71, 1973
01644291	Stave Run near Reston, VA	.08	1971-82
01644295	Smilax Branch at Reston, VA	.32	1967-78
01645784*	Snakeden Branch at Reston, VA	.79	1973-78
01652500*	Fourmile Run at Alexandria, VA	14.4	1951-69, 1974-75, 1979-82
01654500	Long Branch near Annandale, VA	3.71	1947-57

* Currently operated as a crest-stage partial-record station.

Discontinued gaging stations--Continued

STATION NUMBER	STATION NAME	DRAINAGE AREA (mi ²)	PERIOD OF RECORD
POTOMAC RIVER BASIN--Continued			
01655000	Accotink Creek near Accotink Station, VA	37.0	1949-57
01655500*	Cedar Run near Warrenton, VA	12.3	1950-86
01656000*	Cedar Run near Catlett, VA	93.4	1950-86
01656100	Cedar Run near Aden, VA	155	1973-88
01656500	Broad Run at Buckland, VA	50.5	1950-86
01656650	Broad Run near Bristow, VA	89.6	1974-86
01656700	Occoquan River near Manassas, VA	343	1968-81
01656725	Bull Run near Catharpin, VA	25.8	1969-86
01656960	Cub Run near Bull Run, VA	49.9	1972-86
01657000	Bull Run near Manassas, VA	147	1950-81
01657020*	Bull Run near Manassas Park, VA	148	1984-87
01657415	Bull Run near Clifton, VA	185	1972-84
01657500	Occoquan River (Creek) near Occoquan, VA	570	1913-16, 1920-23, 1937-56
01657655	Hooes Run near Occoquan, VA	4.18	1974-82
01658480	Quantico Creek near Dumfries, VA	6.90	1983-85
01658550	South Fork Quantico Creek near Joplin, VA	9.62	1983-85
01658650	South Fork Quantico Creek near Dumfries, VA	16.6	1983-85
01659000	North Branch Chopawamsic Creek near Independent Hill, VA	5.79	1951-57
01659500	Middle Fork Chopawamsic Creek near Garrisonville, VA	4.51	1951-57, 1960-67
01660000	South Branch Chopawamsic Creek near Garrisonville, VA	2.56	1951-57
01660500	Beaverdam Run near Garrisonville, VA	12.7	1951-57
GREAT WICOMICO RIVER BASIN			
01661800	Bush Mill Stream near Heathsville, VA	6.82	1964-86
RAPPAHANNOCK RIVER BASIN			
01662000*	Rappahannock River near Warrenton, VA	195	1942-86
01662500	Rush River at Washington, VA	14.7	1953-77
01663000	Thornton River near Laurel Mills, VA	142	1943-56
01664500	Rappahannock River at Kellys Ford, VA	641	1924-52
01666000	Robinson River at Locust Dale, VA	148	1942
01667000	Rapidan River at Rapidan, VA	446	1924-31
01668800*	Hoskins Creek near Tappahannock, VA	15.4	1964-86

* Currently operated as a crest-stage partial-record station.

Discontinued gaging stations--Continued

STATION NUMBER	STATION NAME	DRAINAGE AREA (mi ²)	PERIOD OF RECORD
PIANKATANK RIVER BASIN			
01669500	Dragon Swamp near Church View, VA	84.9	1943-81
YORK RIVER BASIN			
01670000	Beaverdam Swamp near Ark, VA	6.63	1950-89
01670300*	Contrary Creek near Mineral, VA	5.53	1975-86
01670500	North Anna River near Hewlett, VA	424	1926-28
01671000	North Anna River near Doswell, VA	441	1928-86
01671500	Bunch Creek near Boswells Tavern, VA	4.37	1948-79
01672000	South Anna River at Vontay, VA	332	1926-30
01673500	Totopotomoy Creek near Atlee, VA	5.89	1948-77
01674500	Mattaponi River near Beulahville, VA	601	1941-87
JAMES RIVER BASIN			
02010000	Bolar Spring at Bolar, VA	-	1949-56
02010500	Muddy Run Spring near Warm Springs, VA	-	1946-56
02011000	Warm Spring at Warm Springs, VA	-	1928-44
02011480	Back Creek on Rt. 600, near Mountain Grove, VA	131	1951-84
02012000	Falling Spring Creek near Falling Spring, VA	11.5	1947-52
02012500*	Jackson River at Falling Spring, VA	411	1925-83
02012900	Jackson River at Covington, VA	440	1907-08
02014500	Smith Creek above Old Dam, near Clifton Forge, VA	12.4	1947-56
02015000	Smith Creek near Clifton Forge, VA	12.5	1944-47
02015500	Stuart Spring near McDowell, VA	-	1949-56
02017000	Meadow Creek at New Castle, VA	13.8	1929-52
02019000	Catawba Creek near Fincastle, VA	104	1928-37
02020000	Karnes Spring near Buchanan, VA	-	1949-56
02021000	Calfpasture River at Goshen, VA	190	1925-38
02022000	Big Spring at Kerrs Creek, VA	-	1949-56
02023000	Maury River near Lexington, VA	487	1925-60
02023500	South River near Riverside, VA	111	1949-62
02024300	Buffalo Creek near Glasgow, VA	123	1962-64
02024500	Maury River at Glasgow, VA	831	1895-1906
02025000	Pedlar River near Pedlar Mills, VA	91	1942-56
02026500	Tye River at Roseland, VA	68	1927-38
02028000	Tye River near Norwood, VA	360	1940-60
02029500	Hardware River near Scottsville, VA	104	1925-39

* Currently operated as a crest-stage partial-record station.

Discontinued gaging stations--Continued

STATION NUMBER	STATION NAME	DRAINAGE AREA (mi ²)	PERIOD OF RECORD
JAMES RIVER BASIN--Continued			
02031000	Mechums River near Ivy, VA	97	1942-51
02031500	North Fork Moormans River near White Hall, VA	11.4	1951-63, 1982-84
02032000	Moormans River near White Hall, VA	18	1943-46
02032500	South Fork Rivanna River near Earlysville, VA	216	1951-66
02033000	Rivanna River near Charlottesville, VA	473	1925
02033500	Rivanna River below Moores Creek, near Charlottesville, VA	507	1925-34
02034500*	Willis River at Lakeside Village, VA	247	1926-86
02035500	Lickinghole Creek near Goochland, VA	70	1944-46
02036000	Beaverdam Creek at State Farm, VA	42	1944-47
02038500	Falling Creek near Drewrys Bluff, VA	54	1942-56, 1957-64
02040500*	Flat Creek near Amelia, VA	73	1946-48
02041500	Appomattox River near Petersburg, VA	1,335	1926-66
02042000	Swift Creek near Chester, VA	143	1943-49
CHOWAN RIVER BASIN			
02044000*	Nottoway River near Burkeville, VA	38	1946-86
02045000	Nottoway River near McKenney, VA	362	1946-50
02045200	Waqua Creek near Alberta, VA	15.0	1966-67
02046500	Anderson Branch at Sussex, VA	5.4	1948-56
02047100	Assamoosick Swamp near Sebrell, VA	86.4	1982-88
02048000	Blackwater River at Zuni, VA	456	1943-89
02048500	Seacock Creek at Unity, VA	102	1942-49
02049000	Blackwater River near Burdette, VA	576	1941-44
02050500	North Meherrin River near Keysville, VA	9.2	1948-61
02051600*	Great Creek near Cochran, VA	30.9	1958-86
02053000	Fontaine Creek near Emporia, VA	96	1943-53
ROANOKE RIVER BASIN			
02054000	Big Springs at Elliston, VA	-	1949-56
02055500	Tinker Creek at Roanoke, VA	70	1907-08
02056500	Back Creek near Roanoke, VA	43	1907-08
02057000	Blackwater River near Union Hall, VA	208	1924-63
02057500	Roanoke River near Toshes, VA	1,020	1925-63
02058000	Snow Creek at Sago, VA	60	1934-44

* Currently operated as a crest-stage partial-record station.

Discontinued gaging stations--Continued

STATION NUMBER	STATION NAME	DRAINAGE AREA (mi ²)	PERIOD OF RECORD
ROANOKE RIVER BASIN--Continued			
02058500	Pigg River near Toshes, VA	394	1930-63
02059000	Roanoke River near Gretna, VA	1,430	1925-30
02060000	Goose Creek at Huddleston, VA	218	1929-31
02061000	Big Otter River near Bedford, VA	116	1943-60
02062000	Big Otter River near Altavista, VA	372	1929-37
02063000	Caldwells Creek near Appomattox, VA	5.1	1954-60
02063500	Falling River at Spring Mills, VA	52.2	1954-60
02064500	Little Falling River at Hat Creek, VA	43	1929-35
02065000	Falling River near Brookneal, VA	228	1935-41
02065200	Roanoke River at Clarkton, VA	2,691	1963-76
02066500	Roanoke Creek at Saxe, VA	135	1946-72
02067000	Roanoke River near Clover, VA	3,230	1929-52
02067500	Roanoke River above Dan River, at Clarksville, VA	-	1895-98
02073500	Leatherwood Creek near Old Liberty, VA	68	1925-34
02076000*	Dan River at South Boston, VA	2,730	1900-07, 1922-52
02078000	Hyco River near Omega, VA	413	1934-50
02078500	Dan River at Clarksville, VA	-	1895-98
02079000	Roanoke River at Clarksville, VA	7,320	1934-52
02079500*	Roanoke River at Buggs Island, VA	7,780	1947-62
KANAWHA RIVER BASIN			
03163000	New River near Baywood, VA	1,000	1928-30
03164500	New River near Grayson, VA	1,160	1908-12
03165500	New River at Ivanhoe, VA	1,340	1927, 1929-78
03166000	Cripple Creek near Ivanhoe, VA	148	1930-34
03166500	Neff-Litz Spring near Rural Retreat, VA	-	1947-56
03168500	Peak Creek at Pulaski, VA	58.3 60.9	1927-33, 1951-57
03169500	Little River near Copper Valley, VA	239	1908-16
03171500	New River at Eggleston, VA	2,941	1914-76
03172000	Wabash Spring near Poplar Hill, VA	-	1949-51
03173500	Francis Spring near Bane, VA	-	1951-56
03174500	Wolf Creek near Burkes Garden, VA	36	1927-28

* Currently operated as a crest-stage partial-record station.

Discontinued gaging stations--Continued

STATION NUMBER	STATION NAME	DRAINAGE AREA (mi ²)	PERIOD OF RECORD
KANAWHA RIVER BASIN--Continued			
03175000	West Fork Cove Creek near Bluefield, VA	5.5	1929-32
03177700	Bluestone River at Bluefield, VA	39.8	1965-80
BIG SANDY RIVER BASIN			
03207500*	Levisa Fork near Grundy, VA	235	1941-74, 1986
03208040*	Russell Fork at Council, VA	10.2	1981-83
03208100*	Russell Fork near Birchleaf, VA	87.4	1981-83
03208700*	North Fork Pound River at Pound, VA	18.5	1961-87
03208800*	Pound River above Indian Creek, at Pound, VA	36.7	1965-78
03208850*	Pound River below Bold Camp Creek, at Pound, VA	61.2	1965-78
03208900*	Pound River near Georges Fork, VA	82.5	1963-82
03209200*	Russell Fork at Bartlick, VA	526	1962-81
03213577	Kersaw Branch near Hurley, VA	.60	1980-82
03213590*	Knox Creek at Kelsa, VA	84.3	1980-81
03471000	Steve Keesling Spring at Sugar Grove, VA	-	1947-56
TENNESSEE RIVER BASIN			
03472000	South Fork Holston River near Chilhowie, VA	89.5	1907-09
03472500*	Beaverdam Creek at Damascus, VA	56.0	1947-59
03473500*	Middle Fork Holston River at Groseclose, VA	7.39	1947-57
03474000*	Middle Fork Holston River at Seven Mile Ford, VA	132	1942-81
03474500	Middle Fork Holston River at Chilhowie, VA	155	1907-09, 1920-31
03475500	Cedarville Spring at Cedarville, VA	-	1949-52
03477500	Beaver Creek near Wallace, VA	13.7	1945-57
03478000	Percy Preston Spring near Wallace, VA	-	1949-56
03487800*	Lick Creek near Chatham Hill, VA	25.5	1966-68
03488100	North Fork Holston River near Plasterco, VA	259	1963-66
03488445	Brumley Creek near Hansonville, VA	4.29	1979-81
03488450*	Brumley Creek at Brumley Gap, VA	21.1	1979-81
03488500	North Fork Holston River at Holston, VA	402	1951-59
03489500	North Fork Holston River near Mendota, VA	493	1920-31
03489850	Cove Creek near Hilton, VA	17.6	1966-68

* Currently operated as a crest-stage partial-record station.

WATER RESOURCES DATA - VIRGINIA, 1989

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Discontinued gaging stations--Continued

STATION NUMBER	STATION NAME	DRAINAGE AREA (mi ²)	PERIOD OF RECORD
TENNESSEE RIVER BASIN--Continued			
03489870*	Big Moccasin Creek at Collinwood, near Hansonville, VA	41.9	1966-68
03489900	Big Moccasin Creek near Gate City, VA	79.6	1952-59, 1966-68
03490000*	North Fork Holston River near Gate City, VA	672	1931-81
03520500	Taylor Springs at Cedar Bluff, VA	-	1952-53
03521000	Clinch River at Cedar Bluff, VA	125	1944-46
03522000	Little River at Wardell, VA	103	1949-52
03522500	Will Brooks Spring at Wardell, VA	-	1949-52
03523000	Cedar Creek near Lebanon, VA	51.5	1952-59
03523500	Thompson Creek near Coulwood, VA	14.0	1942-48
03524500*	Guest River at Coeburn, VA	87.3	1949-59, 1979-81
03524900*	Stony Creek at Ka, VA	30.9	1980-81
03525000	Stony Creek at Fort Blackmore, VA	41.4	1949-52
03525500	Clinch River at Clinchport, VA	986	1907-09
03526000*	Copper Creek near Gate City, VA	106	1947-72
03526500	Quillen Springs near Gate City, VA	-	1954-56
03527000*	Clinch River at Speers Ferry, VA	1,126	1920-76, 1979-81
03527500	North Fork Clinch River at Duffield, VA	23.1	1952-59
03529500*	Powell River at Big Stone Gap, VA	112	1944-59, 1979-81
03530000	South Fork Powell River at Big Stone Gap, VA	40	1944-47, 1951-77
03530500*	North Fork Powell River at Pennington Gap, VA	70	1944-51, 1979-81
03531000	Powell River near Pennington Gap, VA	290	1920-31

* Currently operated as a crest-stage partial-record station.

WATER RESOURCES DATA - VIRGINIA, 1989

DISCONTINUED WATER-QUALITY STATIONS

The following water-quality stations have been discontinued in Virginia. Continuous-daily records of water temperature, specific conductance, sediment, and monthly or periodic sampling of chemical quality were collected for the period of record shown for each station.

Discontinued water-quality stations				
STATION NUMBER	STATION NAME	DRAINAGE AREA (mi ²)	TYPE OF RECORD	PERIOD OF RECORD
POTOMAC RIVER BASIN				
01627500	South River at Harriston, VA	212	SC	1949
01629500	South Fork Shenandoah River near Luray, VA	1,377	SC	1949
01631000	South Fork Shenandoah River at Front Royal, VA	1,642	T, SC SED C	1953-56, 1968-77, 1980 1953-56 1949, 1953-56, 1968-86
01634000	North Fork Shenandoah River near Strasburg, VA	768	T, SC SED C	1949, 1956, 1969-71 1956 1930, 1949, 1952, 1956, 1970-86
01644000	Goose Creek near Leesburg, VA	332	T, SC	1969-71
01644291	Stave Run near Reston, VA	.08	SED	1971-74
01644295	Smilax Branch at Reston, VA	.32	SED	1971-75
01645784	Snakeden Branch at Reston, VA	.79	SED	1973-78
01656100	Cedar Run near Aden, VA	155	SED	1974
01656725	Bull Run near Catharpin, VA	25.8	SED	1974
01656960	Cub Run near Bull Run, VA	49.9	SED	1972-74
01657415	Bull Run near Clifton, VA	185	SED	1973-74
01658620	South Fork Quantico Creek near Triangle, VA	15.7	T, SC	1973
RAPPAHANNOCK RIVER BASIN				
01661900	Carter Run near Marshall, VA	19.5	SED	1977-78
01663500	Hazel River at Rixeyville, VA	287	T SC SED	1951-55 1953-55 1952-55
01667500	Rapidan River near Culpeper, VA	472	T SC SED	1946, 1951-56 1953-56 1951-56
01668000*	Rappahannock River near Fredericksburg, VA	1,596	T, SC	1956, 1968-74
01668020	Rappahannock River at VEPCO Dam, at Fredericksburg, VA	-	T, SC	1971-72

TYPE OF RECORD: C (chemical quality); SED (sediment); SC (specific conductance);
T (temperature).

* Presently active periodic sampling station.

Discontinued water-quality stations--Continued

STATION NUMBER	STATION NAME	DRAINAGE AREA (mi ²)	TYPE OF RECORD	PERIOD OF RECORD
YORK RIVER BASIN				
01670600	North Anna River below Lake Anna, near Hewlett, VA	-	T, SC	1972-73
01671500	Bunch Creek near Boswells Tavern, VA	4.37	T	1954-56
01673000*	Pamunkey River near Hanover, VA	1,081	T SC	1946, 1968-76 1968-76
01674000	Mattaponi River near Bowling Green, VA	257	T	1946
01674500*	Mattaponi River near Beulahville, VA	601	T	1946
JAMES RIVER BASIN				
02012500	Jackson River at Falling Spring, VA	411	T, SC C	1969-86 1930, 1948, 1968-86
02019500	James River at Buchanan, VA	2,075	T SC SED C	1948, 1951-56, 1968-86 1953-56, 1968-86 1951-56 1930, 1948, 1951-56, 1968-86
02026000	James River at Bent Creek, VA	3,683	T	1948
02029000	James River at Scottsville, VA	4,584	T, SC SED	1951-56, 1987 1951-56
02035000*	James River at Cartersville, VA	6,257	T, SC SED	1968-76, 1979, 1981 1981
02037000	James River and Kanawha Canal, near Richmond, VA	-	C, T, SC	1972-73
02037500	James River near Richmond, VA	6,758	T, SC	1948-51, 1953-56
02038830	Fishpond Creek near Hixsburg, VA	14.0	SC	1981
02038880	Vaughans Creek near Hixsburg, VA	23.2	SC	1981
CHOWAN RIVER BASIN				
02044000	Nottoway River near Burkeville, VA	38.7	T	1947
02047000*	Nottoway River near Sebrell, VA	1,421	T	1947
02048000	Blackwater River at Zuni, VA	456	T	1947
02051000	North Meherrin River near Lunenburg, VA	55.6	T	1947
02052000*	Meherrin River at Emporia, VA	747	T, SC	1968-80

TYPE OF RECORD: C (chemical quality); SED (sediment); SC (specific conductance);
T (temperature).

* Presently active periodic sampling station.

WATER RESOURCES DATA - VIRGINIA, 1989

Discontinued water-quality stations--Continued

STATION NUMBER	STATION NAME	DRAINAGE AREA (mi ²)	TYPE OF RECORD	PERIOD OF RECORD
ROANOKE RIVER BASIN				
02054500	Roanoke River at Lafayette, VA	257	T, SC	1951
02060500	Roanoke River at Altavista, VA	1,789	T SC SED C	1951, 1953-56, 1968-86 1953-56, 1968-86 1953-56 1951, 1953-56, 1968-86
02066000	Roanoke River at Randolph, VA	2,977	T, SC SED C	1951-56, 1968-62 1954-81 1930, 1951-86
02075500*	Dan River at Paces, VA	2,550	T, SC	1954-56
02076000	Dan River at South Boston, VA	2,730	T SC	1952 1951-52
02079785	Lake Gaston near Elams, NC	2-5	T, SC SED	1988 1988
02079882	Pea Hill Creek near Bowens Corner, nr Valentines	2-5	T, SC SED	1988 1988
KANAWHA RIVER BASIN				
03164000	New River near Galax, VA	1,131	T, SC C	1950, 1968-83 1931, 1950, 1952, 1968-86
03170000	New River at Radford, VA	2,748	T, SC	1950, 1956
03171500	New River at Eggleston, VA	2,941	T, SC	1953-55
03176500*	New River at Glen Lyn, VA	3,768	SC T	1968-88 1964-88
BIG SANDY RIVER BASIN				
03207500	Levisa Fork near Grundy, VA	235	T, SC SED	1950 1986
03207800	Levisa Fork at Big Rock, VA	297	T, SC SED	1970-81 1970-81
03208034	Grissom Creek near Council, VA	2.82	T, SC, C, SED	1982-83
03208036	Barton Fork near Council, VA	10.2	T, SC, C, SED	1981-83
03208040	Russell Fork at Council, VA	1.23	T, SC C	1981-83 1982-83
03208100	Russell Fork near Birchleaf, VA	87.4	T, SC, C	1982-83

TYPE OF RECORD: C (chemical quality); SED (sediment); SC (specific conductance);
T (temperature).

* Presently active periodic sampling station.

WATER RESOURCES DATA - VIRGINIA, 1989

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Discontinued water-quality stations--Continued

STATION NUMBER	STATION NAME	DRAINAGE AREA (mi ²)	TYPE OF RECORD	PERIOD OF RECORD
TENNESSEE RIVER BASIN				
03473000	South Fork Holston River near Damascus, VA	301	T SC C	1950, 1968-73 1950 1950, 1952, 1968-86
03474500	Middle Fork Holston River at Chilhowie, VA	155	T	1962
03488445	Brumley Creek near Hansonville, VA	4.29	T	1980-81
03488450	Brumley Creek at Brumley Gap, VA	21.1	T	1979-81
03488500	North Fork Holston River at Holston, VA	402	T, SC	1952-56
03490000	North Fork Holston River near Gate City, VA	672	T SC SED	1950-51, 1968-78 1950-51 1935-38, 1963-65
03527000	Clinch River at Speers Ferry, VA	1,126	T SC SED	1950, 1965-67 1950 1935-38, 1963-65
03529500	Powell River at Big Stone Gap, VA	112	T, SC	1950
03531500	Powell River near Jonesville, VA	319	T	1964-67

TYPE OF RECORD: C (chemical quality); SED (sediment); SC (specific conductance);
T (temperature).

* Presently active periodic sampling station.

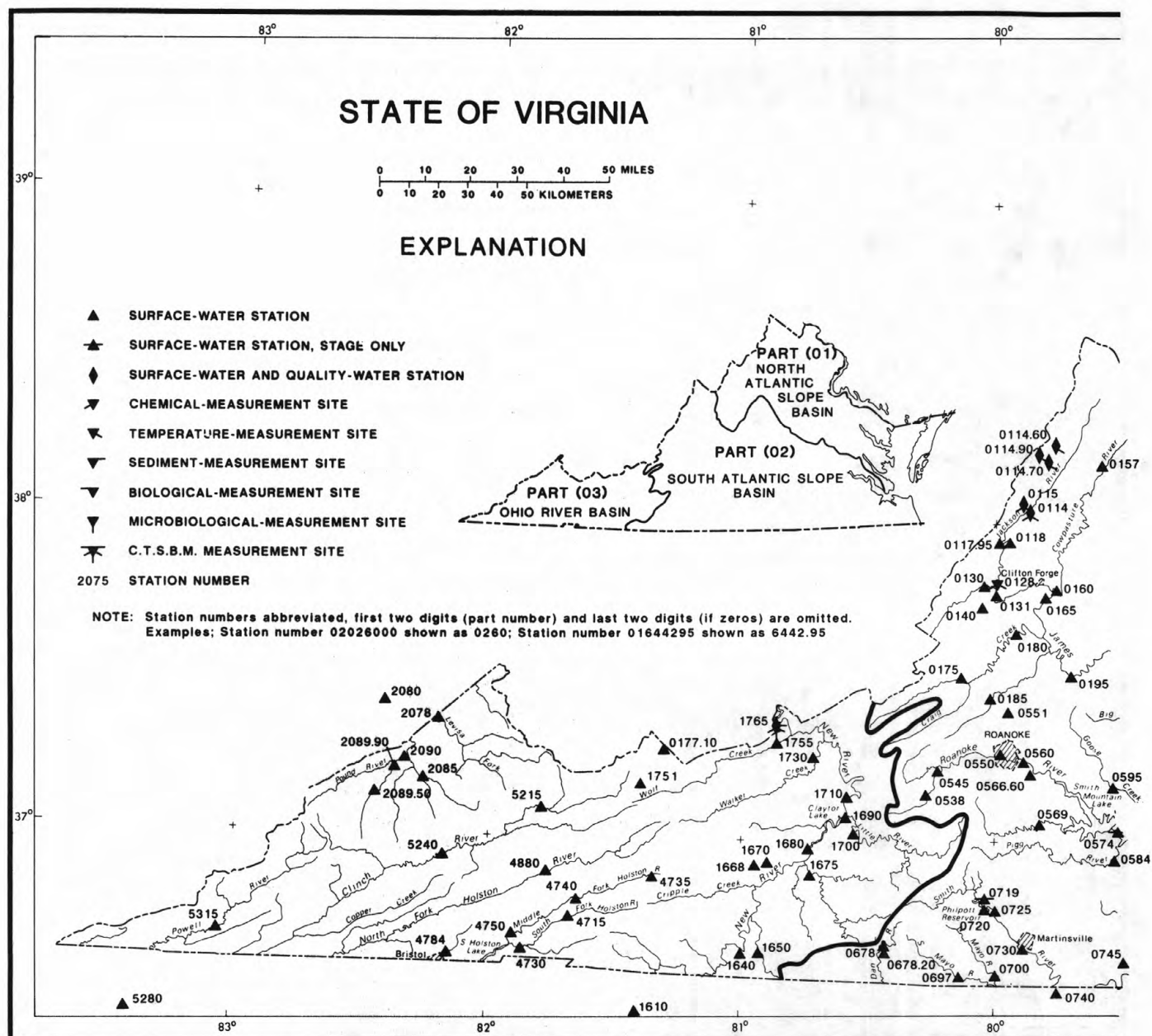
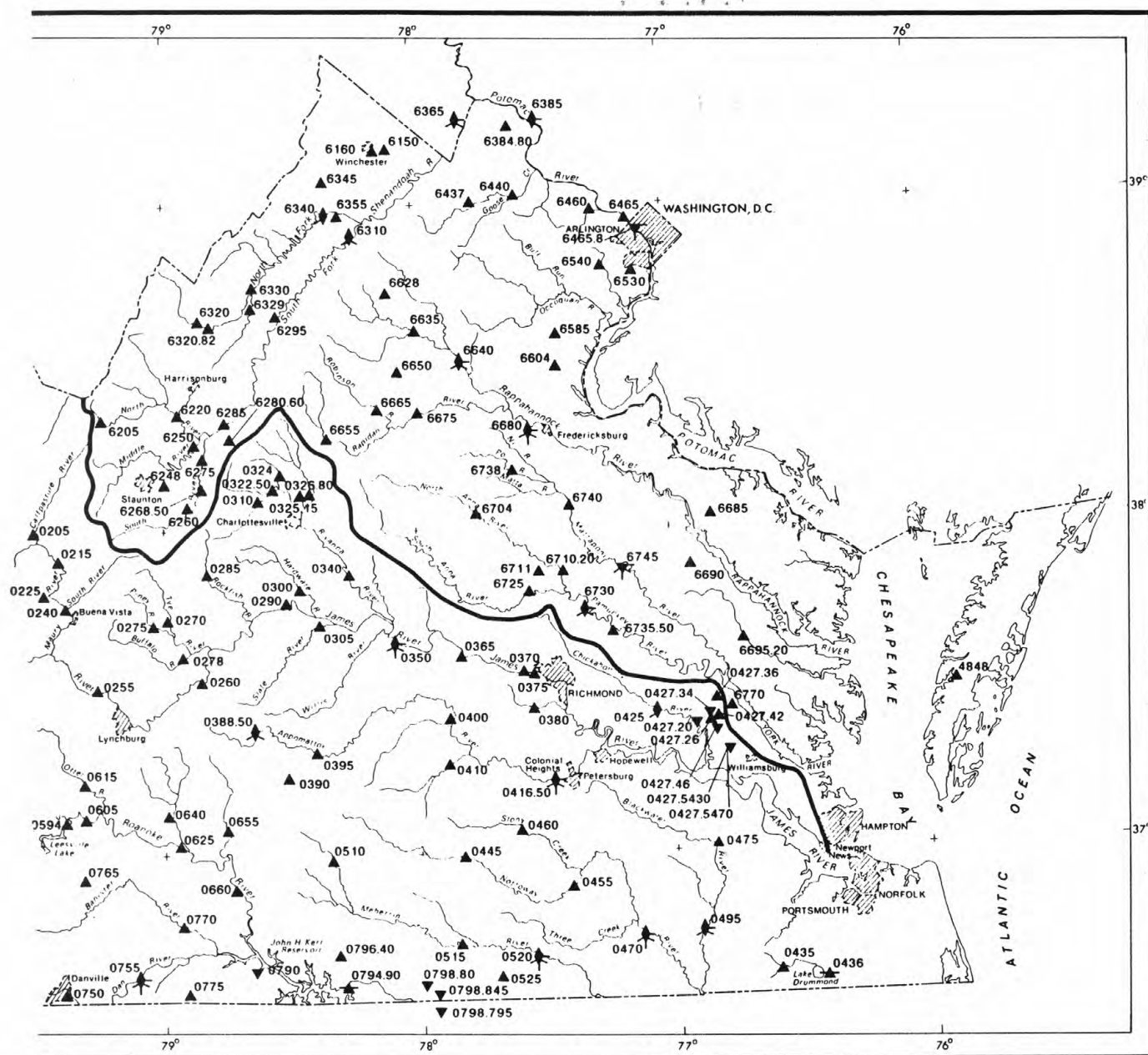


Figure 7.--Location of surface-water and water-quality data-collection stations.



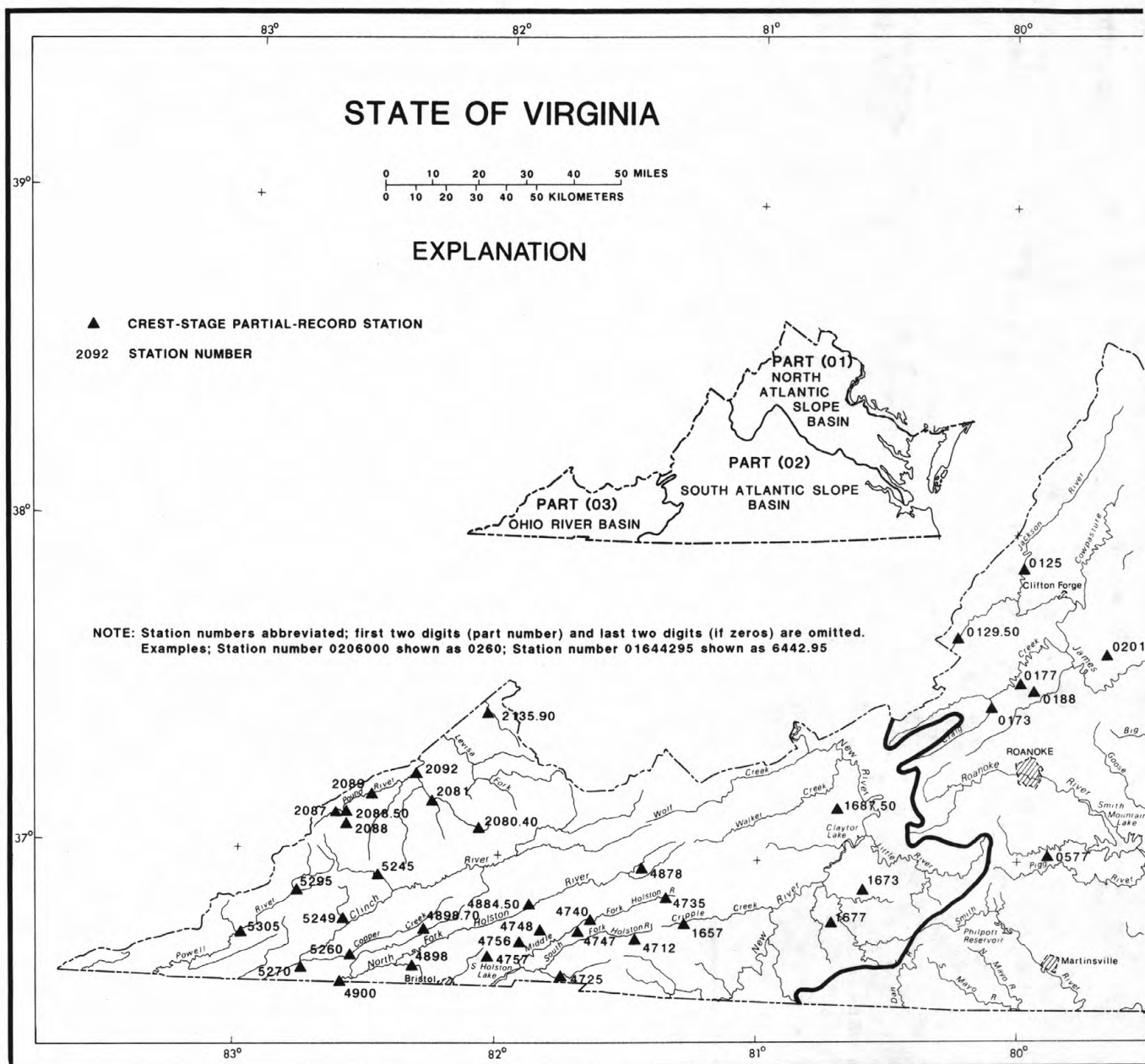
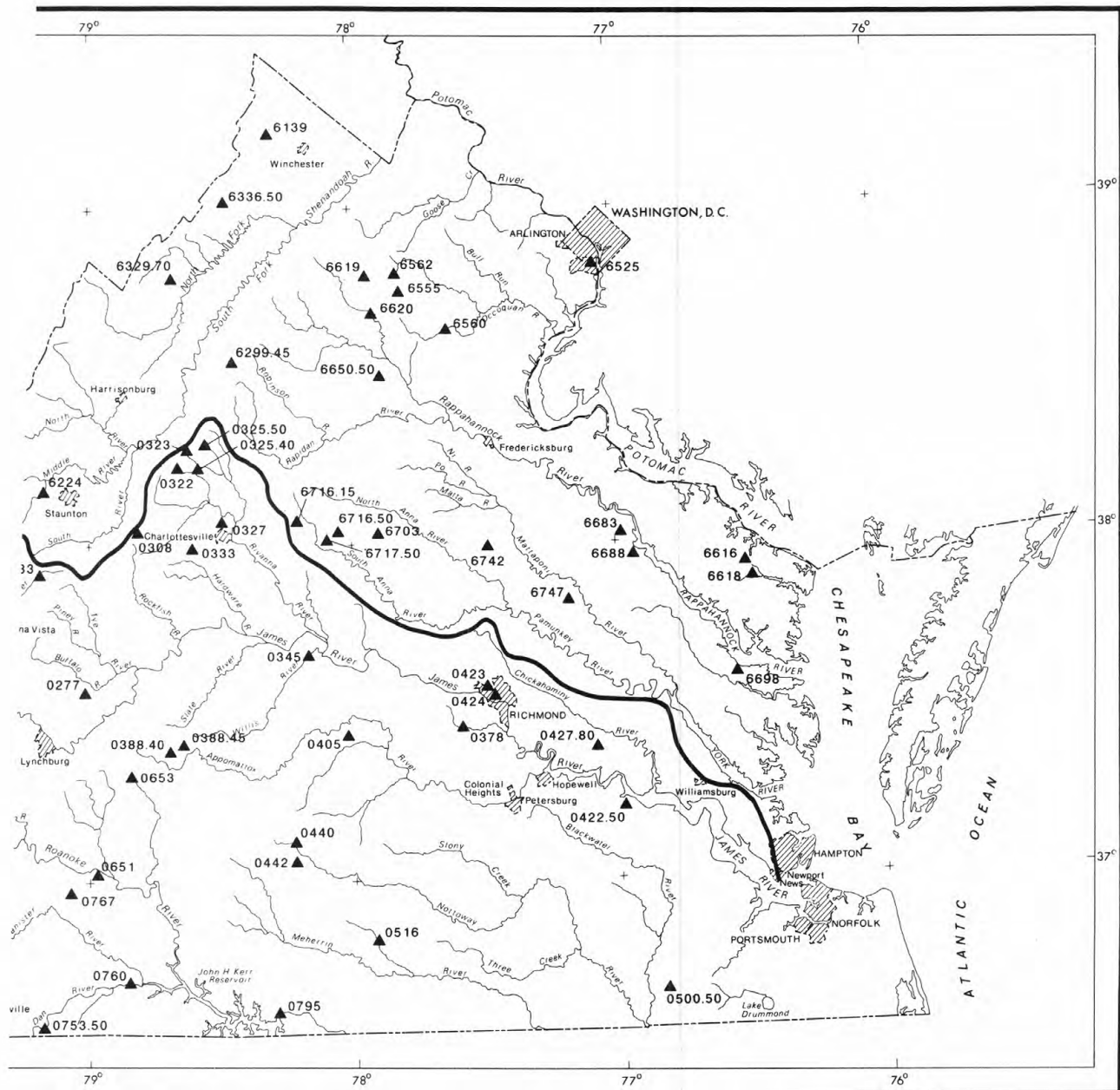


Figure 8.--Location of surface-water partial-record stations.



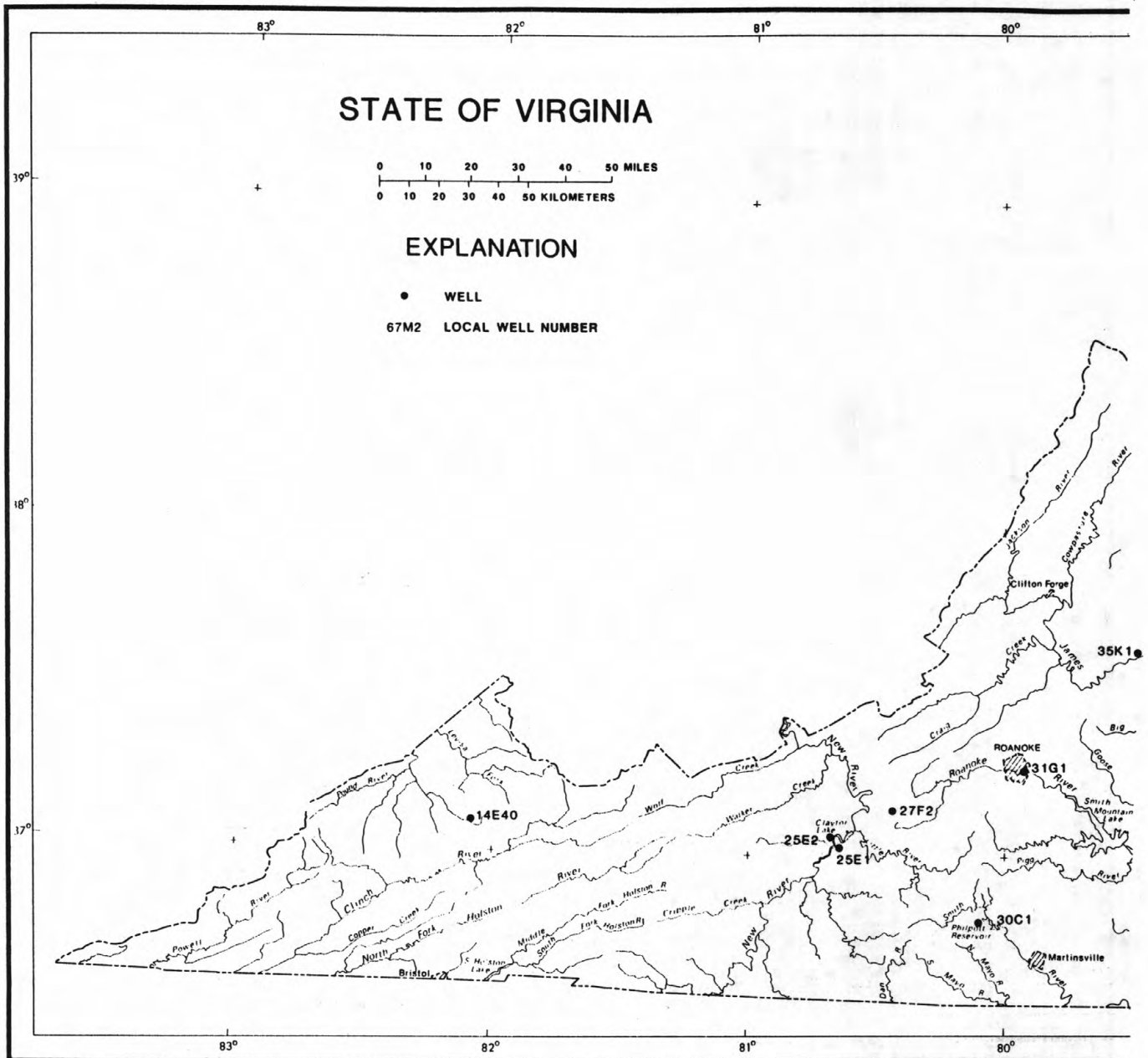
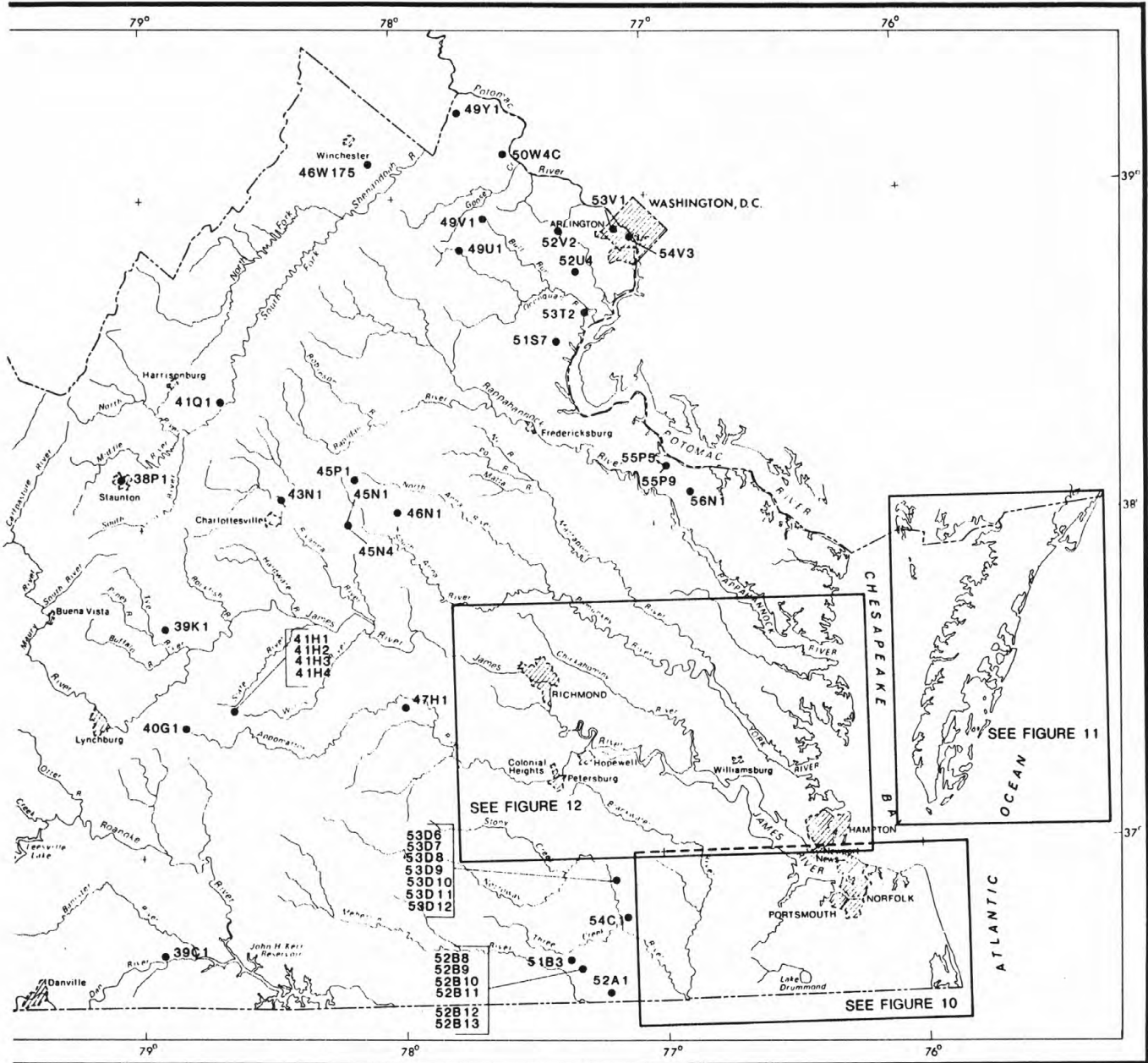
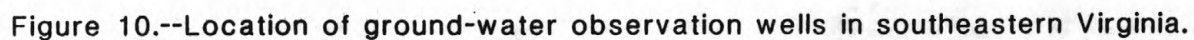
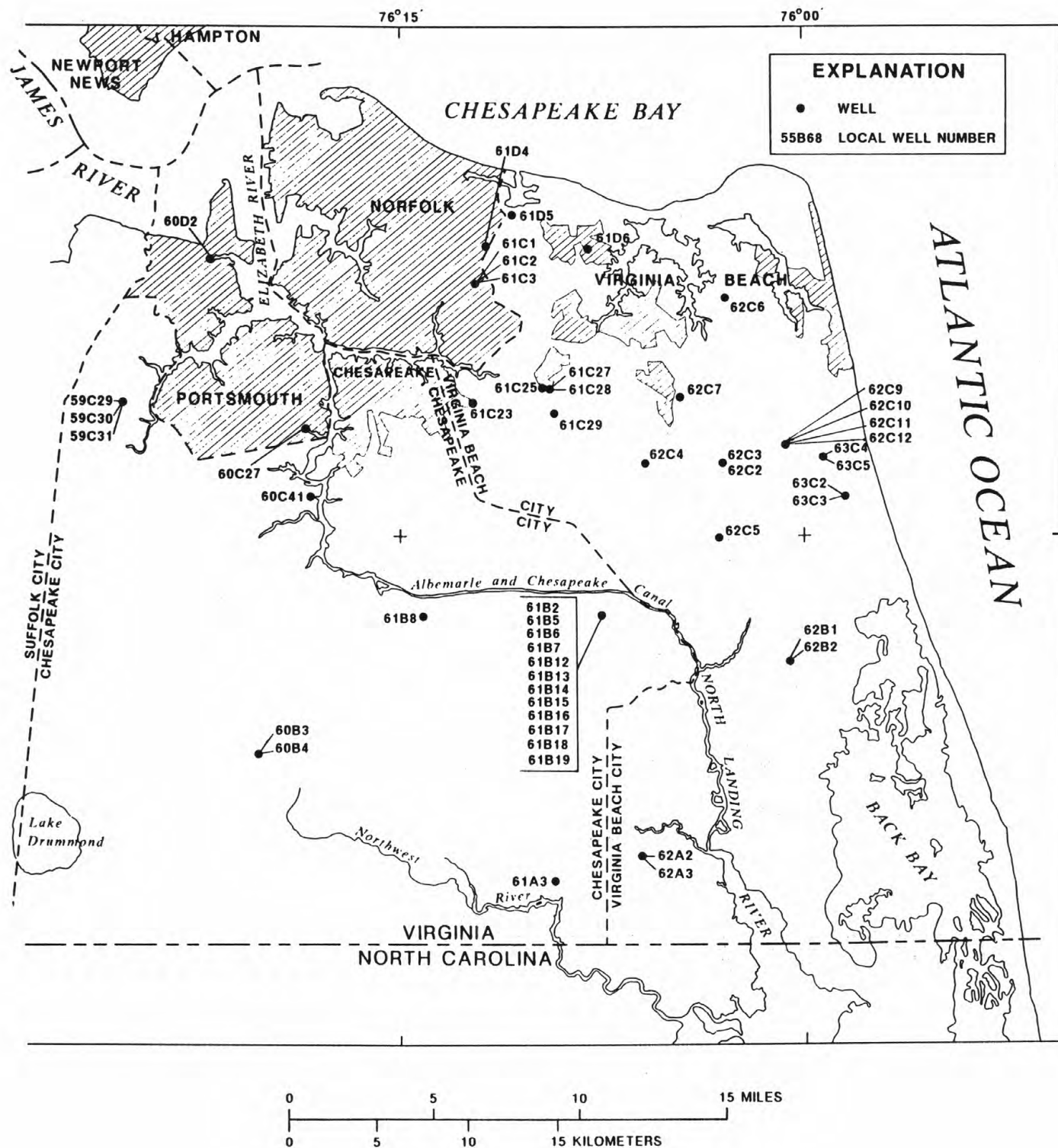


Figure 9.--Location of ground-water observation wells.







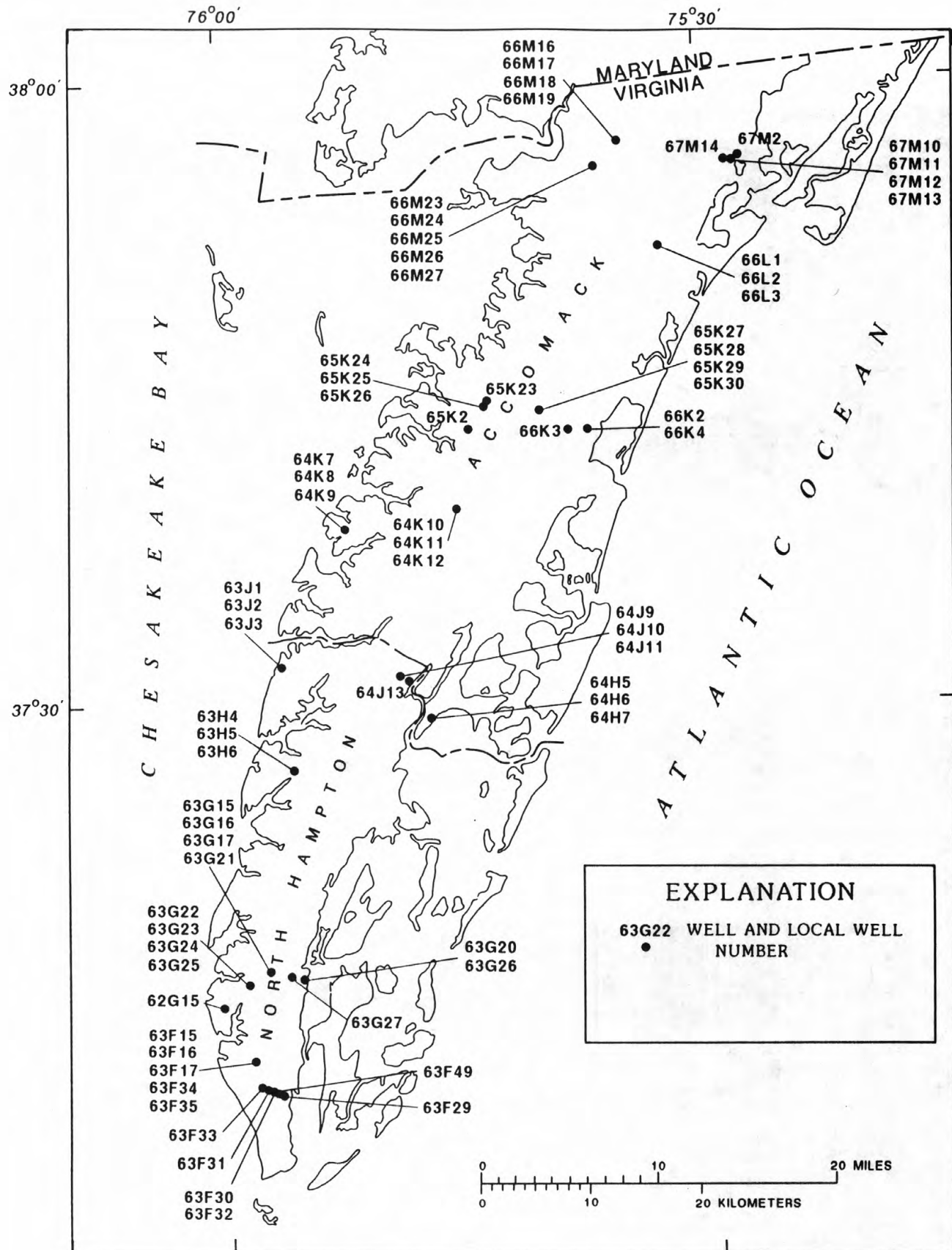


Figure 11.--Location of ground-water observation wells on Delmarva peninsula.

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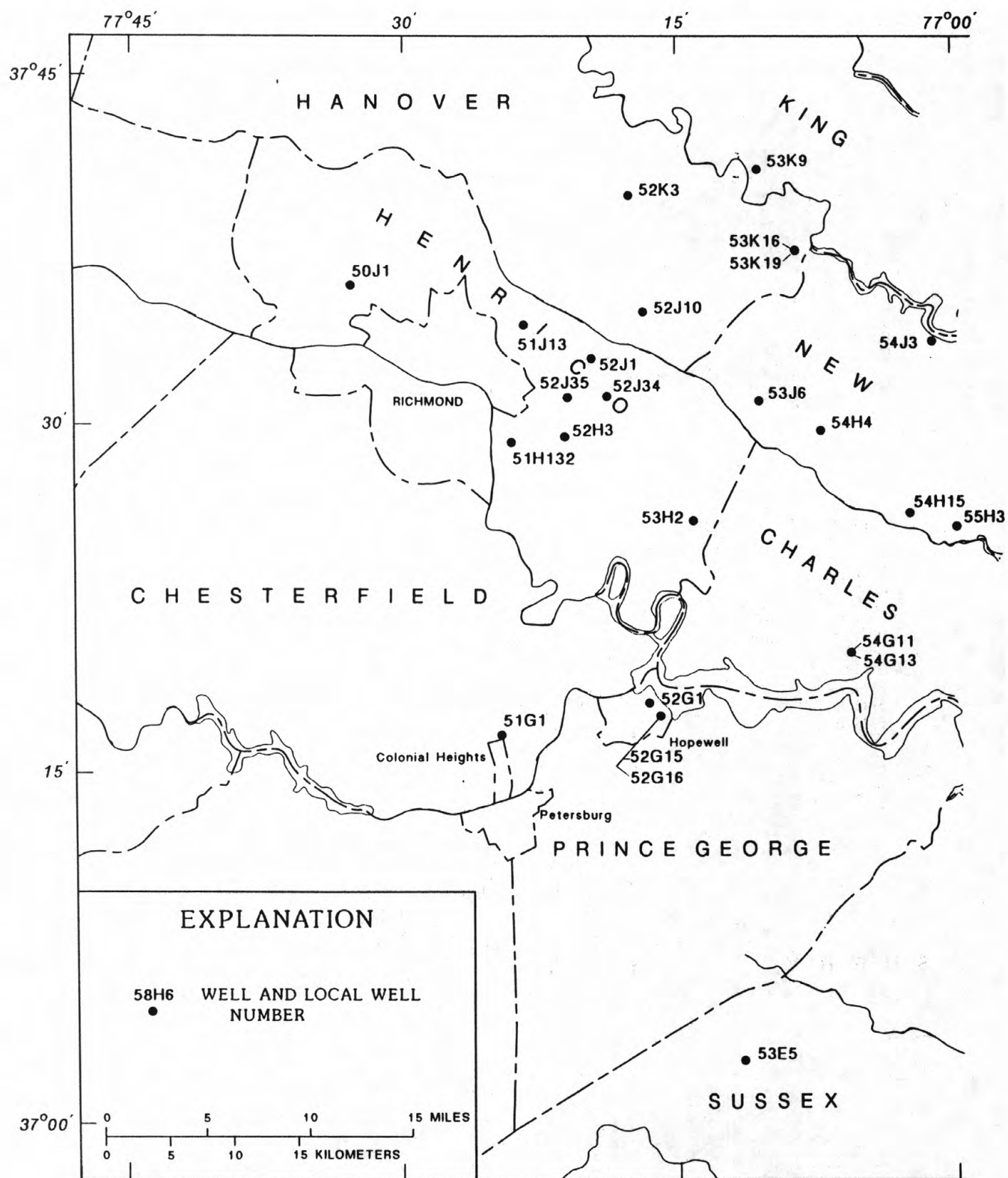
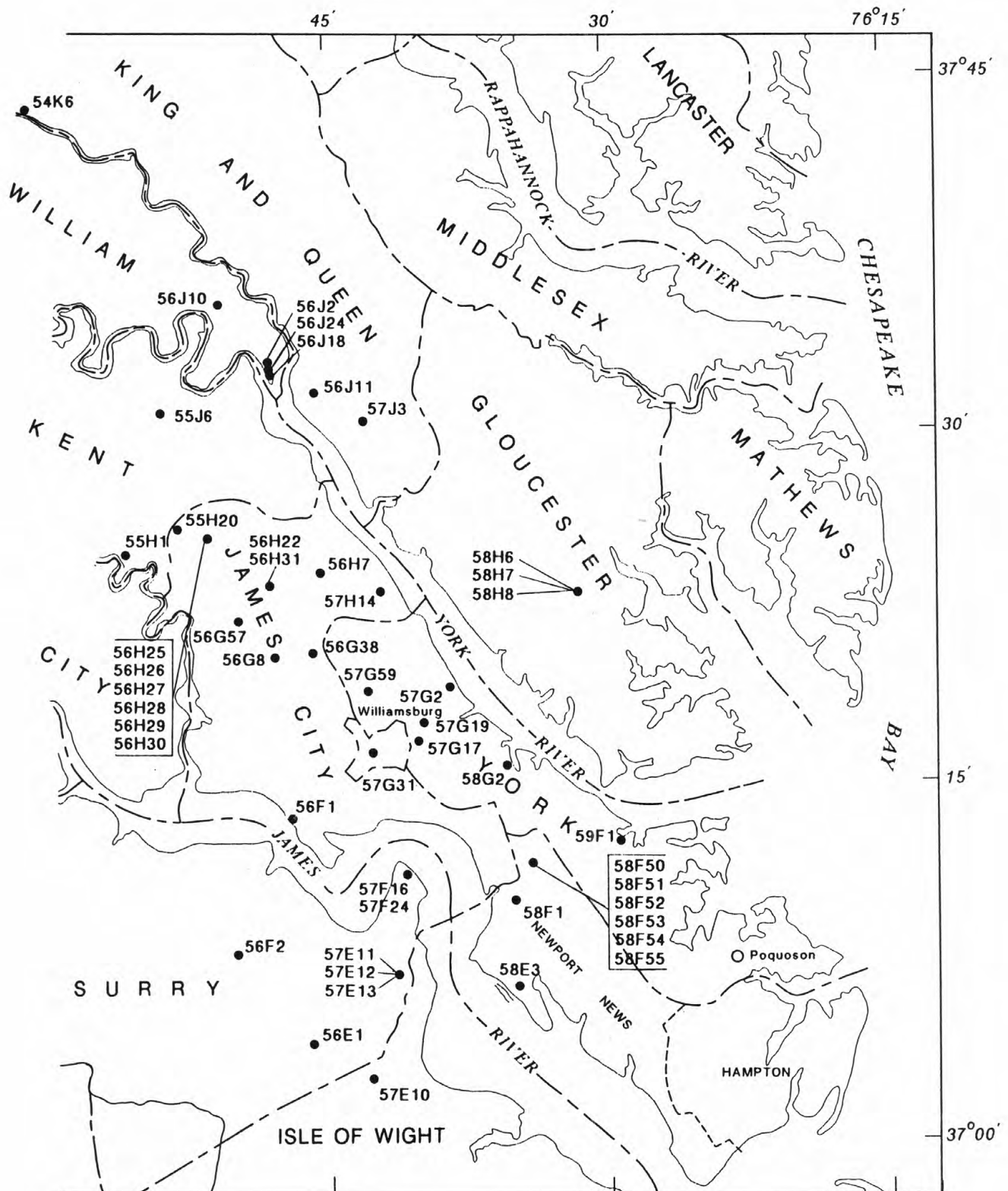


Figure 12.--Location of ground-water observation wells on York-James peninsula and vicinity.



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SURFACE-WATER AND QUALITY-OF-WATER RECORDS

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

<u>PRINTED OUTPUT</u>	<u>REMARK</u>
E	Estimated value
>	Actual value is known to be greater than the value shown.
<	Actual value is known to be less than the value shown
K	Results based on colony count outside the acceptance range (non-ideal colony count)
L	Biological organism count less than 0.5 percent (organism may be observed rather than counted)
D	Biological organism count equal to or greater than 15 percent (dominant)
&	Biological organism estimated as dominant

HYDROLOGIC-DATA STATION RECORDS

NORTH ATLANTIC SLOPE BASINS

NASSAWADOX CREEK BASIN

01484800 GUY CREEK NEAR NASSAWADOX, VA

LOCATION.--Lat 37°30'08", long 75°52'22", Northampton County, Hydrologic Unit 02080109, on left bank 25 ft upstream from bridge on State Highway 606, 1.9 mi northwest of Nassawadox, and 2.1 mi upstream from mouth.

DRAINAGE AREA.--1.72 mi².

PERIOD OF RECORD.--November 1963 to current year.

GAGE.--Water-stage recorder. Datum of gage is 11.67 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair except for period of no gage-height record, Oct. 1 to Jan. 10, which is poor. Some diversion into pond for irrigation upstream from station, amount unknown. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--25 years (water years 1965-89), 1.33 ft³/s, 10.50 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 78 ft³/s, July 31, 1979, gage height, 5.28 ft; no flow at times in 1964, 1966, 1981, 1983-85, and 1987.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 52 ft³/s, Aug. 18, gage height, 4.55 ft; minimum daily, 0.17 ft³/s, Oct. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.18	e1.2	e1.1	e.54	.55	4.1	4.9	2.5	.46	.44	.52	.70
2	e.17	e1.8	e.96	e.58	.55	3.2	3.5	2.6	.38	.43	.51	.64
3	e.25	e1.1	e.84	e.60	.57	2.6	3.2	2.0	.62	.43	.50	.70
4	e.44	e.84	e.72	e.54	.65	2.4	2.9	1.5	.55	.43	.49	.57
5	e.36	e.90	e.66	e.52	.70	2.2	2.6	1.4	.55	.43	.45	.47
6	e.30	e.92	e.62	e.58	.81	2.7	5.7	1.9	.59	.45	.45	.45
7	e.29	e.86	e.58	e.60	1.0	7.3	6.0	1.6	.61	.50	.45	.42
8	e.27	e.75	e.60	e.64	.92	5.9	8.4	1.2	.79	.44	.53	.46
9	e.25	e.64	e.66	e.72	.80	5.0	5.1	1.1	.67	.43	.45	.50
10	e.23	e.58	e.72	e.75	.72	4.3	3.9	2.5	.64	.43	.58	.43
11	e.22	e.57	e.68	.64	.72	3.7	3.3	2.2	.57	.42	.59	.38
12	e.20	e.56	e.62	.75	.71	3.3	2.9	1.6	.55	.42	6.8	.44
13	e.19	e.56	e.56	1.0	.64	2.9	2.6	1.3	.62	.43	7.1	.38
14	e.19	e.55	e.52	.86	.64	3.7	2.4	1.1	.73	.56	7.3	.44
15	e.18	e.55	e.54	.87	.67	3.3	4.9	1.0	.59	.45	4.5	.79
16	e.18	e.58	e.54	.81	.64	4.7	7.2	1.0	.54	7.2	2.8	.95
17	e.18	e.90	e.50	.77	.64	3.6	4.5	1.0	.59	10	1.8	.77
18	e.18	e.86	e.46	.72	.71	3.1	3.6	.98	.58	2.0	22	.71
19	e.19	e.80	e.48	.72	.72	3.2	2.9	.91	.55	1.1	16	2.2
20	e.25	e.76	e.49	.72	.75	2.4	2.3	.87	.52	.84	7.2	1.4
21	e.50	e.70	e.52	.65	2.6	3.5	2.0	.79	.65	.72	4.4	1.0
22	e1.2	e.64	e.58	.64	3.8	3.2	1.8	.67	.67	.64	3.2	.93
23	e1.1	e.56	e.56	.64	2.6	2.5	1.6	.68	.62	.62	2.4	.87
24	e.72	e.52	e.54	.61	2.0	16	1.5	.77	.57	.57	2.1	.84
25	e.56	e.50	e.54	.55	1.8	9.4	1.4	.66	.52	.55	1.8	.90
26	e.45	e.48	e.52	.58	1.9	5.3	1.3	.62	.52	.54	1.5	1.9
27	e.38	e.60	e.52	.61	2.4	4.2	1.1	.56	.49	.53	1.3	.96
28	e.35	e1.5	e.50	.55	4.3	3.7	1.1	.49	.48	.52	1.1	.78
29	e.32	e2.5	e.52	.55	---	3.2	1.1	.51	.50	.50	1.0	.74
30	e.31	e1.7	e.50	.61	---	3.0	3.1	.53	.45	.49	.96	.73
31	e.35	---	e.52	.56	---	4.4	---	.48	---	.54	.80	---
TOTAL	10.94	25.98	18.67	20.48	35.51	132.0	98.8	37.02	17.17	34.05	101.58	23.45
MEAN	.35	.87	.60	.66	1.27	4.26	3.29	1.19	.57	1.10	3.28	.78
MAX	1.2	2.5	1.1	1.0	4.3	16	8.4	2.6	.79	10	22	2.2
MIN	.17	.48	.46	.52	.55	2.2	1.1	.48	.38	.42	.45	.38
CFSM	.21	.50	.35	.38	.74	2.48	1.91	.69	.33	.64	1.91	.45
IN.	.24	.56	.40	.44	.77	2.85	2.14	.80	.37	.74	2.20	.51

CAL YR 1988 TOTAL 286.91 MEAN .78 MAX 6.1 MIN .01 CFSM .46 IN. 6.21
WTR YR 1989 TOTAL 555.65 MEAN 1.52 MAX 22 MIN .17 CFSM .89 IN. 12.02

e Estimated.

01615000 OPEQUON CREEK NEAR BERRYVILLE, VA

LOCATION.--Lat 39°10'40", long 78°04'20", Frederick County, Hydrologic Unit 02070004, on left bank between the bridges on State Highway 7, 0.2 mi upstream from Abrams Creek, and 5.0 mi west of Berryville.

DRAINAGE AREA.--57.4 mi².

PERIOD OF RECORD.--October 1943 to current year.

REVISED RECORDS.--WSP 2103: Drainage area. WDR VA-72-1: 1971(P).

GAGE.--Water-stage recorder. Datum of gage is 503.24 ft above National Geodetic Vertical Datum of 1929. Prior to July 26, 1949, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Some diurnal fluctuation caused by mills and sewage treatment plant upstream from station. Most of water discharged from the treatment plant was diverted from another drainage basin for municipal supply. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--46 years, 42.7 ft³/s, 10.10 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,600 ft³/s, May 18, 1988, gage height, 13.49 ft, from rating curve extended above 4,800 ft³/s; minimum daily, 0.20 ft³/s, Sept. 12, 13, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in October 1942 reached a stage of 18.4 ft, discharge not determined, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 850 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	1330	865	5.13	May 16	1730	*1,090	*5.71

Minimum discharge, 6.3 ft³/s, Dec. 10, 11, 12, 13, 18, result of freezeup; minimum daily, 9.1 ft³/s, Dec. 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	12	13	11	13	24	59	48	29	19	18	12
2	10	12	12	13	13	21	44	162	28	18	17	12
3	11	12	11	15	17	19	40	63	26	18	16	11
4	11	12	10	15	36	19	36	38	25	19	15	11
5	10	14	10	14	30	29	37	39	25	47	15	11
6	10	20	10	14	26	417	48	474	28	32	15	12
7	10	15	10	14	22	185	37	271	31	26	27	11
8	11	13	10	17	19	89	34	101	28	23	17	12
9	11	12	11	47	16	74	33	77	26	21	15	13
10	11	11	11	35	15	125	29	289	25	20	14	12
11	12	11	9.8	26	15	136	26	143	23	19	16	12
12	11	11	9.4	44	15	107	24	91	22	18	18	11
13	11	11	9.2	83	16	78	23	68	23	19	16	12
14	11	12	9.8	42	58	62	22	58	25	19	15	12
15	11	12	10	58	79	55	23	58	25	18	14	12
16	11	11	10	55	85	45	23	610	36	43	14	16
17	12	12	9.5	37	56	38	22	341	35	30	14	17
18	12	11	9.1	29	42	37	21	131	26	21	14	14
19	11	12	9.7	25	34	36	22	85	23	19	17	13
20	11	50	10	22	30	33	20	64	56	21	15	13
21	14	41	11	18	31	45	19	55	58	23	14	14
22	17	21	12	16	73	39	19	47	39	102	14	15
23	14	16	12	17	85	34	18	46	56	24	14	15
24	13	13	14	16	54	345	17	68	34	20	13	14
25	12	12	17	16	38	197	17	45	26	19	13	13
26	11	11	15	16	35	97	17	40	24	19	12	16
27	14	12	13	17	31	69	17	41	22	17	12	16
28	12	19	12	15	27	55	17	36	25	17	12	14
29	11	17	16	13	---	47	17	32	23	16	12	13
30	11	14	12	14	---	46	17	31	21	16	12	12
31	11	---	11	15	---	80	---	30	---	21	12	---
TOTAL	359	462	349.5	789	1011	2683	798	3682	893	764	462	391
MEAN	11.6	15.4	11.3	25.5	36.1	86.5	26.6	119	29.8	24.6	14.9	13.0
MAX	17	50	17	83	85	417	59	610	58	102	27	17
MIN	10	11	9.1	11	13	19	17	30	21	16	12	11
(*)	5.34	5.09	4.94	5.74	5.88	8.37	5.79	10.8	7.91	7.36	6.30	6.00

CAL YR 1988 TOTAL 15661.5 MEAN 42.8 MAX 2610 MIN 7.4
WTR YR 1989 TOTAL 12643.5 MEAN 34.6 MAX 610 MIN 9.1 (*) 6.63

* Discharge from sewage treatment plant, equivalent in cubic feet per second; provided by the Frederick-Winchester Service Authority.

POTOMAC RIVER BASIN

01616000 ABRAMS CREEK NEAR WINCHESTER, VA

LOCATION.--Lat 39°10'40", long 78°05'10", Frederick County, Hydrologic Unit 02070004, on right bank 1,000 ft upstream from bridge on State Highway 659, 0.9 mi upstream from mouth, and 4.4 mi east of Winchester.

DRAINAGE AREA.--16.5 mi².

PERIOD OF RECORD.--July 1949 to September 1960, June 1979 to current year.

GAGE.--Water-stage recorder. Datum of gage is 526.46 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for period of no gage-height record, Dec. 12-14, periods with ice effect, Dec. 15, 18, and period of backwater from debris, Jan. 17 to Feb. 12, which are fair. Slight diurnal fluctuation caused by sewage disposal plant upstream from station at Winchester. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--21 years, 21.7 ft³/s, 17.86 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,220 ft³/s, May 18, 1988, gage height, 6.14 ft; maximum gage height, 6.16 ft, Dec. 4, 1950; minimum discharge, 3.5 ft³/s, Oct. 8, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	0900	*433	*3.41	May 16	1230	213	2.52
May 6	0030	252	2.69	June 20	1630	201	2.47
May 6	1900	210	2.51				

Minimum daily discharge, 7.2 ft³/s, Dec. 13, 14, 18, 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.9	11	9.3	11	e7.8	11	16	38	16	14	12	10
2	9.6	10	8.8	11	e7.8	10	15	30	15	13	13	10
3	10	10	8.5	9.7	e18	10	15	16	15	13	12	9.9
4	11	11	7.6	11	e12	10	14	14	15	22	11	9.8
5	9.1	22	8.0	8.6	e10	19	18	36	19	23	11	9.3
6	9.3	9.7	8.7	9.1	e9.6	124	15	101	21	18	11	10
7	9.5	8.5	8.5	8.3	e9.4	33	14	39	25	16	11	10
8	9.1	8.8	8.7	16	e8.8	21	13	24	17	14	11	12
9	8.2	8.8	10	16	e8.5	22	13	38	18	13	10	10
10	8.6	8.8	8.2	13	e8.5	29	12	66	16	13	10	9.4
11	9.4	8.7	7.6	12	e8.5	29	12	33	15	13	16	8.8
12	9.5	8.9	e7.4	32	e8.5	26	12	25	15	13	12	9.9
13	9.8	13	e7.2	25	11	22	12	22	19	17	11	10
14	10	8.8	e7.2	18	27	19	12	20	15	14	10	10
15	9.9	8.8	e8.2	32	20	17	13	26	24	13	11	10
16	8.9	8.8	8.2	20	20	15	11	115	19	39	11	25
17	9.2	11	8.0	e16	16	14	12	54	26	16	10	11
18	11	9.5	e7.2	e13	13	19	12	33	16	15	10	10
19	10	15	7.2	e11	12	14	12	26	15	13	19	11
20	10	47	8.3	e9.5	11	17	11	23	37	22	11	10
21	21	16	10	e8.8	17	18	11	22	37	17	11	11
22	12	13	8.0	e8.8	25	15	10	21	25	15	11	14
23	8.8	11	10	e8.8	19	14	10	40	38	15	11	11
24	9.5	10	16	e8.8	16	77	10	33	20	12	11	8.9
25	10	9.6	10	e8.8	14	32	10	24	17	15	11	9.6
26	10	9.0	8.0	e8.8	13	23	10	21	16	12	10	17
27	10	12	7.5	e9.2	12	19	9.9	24	15	12	10	9.6
28	10	14	10	e8.0	12	17	9.3	19	19	11	10	9.4
29	9.9	9.9	7.7	e8.0	---	16	11	18	15	11	9.7	9.4
30	9.0	9.7	7.5	e8.0	---	21	9.6	18	15	16	11	9.0
31	9.6	---	7.5	e8.5	---	20	---	17	---	13	10	---
TOTAL	311.8	362.3	265.0	396.7	375.4	753	364.8	1036	595	483	348.7	325.0
MEAN	10.1	12.1	8.55	12.8	13.4	24.3	12.2	33.4	19.8	15.6	11.2	10.8
MAX	21	47	16	32	27	124	18	115	38	39	19	25
MIN	8.2	8.5	7.2	8.0	7.8	10	9.3	14	15	11	9.7	8.8
CFSM	.61	.73	.52	.78	.81	1.47	.74	2.03	1.20	.94	.68	.66
IN.	.70	.82	.60	.89	.85	1.70	.82	2.34	1.34	1.09	.79	.73

CAL YR 1988 TOTAL 7500.4 MEAN 20.5 MAX 295 MIN 7.2 CFSM 1.24 IN. 16.91
WTR YR 1989 TOTAL 5616.7 MEAN 15.4 MAX 124 MIN 7.2 CFSM .93 IN. 12.66

e Estimated.

01620500 NORTH RIVER NEAR STOKESVILLE, VA

LOCATION.--Lat 38°20'15", long 79°14'25", Augusta County, Hydrologic Unit 02070005, George Washington National Forest, on left bank 575 ft upstream from highway bridge, 2.8 mi upstream from city of Staunton dam, 3.8 mi upstream from Broad Run, 5.0 mi west of Stokesville, and 7.8 mi upstream from Skidmore Fork.

DRAINAGE AREA.--17.2 mi².

PERIOD OF RECORD.--October 1946 to current year.

REVISED RECORDS.--WSP 1903: 1960. WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,054.57 ft above National Geodetic Vertical Datum of 1929.

Prior to June 10, 1958, at site 575 ft downstream at datum 6.0 ft lower.

REMARKS.--Records fair except for period of no gage-height record, Oct. 1-12, which is poor. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--43 years, 26.0 ft³/s, 20.53 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,530 ft³/s, revised, June 17, 1949, gage height, 10.9 ft, from floodmarks, site and datum then in use, from rating curve extended above 900 ft³/s on basis of computation of peak flow over dam; maximum gage height, 19.8 ft, Nov. 5, 1985, from floodmarks (backwater from Elkhorn Lake); minimum discharge, 0.10 ft³/s, Sept. 15, 16, 19-22, 1962, Sept. 7-13, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in October 1942 reached a stage of 8.4 ft, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	1000	429	5.02	Aug. 21	1915	555	5.26
May 6	1730	275	4.77	Aug. 25	0500	349	4.94
May 10	1045	239	4.72	Sept. 17	0400	214	4.65
June 20	0430	*657	*5.31	Sept. 22	2300	379	5.00
June 23	2015	225	4.53				

Minimum daily discharge, 0.67 ft³/s, Oct. 14, 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.3	1.3	7.7	12	9.3	22	32	115	3.1	14	86	19
2	e1.4	1.4	7.3	11	8.9	20	28	379	2.7	12	55	15
3	e1.9	1.4	6.9	10	8.8	18	26	206	2.5	10	36	12
4	e1.7	1.3	6.5	9.8	8.7	18	24	96	2.2	12	25	9.3
5	e1.5	1.9	6.2	9.5	8.3	18	23	69	2.4	15	18	8.1
6	e1.3	6.9	5.8	9.7	8.0	56	21	226	4.3	14	15	7.3
7	e1.2	10	5.5	10	8.0	112	20	194	52	16	12	6.6
8	e1.1	8.9	5.2	13	7.7	85	19	110	87	14	9.9	5.7
9	e1.1	7.6	5.2	31	7.5	63	18	78	109	13	8.1	5.0
10	e1.0	6.6	4.9	35	7.2	49	17	217	112	15	7.0	4.8
11	e.98	5.7	4.7	32	7.2	40	15	155	64	10	9.1	5.0
12	e.92	5.1	4.4	31	7.4	34	14	85	40	8.1	18	4.1
13	.71	4.9	4.2	31	7.9	30	13	53	30	8.0	17	21
14	.67	4.5	3.9	31	10	26	13	36	22	7.4	15	17
15	.67	4.2	3.8	63	20	23	13	28	20	6.5	14	15
16	.71	3.9	3.6	76	27	20	12	22	23	6.5	12	107
17	.73	3.8	3.6	62	29	18	11	18	113	7.3	34	187
18	.79	3.5	3.4	49	30	17	10	15	94	7.4	49	100
19	.82	3.6	3.3	40	28	17	11	13	81	6.8	40	57
20	.84	6.0	3.2	33	27	16	10	12	534	6.9	37	39
21	.89	23	3.3	27	27	17	9.4	11	280	6.2	256	32
22	.93	23	3.2	22	30	18	9.4	9.5	165	5.7	324	146
23	.93	19	3.5	19	36	19	9.1	9.0	150	5.4	139	278
24	.99	16	4.0	18	37	60	8.7	8.3	135	5.3	130	174
25	.98	13	7.0	16	35	135	10	7.2	72	5.1	300	76
26	.99	11	15	14	33	127	104	6.3	50	4.6	165	66
27	.93	9.8	17	13	30	89	117	5.5	38	4.7	88	55
28	.94	9.7	16	12	26	65	72	4.8	29	4.8	57	47
29	1.0	8.8	15	11	---	51	58	4.2	23	4.5	40	40
30	1.0	8.1	13	10	---	43	58	3.8	18	4.6	32	33
31	1.1	---	12	9.9	---	38	---	3.4	---	30	24	---
TOTAL	32.02	233.9	208.3	770.9	529.9	1364	805.6	2200.0	2358.2	290.8	2072.1	1551.9
MEAN	1.03	7.80	6.72	24.9	18.9	44.0	26.9	71.0	78.6	9.38	66.8	51.7
MAX	1.9	23	17	76	37	135	117	379	534	30	324	278
MIN	.67	1.3	3.2	9.5	7.2	16	8.7	3.4	2.2	4.5	7.0	4.1
CFSM	.06	.45	.39	1.45	1.10	2.56	1.56	4.13	4.57	.55	3.89	3.01
IN.	.07	.51	.45	1.67	1.15	2.95	1.74	4.76	5.10	.63	4.48	3.36

CAL YR 1988 TOTAL 4249.26 MEAN 11.6 MAX 236 MIN .55 CFSM .67 IN. 9.19
WTR YR 1989 TOTAL 12417.62 MEAN 34.0 MAX 534 MIN .67 CFSM 1.98 IN. 26.86

e Estimated.

POTOMAC RIVER BASIN

01622000 NORTH RIVER NEAR BURKETOWN, VA

LOCATION.--Lat 38°20'25", long 78°54'50", Rockingham County, Hydrologic Unit 02070005, on right bank 0.8 mi downstream from Pleasant Run, 2.8 mi northeast of Burkettown, and 8.5 mi upstream from Middle River.

DRAINAGE AREA.--379 mi².

PERIOD OF RECORD.--October 1925 to October 1972, May 1975 to current year. Monthly discharge only for some periods, published in WSP 1302.

REVISED RECORDS.--WSP 1171: 1936(M). WSP 1302: 1928-29(M), 1932-34(M), 1937-38(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,103.49 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 12, 1938, nonrecording gage at site 3.0 mi downstream at different datum.

REMARKS.--Records good except for period of no gage-height record, June 30 to July 18, which is fair. At a point 26.8 mi upstream from station, there is an aqueduct tunnel diversion of about 2.8 ft³/s from Staunton Dam Reservoir by city of Staunton for industrial and municipal use. Some diurnal fluctuation caused by discharge from sewage treatment plant about 0.9 mi upstream from station. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--61 years, 370 ft³/s, 13.26 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 65,000 ft³/s, Nov. 5, 1985, gage height, 35.85 ft, from high-water mark, from rating curve extended above 16,000 ft³/s on basis of slope-area measurements at gage heights 32.4 ft and 36.3 ft, and contracted-opening measurements at gage heights 35.85 ft and 36.3 ft; maximum gage height, 36.3 ft, June 18, 1949; minimum discharge, 16 ft³/s, Nov. 23, 1965, result of temporary dam upstream.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1852, that of June 18, 1949.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	0500	3,320	7.42	Aug. 24	1830	3,240	7.33
May 6	0430	2,590	6.50	Aug. 25	0600	*4,530	*8.83
May 10	1300	2,550	6.45				

Minimum discharge, 37 ft³/s, Oct. 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55	72	62	65	100	166	392	1560	193	e270	581	555
2	58	64	62	68	96	154	345	3110	183	e250	524	458
3	58	58	62	63	96	147	319	2270	175	e240	395	387
4	54	57	63	63	103	141	292	1610	169	e260	319	339
5	53	87	63	60	92	144	270	1300	164	e280	267	304
6	52	78	62	65	90	312	253	2340	186	e276	238	285
7	52	59	62	69	89	660	243	2120	426	e300	229	270
8	52	57	60	67	86	703	236	1630	618	e280	214	257
9	55	55	67	73	80	612	231	1400	587	e260	203	245
10	53	55	68	91	79	524	210	2480	662	e257	187	231
11	51	55	63	121	77	441	192	2050	594	e250	281	219
12	51	52	65	136	77	393	179	1540	485	e240	329	258
13	53	64	60	142	81	352	171	1200	457	e230	297	316
14	52	64	61	142	94	324	165	937	377	e220	288	361
15	44	56	61	245	88	296	164	775	361	e210	316	319
16	49	56	59	331	109	266	161	820	361	e230	346	1220
17	51	58	56	309	134	243	152	670	553	e260	253	1990
18	51	56	54	266	143	231	147	608	745	e270	462	1360
19	52	55	58	235	151	225	173	549	637	252	497	1010
20	52	105	56	206	153	214	151	499	958	254	441	790
21	63	77	57	183	157	212	147	456	1280	237	1070	658
22	72	65	59	167	183	206	150	405	1090	228	1700	616
23	53	63	59	152	176	207	151	384	932	228	1240	1080
24	56	61	61	139	184	502	150	363	1090	197	1460	1080
25	54	61	68	131	192	1020	154	324	827	186	2930	893
26	54	62	57	124	191	1060	312	297	637	311	1920	892
27	54	63	54	119	187	929	616	272	524	730	1540	744
28	54	83	56	113	179	756	594	251	414	429	1370	650
29	52	67	59	111	---	612	627	234	341	336	1100	571
30	52	63	58	109	---	509	793	217	e287	293	896	495
31	54	---	58	103	---	453	---	203	---	505	695	---
TOTAL	1666	1928	1870	4268	3467	13014	8140	32874	16313	8769	22588	18853
MEAN	53.7	64.3	60.3	138	124	420	271	1060	544	283	729	628
MAX	72	105	68	331	192	1060	793	3110	1280	730	2930	1990
MIN	44	52	54	60	77	141	147	203	164	186	187	219
CFSM	.14	.17	.16	.36	.33	1.11	.72	2.80	1.43	.75	1.92	1.66
IN.	.16	.19	.18	.42	.34	1.28	.80	3.23	1.60	.86	2.22	1.85

CAL YR 1988 TOTAL 70905 MEAN 194 MAX 2520 MIN 42 CFSM .51 IN. 6.96
WTR YR 1989 TOTAL 133750 MEAN 366 MAX 3110 MIN 44 CFSM .97 IN. 13.13

e Estimated.

01624800 CHRISTIANS CREEK NEAR FISHERSVILLE, VA

LOCATION.--Lat 38°07'42", long 78°59'41", Augusta County, Hydrologic Unit 02070005, on right bank at upstream side of bridge on State Highway 794, 2.2 mi northwest of Fishersville, and 12 mi upstream from mouth.

DRAINAGE AREA.--70.1 mi².

PERIOD OF RECORD.--October 1967 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,230 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except for period of no gage-height record, Dec. 13, which is fair. Some diurnal fluctuation caused by discharge of about 1.5 ft³/s from sewage treatment plant just upstream from station. Most of the water discharged from the treatment plant was diverted from another drainage basin for municipal supply. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--22 years, 71.2 ft³/s, 13.79 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,520 ft³/s, Nov. 4, 1985, gage height, 13.58 ft, from rating curve extended above 2,400 ft³/s; minimum, 3.8 ft³/s, Jan. 11, 1977, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	1130	1,790	7.68	Sept. 16	0630	1,990	8.27
May 1	1700	*3,020	*10.80	Sept. 22	1330	1,760	7.60
May 6	0100	2,990	10.74	Sept. 26	0530	1,120	5.63
May 6	1900	1,300	6.19				

Minimum discharge, 8.0 ft³/s, Dec. 18, result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	24	23	21	24	43	55	1250	60	45	71	66
2	16	22	22	22	26	39	52	758	59	44	48	62
3	18	19	21	21	28	39	51	260	58	43	43	58
4	17	18	20	20	32	45	49	174	56	45	41	56
5	16	33	20	19	27	51	52	407	57	55	39	55
6	16	30	20	21	27	772	50	1380	68	49	38	54
7	16	20	20	23	29	218	51	481	144	46	49	52
8	16	18	19	21	28	117	54	284	76	43	40	51
9	16	18	22	21	25	99	52	311	156	46	37	49
10	16	18	21	21	25	87	46	393	105	79	36	47
11	16	17	19	20	26	78	44	238	77	50	78	47
12	16	17	17	23	26	72	42	189	71	79	63	172
13	16	18	e18	23	27	67	41	159	68	105	46	69
14	17	20	19	22	41	67	40	141	64	245	42	58
15	17	17	20	97	51	61	41	144	64	69	41	54
16	17	17	20	61	56	56	40	187	63	184	40	754
17	17	20	19	46	58	53	38	127	60	96	41	196
18	18	20	18	40	49	52	36	113	55	75	98	120
19	18	23	18	36	45	52	42	105	54	66	69	103
20	18	74	18	33	41	50	37	100	68	65	54	93
21	21	38	21	30	48	56	35	96	72	57	59	94
22	23	27	23	28	75	50	35	88	60	52	117	663
23	19	25	23	28	69	51	34	89	56	50	175	230
24	19	24	25	27	58	300	33	82	54	49	303	145
25	18	22	32	27	51	124	40	77	50	46	210	121
26	18	22	27	26	49	92	166	75	54	45	110	465
27	18	21	25	25	46	80	79	72	74	45	109	153
28	18	33	24	24	45	72	72	68	52	44	97	121
29	18	27	22	24	---	67	78	67	50	41	85	106
30	18	24	22	24	---	63	197	66	46	40	82	98
31	18	---	21	25	---	59	---	63	---	71	71	---
TOTAL	540	726	659	899	1132	3132	1682	8044	2051	2069	2432	4412
MEAN	17.4	24.2	21.3	29.0	40.4	101	56.1	259	68.4	66.7	78.5	147
MAX	23	74	32	97	75	772	197	1380	156	245	303	754
MIN	15	17	17	19	24	39	33	63	46	40	36	47
CFSM	.25	.35	.30	.41	.58	1.44	.80	3.70	.98	.95	1.12	2.10
IN.	.29	.39	.35	.48	.60	1.66	.89	4.27	1.09	1.10	1.29	2.34

CAL YR 1988 TOTAL 11115 MEAN 30.4 MAX 325 MIN 14 CFSM .43 IN. 5.90
WTR YR 1989 TOTAL 27778 MEAN 76.1 MAX 1380 MIN 15 CFSM 1.09 IN. 14.74

e Estimated.

POTOMAC RIVER BASIN

01625000 MIDDLE RIVER NEAR GROTTOS, VA

LOCATION.--Lat 38°15'42", long 78°51'44", Augusta County, Hydrologic Unit 02070005, on left bank at upstream side of bridge on State Highway 769 at Mount Meridian, 1.8 mi upstream from mouth, and 2.0 mi west of Grottoes.

DRAINAGE AREA.--375 mi².

PERIOD OF RECORD.--April 1927 to current year. Records for February 1925 to September 1926, published in WSP 601 and 621, are unreliable and should not be used.

REVISED RECORDS.--WSP 1051: 1928-29, 1930(M), 1932, 1935-37, 1938(M), 1940. WSP 1171: 1933. WSP 1302: 1928-29(M), 1931-34(M). WSP 2103: Drainage area. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 1,061.51 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 1, 1938, nonrecording gage at same site and datum.

REMARKS.--Records good except those for period with ice effect, Dec. 13, 14, and period of doubtful gage-height record, Mar. 9, which are fair. There are discharges of about 4.7 ft³/s from sewage treatment plants upstream from station. Most of water discharged from sewage treatment plants was diverted from another drainage basin for industrial and municipal supply. Small diurnal fluctuation at low flow caused by mills upstream from station. Several measurements of water temperature were made during the year. Water-quality records for some periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--62 years, 312 ft³/s, 11.30 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 38,500 ft³/s, Nov. 5, 1985, gage height, 33.09 ft, from rating curve extended above 15,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 18 ft³/s, Dec. 16, 1988, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1877, that of Nov. 5, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	0500	*4,580	*12.03	Aug. 25	0130	3,910	11.18
May 6	0830	4,410	11.82				

Minimum discharge, 18 ft³/s, Dec. 16, result of freezeup; minimum daily, 66 ft³/s, Dec. 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68	96	97	95	95	197	275	1700	206	195	275	359
2	72	114	94	101	93	177	247	3610	196	186	197	323
3	81	96	88	95	98	163	233	1700	193	180	172	294
4	77	93	88	92	123	165	225	1020	185	179	159	271
5	76	99	85	85	112	180	221	861	182	211	150	257
6	69	157	85	87	105	928	218	3690	217	230	146	249
7	71	110	83	97	104	1530	203	2510	475	202	154	242
8	68	96	83	97	113	862	217	1410	516	186	209	235
9	69	87	89	98	103	e560	218	1070	636	178	143	225
10	71	88	102	95	95	450	200	1960	988	237	133	217
11	71	84	93	98	93	379	184	1480	609	252	307	207
12	72	83	66	105	99	333	176	1060	414	201	420	570
13	69	81	e70	118	98	295	172	818	375	334	239	336
14	69	92	e89	113	120	285	167	680	351	673	189	262
15	71	90	94	237	172	262	167	607	338	521	171	235
16	72	83	87	440	200	239	169	702	320	498	164	1380
17	73	90	82	354	263	216	162	563	295	468	214	1460
18	77	97	81	263	229	206	155	482	306	381	398	875
19	78	90	89	214	210	216	169	428	281	348	422	610
20	77	212	89	184	196	200	165	396	328	319	275	497
21	82	184	88	159	190	214	152	380	364	292	372	451
22	106	138	91	144	264	220	146	347	426	248	497	699
23	97	115	92	132	340	227	142	327	370	220	711	1340
24	90	108	101	128	302	791	141	317	391	206	799	888
25	85	100	115	120	270	989	144	291	326	193	2680	640
26	80	93	115	118	243	751	421	272	275	185	1220	1170
27	81	94	111	114	226	562	806	260	298	198	807	815
28	82	112	108	109	209	451	552	241	270	185	617	620
29	85	117	103	100	---	382	447	229	249	173	657	536
30	84	102	99	99	---	336	544	225	212	171	622	477
31	83	---	97	100	---	306	---	216	---	222	421	---
TOTAL	2406	3201	2854	4391	4765	13072	7438	29852	10592	8272	13940	16740
MEAN	77.6	107	92.1	142	170	422	248	963	353	267	450	558
MAX	106	212	115	440	340	1530	806	3690	988	673	2680	1460
MIN	68	81	66	85	93	163	141	216	182	171	133	207
CFSM	.21	.28	.25	.38	.45	1.12	.66	2.57	.94	.71	1.20	1.49
IN.	.24	.32	.28	.44	.47	1.30	.74	2.96	1.05	.82	1.38	1.66

CAL YR 1988 TOTAL 57826 MEAN 158 MAX 1210 MIN 64 CFSM .42 IN. 5.74
WTR YR 1989 TOTAL 117523 MEAN 322 MAX 3690 MIN 66 CFSM .86 IN. 11.66

e Estimated.

01626000 SOUTH RIVER NEAR WAYNESBORO, VA

LOCATION.--Lat 38°03'27", long 78°54'30", Waynesboro City, Hydrologic Unit 02070005, on right bank 80 ft downstream from bridge on State Highway 664, 1.3 mi southwest of Waynesboro post office, and 2.4 mi downstream from Back Creek.

DRAINAGE AREA.--127 mi², of which 41 mi² are above flood-detention structures.

PERIOD OF RECORD.--October 1952 to current year.

REVISED RECORDS.--WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,296.20 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. At a point 13.8 mi upstream from station, there is a diversion of about 1.7 ft³/s from Coles Run Reservoir, capacity 80,000,000 gal., by Augusta County Service Authority for industrial and municipal use. Flow from 41 mi² upstream from station slightly regulated by flood-detention reservoirs (sixteen of which were built by Soil Conservation Service between 1954 and 1961). Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--37 years, 143 ft³/s, 15.29 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,500 ft³/s, Nov. 4, 1985, gage height, 15.30 ft, from rating curve extended above 4,200 ft³/s on basis of contracted-opening measurement at gage height 13.95 ft; minimum, 7.0 ft³/s, July 18, 1966; minimum daily, 17 ft³/s, Aug. 8, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in October 1942 reached a stage of 14.3 ft, from floodmarks, discharge, 14,500 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	1030	1,480	5.89	July 20	0030	1,030	5.07
May 6	1900	*2,040	*6.80	Sept. 22	1430	1,380	5.71

Minimum discharge, 17 ft³/s, Oct. 31; minimum daily, 24 ft³/s, Oct. 19, 20, 31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	33	57	54	49	106	179	671	85	67	210	117
2	29	31	54	53	48	98	160	1380	79	64	178	108
3	30	32	53	53	48	93	151	930	78	61	135	97
4	30	31	52	51	56	118	143	620	76	64	110	88
5	29	76	48	49	54	144	143	608	72	84	94	85
6	28	116	47	50	52	541	140	1740	79	81	87	84
7	27	79	46	53	53	682	137	1450	221	69	87	82
8	27	59	45	53	55	450	153	922	222	64	81	80
9	27	48	49	52	52	339	149	726	232	60	70	80
10	27	44	48	49	51	280	137	823	293	82	66	73
11	27	41	46	50	52	239	130	669	199	63	166	70
12	26	40	42	57	53	213	126	539	160	59	218	135
13	26	41	41	58	53	190	123	453	141	101	137	128
14	26	43	43	57	64	180	119	383	123	124	108	98
15	25	40	43	98	75	164	119	354	110	85	96	88
16	25	37	44	138	87	149	116	378	103	273	101	718
17	26	40	47	115	109	136	109	315	102	238	87	644
18	27	44	40	101	107	134	104	252	90	167	357	410
19	24	46	40	90	104	146	103	214	82	192	501	314
20	24	61	40	81	96	138	99	192	86	697	335	273
21	25	76	42	74	97	150	94	178	129	434	254	295
22	26	68	46	69	126	147	92	160	121	224	217	999
23	26	63	48	64	153	148	89	156	125	184	252	1030
24	27	61	50	61	151	497	86	147	146	175	332	628
25	27	60	54	59	138	517	89	133	111	144	526	445
26	30	51	57	56	130	436	278	123	100	131	338	712
27	29	50	56	54	122	353	309	115	100	119	258	598
28	28	60	57	52	113	293	273	105	86	119	206	446
29	32	62	56	50	---	256	257	100	80	102	174	365
30	27	59	55	51	---	225	255	96	72	91	155	306
31	24	---	53	51	---	203	---	91	---	112	132	---
TOTAL	840	1592	1499	2003	2348	7765	4462	15023	3703	4530	6068	9596
MEAN	27.1	53.1	48.4	64.6	83.9	250	149	485	123	146	196	320
MAX	32	116	57	138	153	682	309	1740	293	697	526	1030
MIN	24	31	40	49	48	93	86	91	72	59	66	70
CFSM	.21	.42	.38	.51	.66	1.97	1.17	3.82	.97	1.15	1.54	2.52
IN.	.25	.47	.44	.59	.69	2.27	1.31	4.40	1.08	1.33	1.78	2.81

CAL YR 1988 TOTAL 30328 MEAN 82.9 MAX 846 MIN 24 CFSM .65 IN. 8.88
WTR YR 1989 TOTAL 59429 MEAN 163 MAX 1740 MIN 24 CFSM 1.28 IN. 17.41

POTOMAC RIVER BASIN

01626850 SOUTH RIVER NEAR DOOMS, VA

LOCATION.--Lat 38°05'19", long 78°52'38", Augusta County, Hydrologic Unit 02070005, on left bank at downstream side of Hopeman Parkway Road bridge, 1.1 mi downstream from Steele Run, and 1.6 mi southwest of Dooms.

DRAINAGE AREA.--149 mi².

PERIOD OF RECORD.--April 1974 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,247.04 ft above National Geodetic Vertical Datum of 1929 (Norfolk and Western Railway bench mark). Prior to Sept. 18, 1980, nonrecording gage at site 30 ft upstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--15 years, 205 ft³/s, 18.68 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,100 ft³/s, Nov. 4, 1985, gage height, 14.03 ft, from flood-marks, from rating curve extended above 8,100 ft³/s; minimum, 42 ft³/s, Aug. 29, 30, 1981, gage height, 2.17 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	2000	1,190	5.75	July 20	0130	1,630	6.97
Apr. 30	2030	1,100	5.65	Aug. 24	2000	1,000	5.41
May 1	2200	1,910	7.56	Sept. 16	0800	1,050	5.53
May 6	0200	2,600	8.83	Sept. 22	1530	1,610	6.93
May 6	2000	*2,600	*8.84				

Minimum discharge, 48 ft³/s, Oct. 19, gage height, 2.60 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55	66	77	73	73	136	216	1070	121	100	276	162
2	57	55	75	72	71	127	193	1740	116	96	233	150
3	58	56	73	70	79	122	183	1070	114	93	184	136
4	58	57	73	69	79	154	175	698	111	119	153	128
5	56	148	69	67	79	188	175	729	111	143	136	122
6	55	142	68	69	77	792	168	2280	129	128	126	120
7	54	100	68	69	80	861	168	1710	304	110	127	118
8	55	80	66	70	79	523	183	1010	309	102	118	117
9	55	71	76	69	76	400	177	795	337	102	105	117
10	55	66	70	67	75	338	164	904	385	120	100	110
11	55	63	67	66	76	294	157	739	278	101	299	107
12	54	61	63	76	77	262	153	591	223	149	310	209
13	54	67	62	74	80	234	149	499	191	166	205	170
14	54	65	65	74	87	221	144	438	168	209	162	137
15	54	62	65	121	99	202	144	419	152	137	149	127
16	54	58	64	160	116	183	142	430	143	417	149	850
17	54	64	67	141	135	167	134	379	141	348	144	735
18	58	65	61	123	136	164	127	319	127	253	426	467
19	53	79	62	113	132	177	131	282	117	355	571	367
20	54	92	62	104	125	167	122	256	120	1030	397	324
21	63	99	66	96	130	179	117	238	169	531	319	337
22	54	91	67	92	171	174	113	217	164	300	279	1100
23	54	86	70	87	194	186	111	208	168	243	306	1150
24	55	82	73	84	189	649	108	197	195	232	429	699
25	54	83	74	82	174	611	129	179	149	190	631	515
26	56	75	76	79	161	497	336	167	140	193	418	838
27	55	78	75	78	155	412	365	157	134	166	328	686
28	54	86	75	76	146	346	329	146	127	161	269	519
29	59	83	73	74	---	308	306	140	115	142	237	434
30	55	79	72	75	---	274	453	135	105	130	210	375
31	53	---	71	75	---	245	---	129	---	217	179	---
TOTAL	1714	2359	2145	2645	3151	9593	5572	18271	5163	6783	7975	11426
MEAN	55.3	78.6	69.2	85.3	113	309	186	589	172	219	257	381
MAX	63	148	77	160	194	861	453	2280	385	1030	631	1150
MIN	53	55	61	66	71	122	108	129	105	93	100	107
CFSM	.37	.53	.46	.57	.76	2.08	1.25	3.96	1.16	1.47	1.73	2.56
IN.	.43	.59	.54	.66	.79	2.40	1.39	4.56	1.29	1.69	1.99	2.85

CAL YR 1988 TOTAL 40723 MEAN 111 MAX 1190 MIN 53 CFSM .75 IN. 10.17
WTR YR 1989 TOTAL 76797 MEAN 210 MAX 2280 MIN 53 CFSM 1.41 IN. 19.17

01627500 SOUTH RIVER AT HARRISTON, VA

LOCATION.--Lat 38°13'07", long 78°50'13", Augusta County, Hydrologic Unit 02070005, on left bank 100 ft downstream from bridge on State Highway 778, 0.3 mi northwest of Harriston, 0.6 mi downstream from Paine Run, and 7.2 mi upstream from confluence with North River.

DRAINAGE AREA.--212 mi².

PERIOD OF RECORD.--February 1925 to September 1951, October 1968 to current year.

REVISED RECORDS.--WSP 1171: 1926(M), 1927-28, 1929-32(M), 1933, 1934(M), 1935, 1937. WSP 1302: 1937(M), 1938(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,129.87 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 1, 1938, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--47 years, 256 ft³/s, 16.40 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,100 ft³/s, Nov. 4, 1985, gage height, 15.47 ft, from rating curve extended above 10,000 ft³/s on basis of slope-area measurement of peak flow; maximum gage height, 17.2 ft, Oct. 15, 1942; minimum discharge, 17 ft³/s, Nov. 14, 1941.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods in 1870 and 1877 reached a stage of about 18.8 ft, from information by observer in 1925.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	2100	1,410	5.65	Aug. 25	0130	1,240	4.93
May 2	0500	2,670	7.06	Sept. 16	2000	1,290	5.01
May 6	0700	*3,360	*7.89	Sept. 22	2100	1,910	6.02
May 10	0300	1,460	5.30	Sept. 26	1030	1,330	5.09
July 20	0600	1,780	5.81				

Minimum daily discharge, 61 ft³/s, Oct. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	62	94	107	91	89	182	259	1180	155	122	322	244
2	64	78	103	90	87	169	239	2430	150	117	262	218
3	69	73	100	89	89	161	227	1590	146	114	214	195
4	70	73	99	86	103	187	220	1060	144	116	177	179
5	65	148	95	84	98	239	220	886	139	176	159	170
6	63	203	89	87	94	776	215	2900	148	158	148	166
7	63	155	90	88	98	1110	210	2440	382	135	148	162
8	63	121	87	87	96	678	223	1500	400	123	142	159
9	63	103	99	86	92	484	218	1160	410	118	127	172
10	64	94	96	83	88	395	206	1390	548	140	120	156
11	63	88	89	80	88	338	198	1160	382	127	314	146
12	62	83	84	92	90	302	190	918	295	170	419	261
13	61	91	80	89	92	274	185	760	252	210	262	232
14	62	85	81	89	104	262	180	640	218	272	201	184
15	63	87	82	140	115	246	180	582	195	181	177	166
16	62	80	82	206	135	229	178	624	181	458	180	924
17	62	85	84	201	162	212	169	539	178	488	171	1060
18	69	87	80	179	171	204	161	440	161	327	421	701
19	65	94	76	163	168	214	168	378	149	251	764	521
20	62	148	77	149	163	205	157	339	144	1290	536	440
21	72	141	78	134	165	214	150	313	181	771	428	429
22	83	133	85	126	207	211	146	283	190	420	357	1140
23	68	124	87	118	253	210	142	269	178	294	425	1560
24	69	115	89	112	253	611	138	257	223	285	421	1020
25	69	113	94	108	235	735	145	231	175	230	1070	743
26	69	104	95	104	218	587	308	215	165	219	718	1140
27	73	99	94	98	210	476	393	200	151	221	514	1020
28	69	124	95	95	195	395	353	185	151	191	395	782
29	71	117	93	92	---	346	326	177	143	173	413	632
30	74	111	91	92	---	311	333	170	128	159	371	525
31	69	---	88	91	---	284	---	165	---	194	287	---
TOTAL	2063	3251	2769	3429	3958	11247	6437	25381	6462	8250	10663	15447
MEAN	66.5	108	89.3	111	141	363	215	819	215	266	344	515
MAX	83	203	107	206	253	1110	393	2900	548	1290	1070	1560
MIN	61	73	76	80	87	161	138	165	128	114	120	146
CFSM	.31	.51	.42	.52	.67	1.71	1.01	3.86	1.02	1.26	1.62	2.43
IN.	.36	.57	.49	.60	.69	1.97	1.13	4.45	1.13	1.45	1.87	2.71

CAL YR 1988 TOTAL 53754 MEAN 147 MAX 1490 MIN 61 CFSM .69 IN. 9.43
WTR YR 1989 TOTAL 99357 MEAN 272 MAX 2900 MIN 61 CFSM 1.28 IN. 17.43

POTOMAC RIVER BASIN

01628060 WHITE OAK RUN NEAR GROTTOS, VA

LOCATION.--Lat 38°15'01", long 78°44'57", Rockingham County, Hydrologic Unit 02070005, Shenandoah National Park, on left bank 700 ft upstream from Madison Run, 0.2 mi south of Madison Run Forest Trail, 1.4 mi upstream from southwest boundary of Shenandoah National Park, and 4.3 mi southeast of Grottoes.

DRAINAGE AREA.--1.94 mi².

PERIOD OF RECORD.--October 1979 to current year.

REVISED RECORDS.--WDR VA-85-1: 1983-84(P).

GAGE.--Water-stage recorder. Elevation of gage is 1,480 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records fair. Several measurements of water temperature were made during the year.

AVERAGE DISCHARGE.--10 years, 2.40 ft³/s, 16.80 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 515 ft³/s, Nov. 4, 1985, gage height, 6.17 ft, from floodmarks; no flow many days in 1980-89.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 30 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	1945	52	2.45	May 6	0530	78	2.75
May 1	1900	*111	*3.09	Aug. 25	0700	42	2.32

No flow during October and Nov. 1-2, 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.58	.84	.35	2.1	2.7	69	.26	.07	.08	.98
2	.00	.00	.55	.72	.32	1.8	2.1	65	.21	.06	.06	.73
3	.00	.02	.50	.64	.34	1.7	1.8	25	.21	.05	.04	.54
4	.00	.00	.48	.58	.57	2.3	1.5	13	.19	.05	.03	.40
5	.00	1.6	.40	.47	.53	5.2	1.4	13	.17	.32	.02	.33
6	.00	1.1	.32	.44	.66	34	1.2	67	.25	.22	.01	.29
7	.00	.32	.30	.43	.90	31	1.1	39	3.2	.13	.02	.26
8	.00	.16	.27	.33	.99	14	1.1	19	2.0	.09	.02	.24
9	.00	.12	.24	.33	.99	7.8	1.1	13	4.1	.07	.02	.23
10	.00	.10	.23	.33	1.0	5.5	1.0	23	7.3	.10	.01	.19
11	.00	.09	.20	.30	1.1	4.2	.95	19	5.9	.06	.02	.16
12	.00	.08	.18	.31	1.1	3.3	.92	12	4.2	.05	.09	.21
13	.00	.07	.15	.38	.96	2.4	.92	8.1	3.2	.05	.07	.19
14	.00	.07	.13	.41	1.0	2.0	.88	6.0	2.2	.05	.06	.15
15	.00	.06	.11	5.2	1.1	1.8	.85	4.9	1.7	.05	.04	.13
16	.00	.05	.13	7.1	1.3	1.4	.85	4.2	1.2	.06	.04	.54
17	.00	.06	.13	6.0	1.5	1.1	.75	3.4	.99	.09	.29	.61
18	.00	.12	.13	4.8	2.0	1.2	.74	2.8	.67	.07	.65	.38
19	.00	.15	.13	3.7	2.4	1.2	.88	2.5	.49	.05	.97	.34
20	.00	3.0	.12	2.7	2.3	1.0	.72	2.3	.40	.12	.77	.38
21	.00	1.8	.16	2.0	2.4	1.3	.68	2.1	.37	.10	1.8	.51
22	.00	1.2	.28	1.5	4.7	1.4	.68	1.8	.32	.06	3.3	4.2
23	.00	.92	.33	1.3	6.6	1.6	.68	1.5	.26	.04	2.7	12
24	.00	.71	.39	1.1	6.3	15	.65	1.4	.23	.04	2.6	8.1
25	.00	.54	.77	.87	5.1	16	.77	1.1	.18	.03	27	5.5
26	.00	.41	.94	.71	4.3	15	2.6	.87	.17	.03	17	13
27	.00	.36	1.1	.67	3.4	10	4.3	.69	.14	.04	8.3	13
28	.00	.60	1.2	.58	2.8	7.0	4.9	.52	.13	.03	4.9	8.9
29	.00	.68	1.2	.48	---	5.3	4.6	.41	.11	.02	3.2	5.8
30	.00	.63	.98	.44	---	4.1	7.3	.36	.10	.02	2.2	3.9
31	.00	---	.91	.40	---	3.5	---	.31	---	.10	1.5	---
TOTAL	0.00	15.02	13.54	46.06	57.01	205.2	50.62	422.26	40.85	2.32	77.81	82.19
MEAN	.00	.50	.44	1.49	2.04	6.62	1.69	13.6	1.36	.075	2.51	2.74
MAX	.00	3.0	1.2	7.1	6.6	34	7.3	69	7.3	.32	27	13
MIN	.00	.00	.11	.30	.32	1.0	.65	.31	.10	.02	.01	.13
CFSM	.00	.26	.23	.77	1.05	3.41	.87	7.02	.70	.04	1.29	1.41
IN.	.00	.29	.26	.88	1.09	3.93	.97	8.10	.78	.04	1.49	1.58

CAL YR 1988	TOTAL 583.11	MEAN 1.59	MAX 70	MIN .00	CFSM .82	IN. 11.18
WTR YR 1989	TOTAL 1012.88	MEAN 2.78	MAX 69	MIN .00	CFSM 1.43	IN. 19.42

01628500 SOUTH FORK SHENANDOAH RIVER NEAR LYNNWOOD, VA

LOCATION.--Lat 38°19'21", long 78°45'18", Rockingham County, Hydrologic Unit 02070005, on left bank 1.2 mi north-east of Lynnwood and 3.3 mi downstream from confluence of North and South Rivers.

DRAINAGE AREA.--1,084 mi².

PERIOD OF RECORD.--September 1930 to current year.

REVISED RECORDS.--WSP 1171: 1933(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,013.17 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Diurnal fluctuation at low flow prior to 1960 caused by mill at Lynnwood. National Weather Service rain gage and gage-height telemeters at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--59 years, 1,004 ft³/s, 12.58 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 95,100 ft³/s, Nov. 5, 1985, gage height, 29.46 ft, from flood-marks, from rating curve extended above 22,000 ft³/s on basis of computations of flow over dam at gage heights 23.60 ft and 27.2 ft; minimum, 32 ft³/s, Sept. 20, 1932, gage height, 1.63 ft; minimum daily, 93 ft³/s, Sept. 21, 29, 1930.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1870, that of Nov. 5, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 7,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	0700	*11,100	*11.57	Aug. 25	1000	9,180	10.49
May 6	1000	10,800	11.44				

Minimum daily discharge, 177 ft³/s, Oct. 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	200	210	268	262	316	581	967	4570	709	596	1100	1230
2	197	247	260	275	306	535	856	9850	677	552	1070	1050
3	205	215	258	267	309	504	797	6180	643	525	825	919
4	209	203	255	259	349	509	755	4070	611	509	691	821
5	196	240	248	251	338	573	726	3200	591	606	607	759
6	190	444	246	256	322	1960	706	9310	605	639	551	722
7	186	332	241	272	321	3900	668	7990	1320	596	532	696
8	185	269	240	278	324	2510	687	5150	1620	537	584	678
9	186	238	257	276	311	1820	683	3900	1640	517	499	660
10	192	227	277	278	289	1470	640	6120	2300	705	459	628
11	191	218	264	310	290	1230	596	5220	1720	629	736	593
12	187	208	220	342	297	1080	563	3920	1280	546	1270	1100
13	184	208	241	365	303	953	541	3070	1170	744	829	884
14	183	234	242	363	336	887	525	2470	1010	1120	707	836
15	182	231	240	535	396	820	523	2080	964	1040	635	746
16	179	221	231	911	441	753	522	2290	909	1100	819	3010
17	182	228	227	885	566	686	501	1900	978	1300	839	4800
18	184	232	217	733	563	651	478	1620	1250	976	1110	3230
19	185	230	224	634	549	660	514	1430	1140	859	1750	2270
20	177	402	233	562	536	635	501	1300	1350	1660	1280	1800
21	188	438	239	502	530	646	464	1210	1940	1280	1860	1560
22	237	355	247	458	624	646	453	1090	1870	892	2850	2080
23	219	305	250	431	796	649	447	1010	1590	747	2530	4170
24	195	286	266	408	753	1840	441	994	1750	687	2690	3200
25	188	277	285	389	715	3040	445	891	1480	624	7560	2380
26	182	267	289	371	677	2670	837	839	1150	596	4310	3300
27	181	260	274	360	646	2180	1880	828	1030	1160	3120	2770
28	183	292	274	344	613	1760	1570	848	896	837	2570	2110
29	183	314	266	334	---	1450	1400	813	783	711	2150	1770
30	185	282	266	326	---	1220	1600	772	661	633	2200	1520
31	183	---	255	323	---	1100	---	738	---	961	1510	---
TOTAL	5904	8113	7800	12560	12816	39918	22286	95673	35637	24884	50243	52292
MEAN	190	270	252	405	458	1288	743	3086	1188	803	1621	1743
MAX	237	444	289	911	796	3900	1880	9850	2300	1660	7560	4800
MIN	177	203	217	251	289	504	441	738	591	509	459	593
CFSM	.18	.25	.23	.37	.42	1.19	.69	2.85	1.10	.74	1.50	1.61
IN.	.20	.28	.27	.43	.44	1.37	.76	3.28	1.22	.85	1.72	1.79

CAL YR 1988	TOTAL 198201	MEAN 542	MAX 4270	MIN 177	CFSM .50	IN. 6.80
WTR YR 1989	TOTAL 368126	MEAN 1009	MAX 9850	MIN 177	CFSM .93	IN. 12.63

POTOMAC RIVER BASIN

01629500 SOUTH FORK SHENANDOAH RIVER NEAR LURAY, VA

LOCATION.--Lat 38°38'46", long 78°32'06", Page County, Hydrologic Unit 02070005, on right bank between bridges on U.S. Highway 211, 1.2 mi downstream from Big Run, 2.2 mi upstream from Mill Creek, and 4.1 mi west of Luray.

DRAINAGE AREA.--1,377 mi².

PERIOD OF RECORD.--April 1925 to September 1930, October 1938 to September 1951, June 1979 to current year.

GAGE.--Water-stage recorder. Datum of gage is 721.76 ft above National Geodetic Vertical Datum of 1929.

April 1925 to September 1930, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Diurnal fluctuation at low and medium flow caused by powerplant 10 mi upstream from station. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--28 years, 1,322 ft³/s, 13.04 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 110,000 ft³/s, Nov. 5, 1985, gage height, 26.72 ft; minimum, 70 ft³/s, Sept. 27, 1941, gage height, 2.15 ft; minimum daily, 135 ft³/s, Sept. 16, 1925, Sept. 28, 1930.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 18, 1936, reached a stage of 23.6 ft, from floodmarks, discharge, 81,600 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 8,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	1130	*17,300	*11.40	May 10	2200	8,760	8.09
May 6	2230	17,100	11.35	Aug. 25	1830	10,200	8.71

Minimum discharge, 240 ft³/s, Oct. 29; minimum daily, 257 ft³/s, Oct. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	306	306	394	376	418	795	1460	4240	873	786	1240	1720
2	312	317	384	378	418	735	1290	15300	814	720	1470	1450
3	310	347	376	390	421	681	1170	10200	733	669	1200	1250
4	317	326	366	386	425	645	1100	6130	707	650	985	1090
5	311	323	363	375	442	760	1050	4500	679	718	841	978
6	304	401	358	378	442	1500	1040	11900	696	768	768	907
7	293	526	353	378	431	5630	955	13800	1280	781	684	868
8	285	431	348	387	423	4180	955	8090	2070	709	686	855
9	292	371	361	400	425	2910	974	5610	2170	645	722	873
10	289	339	369	393	412	2300	948	7490	2700	671	618	804
11	309	332	372	390	391	1930	885	7730	2580	828	630	754
12	291	324	367	409	397	1670	847	5660	1920	1010	1280	839
13	286	322	343	442	409	1480	770	4420	1720	1040	1330	1360
14	289	318	331	463	421	1340	755	3540	1590	1140	988	1040
15	279	326	336	517	452	1260	757	2960	1550	1540	868	969
16	291	334	355	866	507	1160	748	3030	1490	1280	863	1260
17	287	333	344	1240	554	1070	737	2860	1420	1680	955	5610
18	297	338	336	1070	682	961	701	2370	1540	1440	1240	4380
19	291	342	331	842	676	960	812	2090	1650	1190	1820	3000
20	270	384	320	761	669	948	860	1890	1460	1350	1940	2360
21	297	540	353	676	707	927	786	1760	2020	2020	1620	2040
22	298	547	357	634	725	938	731	1620	2340	1450	3410	1950
23	318	463	361	513	984	920	699	1510	2080	1060	3260	4280
24	333	416	365	532	1080	1350	679	1460	1920	920	2880	4240
25	306	392	385	508	993	4210	673	1360	2040	847	7320	3150
26	308	382	394	492	938	3930	729	1280	1630	772	6090	3180
27	285	383	404	476	883	3240	1670	1180	1380	1100	4110	4010
28	289	392	393	457	841	2620	2120	1070	1270	1310	3310	2860
29	257	414	384	441	---	2150	1850	1030	1070	983	2790	2370
30	281	435	379	436	---	1840	1870	969	915	852	2750	2050
31	285	---	366	430	---	1630	---	860	---	998	2130	---
TOTAL	9166	11404	11248	16436	16566	56670	30621	137909	46307	31927	60798	62497
MEAN	296	380	363	530	592	1828	1021	4449	1544	1030	1961	2083
MAX	333	547	404	1240	1080	5630	2120	15300	2700	2020	7320	5610
MIN	257	306	320	375	391	645	673	860	679	645	618	754
CFSM	.21	.28	.26	.39	.43	1.33	.74	3.23	1.12	.75	1.42	1.51
IN.	.25	.31	.30	.44	.45	1.53	.83	3.73	1.25	.86	1.64	1.69

CAL YR 1988	TOTAL 284526	MEAN 777	MAX 6810	MIN 257	CFSM .56	IN. 7.69
WTR YR 1989	TOTAL 491549	MEAN 1347	MAX 15300	MIN 257	CFSM .98	IN. 13.28

01631000 SOUTH FORK SHENANDOAH RIVER AT FRONT ROYAL, VA

LOCATION.--Lat 38°54'50", long 78°12'40", Warren County, Hydrologic Unit 02070005, on left bank 0.7 mi downstream from bridge on State Highway 619, 1.0 mi west of Front Royal, and 3.5 mi upstream from confluence with North Fork.

DRAINAGE AREA.--1,642 mi².

PERIOD OF RECORD.--June 1899 to September 1906, September 1930 to current year. Monthly discharge only for some periods, published in WSP 1302.

REVISED RECORDS.--WSP 951: 1936(M). WSP 1171: 1935(M), 1937(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 469.38 ft above National Geodetic Vertical Datum of 1929. June 1899 to July 1906, nonrecording gage at site 1.0 mi upstream at different datum.

REMARKS.--Records good except for period with ice effect, Dec. 13-20, which is fair. Large diurnal fluctuation at low and medium flow caused by powerplants upstream from station prior to 1954; occasional large diurnal fluctuation thereafter. National Weather Service gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--66 years, 1,594 ft³/s, 13.18 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 130,000 ft³/s, Oct. 16, 1942, gage height, 34.8 ft, from floodmark in gage well, from rating curve extended above 92,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 59 ft³/s, Jan. 30, 1934, gage height, 0.56 ft; minimum daily, 103 ft³/s, Sept. 30, 1930.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1870, that of Oct. 16, 1942.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 8,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	2215	17,300	9.87	May 11	1000	8,730	6.62
May 7	0715	*18,200	*10.16	Aug. 26	0545	9,260	6.88

Minimum daily discharge, 276 ft³/s, Oct. 31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	382	331	500	433	457	785	1700	2200	962	1030	1200	1640
2	352	350	475	425	432	750	1530	11200	935	887	1480	1340
3	353	336	428	424	438	651	1410	13300	915	859	1450	1140
4	352	347	426	431	468	693	1330	7590	867	811	1090	1050
5	354	438	409	421	451	639	1260	5250	895	991	1120	822
6	349	405	407	427	444	949	1340	7290	955	1060	911	806
7	317	423	405	426	465	3440	1170	16500	970	987	860	762
8	344	568	393	418	455	5440	1190	10500	1830	1030	813	756
9	297	518	398	443	434	3720	1140	6810	2520	874	726	715
10	304	439	408	465	426	2840	1170	6360	2740	866	717	791
11	328	388	409	448	409	2250	1140	8470	3310	970	768	748
12	306	375	376	462	411	1890	1080	6760	2820	1090	622	674
13	309	393	e350	492	381	1630	1050	5240	2210	1300	1160	685
14	300	388	e365	504	417	1480	963	4300	2090	1390	1270	1160
15	301	382	e355	563	444	1360	943	3630	2000	1400	930	783
16	310	366	e360	597	458	1200	952	3980	1950	1590	862	752
17	289	406	e365	838	493	1160	928	4390	1920	1460	800	2400
18	303	402	e375	1170	533	1090	1050	3570	1790	1870	979	4890
19	298	380	e360	1010	599	989	1300	2990	2010	1630	1340	3130
20	317	445	e365	862	651	992	1260	2710	2110	1540	1660	2250
21	300	490	354	699	638	1060	1200	2170	1910	1890	1690	1820
22	320	584	354	685	749	942	1120	1920	2870	2180	1780	1660
23	320	652	393	645	766	997	969	1730	2990	1700	3050	2150
24	318	548	394	595	997	1310	952	1620	2600	1350	2740	4500
25	368	488	405	504	996	2700	936	1510	2490	1230	3030	3300
26	345	466	408	543	899	4410	918	1390	2410	1060	7790	2600
27	315	439	423	523	870	3840	965	1280	1780	1010	4660	3450
28	310	473	445	489	810	3200	2020	1170	1610	1200	3170	2950
29	303	456	440	475	---	2640	2100	1110	1350	1450	2600	2260
30	291	457	406	469	---	2200	1890	1060	1150	1030	2160	1880
31	276	---	405	452	---	1960	---	1010	---	1020	2210	---
TOTAL	9931	13133	12356	17338	15991	59207	36976	149010	56959	38755	55638	53864
MEAN	320	438	399	559	571	1910	1233	4807	1899	1250	1795	1795
MAX	382	652	500	1170	997	5440	2100	16500	3310	2180	7790	4890
MIN	276	331	350	418	381	639	918	1010	867	811	622	674
CFSM	.20	.27	.24	.34	.35	1.16	.75	2.93	1.16	.76	1.09	1.09
IN.	.22	.30	.28	.39	.36	1.34	.84	3.38	1.29	.88	1.26	1.22

CAL YR 1988 TOTAL 340622 MEAN 931 MAX 7510 MIN 276 CFSM .57 IN. 7.72
WTR YR 1989 TOTAL 519158 MEAN 1422 MAX 16500 MIN 276 CFSM .87 IN. 11.76

e Estimated.

POTOMAC RIVER BASIN

01632000 NORTH FORK SHENANDOAH RIVER AT COOTES STORE, VA

LOCATION.--Lat 38°38'13", long 78°51'11", Rockingham County, Hydrologic Unit 02070006, on right bank at Cootes Store, 300 ft upstream from bridge on State Highway 259, and 3.7 mi upstream from Linville Creek.

DRAINAGE AREA.--210 mi².

PERIOD OF RECORD.--February 1925 to current year.

REVISED RECORDS.--WSP 726: 1928-31. WSP 951: 1936, 1939(M). WSP 1171: 1935, 1937, 1938(M). WSP 1502: 1926, 1927-28(M), 1929, 1930-34(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,051.8 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). Prior to Nov. 15, 1937, nonrecording gage at same site and datum.

REMARKS.--Records good except for period of doubtful gage-height record from beaver dams, Oct. 1 to Mar. 6, which is fair. National Weather Service gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--64 years, 192 ft³/s, 12.42 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 50,000 ft³/s, Oct. 15, 1942, gage height, 25.3 ft, from flood-mark, from rating curve extended above 9,000 ft³/s on basis of contracted-opening measurement of peak flow; minimum, 0.20 ft³/s, Aug. 28, 29, Sept. 4, 1957, Sept. 7-10, 1966; minimum gage height, 1.74 ft, Sept. 7-10, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1836, that of Oct. 15, 1942.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	0745	*3,330	*7.26	No peak equal to or greater than base discharge.			

Minimum daily discharge, 1.4 ft³/s, Oct. 1, 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	e3.6	e8.2	11	13	43	143	1220	43	48	60	75
2	1.4	e3.5	e7.9	11	13	38	124	2800	38	41	51	62
3	1.7	e3.1	e7.6	10	13	33	109	1300	34	36	43	51
4	1.8	4.7	e7.4	11	14	31	99	658	31	35	38	44
5	1.9	5.7	e7.4	10	15	31	92	492	61	57	33	39
6	1.7	7.5	e7.2	12	16	293	84	1910	109	45	31	35
7	1.7	6.5	e7.1	13	17	550	78	1160	164	50	32	32
8	1.9	5.6	e7.1	14	15	340	74	698	582	45	43	33
9	1.8	5.4	e7.2	20	14	233	72	553	377	39	38	36
10	2.0	5.5	e7.5	29	13	213	65	1780	503	57	33	30
11	2.4	5.9	e7.1	31	13	217	59	1120	280	47	50	27
12	2.5	6.0	e6.2	33	13	212	54	692	184	73	133	52
13	e2.7	6.4	e6.5	32	12	192	50	486	146	653	118	37
14	e2.6	6.5	e6.6	33	16	172	47	367	127	1040	86	32
15	e2.4	6.4	e6.7	44	24	152	46	357	168	370	70	29
16	e2.3	6.3	e6.6	54	34	134	45	1020	215	304	61	468
17	e2.4	6.3	e6.5	59	40	117	42	788	324	265	196	680
18	e2.6	6.1	e6.5	56	42	106	90	585	254	228	332	359
19	e2.7	6.5	e6.7	49	44	101	205	417	168	179	258	230
20	e2.8	8.8	7.1	43	42	91	147	312	136	426	276	170
21	e2.9	9.7	7.4	36	42	99	118	245	131	828	277	153
22	e3.0	12	7.5	31	45	119	105	193	121	973	310	269
23	e3.1	12	7.7	28	61	112	95	163	151	492	288	660
24	e3.2	11	7.8	25	65	950	86	146	170	292	265	443
25	e3.0	11	7.8	23	59	1020	84	122	129	199	244	295
26	e2.9	10	7.6	21	59	678	135	105	103	146	203	310
27	e2.9	e9.3	7.2	19	54	432	167	90	90	139	169	271
28	e2.8	e9.1	7.6	17	49	295	174	74	83	106	174	222
29	e2.9	e9.3	8.1	16	---	225	183	63	71	81	138	182
30	e3.0	e8.7	8.6	15	---	185	240	54	57	68	119	149
31	e3.2	---	9.2	14	---	165	---	48	---	71	94	---
TOTAL	75.6	218.4	227.6	820	857	7579	3112	20018	5050	7433	4263	5475
MEAN	2.44	7.28	7.34	26.5	30.6	244	104	646	168	240	138	182
MAX	3.2	12	9.2	59	65	1020	240	2800	582	1040	332	680
MIN	1.4	3.1	6.2	10	12	31	42	48	31	35	31	27
CFSM	.01	.03	.03	.13	.15	1.16	.49	3.07	.80	1.14	.65	.87
IN.	.01	.04	.04	.15	.15	1.34	.55	3.55	.89	1.32	.76	.97

CAL YR 1988 TOTAL 42935.20 MEAN 117 MAX 5430 MIN .95 CFSM .56 IN. 7.61
WTR YR 1989 TOTAL 55128.6 MEAN 151 MAX 2800 MIN 1.4 CFSM .72 IN. 9.77

e Estimated.

01632082 LINVILLE CREEK AT BROADWAY, VA

LOCATION.--Lat 38°36'24", long 78°48'13", Rockingham County, Hydrologic Unit 02070006, on left bank at Linville, 170 ft downstream from bridge on State Highway 1421, and 1.1 mi upstream from mouth.

DRAINAGE AREA.--45.5 mi².

PERIOD OF RECORD.--August 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,029.90 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for periods with ice effect, Dec. 11-14, 16-18, and Feb. 9-12, which are fair. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,160 ft³/s, Nov. 4, 1985, gage height, 6.22 ft; minimum, 2.8 ft³/s, Sept. 13, 14, 17, 1986.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 250 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	0245	340	2.68	June 21	1100	474	3.01
May 9	2300	438	2.93	Aug. 28	0215	907	3.81
May 16	0030	*970	*3.90				

Minimum discharge, 3.3 ft³/s, Feb. 13, result of freezeup; minimum daily, 5.7 ft³/s, Oct. 6, 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.1	10	7.5	7.8	7.1	11	17	87	26	26	21	38
2	6.4	8.6	7.6	8.6	7.1	9.9	15	147	24	25	19	34
3	7.5	7.4	7.4	8.7	8.4	9.8	15	88	23	23	16	30
4	7.3	7.3	7.3	7.8	8.9	9.8	14	68	19	24	16	28
5	6.0	12	7.0	9.6	7.5	10	14	71	19	24	15	27
6	5.7	17	7.1	8.3	7.2	32	13	213	22	20	14	26
7	5.8	11	7.1	8.3	7.4	37	13	140	37	18	14	25
8	6.0	9.6	7.0	9.5	7.0	26	13	100	37	16	14	24
9	6.1	8.1	7.7	9.8	e7.0	20	12	129	41	16	13	22
10	6.2	7.8	7.9	9.2	e6.9	18	10	208	32	19	13	20
11	6.1	7.5	e7.6	8.2	e6.8	15	10	128	27	14	22	19
12	5.9	7.1	e6.5	8.5	e6.9	14	9.8	103	23	13	24	20
13	5.7	8.3	e6.6	8.3	6.9	13	9.3	88	24	18	18	20
14	5.8	7.9	e7.0	7.5	10	12	8.9	76	21	22	16	18
15	6.2	7.5	7.2	16	12	11	9.7	107	26	14	16	17
16	6.2	7.6	e7.2	18	12	10	9.2	261	25	21	16	33
17	6.3	7.5	e7.0	15	11	9.0	8.4	118	36	18	16	31
18	6.8	7.1	e7.0	13	10	9.3	8.9	93	27	14	17	26
19	6.8	7.6	6.9	12	9.8	8.5	12	78	24	12	20	23
20	6.9	14	6.6	11	9.3	7.7	9.8	70	34	12	18	21
21	9.1	13	6.7	10	11	8.2	9.2	61	161	12	34	24
22	9.9	10	6.5	12	15	7.9	9.2	54	72	12	38	28
23	7.2	9.5	6.5	12	18	7.0	9.0	54	52	11	35	27
24	6.8	8.4	7.1	9.2	16	31	9.2	47	43	10	33	22
25	6.7	7.8	7.7	8.7	17	38	11	41	38	10	31	20
26	6.7	7.5	7.1	8.1	13	31	15	38	34	18	30	36
27	6.8	8.0	7.0	7.9	12	27	13	35	31	44	28	30
28	6.9	9.5	6.8	7.2	12	25	12	32	31	19	179	26
29	6.7	7.9	6.9	7.3	---	22	17	30	28	17	60	23
30	6.9	7.6	6.6	7.5	---	20	20	28	27	17	51	22
31	7.1	---	6.4	7.1	---	20	---	27	---	30	43	---
TOTAL	206.6	270.1	218.5	302.1	283.2	530.1	356.6	2820	1064	569	900	760
MEAN	6.66	9.00	7.05	9.75	10.1	17.1	11.9	91.0	35.5	18.4	29.0	25.3
MAX	9.9	17	7.9	18	18	38	20	261	161	44	179	38
MIN	5.7	7.1	6.4	7.1	6.8	7.0	8.4	27	19	10	13	17
CFSM	.15	.20	.15	.21	.22	.38	.26	2.00	.78	.40	.64	.56
IN.	.17	.22	.18	.25	.23	.43	.29	2.31	.87	.47	.74	.62
CAL YR 1988	TOTAL 7023.7	MEAN 19.2	MAX 214	MIN 5.1	CFSM .42	IN. 5.74						
WTR YR 1989	TOTAL 8280.2	MEAN 22.7	MAX 261	MIN 5.7	CFSM .50	IN. 6.77						

e Estimated.

POTOMAC RIVER BASIN

01632900 SMITH CREEK NEAR NEW MARKET, VA

LOCATION.--Lat 38°41'36", long 78°38'35", Shenandoah County, Hydrologic Unit 02070006, on left bank 25 ft upstream from bridge on State Highway 616, 3.6 mi north of New Market, and 4.4 mi upstream from mouth.

DRAINAGE AREA.--93.2 mi².

PERIOD OF RECORD.--August 1960 to current year.

REVISED RECORDS.--WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 881.50 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 2, 1963, on right bank a short distance downstream, at datum 0.71 ft higher.

REMARKS.--Records good except those for periods with ice effect, Dec. 12, 13, and Feb. 11, which are fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--29 years, 72.0 ft³/s, 10.49 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,600 ft³/s, Oct. 6, 1972, gage height, 16.38 ft, from rating curve extended above 2,300 ft³/s on basis of contracted-opening measurement of peak flow; minimum, 4.5 ft³/s, Feb. 9, 1981, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 1, 1959, reached a stage of 10.7 ft, discharge not determined, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 650 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	0300	981	6.07	July 12	2400	*1,030	*6.25
May 6	1000	651	4.97				

Minimum discharge, 6.0 ft³/s, Dec. 16, result of freezeup; minimum daily, 12 ft³/s, Oct. 13, 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	21	16	14	14	26	44	248	50	35	45	29
2	14	21	15	16	14	23	40	690	47	34	37	28
3	15	19	15	15	15	23	37	255	46	33	32	27
4	14	17	15	15	19	22	36	166	44	35	29	25
5	13	23	14	15	17	24	35	140	43	50	27	25
6	13	25	14	16	15	82	36	482	47	41	26	25
7	13	17	14	16	15	115	34	385	66	37	25	25
8	13	15	14	18	15	69	35	224	63	34	25	24
9	13	14	15	23	14	55	34	187	65	32	23	27
10	13	13	16	19	14	49	32	376	106	36	23	24
11	13	13	15	17	e13	45	30	239	59	31	31	22
12	13	13	e13	18	14	41	29	186	52	84	44	24
13	12	13	e14	19	13	37	28	155	55	189	33	26
14	12	15	15	17	16	36	27	135	63	117	29	24
15	13	14	14	25	18	33	27	143	69	55	27	22
16	14	13	14	35	20	30	27	363	78	71	27	33
17	14	14	15	29	20	27	25	236	73	58	28	37
18	14	14	15	25	19	27	25	173	63	46	31	28
19	13	14	14	23	19	27	47	140	55	39	32	26
20	13	25	13	22	18	25	61	122	60	42	34	27
21	16	27	13	20	20	25	45	110	67	39	40	28
22	20	21	15	19	38	24	39	98	60	32	58	33
23	18	18	14	18	48	23	35	92	54	35	48	63
24	16	17	15	18	40	77	32	88	50	30	43	44
25	15	16	17	18	34	100	31	78	46	30	40	34
26	15	15	15	16	32	75	38	73	43	30	37	46
27	16	16	14	16	30	62	47	68	41	49	36	50
28	16	20	14	15	27	55	42	63	40	38	34	38
29	16	19	13	15	---	50	62	59	41	31	35	34
30	16	17	13	15	---	48	88	56	36	29	34	32
31	17	---	13	14	---	50	---	53	---	51	30	---
TOTAL	447	519	446	581	591	1405	1148	5883	1682	1493	1043	930
MEAN	14.4	17.3	14.4	18.7	21.1	45.3	38.3	190	56.1	48.2	33.6	31.0
MAX	20	27	17	35	48	115	88	690	106	189	58	63
MIN	12	13	13	14	13	22	25	53	36	29	23	22
CFSM	.15	.19	.15	.20	.23	.49	.41	2.04	.60	.52	.36	.33
IN.	.18	.21	.18	.23	.24	.56	.46	2.35	.67	.60	.42	.37

CAL YR 1988 TOTAL 19467 MEAN 53.2 MAX 1640 MIN 11 CFSM .57 IN. 7.77
WTR YR 1989 TOTAL 16168 MEAN 44.3 MAX 690 MIN 12 CFSM .48 IN. 6.45

e Estimated.

01633000 NORTH FORK SHENANDOAH RIVER AT MOUNT JACKSON, VA

LOCATION.--Lat 38°44'43", long 78°38'21", Shenandoah County, Hydrologic Unit 02070006, on right bank at upstream side of bridge on State Highway 698 at Mount Jackson and 0.4 mi downstream from Mill Creek.

DRAINAGE AREA.--506 mi².

PERIOD OF RECORD.--October 1943 to current year.

REVISED RECORDS.--WSP 1382: 1945, 1948-50(M), 1951-53(P), 1954(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 838.55 ft above National Geodetic Vertical Datum of 1929. Prior to July 1, 1976, nonrecording gage, and July 1, 1976, to Oct. 23, 1981, water-stage recorder, at site 400 ft upstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Some diversion during low flow by irrigation at points upstream from station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--46 years, 387 ft³/s, 10.39 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 50,800 ft³/s, Nov. 5, 1985, gage height, 17.79 ft, from rating curve extended above 19,000 ft³/s on basis of peak runoff for stations at Cootes Store and near Strasburg; maximum gage height, 18.10 ft, Oct. 6, 1972; minimum discharge observed, 7.0 ft³/s, Sept. 3, 1966, gage height, 1.97 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in October 1942 reached a stage of 20.2 ft, from floodmarks, discharge, about 80,000 ft³/s, from rating curve extended above 18,000 ft³/s on basis of peak runoff for flood in October 1942 for stations at Cootes Store and near Strasburg.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 5,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	1100	*5,570	*8.95	No other peak equal to or greater than base discharge.			

Minimum daily discharge, 30 ft³/s, Oct. 14, 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	52	48	44	49	106	264	1290	169	179	204	194
2	36	54	46	47	47	96	226	4920	157	164	177	172
3	38	52	44	49	50	89	201	2290	147	152	155	154
4	37	49	44	49	55	86	183	1220	138	156	139	138
5	34	58	43	46	56	89	171	849	139	208	128	129
6	33	73	42	49	53	174	162	3020	232	185	119	123
7	32	68	42	53	54	835	149	2300	296	164	118	118
8	34	50	41	54	54	576	145	1400	765	161	117	114
9	35	43	44	68	51	408	142	1010	614	150	120	131
10	37	42	46	66	46	344	131	2820	892	167	111	117
11	38	40	43	73	47	332	118	2000	563	166	140	105
12	36	38	38	79	49	328	111	1330	396	161	270	116
13	35	41	39	86	49	302	104	976	329	833	250	131
14	30	43	39	80	54	274	97	769	303	1560	205	118
15	33	44	41	97	65	245	96	703	349	693	172	108
16	34	39	39	126	78	215	94	2090	485	523	159	292
17	35	39	39	126	87	188	88	1570	555	496	152	956
18	35	37	36	120	90	171	92	1160	534	414	474	580
19	33	39	37	110	93	161	323	871	394	350	369	375
20	30	56	38	102	93	149	312	690	343	356	402	293
21	35	71	39	91	97	144	228	580	502	1170	391	257
22	45	59	42	82	124	159	190	480	445	1280	509	286
23	49	53	40	77	145	167	166	422	513	810	453	767
24	43	53	40	73	149	838	149	394	443	518	432	681
25	42	51	44	69	134	1510	139	332	351	379	400	456
26	41	47	43	66	129	993	171	292	292	306	355	439
27	43	46	39	62	121	676	247	264	258	326	312	449
28	43	53	39	58	113	492	257	233	242	265	385	370
29	45	54	39	56	---	383	285	211	227	215	305	316
30	44	50	39	55	---	326	370	196	197	189	263	272
31	45	---	40	52	---	306	---	181	---	224	225	---
TOTAL	1167	1494	1273	2265	2232	11162	5411	36863	11270	12920	8011	8757
MEAN	37.6	49.8	41.1	73.1	79.7	360	180	1189	376	417	258	292
MAX	49	73	48	126	149	1510	370	4920	892	1560	509	956
MIN	30	37	36	44	46	86	88	181	138	150	111	105
CFSM	.07	.10	.08	.14	.16	.71	.36	2.35	.74	.82	.51	.58
IN.	.09	.11	.09	.17	.16	.82	.40	2.71	.83	.95	.59	.64

CAL YR 1988	TOTAL	95460	MEAN	261	MAX	7830	MIN	21	CFSM	.52	IN.	7.02
WTR YR 1989	TOTAL	102825	MEAN	282	MAX	4920	MIN	30	CFSM	.56	IN.	7.56

POTOMAC RIVER BASIN

01634000 NORTH FORK SHENANDOAH RIVER NEAR STRASBURG, VA

LOCATION.--Lat 38°58'36", long 78°20'11", Warren County, Hydrologic Unit 02070006, on right bank at downstream side of bridge on State Highway 55, 1.5 mi southeast of Strasburg, 2.2 mi upstream from Cedar Creek, and 10 mi upstream from confluence with South Fork.

DRAINAGE AREA.--768 mi².

PERIOD OF RECORD.--March 1925 to current year.

REVISED RECORDS.--WSP 951: 1936(M). WSP 1001: 1931. WSP 1171: 1929(M), 1933(M), 1936-37. WSP 1302: 1928(M), 1930(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 494.03 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 21, 1930, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Large diurnal fluctuation at low and medium flow from unknown cause. National Weather Service gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--64 years, 584 ft³/s, 10.33 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 100,000 ft³/s, Oct. 16, 1942, gage height, 31.2 ft, from high-water mark in well, from rating curve extended above 46,000 ft³/s; minimum, 6.0 ft³/s, Feb. 9, 1934, gage height, 1.52 ft; minimum daily, 35 ft³/s, Oct. 15, 1985, Sept. 14, 18, 1986.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1870, that of Oct. 16, 1942.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 6,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	2245	*5,330	*8.30	No peak equal to or greater than base discharge.			

Minimum discharge, 50 ft³/s, Jan. 27; minimum daily, 63 ft³/s, Oct. 12, Nov. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	97	96	103	78	103	189	546	466	289	317	355	342
2	106	91	101	79	92	179	459	2980	273	290	371	311
3	105	66	102	81	87	174	403	4090	252	274	322	248
4	99	63	112	89	106	171	364	2090	240	348	297	249
5	93	107	75	82	113	175	352	1370	234	390	277	229
6	86	119	89	109	114	236	340	2060	322	367	236	227
7	91	104	88	124	111	425	318	3690	399	618	394	218
8	92	108	87	92	110	1020	305	2320	408	544	313	200
9	90	129	96	95	108	740	300	1620	885	376	249	233
10	90	116	110	96	125	590	296	2180	859	356	222	228
11	78	109	91	115	122	531	288	3340	1010	256	233	206
12	63	102	75	130	103	524	278	2190	685	286	252	193
13	65	105	89	137	101	507	236	1610	528	378	503	190
14	68	103	126	166	113	474	231	1270	456	1020	443	187
15	66	97	98	187	113	431	231	1120	467	1490	377	201
16	75	93	94	174	117	385	227	1960	634	826	318	215
17	98	95	97	157	131	337	222	2810	676	653	279	228
18	104	96	95	180	171	307	217	1990	694	625	276	1050
19	99	103	90	186	156	283	235	1510	659	537	534	717
20	80	130	87	178	154	274	383	1190	543	486	559	527
21	70	122	81	169	160	277	439	982	606	605	566	433
22	81	102	71	161	185	269	355	829	778	2030	543	388
23	77	139	68	156	203	274	315	705	1090	1480	660	460
24	73	90	86	148	237	424	283	642	1070	971	637	790
25	91	91	88	121	237	1680	265	591	738	693	597	786
26	91	98	84	90	228	1680	260	520	574	564	550	625
27	106	69	84	70	210	1220	263	482	478	572	508	553
28	102	80	90	111	204	899	317	411	436	520	461	576
29	97	82	83	144	---	701	343	373	397	437	477	498
30	96	104	69	130	---	590	350	346	392	374	459	446
31	94	---	75	80	---	573	---	320	---	353	396	---
TOTAL	2723	3009	2784	3915	4014	16539	9421	48057	17072	19036	12664	11754
MEAN	87.8	100	89.8	126	143	534	314	1550	569	614	409	392
MAX	106	139	126	187	237	1680	546	4090	1090	2030	660	1050
MIN	63	63	68	70	87	171	217	320	234	256	222	187
CFSM	.11	.13	.12	.16	.19	.69	.41	2.02	.74	.80	.53	.51
IN.	.13	.15	.13	.19	.19	.80	.46	2.33	.83	.92	.61	.57

CAL YR 1988 TOTAL 143660 MEAN 393 MAX 8840 MIN 61 CFSM .51 IN. 6.96
WTR YR 1989 TOTAL 150988 MEAN 414 MAX 4090 MIN 63 CFSM .54 IN. 7.31

01634500 CEDAR CREEK NEAR WINCHESTER, VA

LOCATION.--Lat 39°04'52", long 78°19'47", Frederick County, Hydrologic Unit 02070006, on left bank 0.2 mi upstream from Fawcett Run, 0.3 mi upstream from bridge on State Highway 628, 1.3 mi downstream from Froman Run, and 11.4 mi southwest of Winchester.

DRAINAGE AREA.--103 mi².

PERIOD OF RECORD.--June 1937 to current year.

REVISED RECORDS.--WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 647.09 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for periods with ice effect, Dec. 11-20, Jan. 5, 6, 23, and Feb. 9-12, and period of doubtful gage-height record, July 9-11, which are fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--52 years, 94.4 ft³/s, 12.45 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,000 ft³/s, Oct. 15, 1942, gage height, 27.0 ft, from flood-marks, from rating curve extended above 15,000 ft³/s; minimum, 1.8 ft³/s, Feb. 19, 1941, Dec. 7, 1958, result of freezeups; minimum daily, 2.8 ft³/s, Sept. 7, 1964, Sept. 3, 4, 7, 8, 1966; minimum gage height, 1.04 ft, Feb. 19, 1941.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 17, 1936, reached a stage of about 25 ft, discharge, about 18,000 ft³/s, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	1130	1,620	5.86	May 10	0430	1,760	6.13
Mar. 24	1400	1,120	4.86	May 16	2130	1,560	5.75
May 6	0400	1,430	5.48	June 23	0230	*3,750	*9.53

Minimum discharge, 2.1 ft³/s, Feb. 9, result of freezeup; minimum daily, 6.9 ft³/s, Oct. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.4	15	21	27	26	48	163	99	46	46	46	13
2	9.0	15	20	26	25	43	131	374	40	38	40	13
3	10	15	19	27	27	41	117	214	37	34	33	12
4	11	16	18	27	37	40	105	153	35	63	28	11
5	9.9	24	17	e26	34	46	101	182	33	136	26	11
6	6.9	40	17	e26	31	705	98	914	48	102	23	11
7	7.0	23	17	31	30	348	87	483	51	107	23	13
8	8.7	16	17	33	28	195	83	293	45	139	23	15
9	9.4	14	18	92	e26	159	83	264	39	e80	20	30
10	9.9	13	18	64	e25	179	71	1180	47	e65	18	19
11	11	13	e17	52	e25	205	64	595	36	e54	22	15
12	11	12	e16	64	e26	201	60	395	31	50	36	14
13	9.4	15	e15	101	30	170	57	290	33	60	27	14
14	9.3	17	e17	72	49	145	54	233	33	126	25	15
15	10	15	e19	95	64	127	54	219	31	69	25	14
16	11	14	e18	91	70	105	54	804	32	84	23	26
17	11	14	e17	74	59	91	48	803	42	80	21	34
18	11	13	e16	65	53	90	46	385	34	64	26	21
19	12	15	e17	58	48	88	49	266	27	52	30	19
20	11	78	e20	52	47	77	45	212	31	54	26	20
21	14	76	22	44	51	98	42	176	48	181	24	21
22	24	46	23	43	90	88	40	140	67	303	25	25
23	20	36	21	e43	107	78	37	130	1090	129	23	40
24	15	31	26	43	84	564	36	138	201	91	19	38
25	15	28	43	35	69	388	35	101	120	72	19	27
26	14	25	36	33	68	243	36	86	88	61	18	36
27	13	25	30	31	61	194	36	91	69	73	18	35
28	15	27	28	29	53	162	34	77	63	56	18	30
29	14	28	25	28	---	138	35	62	58	46	16	26
30	16	24	25	27	---	131	38	56	46	42	18	25
31	15	---	24	27	---	214	---	52	---	49	16	---
TOTAL	372.9	744	658	1486	1343	5401	1939	9467	2601	2606	755	643
MEAN	12.0	24.8	21.2	47.9	48.0	174	64.6	305	86.7	84.1	24.4	21.4
MAX	24	78	43	101	107	705	163	1180	1090	303	46	40
MIN	6.9	12	15	26	25	40	34	52	27	34	16	11
CFSM	.12	.24	.21	.47	.47	1.69	.63	2.96	.84	.82	.24	.21
IN.	.13	.27	.24	.54	.49	1.95	.70	3.42	.94	.94	.27	.23

CAL YR 1988 TOTAL 28286.5 MEAN 77.3 MAX 2890 MIN 6.3 CFSM .75 IN. 10.22
WTR YR 1989 TOTAL 28015.9 MEAN 76.8 MAX 1180 MIN 6.9 CFSM .75 IN. 10.12

e Estimated.

POTOMAC RIVER BASIN

01635500 PASSAGE CREEK NEAR BUCKTON, VA

LOCATION.--Lat 38°57'29", long 78°16'01", Warren County, Hydrologic Unit 02070006, on right bank 350 ft upstream from bridge on State Highway 55, 1.2 mi south of Buckton railroad station, 1.4 mi upstream from mouth, and 4.2 mi west of Riverton.

DRAINAGE AREA.--87.8 mi².

PERIOD OF RECORD.--October 1905 to July 1906 (gage heights only), April 1932 to current year. Prior to October 1966, published as "at Buckton."

REVISED RECORDS.--WSP 2103: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 525.14 ft above National Geodetic Vertical Datum of 1929. October 1905 to July 1906, nonrecording gage at site 1 mi downstream at different datum.

Apr. 4, 1932, to Oct. 7, 1937, nonrecording gage at site 350 ft downstream at different datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 12, 13, 17, Jan. 5, 6, 22, and Feb. 9, 10, which are fair. Occasional diurnal fluctuation during low flow caused by State Fish Hatchery 2 mi upstream from station. At a point 14.2 mi upstream from station on Little Passage Creek, there is a diversion from Strasburg Reservoir, capacity, 54.6 acre-ft, by town of Strasburg for municipal water supply. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--57 years, 68.6 ft³/s, 10.61 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,000 ft³/s, Oct. 15, 1942, gage height, 15.5 ft, from high-water mark in well, from rating curve extended above 5,200 ft³/s; minimum observed, 0.1 ft³/s, Aug. 5, 1932.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	0400	1,360	6.60	May 7	0330	1,180	6.32
May 6	1030	1,110	6.21	May 17	0100	*1,450	*6.74

Minimum discharge, 2.0 ft³/s, Oct. 1, gage height, 2.84 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	5.4	9.5	8.8	10	26	90	192	26	16	27	6.2
2	3.2	11	8.6	9.5	9.9	23	71	1130	21	15	22	6.1
3	4.3	8.9	8.1	10	12	22	64	406	19	13	19	5.6
4	3.8	6.1	8.5	10	23	22	57	236	17	18	16	5.2
5	3.4	7.3	6.6	e10	27	26	66	203	18	71	13	4.6
6	3.5	11	6.6	e11	21	97	86	885	49	42	22	4.6
7	3.2	10	6.8	12	19	155	69	792	43	63	41	4.7
8	3.3	9.2	6.9	12	17	83	64	355	43	41	23	5.3
9	3.4	7.3	7.3	26	e16	64	63	262	36	32	19	7.3
10	3.5	6.3	7.4	29	e14	77	53	687	69	32	17	11
11	3.8	5.7	7.4	20	14	76	47	395	37	26	18	8.3
12	3.7	5.6	e6.0	20	14	71	42	290	27	22	23	6.1
13	3.5	6.3	e6.0	35	15	59	40	221	25	59	22	5.9
14	3.5	6.8	6.3	28	17	51	38	211	24	92	18	6.6
15	3.5	9.6	6.8	28	22	46	38	358	28	52	16	6.2
16	3.7	8.2	7.5	36	30	40	38	1150	43	40	15	8.3
17	4.0	7.2	e7.0	28	32	35	35	989	42	39	14	17
18	3.8	7.6	6.9	22	29	34	49	436	35	34	14	14
19	3.6	8.0	7.1	19	26	38	343	278	29	29	13	10
20	3.5	16	7.5	17	23	35	186	204	25	45	14	8.8
21	4.5	27	9.0	15	24	48	125	161	30	101	13	8.9
22	7.4	19	10	e14	45	49	100	127	37	167	13	11
23	8.3	13	11	14	82	43	82	108	45	72	14	13
24	7.1	10	11	14	50	260	70	103	46	48	13	14
25	5.3	9.0	11	13	37	287	61	77	37	38	12	11
26	4.5	8.3	11	13	35	164	57	60	31	34	11	14
27	3.9	8.3	9.9	13	31	122	52	53	24	32	9.9	20
28	4.2	9.6	9.6	12	28	100	46	42	22	27	9.2	15
29	4.3	9.9	8.6	11	---	84	46	38	21	23	8.7	12
30	4.4	10	8.1	10	---	83	66	35	20	20	8.4	11
31	4.5	---	8.0	10	---	109	---	32	---	21	7.0	---
TOTAL	129.0	287.6	252.0	530.3	722.9	2429	2244	10516	969	1364	505.2	281.7
MEAN	4.16	9.59	8.13	17.1	25.8	78.4	74.8	339	32.3	44.0	16.3	9.39
MAX	8.3	27	11	36	82	287	343	1150	69	167	41	20
MIN	2.4	5.4	6.0	8.8	9.9	22	35	32	17	13	7.0	4.6
CFSM	.05	.11	.09	.19	.29	.89	.85	3.86	.37	.50	.19	.11
IN.	.05	.12	.11	.22	.31	1.03	.95	4.46	.41	.58	.21	.12

CAL YR 1988 TOTAL 19613.6 MEAN 53.6 MAX 1170 MIN 1.3 CFSM .61 IN. 8.31
WTR YR 1989 TOTAL 20230.7 MEAN 55.4 MAX 1150 MIN 2.4 CFSM .63 IN. 8.57

e Estimated.

01636500 SHENANDOAH RIVER AT MILLVILLE, WV
(National stream-quality accounting network station)

LOCATION.--Lat 39°16'55", long 77°47'22", Jefferson County, Hydrologic Unit 02070007, on left bank 0.4 mi downstream from Cattail Run, 1.0 mi upstream from Millville, 5.0 mi upstream from Harpers Ferry, and at mile 5.0.

DRAINAGE AREA.--3,040 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1895 to March 1909, August 1928 to current year.

REVISED RECORDS.--WSP 951: 1936(M). WSP 1432: Drainage area at former site, 1895-99, 1901-2, 1905, 1907-8, 1932(M), 1935(M).

GAGE.--Water-stage recorder. Datum of gage is 293.00 ft above National Geodetic Vertical Datum of 1929. Apr. 15, 1895, to Mar. 31, 1909, nonrecording gage at site 0.8 mi downstream at datum 0.32 ft higher.

REMARKS.--No estimated daily discharges. Records good. Regulation by hydroelectric plants, particularly that of Potomac Light and Power Company, 0.5 mi upstream from station. National Weather Service gage-height telemeter and U.S. Army Corps of Engineers satellite telemeter at station.

AVERAGE DISCHARGE.--74 years (water years 1896-1908, 1929-89), 2,687 ft³/s, 12.00 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 230,000 ft³/s, Oct. 16, 1942, gage height, 32.4 ft, from floodmarks; minimum, 59 ft³/s, Oct. 4, 1930, gage height, 0.39 ft; minimum daily, 194 ft³/s, July 24, 1930.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1870 reached practically same stage as flood of Mar. 18, 1936, 26.36 ft, discharge, 151,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 15,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 3	1000	23,500	10.56	May 11	1515	15,100	8.44
May 7	1745	*25,100	*10.92				

Minimum discharge, 310 ft³/s, Oct. 20, gage height, 1.08 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	582	440	656	601	756	1400	3330	2500	1780	1730	1530	2850
2	546	465	677	614	683	1350	2900	6620	1590	1750	2280	
3	425	481	689	632	724	1280	2520	21600	1570	1350	1990	1970
4	531	502	664	638	784	1230	2320	14200	1520	1370	1930	1750
5	515	542	621	601	785	1220	2150	9040	1360	1520	1600	1520
6	452	667	590	633	810	1470	2190	9180	1480	2030	1530	1250
7	462	773	567	649	794	2990	2200	20400	1700	1780	1380	1280
8	467	611	556	640	786	5870	1900	19100	1710	1920	1460	1330
9	456	672	587	700	766	5830	1920	12000	2650	1890	1280	1240
10	453	799	577	710	721	4550	1830	10000	3660	1470	1230	1210
11	468	668	583	822	675	3860	1780	13500	3840	1400	1090	1280
12	439	602	591	840	690	3440	1690	12600	4160	1370	1140	1220
13	426	575	529	851	706	3130	1590	9440	3330	1430	1110	1130
14	437	587	506	959	721	2800	1540	7520	2740	1910	1760	1140
15	396	565	565	1000	783	2560	1390	6590	2660	2770	1950	1510
16	419	549	682	1080	854	2300	1390	7940	2680	3010	1550	1340
17	426	545	587	1150	892	2070	1400	12000	2980	2660	1400	1280
18	427	540	560	1360	922	1970	1380	9350	2770	2300	1270	3840
19	438	547	485	1710	980	1910	1590	6960	2590	2600	1430	5430
20	446	713	523	1520	1090	1710	2340	5660	2660	2940	1970	4000
21	505	757	607	1350	1130	1710	2120	4820	2560	2520	2530	3190
22	539	855	601	1150	1220	1820	2020	4220	2560	4090	2420	2690
23	478	820	566	1100	1410	1630	1810	3780	4130	4890	2830	2490
24	469	929	573	1070	1550	2100	1560	3440	4750	3550	3960	3780
25	461	834	608	922	1640	4430	1460	3170	3620	2570	3660	5280
26	444	728	623	903	1690	6880	1410	2870	3210	2170	5810	4420
27	528	698	627	858	1580	6430	1320	2600	2820	1800	6680	3720
28	495	701	632	786	1510	5380	1360	2500	2330	1740	4810	4640
29	466	655	647	770	---	4500	2570	2190	2120	1830	3940	3850
30	441	667	657	785	---	3850	2610	1980	1920	2000	3480	3180
31	455	---	627	802	---	3510	---	1900	---	1650	3040	---
TOTAL	14492	19487	18563	28206	27652	95180	57590	249670	79520	67850	73510	76090
MEAN	467	650	599	910	988	3070	1920	8054	2651	2189	2371	2536
MAX	582	929	689	1710	1690	6880	3330	21600	4750	4890	6680	5430
MIN	396	440	485	601	675	1220	1320	1900	1360	1350	1090	1130
CFSM	.15	.21	.20	.30	.32	1.01	.63	2.65	.87	.72	.78	.83
IN.	.18	.24	.23	.35	.34	1.16	.70	3.06	.97	.83	.90	.93

CAL YR 1988 TOTAL 628191 MEAN 1716 MAX 18700 MIN 396 CFSM .56 IN. 7.69
WTR YR 1989 TOTAL 807810 MEAN 2213 MAX 21600 MIN 396 CFSM .73 IN. 9.89

POTOMAC RIVER BASIN

01636500 SHENANDOAH RIVER AT MILLVILLE, WV--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960-63, 1965, 1969-71, 1979 to current year.

INSTRUMENTATION.--Water-quality monitor October 1980 to September 1983.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1980 to September 1983 (discontinued).

WATER TEMPERATURES: October 1980 to September 1983 (discontinued).

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (water years 1981-82): Maximum, 778 microsiemens, Dec. 29, 1980; minimum, 212 microsiemens, Jan. 17, 1982.

WATER TEMPERATURE: Maximum, 30.0°C, July 20, 21, 1981; minimum, 0.0°C on many days during winter periods.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TEMPER- ATURE AIR (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED SATUR- ATION	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT 31...	0925	457	410	8.0	8.5	14.0	768	1.4	11.3	96	K6000
JAN 03...	0915	645	435	8.5	40.0	10.0	753	1.3	13.6	215	K3
MAR 14...	0945	2800	260	7.6	6.0	8.0	757	6.4	12.4	100	--
MAY 01...	0700	2430	350	7.8	19.0	18.5	756	3.4	8.0	87	50
JUN 26...	0915	3200	318	7.7	25.5	28.0	755	13	6.4	79	180
SEP 05...	0905	1320	314	7.9	20.5	21.0	766	6.0	7.8	86	K65

DATE	STREP- TOCOCCHI FECAL, KF AGAR (COLS. PER 100 ML)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY WAT WH TOT FET FIELD MG/L AS CACO3	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
OCT 31...	K1	52	17	75	3.4	11	160	29	0.20	11	436
JAN 03...	K6	53	15	43	2.4	154	94	23	0.10	0.20	339
MAR 14...	--	28	6.3	12	2.0	74	36	8.8	0.10	6.2	145
MAY 01...	21	35	10	19	2.4	105	38	12	0.10	1.5	184
JUN 26...	2000	36	9.0	12	2.7	102	29	9.7	0.10	7.6	185
SEP 05...	320	39	9.7	10	2.6	112	24	8.4	0.10	7.1	167

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)
OCT 31...	357	--	<0.010 ¹	0.540	<0.010	<0.010	0.30	0.020	0.020	<0.010
JAN 03...	327	--	<0.010	0.850	0.020	0.020	0.80	0.020	0.010	0.010
MAR 14...	149	1.09	0.010	1.10	0.070	0.060	0.90	0.080	0.040	0.050
MAY 01...	185	0.900	0.020	0.920	0.050	0.050	1.4	0.120	0.090	0.070
JUN 26...	175	1.58	0.020	1.60	0.050	0.040	0.40	0.110	0.090	0.100
SEP 05...	174	--	<0.010	1.20	0.020	0.020	0.30	0.080	0.070	0.070

POTOMAC RIVER BASIN

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01636500 SHENANDOAH RIVER AT MILLVILLE, WV--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)
OCT 31...	<10	<1	28	<0.5	<1	2	<3	<1	330	<5
JAN 03...	--	--	--	--	--	--	--	--	--	--
MAR 14...	10	<1	24	<0.5	<1	<1	<3	<1	31	<5
MAY 01...	<10	<1	33	<0.5	<1	<1	<3	4	15	<5
JUN 26...	--	--	--	--	--	--	--	--	--	--
SEP 05...	10	<1	34	<0.5	<1	<1	<3	4	10	<1

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 31...	6	80	<0.1	20	<1	<1	1.0	91	<6	18
JAN 03...	--	--	--	--	--	--	--	--	--	--
MAR 14...	6	13	<0.1	<10	6	<1	<1.0	96	<6	10
MAY 01...	6	5	<0.1	<10	1	<1	<1.0	120	<6	9
JUN 26...	--	--	--	--	--	--	--	--	--	--
SEP 05...	5	15	<0.1	<10	1	<1	<1.0	130	<6	4

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	TEMPER- ATURE WATER (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 31...	0925	457	8.5	410	2	2.5	90
JAN 03...	0915	645	40.0	435	5	8.7	76
MAR 14...	0945	2800	6.0	260	17	129	92
MAY 01...	0700	2430	19.0	350	16	105	90
JUN 26...	0915	3200	25.5	318	43	372	96
SEP 05...	0905	1320	20.5	314	13	46	99

POTOMAC RIVER BASIN

01638480 CATOCTIN CREEK AT TAYLORSTOWN, VA

LOCATION.--Lat 39°15'18", long 77°34'36", Loudoun County, Hydrologic Unit 02070008, on left bank at downstream side of bridge on State Highway 663 at Taylorstown and 3.2 mi downstream from Milltown Creek.

DRAINAGE AREA.--89.6 mi².

PERIOD OF RECORD.--August 1971 to current year.

GAGE.--Water-stage recorder. Datum of gage is 247.37 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 3, 1983, at site 60 ft upstream at datum 1.78 ft higher.

REMARKS.--Records good except those for periods with ice effect, Dec. 12, 13, 18, Jan. 5, and Feb. 9-13, and periods of doubtful gage-height record, Mar. 24 to Apr. 20 and May 8, 9, which are fair. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--18 years, 103 ft³/s, 15.61 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,800 ft³/s, June 22, 1972, gage height, 23.83 ft, from flood-marks, site and datum then in use, from rating curve extended above 7,400 ft³/s on basis of contracted-opening measurement of peak flow; minimum daily, 0.20 ft³/s, Sept. 23, 1986.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 24	Unknown	Unknown	Unknown	May 6	2215	1,420	6.60
May 6	0515	1,620	6.96	May 16	1330	*3,670	*10.39

Minimum daily discharge, 4.6 ft³/s, Oct. 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.7	9.5	24	20	29	56	e150	152	89	33	52	6.7
2	7.4	11	21	22	27	52	e130	568	78	33	36	6.3
3	8.6	12	19	24	32	49	e110	251	72	30	29	5.4
4	9.9	11	18	27	60	49	e100	165	69	33	23	5.5
5	8.4	13	17	e22	46	64	e110	192	66	115	20	5.6
6	6.7	42	16	23	39	362	e150	1230	78	65	17	5.7
7	6.4	27	16	27	36	290	e120	753	104	49	32	6.0
8	5.7	16	16	28	33	161	e100	e322	81	40	27	6.2
9	5.5	12	16	50	e27	136	e90	e235	86	34	19	6.3
10	5.4	11	16	55	e27	179	e80	724	89	29	17	6.1
11	5.5	10	16	45	e28	188	e70	459	62	26	18	5.6
12	4.9	9.8	e14	160	e29	165	e65	353	54	23	20	5.5
13	4.8	11	e13	230	e27	133	e62	281	56	27	19	5.8
14	4.8	20	13	109	59	115	e60	279	62	34	18	6.2
15	4.6	17	15	135	94	107	e65	687	69	26	18	5.9
16	4.7	13	15	122	108	92	e74	2650	133	35	16	7.3
17	5.1	14	15	82	75	79	e65	1180	214	36	15	9.7
18	5.4	16	e13	67	61	80	e60	553	91	28	14	9.8
19	6.6	16	13	59	56	96	e100	395	65	24	13	8.0
20	6.9	133	13	51	52	78	e65	318	58	176	14	8.6
21	9.3	118	17	44	56	153	55	268	60	57	14	14
22	35	59	18	38	145	113	54	219	57	37	13	13
23	22	41	20	40	158	89	48	287	109	30	11	9.8
24	12	33	25	38	97	e600	46	333	72	25	10	11
25	9.4	27	32	37	74	e450	44	194	64	23	9.9	9.0
26	8.6	25	29	35	76	e350	44	168	51	22	9.3	14
27	8.5	22	22	36	70	e260	42	151	44	21	9.0	18
28	8.1	30	20	32	61	e210	41	126	42	21	10	11
29	8.0	36	21	30	---	e170	40	109	43	18	10	8.2
30	7.8	28	21	30	---	e140	46	100	36	19	8.9	7.4
31	8.1	---	19	32	---	e240	---	95	---	137	7.6	---
TOTAL	261.8	843.3	563	1750	1682	5306	2286	13797	2254	1306	549.7	247.6
MEAN	8.45	28.1	18.2	56.5	60.1	171	76.2	445	75.1	42.1	17.7	8.25
MAX	35	133	32	230	158	600	150	2650	214	176	52	18
MIN	4.6	9.5	13	20	27	49	40	95	36	18	7.6	5.4
CFSM	.09	.31	.20	.63	.67	1.91	.85	4.97	.84	.47	.20	.09
IN.	.11	.35	.23	.73	.70	2.20	.95	5.73	.94	.54	.23	.10

CAL YR 1988 TOTAL 31749.1 MEAN 86.7 MAX 2140 MIN 4.6 CFSM .97 IN. 13.18
WTR YR 1989 TOTAL 30846.4 MEAN 84.5 MAX 2650 MIN 4.6 CFSM .94 IN. 12.81

e Estimated.

01638500 POTOMAC RIVER AT POINT OF ROCKS, MD

LOCATION.--Lat 39°16'25", long 77°32'35", Frederick County, Hydrologic Unit 02070008, on left bank at downstream side of bridge on U.S. Highway 15 at Point of Rocks, 0.3 mi downstream from Catoctin Creek (Virginia), 6 mi upstream from Monocacy River, and at mile 159.5.

DRAINAGE AREA.--9,651 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1895 to current year.

REVISED RECORDS.--WSP 192: 1895-1905. WSP 1432: 1899, 1901-2, 1904-5, 1912, 1914(M), 1915, 1917(M), 1918, 1919(M), 1920, 1921-23(M), 1924, 1925-28(M), 1930(M).

GAGE.--Water-stage recorder. Datum of gage is 200.63 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 28, 1929, nonrecording gage at same site. Prior to Sept. 2, 1902, at datum about 0.45 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Low flow affected slightly from 1913 to July 1981 by Stony River Reservoir, since December 1950 by Savage River Reservoir, and since July 1981 by Jennings Randolph Lake. Low flow affected extensively at times by run-of-the-river hydroelectric plants. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--94 years, 9,389 ft³/s, 13.21 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 480,000 ft³/s, Mar. 19, 1936, gage height, 41.03 ft, from rating curve extended above 300,000 ft³/s on the basis of adjustment of figure of peak flow at station near Washington for inflow and storage, and slope-area measurement of peak flow; minimum discharge, 530 ft³/s, Sept. 11, 12, 1966, gage height, 0.27 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 2, 1889, reached a stage of 40.2 ft, from floodmarks, discharge, about 460,000 ft³/s from rating curve extended as explained above.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 35,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 26	1030	37,000	8.84	May 11	2400	61,900	12.58
May 4	0500	35,200	8.55	May 17	1900	*80,900	*15.11
May 7	2300	66,200	13.17				

Minimum discharge, 1,270 ft³/s, Oct. 16, gage height, 0.72 ft.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2260	1520	3500	3440	3920	6720	19400	7350	7320	6770	8880	6130
2	2050	1550	3190	3230	3790	6060	19200	11300	6770	5910	9160	5350
3	1910	1510	2910	3180	3730	5500	16100	28600	6200	5250	7720	4720
4	1730	1550	2750	3050	4050	5110	13900	33100	5800	4860	6780	4200
5	2270	1740	2560	2970	4100	4910	12400	24800	5590	5810	6020	3860
6	2190	2100	2400	2870	4300	6360	11200	27100	5950	8870	5230	4010
7	1660	2320	2370	2850	4230	13500	10400	54000	6110	10100	4760	3420
8	1520	3000	2320	2840	4200	29600	9300	57400	5950	10300	4410	3180
9	1490	2980	2230	3250	4060	25700	8670	40100	6790	11800	4070	3070
10	1510	3000	2110	3920	3740	19600	8090	32100	8070	8720	3810	2950
11	1470	2870	2160	5580	3390	16800	7700	49200	8540	6970	3490	2950
12	1470	2490	2140	6730	3310	17300	7240	56400	8790	6440	3480	3030
13	1380	2340	2060	7140	3350	19200	6750	41600	7870	6380	3450	2870
14	1380	2360	1790	11100	3400	19000	6430	31900	6980	6690	3620	2790
15	1380	2390	1440	11400	3570	17000	6130	27300	6860	7690	4390	3040
16	1320	2500	1970	11500	4230	15900	5860	36000	7060	10100	4260	3200
17	1360	2570	2160	12900	7500	15500	5910	71200	8090	10700	3810	3050
18	1390	2390	1890	12000	10900	13500	5890	63100	11800	14900	3700	4340
19	1410	2320	1850	10900	9850	11800	5760	40200	13600	12300	3740	8960
20	1430	2920	1700	9360	8760	10900	6310	29300	11400	12100	4090	8260
21	1480	4490	1880	8070	7960	10200	6110	23500	10500	20800	4820	6730
22	1770	11600	2080	6990	7680	9910	5900	19000	23500	20400	5530	5620
23	1740	9590	2040	5870	8970	10600	5490	16300	19400	20600	5850	5070
24	1700	7580	2130	5290	9270	13600	5020	15600	20900	17600	7300	5270
25	1720	6140	2420	5010	8470	22100	4830	17400	19000	13200	8910	7430
26	1720	5110	3180	4560	7980	35600	4680	14800	14900	10700	11800	8560
27	1760	4510	5090	4440	7480	29700	4520	12700	12200	9280	14600	7870
28	1680	4250	4960	4160	7740	23500	4320	11400	10100	11200	11700	7740
29	1630	4010	4620	4000	---	19000	5600	9800	9300	11300	9010	7230
30	1550	3820	4130	3950	---	16000	7310	8620	7810	9540	7560	6450
31	1530	---	3760	3960	---	15600	---	7830	---	8210	6630	---
TOTAL	50860	107520	81790	186510	163930	485770	246420	919000	303150	325490	192580	151350
MEAN	1641	3584	2638	6016	5855	15670	8214	29650	10100	10500	6212	5045
MAX	2270	11600	5090	12900	10900	35600	19400	71200	23500	20800	14600	8960
MIN	1320	1510	1440	2840	3310	4910	4320	7350	5590	4860	3450	2790
CFSM	.17	.37	.27	.62	.61	1.62	.85	3.07	1.05	1.09	.64	.52
IN.	.20	.41	.32	.72	.63	1.87	.95	3.54	1.17	1.25	.74	.58

CAL YR 1988	TOTAL 2609620	MEAN 7130	MAX 93400	MIN 1230	CFSM .74	IN. 10.06
WTR YR 1989	TOTAL 3214370	MEAN 8806	MAX 71200	MIN 1320	CFSM .91	IN. 12.39

01638500 POTOMAC RIVER AT POINT OF ROCKS, MD--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1961 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1960 to current year.

SUSPENDED-SEDIMENT DISCHARGE: October 1960 to current year.

REMARKS.--Water temperatures are measured daily in field by local observer at time of sampling. Missing record from July 25 to August 25 when local observer was sick.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum daily, 33.5°C, Aug. 24, 1964, July 19, 1977; minimum daily, 0.0°C on many days during winter periods.

SEDIMENT CONCENTRATION: Maximum daily mean, 2,690 mg/L, Nov. 7, 1985; minimum daily mean, 1 mg/L on many days most years.

SEDIMENT LOAD: Maximum daily, 1,930,000 tons, Nov. 7, 1985; minimum daily, 2.0 tons on many days during 1964, 1966-69.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum daily recorded, 29.0°C, June 25, July 11, 15 (may have been higher during period of missing record); minimum daily, 0.0°C, Dec. 10-12.

SEDIMENT CONCENTRATION: Maximum daily mean, 330 mg/L, May 7; minimum daily mean, 1 mg/L, Nov. 11, Dec. 2, 3, 7-9.

SEDIMENT LOAD: Maximum daily, 53,400 tons, May 17; minimum daily, 6.0 tons, Dec. 9.

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	TEMPER- ATURE WATER (DEG C)	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM	
MAY 08...	1305	1180	13.0	245	781	85	91	
DATE		SED. SUSP. SIEVE DIAM. % FINER THAN .250 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .500 MM	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .008 MM	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .031 MM
MAY 08...	97	99	13	34	48	62	74	

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21.0	8.0	6.0	2.0	7.0	5.0	10.0	17.0	24.0	22.0	---	25.0
2	20.0	8.0	5.0	3.0	6.0	6.0	10.0	16.0	23.0	26.0	---	25.0
3	18.0	13.0	5.0	2.0	7.0	4.0	10.0	16.0	24.0	24.0	---	24.0
4	17.0	8.0	5.0	1.0	4.0	4.0	10.0	16.0	25.0	24.0	---	23.0
5	17.0	14.0	5.0	---	5.0	4.0	11.0	14.0	23.0	24.0	---	22.0
6	16.0	11.0	6.0	6.0	4.0	---	10.0	15.0	23.0	24.0	---	21.0
7	15.0	10.0	5.0	7.0	5.0	---	11.0	13.0	23.0	23.0	---	23.0
8	15.0	10.0	5.0	4.0	4.0	---	10.0	13.0	25.0	24.0	---	21.0
9	15.0	9.0	4.0	4.0	2.0	4.0	14.0	12.0	24.0	25.0	---	---
10	15.0	9.0	.0	3.0	2.0	4.0	11.0	11.0	23.0	25.0	---	26.0
11	15.0	10.0	.0	3.0	3.0	5.0	8.0	11.0	---	29.0	---	24.0
12	16.0	9.0	.0	2.0	3.0	5.0	10.0	10.0	19.0	27.0	---	25.0
13	11.0	9.0	1.0	3.0	1.0	6.0	11.0	11.0	22.0	24.0	---	24.0
14	12.0	10.0	1.0	2.0	2.0	6.0	13.0	12.0	22.0	24.0	---	24.0
15	13.0	9.0	---	4.0	4.0	7.0	11.0	12.0	22.0	29.0	---	23.0
16	15.0	10.0	---	4.0	4.0	7.0	13.0	12.0	23.0	24.0	---	22.0
17	16.0	11.0	---	3.0	2.0	7.0	13.0	15.0	22.0	23.0	---	23.0
18	14.0	9.0	---	4.0	4.0	11.0	15.0	15.0	25.0	22.0	---	20.0
19	14.0	9.0	2.0	5.0	5.0	9.0	13.0	16.0	23.0	23.0	---	20.0
20	12.0	8.0	2.0	7.0	5.0	8.0	12.0	16.0	24.0	24.0	---	20.0
21	11.0	8.0	4.0	9.0	5.0	8.0	16.0	19.0	24.0	23.0	---	22.0
22	12.0	8.0	3.0	4.0	5.0	7.0	16.0	17.0	22.0	25.0	---	22.0
23	12.0	7.0	4.0	3.0	5.0	7.0	17.0	17.0	20.0	25.0	---	19.0
24	13.0	6.0	5.0	5.0	4.0	6.0	14.0	17.0	---	---	---	18.0
25	18.0	7.0	5.0	4.0	4.0	9.0	14.0	17.0	29.0	---	---	17.0
26	11.0	8.0	3.0	3.0	5.0	9.0	15.0	8.0	23.0	---	24.0	17.0
27	11.0	9.0	4.0	5.0	4.0	8.0	19.0	19.0	25.0	---	25.0	17.0
28	10.0	7.0	5.0	4.0	3.0	3.0	18.0	20.0	24.0	---	25.0	17.0
29	9.0	7.0	2.0	5.0	---	13.0	18.0	22.0	24.0	---	24.0	16.0
30	10.0	7.0	1.0	4.0	---	12.0	17.0	21.0	23.0	---	24.0	17.0
31	9.0	---	4.0	6.0	---	13.0	---	20.0	---	---	22.0	---

01638500 POTOMAC RIVER AT POINT OF ROCKS, MD--Continued

SEDIMENT, SUSPENDED CONCENTRATION (MG/L), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)	MEAN CONCEN- TRATION (MG/L)	LOAD (TONS/ DAY)
OCTOBER			NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	11	67	7	29	4	38	8	74	4	42	9	163
2	6	33	13	54	1	8.6	5	44	4	41	14	229
3	6	31	22	90	1	7.9	5	43	4	40	13	193
4	9	42	10	42	2	15	6	49	6	66	6	83
5	5	31	4	19	3	21	6	48	7	77	5	66
6	4	24	4	23	2	13	5	39	6	70	14	240
7	5	22	5	31	1	6.4	5	38	4	46	84	4410
8	3	12	6	49	1	6.3	3	23	5	57	262	20900
9	2	8.0	4	32	1	6.0	3	26	5	55	204	14200
10	2	8.2	3	24	2	11	4	42	4	40	104	5500
11	3	12	1	7.7	2	12	7	105	5	46	40	1810
12	4	16	2	13	3	17	11	200	4	36	26	1210
13	6	22	3	19	7	39	10	193	5	45	26	1350
14	10	37	3	19	18	87	24	719	14	129	34	1740
15	8	30	3	19	14	54	26	800	6	58	33	1510
16	7	25	3	20	8	43	21	652	5	57	28	1200
17	7	26	4	28	5	29	22	766	14	283	26	1090
18	5	19	4	26	3	15	17	551	31	912	23	838
19	3	11	5	31	2	10	14	412	19	505	21	669
20	3	12	5	39	4	18	11	278	16	378	17	500
21	5	20	8	118	5	25	8	174	11	236	12	330
22	4	19	31	971	4	22	6	113	11	228	10	268
23	3	14	22	570	3	17	5	79	10	242	9	258
24	6	28	12	246	4	23	4	57	6	150	16	588
25	7	33	5	83	3	20	4	54	6	137	38	2640
26	7	33	11	152	4	34	4	49	7	151	141	13600
27	7	33	4	49	6	82	4	48	7	141	90	7220
28	6	27	3	34	5	67	4	45	6	125	53	3360
29	5	22	3	32	4	50	4	43	---	---	29	1490
30	5	21	7	72	6	67	5	53	---	---	22	950
31	5	21	---	---	12	122	4	43	---	---	29	1220
TOTAL	---	759.2	---	2941.7	---	986.2	---	5860	---	4393	---	89825
APRIL			MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	43	2250	29	576	17	336	21	384	e23	551	21	348
2	41	2130	58	1770	17	311	14	223	e17	420	20	289
3	33	1430	114	8800	16	268	12	170	e17	354	17	217
4	26	976	152	13600	13	204	14	184	e19	348	16	181
5	23	770	85	5690	11	166	18	282	e13	211	15	156
6	25	756	112	8200	12	193	39	934	e14	198	14	152
7	21	590	330	48100	14	231	42	1150	e14	180	11	102
8	13	326	276	42800	16	257	45	1250	e15	179	9	77
9	13	304	134	14500	17	312	44	1400	e14	154	9	75
10	14	306	72	6240	18	392	23	542	e13	134	10	80
11	15	312	117	15500	21	484	23	433	e13	122	10	80
12	14	274	110	16800	23	546	26	452	e14	132	9	74
13	11	200	89	10000	19	404	26	448	e14	130	8	62
14	7	122	61	5250	21	396	23	415	e15	147	8	60
15	6	99	51	3760	20	370	23	478	e18	213	7	57
16	5	79	75	7290	18	343	27	736	e17	196	9	78
17	5	80	278	53400	20	437	35	1010	e17	175	9	74
18	5	80	219	37300	41	1310	60	2410	e18	180	10	117
19	6	93	112	12200	42	1540	55	1830	e17	172	42	1020
20	10	170	65	5140	46	1420	34	1110	e17	188	32	714
21	22	363	44	2790	37	1050	82	4610	e18	234	21	382
22	17	271	39	2000	119	7550	103	5670	e20	299	18	273
23	9	133	35	1540	148	7750	e93	5170	e21	332	17	233
24	7	95	35	1470	112	6320	e76	3610	e23	453	18	256
25	7	91	36	1690	66	3390	e56	2000	e25	601	37	742
26	6	76	36	1440	59	2370	e40	1160	e28	892	43	994
27	5	61	33	1130	42	1380	e36	902	47	1850	30	637
28	8	93	30	923	28	764	e37	1120	48	1520	36	752
29	27	408	29	767	26	653	e33	1010	42	1020	32	625
30	25	493	21	489	24	506	e24	618	30	612	23	401
31	---	---	18	381	---	---	e20	443	25	448	---	---
TOTAL	---	13431	---	331536	---	41653	---	42154	---	12645	---	9308

TOTAL LOAD FOR YEAR: 555492.1 TONS.

e Estimate

POTOMAC RIVER BASIN

01643700 GOOSE CREEK NEAR MIDDLEBURG, VA

LOCATION.--Lat 38°59'11", long 77°47'49", Loudoun County, Hydrologic Unit 02070008, on right bank 250 ft upstream from bridge on State Highway 611, 2.0 mi downstream from Panther Skin Creek, and 3.4 mi northwest of Middleburg.

DRAINAGE AREA.--123 mi².

PERIOD OF RECORD.--October 1965 to September 1967, July 1969 to current year.

REVISED RECORDS.--WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 329.80 ft above National Geodetic Vertical Datum of 1929. October 1965 to September 1967, at site 300 ft downstream at datum 0.73 ft lower.

REMARKS.--Records good except those for periods of backwater from leaves, Oct. 3-6, 12-14, Oct. 22 to Nov. 5, periods with ice effect, Jan. 5, Feb. 9, and discharges above 1,200 ft³/s, which are fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--22 years, 131 ft³/s, 14.46 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,200 ft³/s, June 22, 1972, gage height, 27.46 ft, from flood-marks, from rating curve extended above 2,900 ft³/s on basis of slope-area measurements at gage heights 14.44 ft and 27.46 ft; no flow Sept. 21-26, 1985, Sept. 29 to Oct. 3, 1986.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,350 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	0500	1,420	7.00	May 16	1400	1,820	7.84
May 6	2230	1,990	8.28	July 20	0730	*7,330	*17.36

Minimum daily discharge, 0.58 ft³/s, Oct. 14, 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	e4.0	18	12	20	46	137	340	102	62	108	12
2	1.7	e14	16	14	19	41	109	789	91	56	83	11
3	e2.1	e10	14	16	20	38	102	412	85	53	67	11
4	e2.7	e8.0	12	17	35	39	94	290	79	63	56	9.7
5	e2.6	e11	11	e15	32	58	101	276	87	174	50	10
6	e2.3	82	10	14	26	224	137	1120	157	108	45	10
7	2.3	27	10	17	25	230	105	1060	199	90	50	12
8	2.1	15	10	18	23	147	106	606	122	65	49	13
9	2.1	11	10	39	e20	122	105	452	180	54	40	12
10	2.3	8.9	11	46	17	125	88	698	209	56	37	12
11	2.3	7.8	10	37	17	113	80	558	131	46	39	11
12	e2.0	6.9	8.6	71	19	105	74	456	107	40	46	12
13	e1.0	7.9	7.3	110	19	92	70	384	104	51	43	20
14	e.58	14	7.0	68	28	86	66	331	118	81	38	16
15	.58	14	8.7	84	37	81	74	371	144	51	37	14
16	.79	10	10	80	45	71	80	1460	126	80	38	37
17	.89	11	9.5	59	38	61	67	1080	195	70	33	50
18	.88	13	8.4	51	31	59	111	678	149	54	33	24
19	1.1	12	7.9	45	29	67	287	491	117	45	39	18
20	1.6	60	8.1	39	29	55	182	391	103	2590	36	18
21	2.7	59	10	32	32	79	147	323	98	505	31	47
22	e18	34	13	28	84	70	126	264	96	324	33	41
23	e14	23	14	28	109	60	109	240	427	222	28	48
24	e6.9	19	16	28	75	429	96	228	216	171	24	25
25	e4.9	16	19	28	62	345	88	186	143	140	22	19
26	e3.7	14	18	26	66	244	83	163	116	123	20	53
27	e2.9	13	15	26	57	191	77	205	97	107	19	47
28	e2.4	21	13	23	51	162	72	156	87	94	21	26
29	e2.2	29	12	21	---	138	69	128	83	79	19	21
30	e2.2	21	12	23	---	128	73	118	69	73	18	18
31	e2.2	---	12	22	---	190	---	111	---	94	16	---
TOTAL	95.72	596.5	361.5	1137	1065	3896	3115	14365	4037	5821	1218	677.7
MEAN	3.09	19.9	11.7	36.7	38.0	126	104	463	135	188	39.3	22.6
MAX	18	82	19	110	109	429	287	1460	427	2590	108	53
MIN	.58	4.0	7.0	12	17	38	66	111	69	40	16	9.7
CFSM	.03	.16	.09	.30	.31	1.02	.84	3.77	1.09	1.53	.32	.18
IN.	.03	.18	.11	.34	.32	1.18	.94	4.34	1.22	1.76	.37	.20

CAL YR 1988 TOTAL 32154.62 MEAN 87.9 MAX 1480 MIN .58 CFSM .71 IN. 9.72
WTR YR 1989 TOTAL 36385.42 MEAN 99.7 MAX 2590 MIN .58 CFSM .81 IN. 11.00

e Estimated.

POTOMAC RIVER BASIN

89

01644000 GOOSE CREEK NEAR LEESBURG, VA

LOCATION.--Lat 39°01'10", long 77°34'40", Loudoun County, Hydrologic Unit 02070008, on left bank 400 ft upstream from bridge on State Highway 621 at Evergreen Mills, 1.4 mi downstream from Little River, 6.7 mi south of Leesburg, and 10.9 mi upstream from mouth.

DRAINAGE AREA.--332 mi².

PERIOD OF RECORD.--July 1909 to April 1911, September 1911 to December 1912, January 1930 to current year.

REVISED RECORDS.--WSP 851: 1935-37. WSP 951: 1933(M), 1937. WSP 1302: 1934-35(M). WSP 2103: Drainage area.

WDR VA-72-1: 1937(M), 1943(M), 1951(M), 1956(M). WDR VA-79-1: 1978.

GAGE.--Water-stage recorder. Datum of gage is 248.93 ft above National Geodetic Vertical Datum of 1929. July 12, 1909, to Dec. 31, 1912, nonrecording gage at site 1,000 ft downstream at different datum. Jan. 21, 1930, to Nov. 28, 1938, nonrecording gage at site 400 ft downstream at datum 4.20 ft lower than present datum.

REMARKS.--No estimated daily discharges. Records good. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--61 years (water years 1910, 1912, 1931-89), 315 ft³/s, 12.88 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 78,100 ft³/s, June 22, 1972, gage height, 30.59 ft, from high-water mark in gage house, from rating curve extended above 11,000 ft³/s on basis of slope-area measurement of peak flow; minimum daily, 0.40 ft³/s, Sept. 27-30, 1941.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May or June 1889 reached a stage of about 29 ft, discharge, about 45,000 ft³/s, site and datum in use 1930-38, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	0630	*5,460	*8.71	July 20	1930	5,270	8.46
May 16	2230	5,380	8.61				

Minimum daily discharge, 5.2 ft³/s, Oct. 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.7	27	72	46	76	163	577	418	279	140	172	26
2	8.8	45	63	53	71	144	405	2520	248	128	176	22
3	11	37	56	60	76	134	360	1130	225	119	143	19
4	14	44	52	65	106	132	330	752	213	161	112	16
5	13	34	48	49	108	167	323	1280	218	585	95	16
6	11	107	45	55	94	624	460	4430	437	287	85	17
7	11	96	43	61	87	778	348	2930	581	318	82	19
8	10	53	43	65	82	456	338	1650	407	183	88	19
9	9.3	37	41	99	67	369	330	1190	363	139	78	20
10	8.9	31	43	138	63	395	282	1960	528	122	67	20
11	9.0	27	41	121	65	392	246	1630	327	115	66	19
12	8.5	23	34	254	65	350	226	1340	256	96	73	18
13	6.5	26	33	431	63	305	211	1070	244	98	75	21
14	5.2	37	31	258	95	270	198	902	337	136	84	30
15	5.6	39	34	298	126	253	214	995	391	114	77	25
16	8.2	41	38	299	157	226	267	3290	292	123	68	28
17	9.0	47	40	216	143	193	209	3350	399	173	67	65
18	7.1	53	37	175	122	187	207	1900	365	117	57	51
19	6.0	54	36	154	118	223	675	1400	262	97	56	32
20	5.9	160	34	136	118	185	486	1080	262	2640	60	27
21	14	235	38	116	129	285	374	820	253	1060	54	34
22	62	139	44	89	312	269	321	673	300	629	52	57
23	61	95	48	94	450	212	275	639	1050	415	51	57
24	46	77	59	93	303	1480	244	681	528	304	44	54
25	28	68	68	99	222	1330	224	509	389	239	39	38
26	19	60	65	93	221	797	210	442	287	201	36	57
27	15	56	58	93	203	604	196	566	232	177	35	101
28	13	88	51	84	178	494	184	474	202	159	35	70
29	13	94	49	78	---	424	177	356	190	134	36	51
30	14	85	46	78	---	402	194	318	159	119	34	43
31	14	---	45	80	---	708	---	300	---	172	30	---
TOTAL	476.7	2015	1435	4030	3920	12951	9091	40995	10224	9500	2227	1072
MEAN	15.4	67.2	46.3	130	140	418	303	1322	341	306	71.8	35.7
MAX	62	235	72	431	450	1480	675	4430	1050	2640	176	101
MIN	5.2	23	31	46	63	132	177	300	159	96	30	16
CFSM	.05	.20	.14	.39	.42	1.26	.91	3.98	1.03	.92	.22	.11
IN.	.05	.23	.16	.45	.44	1.45	1.02	4.59	1.15	1.06	.25	.12

CAL YR 1988	TOTAL 92403.6	MEAN 252	MAX 3790	MIN 5.2	CFSM .76	IN. 10.35
WTR YR 1989	TOTAL 97936.7	MEAN 268	MAX 4430	MIN 5.2	CFSM .81	IN. 10.97

POTOMAC RIVER BASIN

01646000 DIFFICULT RUN NEAR GREAT FALLS, VA

LOCATION.--Lat 38°58'33", long 77°14'46", Fairfax County, Hydrologic Unit 02070008, on right bank 250 ft downstream from bridge on State Highway 193, 300 ft downstream from Rocky Run, 0.7 mi upstream from mouth, and 1.5 mi southeast of Great Falls.

DRAINAGE AREA.--57.9 mi².

PERIOD OF RECORD.--October 1934 to current year. Monthly discharge only October to December 1934, published in WSP 1302.

REVISED RECORDS.--WSP 951: 1936(M), 1937-38, 1939-40(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 151.30 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for period with ice effect, Dec. 17, 18, and period of doubtful gage-height record, May 7-9, which are fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--55 years, 59.3 ft³/s, 13.91 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,200 ft³/s, June 22, 1972, gage height, 21.40 ft, from flood-marks, from rating curve extended above 1,600 ft³/s on basis of contracted-opening measurement at gage height 13.18 ft and slope-area measurement at gage height 21.40 ft; minimum, 0.05 ft³/s, Sept. 9, 10, 1966, gage height, 1.65 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 24	1400	1,000	7.31	May 6	0400	*6,810	*13.31

Minimum discharge, 5.8 ft³/s, Oct. 12, gage height, 2.49 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.5	70	29	24	26	43	77	100	41	32	31	12
2	7.2	30	25	34	25	38	53	325	38	30	30	12
3	7.7	17	23	31	40	37	59	80	37	29	29	11
4	8.9	15	22	31	82	38	53	56	35	42	26	11
5	8.7	69	21	24	35	52	77	290	36	48	25	11
6	7.4	115	21	28	31	297	125	2310	66	61	23	12
7	7.2	26	21	33	31	136	71	e192	368	43	23	12
8	7.4	19	21	80	30	67	87	e103	77	34	24	11
9	7.2	17	21	107	27	68	70	e87	114	30	21	11
10	7.5	17	22	51	25	69	55	239	68	29	21	11
11	7.3	16	20	38	25	60	50	118	46	27	22	10
12	6.7	14	18	128	25	57	49	82	41	27	24	21
13	6.5	31	18	85	25	54	47	76	41	35	23	17
14	6.4	29	18	43	70	58	45	72	170	39	22	15
15	6.5	19	20	164	55	57	80	235	162	28	23	13
16	7.1	16	19	62	54	54	75	711	105	186	22	54
17	7.0	130	e18	41	40	50	52	291	96	59	21	68
18	7.5	38	e18	36	34	41	53	111	55	38	20	20
19	9.1	29	18	33	32	46	211	81	45	33	19	22
20	8.1	174	18	31	30	38	74	68	100	489	19	61
21	46	44	21	29	179	137	54	60	76	72	23	25
22	114	27	25	27	193	73	49	54	49	44	23	23
23	18	24	25	27	95	54	46	66	84	36	20	22
24	14	22	61	27	59	618	45	111	93	32	18	26
25	13	21	71	26	48	156	43	59	48	46	17	18
26	10	20	29	28	47	82	42	53	42	63	16	197
27	10	25	25	29	50	66	40	68	38	50	17	33
28	10	339	28	25	43	60	39	52	37	81	17	23
29	11	55	34	26	---	56	79	45	37	32	17	21
30	14	33	24	30	---	54	60	42	33	28	18	20
31	13	---	23	31	---	109	---	42	---	33	15	---
TOTAL	421.9	1501	777	1409	1456	2825	1960	6279	2278	1856	669	823
MEAN	13.6	50.0	25.1	45.5	52.0	91.1	65.3	203	75.9	59.9	21.6	27.4
MAX	114	339	71	164	193	618	211	2310	368	489	31	197
MIN	6.4	14	18	24	25	37	39	42	33	27	15	10
CFSM	.24	.86	.43	.79	.90	1.57	1.13	3.50	1.31	1.03	.37	.47
IN.	.27	.96	.50	.91	.94	1.82	1.26	4.03	1.46	1.19	.43	.53

CAL YR 1988 TOTAL 17670.1 MEAN 48.3 MAX 1190 MIN 5.8 CFSM .83 IN. 11.35
WTR YR 1989 TOTAL 22254.9 MEAN 61.0 MAX 2310 MIN 6.4 CFSM 1.05 IN. 14.30

e Estimated.

01646500 POTOMAC RIVER NEAR WASHINGTON, DC

LOCATION.--Lat 38°56'58", long 77°07'40", Montgomery County, Md., Hydrologic Unit 02070008, on left bank just upstream from Little Falls Dam, 1 mi upstream from District of Columbia boundary line, 1.2 mi upstream from Chain Bridge, 1.8 mi east of Langley, Fairfax County, Va., and at mile 117.4.

DRAINAGE AREA.--11,560 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1930 to current year.

REVISED RECORDS.--WSP 726: Drainage area. WDR MD-DE-75-1: 1973-74(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 37.95 ft above National Geodetic Vertical Datum of 1929. Prior to June 7, 1930, nonrecording gage, and June 7, 1930, to Jan. 22, 1965, water-stage recorder at site 1 mi upstream on right bank at same datum.

REMARKS.--No estimated daily discharges. Water-discharge records good. Diversions at Great Falls through aqueducts, and since June 1959, from gage pool at Little Falls Dam, for municipal supply of Washington, D.C.; since October 1958, at Rockville Filtration Plant, for municipal supply of city of Rockville; since April 1961, at Potomac Filtration Plant for water supply of Washington Suburban Sanitary District; since October 1961, at Fairfax Water Treatment Plant for water supply of city of Fairfax (from Goose Creek); since April 1964, at Violets Lock to Chesapeake and Ohio Canal; and since October 1985, at Fairfax County Water Authority Treatment Plant for water supply of the county. Low flow affected slightly prior to July 1981 by Stony River Reservoir, since December 1950, by Savage River Reservoir (see station 01597500), and since July 1981, by Jennings Randolph Lake. Gage-height telemeter at station.

AVERAGE DISCHARGE.--59 years, 11,510 ft³/s, 13.52 in/yr, adjusted for diversions.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 484,000 ft³/s, Mar. 19, 1936, gage height, 28.1 ft, site then in use; minimum daily discharge observed at gaging station, 121 ft³/s, Sept. 9, 1966, does not include diversion of 489 ft³/s for municipal use; minimum daily discharge (adjusted), 601 ft³/s, Sept. 10, 1966, includes diversion of 449 ft³/s for municipal use.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 2, 1889, was of approximately the same magnitude as that of March 19, 1936.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 45,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 26	1745	45,800	6.48	May 12	0730	75,700	7.90
May 6	0715	74,300	7.84	May 18	0115	*107,000	*9.10
May 8	0015	88,200	8.41				

Minimum daily discharge, 1,050 ft³/s, Oct. 14, does not include diversion for municipal use; minimum daily (adjusted) discharge, 1,700 ft³/s, Oct. 14, 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2020	1540	3980	4150	4270	8810	22500	8690	9590	8740	8960	6300
2	1970	1500	3560	3860	4210	7560	24000	16100	8710	7410	10700	5900
3	1850	1320	3190	3570	4190	6830	21400	29800	8120	6370	9790	4990
4	1730	1220	2870	3510	4540	6180	18000	41200	7360	5960	8240	4410
5	1490	1370	2640	3320	4870	5780	16200	35200	6950	6090	7210	3900
6	1720	2180	2470	3340	4940	7930	15600	65400	8740	9200	6180	3510
7	2080	2080	2330	3130	4900	13100	14200	75600	12100	12600	5300	3680
8	1630	2250	2270	3350	4720	31600	12900	79800	10200	11800	4800	3110
9	1300	2830	2280	3800	4570	35900	11700	55200	8790	12700	4380	2860
10	1210	2890	2140	4430	4280	26000	10800	44600	9820	11700	4050	2670
11	1210	2810	2000	5500	3820	21100	10000	53500	11300	8880	3730	2470
12	1170	2680	1880	8380	3610	20100	9340	72500	10700	7200	3480	2590
13	1070	2480	1790	11500	3470	22100	8790	56800	10300	7000	3410	2750
14	1050	2380	1690	12400	3920	23500	8140	42400	9540	7260	3280	2580
15	1090	2320	1560	16100	4270	21400	7900	35200	9680	8040	3580	2490
16	1090	2260	1260	16300	4720	19400	8100	47400	8780	10000	4190	2850
17	1080	2890	1470	16500	5710	18700	7490	89200	9010	11100	4110	3360
18	1090	2770	1710	15700	10300	17300	7400	92000	11600	14700	3690	2880
19	1110	2460	1540	14200	11800	15300	9250	58200	15900	14600	3660	4970
20	1120	3200	1500	12500	10300	14300	8520	40300	14500	15900	3610	9550
21	1260	4060	1490	10600	10300	14400	8160	31300	13600	19800	4430	8190
22	2120	8200	1690	9300	10700	13500	7680	25500	19700	24700	5220	6650
23	1810	12400	1980	7940	12500	12900	7230	21600	29800	22800	5600	5750
24	1760	9670	2270	6770	12500	20200	6610	22800	33900	21100	6000	5090
25	1720	7680	2480	6230	11000	29100	6030	21800	26300	16700	7650	5600
26	1620	6220	2810	5760	9910	42900	5870	20500	19900	13300	9860	8860
27	1560	5230	3840	5350	9180	40300	5500	17800	15900	11100	13600	9290
28	1510	6300	5630	5130	8930	31300	5170	16100	13000	10300	14300	8060
29	1480	4850	5500	4820	---	25200	5130	13800	11900	12700	11100	8090
30	1380	4280	5040	4480	---	21000	7400	11800	10800	11300	8620	7320
31	1320	---	4510	4300	---	20300	---	10500	---	10400	7290	---
TOTAL	45620	114320	81370	236220	192430	613990	317010	1252590	396490	371450	200020	150720
MEAN	1472	3811	2625	7620	6872	19810	10570	40410	13220	11980	6452	5024
MAX	2120	12400	5630	16500	12500	42900	24000	92000	33900	24700	14300	9550
MIN	1050	1220	1260	3130	3470	5780	5130	8690	6950	5960	3280	2470
(*)	611	582	573	552	525	531	558	580	615	651	672	666
MEAN†	2083	4394	3198	8175	7391	20340	11120	40990	13830	12630	7124	5691
CFSM†	.18	.38	.28	.71	.64	1.76	.96	3.55	1.20	1.09	.62	.49
IN.†	.21	.42	.32	.82	.67	2.03	1.07	4.09	1.33	1.26	.71	.55

CAL YR 1988	TOTAL	3188490	MEAN	8712	MAX	125000	MIN	742	MEAN†	9326	CFSM†	.81	IN.†	10.98
WTR YR 1989	TOTAL	3972230	MEAN	10880	MAX	92000	MIN	1050	MEAN†	11480	CFSM†	.99	IN.†	13.48

* Diversions, in cubic feet per second, for municipal supply of Washington, D.C., Washington Suburban Sanitary District, city of Rockville, city of Fairfax (from Goose Creek), Fairfax County, and the Chesapeake and Ohio Canal (insignificant diversion to canal during current water year). Records provided by U.S. Army Corps of Engineers, Washington Suburban Sanitary Commission, city of Rockville, city of Fairfax, and Fairfax County Water Authority.

† Adjusted for diversion.

POTOMAC RIVER BASIN

01646500 POTOMAC RIVER NEAR WASHINGTON, DC--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1988 to September 1989.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1988 to September 1989.

WATER TEMPERATURE: October 1988 to September 1989.

INSTRUMENTATION.--Water-quality monitor.

REMARKS--Periods of missing record due to monitor malfunction.

EXTREMES FOR PERIOD OF DAILY RECORD--

SPECIFIC CONDUCTANCE: Maximum, 543 microsiemens, Jan. 9, 1989; minimum, 80 microsiemens, May 6, 1989.

WATER TEMPERATURE: Maximum, 29.5°C, July 11, 12, 1989; minimum, 0.5°C, Dec. 13-15, 17-20, 1988, Jan. 6, 1989.

EXTREMES FOR CURRENT PERIOD.--

SPECIFIC CONDUCTANCE: Maximum, 543 microsiemens, Jan. 9; minimum, 80 microsiemens, May 6.

WATER TEMPERATURE: Maximum, 29.5°C, July 11, 12; minimum, 0.5°C, Dec. 13-15, 17-20, Jan. 6.

SPECIFIC CONDUCTANCE, (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	479	450	466	488	479	484	297	285	291	406	381	396
2	490	477	484	479	447	462	299	295	297	417	384	400
3	490	485	488	491	455	479	296	293	294	414	387	402
4	498	486	492	508	489	499	298	293	296	417	388	409
5	509	497	502	507	499	502	305	298	301	409	361	382
6	508	497	504	506	434	485	310	305	307	369	355	360
7	499	485	491	491	474	479	321	310	315	410	363	389
8	485	475	480	502	487	494	330	321	326	480	410	424
9	479	463	471	509	498	505	342	330	336	543	428	485
10	468	458	463	507	492	498	354	342	348	428	388	405
11	462	402	454	506	491	498	361	353	358	390	385	388
12	457	339	439	520	507	516	365	360	363	390	331	371
13	468	382	448	518	501	512	367	364	366	345	338	342
14	472	464	467	501	478	491	370	366	369	343	323	336
15	472	463	469	497	490	494	376	367	371	323	276	306
16	478	449	468	497	492	495	378	374	376	315	272	292
17	488	460	476	493	359	453	383	377	380	272	259	262
18	490	437	483	420	380	413	389	380	386	268	261	265
19	489	481	485	420	399	414	390	386	388	261	253	256
20	483	471	478	399	280	339	399	390	395	263	253	258
21	479	454	472	366	334	356	405	398	400	272	263	268
22	464	326	395	367	346	362	420	405	412	273	270	271
23	440	362	405	376	333	357	426	418	423	273	270	272
24	467	437	456	370	351	365	425	412	419	273	271	272
25	485	463	473	351	270	299	412	360	378	277	271	273
26	511	484	496	279	269	275	411	383	399	290	277	283
27	512	504	507	279	276	277	413	404	409	294	290	292
28	508	489	499	278	175	225	411	405	409	300	294	297
29	489	471	480	270	240	258	432	404	417	304	300	301
30	475	470	473	284	271	277	440	432	437	312	304	309
31	488	473	480	---	---	---	434	405	418	310	302	305
MONTH	512	326	472	520	175	419	440	285	367	543	253	331

POTOMAC RIVER BASIN

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01646500 POTOMAC RIVER NEAR WASHINGTON, DC--Continued

SPECIFIC CONDUCTANCE, (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	313	303	310	297	286	292	218	209	213	304	287	299
2	320	313	317	287	282	284	223	218	221	287	235	271
3	317	312	316	290	283	285	218	208	213	264	226	236
4	310	269	291	298	290	294	209	205	207	262	207	220
5	327	302	315	307	298	302	226	208	214	214	92	193
6	337	325	332	305	162	248	228	223	225	137	80	120
7	341	333	336	283	236	263	236	228	231	170	138	153
8	344	339	341	270	235	251	243	235	239	170	159	163
9	346	341	344	252	213	224	250	243	247	167	161	163
10	348	343	346	213	195	201	255	250	252	169	164	166
11	350	342	347	208	199	201	258	254	256	181	167	173
12	345	340	343	214	208	211	263	258	259	183	161	168
13	343	339	341	220	213	217	271	263	268	169	164	165
14	345	325	335	219	215	217	276	271	273	175	169	172
15	342	329	337	215	206	209	277	265	274	183	173	176
16	340	332	336	207	203	205	277	267	272	180	172	177
17	339	328	335	209	206	208	281	277	280	176	160	167
18	340	331	335	216	209	213	286	281	284	175	155	161
19	358	341	346	219	210	213	286	237	267	166	151	161
20	341	301	319	232	211	215	278	267	273	179	166	173
21	313	229	282	264	225	238	290	270	283	195	179	188
22	278	248	265	228	225	226	302	290	298	207	195	200
23	272	258	262	231	225	228	311	301	306	217	207	213
24	267	262	265	237	163	205	308	297	304	217	205	211
25	274	266	270	209	197	201	298	289	292	232	212	220
26	283	271	274	234	209	224	299	291	296	245	232	239
27	296	283	288	209	182	190	297	285	291	243	225	236
28	298	295	296	198	186	193	292	287	290	234	227	230
29	---	---	---	204	198	201	296	290	293	248	235	243
30	---	---	---	213	204	208	297	289	292	260	248	253
31	---	---	---	216	208	211	---	---	---	265	260	263
MONTH	358	229	315	307	162	228	311	205	264	304	80	199
JUNE			JULY			AUGUST			SEPTEMBER			
1	271	265	269	260	246	255	248	240	246	252	248	249
2	275	270	273	256	252	254	261	247	253	257	251	253
3	277	275	276	271	256	264	264	260	262	262	256	260
4	280	276	278	272	247	262	---	---	---	271	262	266
5	283	280	282	268	246	260	---	---	---	275	271	273
6	282	265	273	271	257	266	---	---	---	282	275	279
7	267	191	241	271	256	263	---	---	---	289	282	286
8	251	228	236	287	271	283	---	---	---	297	289	294
9	269	253	263	345	277	287	---	---	---	308	297	302
10	287	269	283	338	249	266	---	---	---	315	308	312
11	301	287	295	276	249	261	---	---	---	320	315	319
12	311	300	304	358	276	289	---	---	---	330	320	325
13	313	308	310	286	273	281	---	---	---	334	329	331
14	317	257	305	273	267	268	---	---	---	344	334	339
15	286	260	278	272	265	268	---	---	---	350	343	346
16	276	269	272	277	252	267	---	---	---	357	345	351
17	282	274	278	298	264	284	---	---	---	352	316	336
18	283	278	281	305	300	303	---	---	---	366	352	361
19	295	283	288	303	287	293	325	321	323	359	356	358
20	303	272	298	287	189	224	332	323	327	364	350	356
21	272	248	255	273	188	208	350	332	340	385	364	375
22	259	240	254	257	223	247	358	350	353	372	351	365
23	251	185	234	230	200	211	362	357	359	362	347	357
24	185	176	179	288	220	229	363	359	362	347	328	335
25	210	183	203	231	226	228	359	350	354	328	317	321
26	216	199	208	237	209	230	351	349	350	317	223	270
27	223	203	216	231	228	230	349	315	332	273	263	268
28	225	220	222	240	229	234	315	274	298	284	271	279
29	237	224	231	250	240	245	274	255	266	291	284	287
30	246	237	239	253	250	252	255	247	248	291	276	285
31	---	---	---	252	235	241	250	246	248	---	---	---
MONTH	317	176	261	358	188	257	---	---	---	385	223	311

POTOMAC RIVER BASIN

01646500 POTOMAC RIVER NEAR WASHINGTON, DC--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	21.5	20.0	20.5	10.5	9.5	10.0	7.0	6.5	6.5	4.0	2.5	3.0
2	22.0	20.5	21.0	9.5	9.0	9.5	7.0	5.5	6.0	3.0	2.5	3.0
3	21.5	21.0	21.0	9.5	8.5	9.0	6.0	5.0	5.5	3.5	2.5	3.0
4	21.0	20.0	20.5	10.5	9.0	9.5	6.5	5.5	5.5	3.5	2.5	2.5
5	20.0	19.0	19.5	11.5	10.5	11.0	5.5	5.0	5.5	2.5	1.0	1.5
6	19.0	17.5	18.5	12.5	11.0	11.5	5.5	5.0	5.0	2.0	.5	1.0
7	18.0	16.5	17.0	12.5	12.0	12.0	5.5	4.5	5.0	1.0	1.0	1.0
8	16.5	15.5	15.5	12.0	11.5	11.5	5.0	4.5	5.0	1.5	1.0	1.5
9	15.5	14.5	15.5	11.5	11.0	11.5	5.0	4.5	5.0	2.0	1.5	1.5
10	15.5	14.5	15.0	11.5	10.5	11.0	4.5	3.5	4.0	2.5	1.5	2.0
11	15.5	14.5	15.0	11.0	10.5	10.5	4.0	3.0	3.5	3.0	2.0	2.5
12	15.0	14.0	14.5	10.5	9.5	10.0	3.0	2.0	2.5	3.5	2.5	3.0
13	14.0	12.5	13.0	10.0	9.5	9.5	2.0	.5	1.0	4.0	3.0	3.5
14	13.5	11.5	12.5	10.0	9.5	10.0	1.0	.5	.5	3.0	2.0	2.5
15	14.0	11.5	12.5	10.5	9.5	10.0	1.5	.5	1.0	3.0	2.5	2.5
16	13.5	11.5	12.5	11.0	10.0	10.5	1.5	1.0	1.0	3.5	3.0	3.0
17	14.5	12.5	13.5	11.5	10.5	11.0	1.0	.5	1.0	3.5	3.0	3.5
18	14.5	14.0	14.0	11.0	10.0	10.5	1.0	.5	.5	3.5	3.0	3.5
19	14.5	14.5	14.5	11.0	9.0	10.0	1.0	.5	.5	4.5	3.5	4.0
20	14.5	14.0	14.5	9.0	8.5	9.0	1.5	.5	1.0	4.5	4.0	4.0
21	14.5	13.5	14.0	9.0	8.5	9.0	2.5	1.5	2.0	4.0	2.0	3.5
22	13.5	12.0	12.5	8.5	7.5	8.0	3.0	2.0	2.5	3.0	2.0	2.5
23	13.0	11.5	12.0	8.0	7.5	7.5	3.0	3.0	3.0	3.0	2.0	2.5
24	13.5	12.0	13.0	8.0	6.5	7.5	4.0	3.0	3.0	3.5	2.0	2.5
25	13.0	12.0	12.5	7.5	6.5	6.5	5.0	4.0	4.5	3.5	3.0	3.0
26	12.5	11.5	12.0	7.5	6.0	6.5	5.0	4.0	4.5	4.0	3.5	3.5
27	12.0	11.0	12.0	8.0	7.0	7.5	4.5	4.0	4.5	5.5	4.0	4.5
28	12.0	11.0	11.5	10.5	8.0	9.5	5.5	4.0	5.0	5.5	4.0	4.5
29	11.5	10.5	11.0	8.5	7.5	8.0	5.0	4.5	4.5	5.0	4.0	4.5
30	11.5	10.5	11.0	7.5	6.5	7.0	4.5	3.5	3.5	5.5	5.0	5.0
31	11.0	10.0	10.5	---	---	---	4.0	3.0	3.5	6.0	5.0	5.5
MONTH	22.0	10.0	14.6	12.5	6.0	9.5	7.0	.5	3.4	6.0	.5	3.0
FEBRUARY			MARCH			APRIL			MAY			
1	7.5	5.0	6.0	5.0	3.5	4.0	13.0	11.5	12.0	18.5	17.5	18.0
2	8.0	6.0	7.0	5.5	4.0	4.5	11.5	11.0	11.5	18.5	16.5	17.5
3	8.0	7.5	7.5	5.0	4.0	4.5	12.0	10.5	11.5	17.5	16.0	16.5
4	7.5	6.0	6.5	5.0	4.5	5.0	13.5	12.0	12.5	17.0	15.5	16.0
5	6.0	5.0	5.5	5.5	5.0	5.0	13.5	13.0	13.5	16.5	15.5	15.5
6	5.5	4.5	5.0	5.5	4.0	5.0	13.0	12.0	12.5	15.5	14.5	15.0
7	5.5	4.5	5.0	4.0	3.0	3.5	12.0	11.0	11.5	14.5	13.5	14.0
8	5.0	4.0	4.5	3.0	1.5	2.0	11.0	10.5	10.5	13.5	13.0	13.5
9	4.0	2.5	3.0	3.0	1.5	2.0	11.0	10.5	10.5	13.0	12.5	13.0
10	3.0	1.5	2.0	4.0	2.5	3.0	11.5	10.5	11.0	12.5	12.5	12.5
11	3.5	1.0	2.0	5.0	3.0	4.0	12.0	10.0	11.0	12.5	11.5	12.0
12	3.5	1.5	2.5	5.5	4.5	5.0	12.5	10.5	11.0	12.0	11.5	11.5
13	3.5	2.0	2.5	6.0	5.0	5.5	12.5	10.5	11.5	12.0	11.5	12.0
14	4.0	2.5	3.0	6.0	5.5	5.5	13.5	11.0	12.0	12.5	11.5	12.0
15	5.5	3.5	4.0	8.0	6.0	6.5	12.5	12.0	12.5	13.0	12.5	12.5
16	5.5	5.0	5.0	8.5	7.5	8.0	14.0	12.0	12.5	13.0	13.0	13.0
17	5.0	4.0	4.5	9.5	8.0	9.0	15.0	12.5	13.5	14.0	13.0	13.5
18	4.5	3.5	4.0	11.0	9.5	10.0	17.0	13.5	15.5	14.5	13.5	14.0
19	4.0	3.0	3.5	11.0	9.5	10.0	17.0	15.5	16.0	16.5	14.5	15.5
20	5.0	3.5	4.0	9.5	8.5	9.0	17.5	15.5	16.0	18.0	16.0	17.0
21	6.0	4.5	5.0	8.5	8.0	8.0	17.0	15.5	16.0	19.0	17.5	18.5
22	6.5	5.5	6.0	8.5	7.0	8.0	17.5	15.5	16.5	20.0	18.0	19.0
23	5.5	5.0	5.5	8.0	7.5	8.0	17.5	15.5	16.5	19.5	18.5	19.0
24	5.0	3.5	4.0	8.0	6.5	7.0	17.5	15.0	16.0	19.5	18.5	19.0
25	4.0	2.5	3.0	8.0	6.0	7.0	18.0	15.5	16.5	20.0	18.0	19.0
26	3.5	3.0	3.0	9.0	7.5	8.0	19.0	16.5	17.5	20.5	19.0	20.0
27	4.5	3.0	3.5	10.5	8.0	9.0	19.5	17.0	18.5	21.0	20.0	20.5
28	4.5	4.0	4.0	13.0	10.0	11.5	20.5	18.0	19.0	20.5	19.5	20.0
29	---	---	---	14.0	12.5	13.5	19.0	17.5	18.0	21.0	20.0	20.5
30	---	---	---	14.0	13.5	13.5	19.5	17.0	18.0	21.5	21.0	21.5
31	---	---	---	14.0	13.0	13.5	---	---	---	23.0	21.5	22.0
MONTH	8.0	1.0	4.3	14.0	1.5	7.0	20.5	10.0	14.0	23.0	11.5	16.2

POTOMAC RIVER BASIN

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01646500 POTOMAC RIVER NEAR WASHINGTON, DC--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	25.0	22.5	23.5	27.5	25.5	26.5	---	---	---	27.0	25.5	26.0
2	26.0	24.0	25.0	28.0	26.0	26.5	---	---	---	27.0	25.5	26.0
3	26.5	25.0	25.5	28.0	26.5	27.0	---	---	---	26.5	25.0	25.5
4	27.0	25.0	26.0	27.0	26.0	27.0	---	---	---	25.0	23.5	24.5
5	26.0	25.5	25.5	26.5	26.0	26.5	---	---	---	24.5	23.0	23.5
6	25.5	24.5	25.0	26.5	25.5	26.0	---	---	---	24.5	22.5	23.5
7	24.5	22.0	23.5	27.0	25.5	26.0	---	---	---	25.0	23.0	24.0
8	24.0	22.5	23.0	27.5	27.0	27.0	26.5	---	---	25.0	23.5	24.5
9	24.0	23.5	24.0	27.5	26.5	27.0	25.5	24.0	25.0	25.5	24.0	24.5
10	25.0	23.5	24.0	27.5	26.5	27.0	24.5	23.0	24.0	26.5	24.5	25.5
11	24.5	23.0	24.0	29.5	27.5	28.5	24.0	23.0	23.0	27.5	26.0	26.5
12	23.5	23.0	23.5	29.5	28.5	29.0	23.0	22.5	23.0	27.0	26.5	27.0
13	24.0	23.0	23.5	28.5	26.5	28.0	25.0	23.0	23.5	27.0	26.0	26.0
14	24.5	22.5	23.5	27.5	26.0	26.5	26.0	24.0	25.0	26.5	25.5	26.0
15	24.5	23.0	24.0	28.0	26.0	27.0	26.0	24.5	25.5	26.5	25.5	26.0
16	25.0	24.0	24.0	27.0	25.5	26.5	27.5	24.5	26.0	26.5	24.5	25.5
17	24.5	23.5	24.0	26.0	25.0	25.5	28.0	26.0	27.0	25.0	23.5	24.0
18	25.0	23.5	24.0	26.0	25.0	25.5	27.0	26.0	26.5	24.0	23.0	23.5
19	25.0	24.5	24.5	26.0	25.5	25.5	26.0	25.0	25.5	23.5	21.5	22.5
20	25.0	24.5	25.0	25.5	24.5	25.0	26.5	24.5	25.5	21.5	21.0	21.5
21	25.0	24.5	24.5	26.5	25.5	25.5	26.5	25.5	26.0	23.0	21.0	22.0
22	25.5	24.5	25.0	26.5	25.5	26.0	27.0	25.5	26.0	24.0	22.5	23.0
23	25.5	23.5	24.5	27.0	25.5	26.5	28.5	26.0	27.5	24.0	22.0	23.0
24	24.0	23.0	23.5	27.5	26.0	27.0	28.0	27.0	27.5	22.0	20.0	21.0
25	25.0	23.5	24.0	27.5	26.5	27.0	27.5	26.0	26.5	20.0	18.5	19.0
26	26.5	24.5	25.5	27.5	26.5	27.0	26.0	25.0	26.0	19.0	17.0	18.5
27	27.0	26.0	26.5	28.5	27.0	27.5	26.0	25.0	25.5	19.0	17.5	18.5
28	27.0	26.5	27.0	---	---	---	26.0	25.5	26.0	19.0	17.5	18.0
29	27.0	26.0	26.5	---	---	---	26.0	25.5	26.0	18.5	17.5	18.0
30	26.5	25.5	26.0	---	---	---	27.5	25.5	26.5	18.5	18.0	18.0
31	---	---	---	---	---	---	27.0	25.5	26.0	---	---	---
MONTH	27.0	22.0	24.6	---	---	---	---	---	---	27.5	17.0	23.2

POTOMAC RIVER BASIN

01646580 POTOMAC RIVER AT CHAIN BRIDGE AT WASHINGTON, DC
(National stream-quality accounting network station)

LOCATION.--Lat 38°55'46", long 77°07'02", Arlington County, Va., Hydrologic Unit 02070010, under right downstream side of bridge on Virginia State Highway 123, and at river mile 115.9.

DRAINAGE AREA.--11,570 mi².

PERIOD OF RECORD.--Water years 1973 to current year. Prior to October 1977, published as "at Great Falls."

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: June 1978 to September 1981 (discontinued).

pH: June 1978 to September 1981 (discontinued).

WATER TEMPERATURE: June 1978 to September 1981 (discontinued).

DISSOLVED OXYGEN: June 1978 to September 1981 (discontinued).

SUSPENDED-SEDIMENT DISCHARGE: October 1978 to September 1981 (discontinued).

INSTRUMENTATION.--Water-quality monitor June 1978 to September 1981.

REMARKS.--High flows are sampled from the George Mason Memorial Bridge (14th Street) located 6 mi downstream from Chain Bridge.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (water years 1979, 1981): Maximum, 598 microsiemens, Sept. 12, 1981; minimum, 116 microsiemens, Jan. 25, 1979.

pH (water years 1979, 1981): Maximum, 9.3 units, Mar. 29, 1981; minimum, 6.7 units, June 2, 1981.

WATER TEMPERATURE (water years 1979, 1981): Maximum, 31.0°C, July 23, 24, 1978; minimum, 0.0°C on many days during winter periods.

DISSOLVED OXYGEN (water years 1979, 1981): Maximum, 16.4 mg/L, on many days in 1979; minimum, 5.6 mg/L, June 2, 1981.

SEDIMENT CONCENTRATION: Maximum daily mean, 812 mg/L, Sept. 6, 1979; minimum daily mean, 1 mg/L on many days during winter periods.

SEDIMENT LOAD: Maximum daily, 281,000 tons, Feb. 27, 1979; minimum daily, 3.2 tons, Jan. 5, 1981.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TEMPER- ATURE AIR (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
NOV											
01...	1020	1600	420	7.7	10.0	16.0	763	1.9	10.7	95	520
01...	1025	1600	440	7.5	10.0	16.0	763	--	10.7	95	--
JAN											
05...	1100	3280	363	7.6	2.0	5.0	772	2.2	13.8	99	K85
05...	1105	3280	382	7.5	2.0	5.0	772	--	13.8	99	--
MAR											
15...	1050	21700	240	7.4	7.0	16.0	758	16	12.8	106	--
15...	1055	21700	227	7.3	7.0	16.0	758	--	12.8	106	--
MAY											
04...	1040	46600	228	7.5	15.0	19.0	770	20	10.4	102	1200
04...	1045	46600	232	7.5	15.0	19.0	770	--	10.4	102	--
JUN											
27...	1030	16300	230	7.5	25.0	31.0	761	67	8.3	101	750
27...	1035	16300	233	7.6	25.0	31.0	761	--	8.3	101	--
SEP											
06...	1050	3460	280	7.8	23.0	23.0	771	3.3	8.9	103	K3
06...	1055	3460	285	7.7	23.0	23.0	771	--	8.9	103	--

POTOMAC RIVER BASIN

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01646580 POTOMAC RIVER AT CHAIN BRIDGE AT WASHINGTON, DC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	STREP- TOCOC FECAL, KF AGAR (COLS. PER 100 ML)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WAT WH TOT FET FIELD MG/L AS CAC03	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
NOV											
01...	1000	51	13	30	3.5	105	94	26	0.10	0.20	300
01...	--	--	--	--	--	103	--	--	--	<0.50	--
JAN											
05...	24	36	8.5	19	2.6	82	53	21	0.10	1.4	201
05...	--	--	--	--	--	81	--	--	--	1.7	--
MAR											
15...	--	26	5.7	8.5	2.0	49	37	12	0.10	6.4	139
15...	--	--	--	--	--	49	--	--	--	6.7	--
MAY											
04...	540	26	5.9	7.1	2.4	74	21	7.6	0.10	5.8	136
04...	--	--	--	--	--	76	--	--	--	6.2	--
JUN											
27...	740	27	5.7	6.2	2.7	65	27	8.3	0.10	7.2	122
27...	--	--	--	--	--	63	--	--	--	7.6	--
SEP											
06...	100	37	7.8	8.4	2.5	89	25	10	0.10	6.7	160
06...	--	--	--	--	--	92	--	--	--	--	--

K: Results based on colony count outside the accepted range (non-ideal colony).

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)
NOV											
01...	285	--	<0.010	0.850	<0.010	<0.010	0.50	--	0.030	0.030	0.010
01...	--	0.862	0.018	0.880	--	<0.010	0.70	0.40	0.030	0.030	0.010
JAN											
05...	195	0.970	0.010	0.980	0.010	0.020	0.30	--	0.020	<0.010	0.020
05...	--	0.961	0.009	0.970	--	0.010	0.70	0.70	0.020	<0.010	<0.010
MAR											
15...	134	1.59	0.010	1.60	0.060	0.060	0.60	--	0.050	0.030	0.020
15...	--	1.59	0.010	1.60	--	0.060	0.50	0.50	0.060	0.020	0.030
MAY											
04...	125	0.960	0.040	1.00	0.130	0.140	0.50	--	0.120	0.060	0.050
04...	--	0.961	0.039	1.00	--	0.130	1.2	0.70	0.090	0.050	0.040
JUN											
27...	130	1.48	0.020	1.50	0.060	0.070	0.60	--	0.040	0.030	0.050
27...	--	1.48	0.017	1.50	--	0.060	0.60	0.70	0.070	0.060	0.060
SEP											
06...	158	--	<0.010	1.50	0.040	0.050	0.20	--	0.080	0.070	0.060
06...	--	1.49	0.006	1.50	--	0.060	0.30	0.60	0.070	0.060	0.060

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

[illegible]

POTOMAC RIVER BASIN

99

01646580 POTOMAC RIVER AT CHAIN BRIDGE AT WASHINGTON, DC--Continued

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	TEMPER- ATURE WATER (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV							
01...	1020	1600	10.0	420	5	22	84
01...	1025	1600	10.0	440	7	30	--
JAN							
05...	1100	3280	2.0	363	4	35	85
05...	1105	3280	2.0	382	4	35	--
MAR							
15...	1050	21700	7.0	240	42	2460	95
15...	1055	21700	7.0	227	36	2110	--
MAY							
04...	1040	46600	15.0	228	271	34100	94
04...	1045	46600	15.0	232	260	32700	--
JUN							
27...	1030	16300	25.0	230	119	5240	--
27...	1035	16300	25.0	233	116	5110	--
SEP							
06...	1050	3460	23.0	280	9	84	89
06...	1055	3460	23.0	285	11	103	--

RADIOCHEMICAL ANALYSES

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	GROSS ALPHA, DIS- SOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS BETA, DIS- SOLVED (PCI/L AS CS-137)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	RADIUM 226, DIS- SOLVED, RADON METHOD (PCI/L)	GROSS BETA, DIS- SOLVED (PCI/L AS SR/ YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/ YT-90)	URANIUM NATURAL DIS- SOLVED (UG/L AS U)
MAR										
15...	1050	21700	<0.4	1.1	2.3	1.4	0.06	1.9	1.3	0.06

POTOMAC RIVER BASIN

01653000 CAMERON RUN AT ALEXANDRIA, VA

LOCATION.--Lat 38°48'23", long 77°06'36", Fairfax County, Hydrologic Unit 02070010, on left downstream side of Norfolk Southern Railway bridge at Alexandria, 800 ft downstream from confluence of Holmes Run and Backlick Run, 0.5 mi east of the U.S. Army Quartermaster Depot, and 3.4 mi upstream from mouth.

DRAINAGE AREA.--33.7 mi².

PERIOD OF RECORD.--June 1955 to March 1979, October 1979 to September 1980, October 1980 to September 1986 (annual maximum only), October 1986 to current year.

GAGE.--Water-stage recorder. Gage reinstalled Nov. 8, 1979. Datum of gage is 31.07 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 20, 1965, at present site at datum 7.78 ft higher. Sept. 20, 1965, to Jan. 19, 1976, at present site at datum 5.44 ft higher. Jan. 20, 1976, to Nov. 8, 1976, at site 1,200 ft downstream at datum 10.00 ft lower. Nov. 9, 1976, to Mar. 31, 1979, at site 0.5 mi downstream at datum 7.22 ft lower.

REMARKS.--Records good except for period of doubtful gage-height record, Aug. 29 to Sept. 30, which is fair. Some regulation by Lake Barcroft, formerly Alexandria Reservoir, on Holmes Run 3.6 mi upstream, usable capacity, 2,092 acre-ft. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--27 years (water year 1956-78, 1980, 1987-89), 36.3 ft³/s, 14.63 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,900 ft³/s, June 22, 1972, gage height, 18.14 ft, from rating curve extended above 2,500 ft³/s on basis of culvert computations of peak flow for main channel and bypass channels; minimum, 1.1 ft³/s, Aug. 15, 1957, Sept. 22-25, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,960 ft³/s, May 6; minimum daily, 4.0 ft³/s, Oct. 14-17, 19, 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.2	73	16	22	12	15	25	136	19	12	13	e4.7
2	28	16	13	18	9.7	14	20	214	17	11	12	e4.7
3	11	9.5	9.5	14	60	12	31	40	16	11	10	e4.7
4	8.0	6.6	8.4	16	37	15	22	28	14	138	7.8	e4.7
5	5.0	51	7.5	14	16	34	96	386	145	103	6.8	e4.8
6	4.3	34	6.8	40	13	296	97	1140	72	91	5.7	e4.9
7	4.2	13	6.6	35	18	71	63	86	445	28	5.9	e5.0
8	4.2	8.6	6.3	54	13	32	42	44	42	19	6.5	e4.9
9	4.2	6.2	11	36	15	42	29	49	196	16	5.7	e4.8
10	4.2	8.5	7.9	19	11	29	25	141	43	14	5.8	e4.8
11	4.2	7.3	6.8	14	9.1	23	20	45	27	16	6.0	e6.0
12	4.2	4.7	e6.6	68	8.7	20	21	37	21	18	7.0	e15
13	4.1	30	e7.0	27	14	18	17	49	23	15	6.3	e23
14	4.0	11	6.1	20	45	18	16	30	116	29	6.0	20
15	4.0	8.0	6.1	189	20	17	87	144	103	16	6.7	e7.1
16	4.0	6.5	6.3	29	39	15	32	230	45	110	6.6	e115
17	4.0	215	5.5	19	18	13	20	134	30	25	5.7	15
18	4.3	20	8.3	16	14	24	82	44	22	17	6.3	8.8
19	4.0	47	5.4	13	13	17	154	33	19	14	6.5	e9.0
20	4.0	200	5.3	12	11	29	34	28	19	157	5.5	20
21	118	23	18	14	239	70	23	25	56	22	11	e8.8
22	48	14	12	10	124	23	19	23	21	16	6.4	e8.8
23	13	11	20	10	39	26	18	195	204	14	5.5	e17
24	14	8.8	78	9.8	27	567	17	155	52	12	5.3	e10
25	7.4	7.6	34	9.0	26	66	17	34	29	11	5.3	e11
26	6.2	6.6	14	12	26	36	16	26	22	84	5.0	194
27	4.8	55	11	11	20	29	15	55	17	41	5.0	e11
28	4.7	413	20	9.8	18	26	15	24	15	33	5.0	12
29	4.4	29	17	9.5	---	23	160	20	15	16	e4.9	12
30	4.2	18	12	23	---	90	39	18	13	14	e4.9	e11
31	4.2	---	9.6	14	---	69	---	19	---	13	e4.8	---
TOTAL	347.0	1361.9	402.0	807.1	915.5	1779	1272	3632	1878	1136	204.9	582.5
MEAN	11.2	45.4	13.0	26.0	32.7	57.4	42.4	117	62.6	36.6	6.61	19.4
MAX	118	413	78	189	239	567	160	1140	445	157	13	194
MIN	4.0	4.7	5.3	9.0	8.7	12	15	18	13	11	4.8	4.7
CFSM	.33	1.35	.38	.77	.97	1.70	1.26	3.48	1.86	1.09	.20	.58
IN.	.38	1.50	.44	.89	1.01	1.96	1.40	4.01	2.07	1.25	.23	.64

CAL YR 1988 TOTAL 9852.8 MEAN 26.9 MAX 577 MIN 1.9 CFSM .80 IN. 10.88
WTR YR 1989 TOTAL 14317.9 MEAN 39.2 MAX 1140 MIN 4.0 CFSM 1.16 IN. 15.80

e Estimated.

POTOMAC RIVER BASIN

101

01654000 ACCOTINK CREEK NEAR ANNANDALE, VA

LOCATION.--Lat 38°48'46", long 77°13'43", Fairfax County, Hydrologic Unit 02070010, on left bank 800 ft upstream from bridge on State Highway 620, 0.2 mi upstream from Long Branch, and 2.3 mi southwest of Annandale.

DRAINAGE AREA.--23.5 mi².

PERIOD OF RECORD.--March 1947 to current year (fragmentary prior to October 1947).

REVISED RECORDS.--WSP 1502: 1952. WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 191.24 ft above National Geodetic Vertical Datum of 1929 (levels by Stone and Webster Engineering Corporation). Prior to May 12, 1949, nonrecording gage at site 800 ft downstream at datum 0.33 ft lower. May 12, 1949, to June 4, 1970, water-stage recorder at site 800 ft downstream at datum 0.33 ft lower.

REMARKS.--Records good except for period with ice effect, Feb. 10-12, which is fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--42 years, 27.4 ft³/s, 15.83 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,000 ft³/s, June 22, 1972, gage height, 15.96 ft, from high-water mark in gage house, from rating curve extended above 6,600 ft³/s on basis of contracted-opening and flow-over-road measurement of peak flow; minimum, 0.02 ft³/s, Oct. 9-13, 1986, Oct. 18, 1988.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,400 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	a0130	*8,820	*b14.40	July 20	0815	1,580	8.19

a About.

b From high-water mark.

Minimum discharge, 0.02 ft³/s, Oct. 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	65	5.1	12	5.4	11	20	83	11	6.1	5.8	1.4
2	4.4	5.8	4.5	16	5.0	8.8	15	131	11	5.9	6.0	2.3
3	6.0	1.7	4.1	8.3	46	8.5	25	22	9.8	5.9	5.1	1.3
4	6.3	1.8	3.8	11	30	13	16	17	9.4	42	4.3	1.0
5	2.7	44	3.8	5.3	8.8	28	72	529	50	36	3.8	1.1
6	.87	21	3.7	13	7.4	200	54	e1570	44	40	3.5	1.2
7	.66	3.0	3.9	20	11	43	43	56	247	11	3.4	1.3
8	.71	2.5	3.8	58	8.2	18	32	26	19	7.2	4.2	1.4
9	.74	2.1	5.7	40	6.1	24	23	36	119	6.0	3.2	1.3
10	.49	2.0	6.0	15	e5.0	17	17	135	21	5.7	3.1	1.3
11	.25	2.7	3.7	8.8	e5.0	14	15	33	13	6.5	3.5	1.1
12	.25	2.5	3.1	61	e5.0	13	15	24	12	8.6	5.4	11
13	.25	21	3.2	20	6.8	11	15	26	12	11	3.9	14
14	.13	6.4	3.3	10	45	11	14	19	95	26	3.3	3.3
15	.11	2.5	3.7	110	15	10	64	218	67	5.7	3.5	1.8
16	.10	2.1	3.3	15	25	9.4	24	337	36	203	3.3	98
17	.05	105	3.2	10	10	8.5	16	123	24	15	3.6	28
18	.03	6.7	2.9	8.3	8.0	19	60	36	12	9.3	3.9	3.3
19	.19	27	3.1	7.7	7.5	15	136	26	10	10	3.4	29
20	.18	108	3.1	6.9	7.0	15	25	23	11	280	2.7	36
21	84	8.7	9.4	5.9	161	61	19	20	15	14	8.6	5.9
22	34	4.3	8.9	5.6	88	14	17	18	10	9.1	4.8	4.2
23	2.3	3.7	12	5.9	24	13	16	146	30	7.9	2.8	14
24	4.6	3.2	48	5.8	16	375	15	105	17	6.9	2.6	7.8
25	2.7	2.8	19	5.5	12	44	14	22	9.6	6.6	2.4	4.9
26	1.2	2.7	5.8	8.0	15	24	13	17	8.4	6.9	2.6	204
27	1.2	20	4.6	7.3	14	20	13	25	7.7	13	2.1	7.4
28	2.0	230	19	5.2	12	18	13	14	7.5	17	2.1	4.2
29	4.0	12	11	5.0	---	16	81	13	7.2	4.9	2.1	3.4
30	4.6	6.8	4.8	16	---	21	20	12	6.1	4.5	2.1	3.3
31	5.9	---	4.6	8.7	---	59	---	12	---	7.7	1.7	---
TOTAL	171.91	727.0	224.1	535.2	609.2	1162.2	922	3874	951.7	839.4	112.8	498.2
MEAN	5.55	24.2	7.23	17.3	21.8	37.5	30.7	125	31.7	27.1	3.64	16.6
MAX	84	230	48	110	161	375	136	1570	247	280	8.6	204
MIN	.03	1.7	2.9	5.0	5.0	8.5	13	12	6.1	4.5	1.7	1.0
CFSM	.24	1.03	.31	.73	.93	1.60	1.31	5.32	1.35	1.15	.15	.71
IN.	.27	1.15	.35	.85	.96	1.84	1.46	6.13	1.51	1.33	.18	.79

CAL YR 1988 TOTAL 6626.09 MEAN 18.1 MAX 408 MIN .03 CFSM .77 IN. 10.49
WTR YR 1989 TOTAL 10627.71 MEAN 29.1 MAX 1570 MIN .03 CFSM 1.24 IN. 16.82

e Estimated.

POTOMAC RIVER BASIN

01658500 SOUTH FORK QUANTICO CREEK NEAR INDEPENDENT HILL, VA

LOCATION.--Lat 38°35'14", long 77°25'44", Prince William County, Hydrologic Unit 02070011, on left bank at upstream side of bridge on State Highway 619, 3.4 mi south of Independent Hill, 5.6 mi west of Dumfries, and 6.5 mi upstream from mouth.

DRAINAGE AREA.--7.64 mi².

PERIOD OF RECORD.--May 1951 to current year.

REVISED RECORDS.--WSP 2103: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 238.88 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records poor. Several measurements of water temperature were made during the year.

AVERAGE DISCHARGE.--38 years, 6.85 ft³/s, 12.18 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,160 ft³/s, May 6, 1989, gage height, 11.62 ft; no flow at times in 1954, 1957, 1962-66, 1983, 1985, 1987, and 1988.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	0100	*4,160	*11.62	June 7	0930	205	5.14
May 16	Unknown	Unknown	Unknown	June 13	2100	648	7.44

Minimum daily discharge, 0.02 ft³/s, Oct. 24, 26, 27, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.07	.06	1.9	1.4	e2.1	4.5	4.9	12	5.8	2.9	3.8	.21
2	.08	.05	1.6	1.7	e1.7	3.7	4.2	57	4.8	2.4	3.0	.18
3	.12	.06	1.3	1.7	e1.8	3.3	4.5	13	4.3	2.2	1.9	.15
4	.15	.06	1.1	1.6	e3.5	3.5	4.5	7.2	3.6	2.7	1.2	.13
5	.11	.11	1.0	1.4	e2.7	4.8	9.1	29	3.3	4.0	.86	.11
6	.09	1.9	.88	1.6	e2.5	34	24	549	8.7	7.2	.65	.10
7	.09	2.5	.90	2.0	e2.4	21	12	50	121	4.6	.53	.10
8	.10	2.1	.81	2.6	e2.6	9.2	16	e30	25	2.9	.51	.11
9	.09	1.9	.82	4.7	e2.3	7.6	8.9	e14	30	2.1	.44	.12
10	.09	1.7	.90	3.4	e2.0	11	6.5	45	21	2.0	.42	.13
11	.09	1.6	.89	2.6	e1.8	13	5.3	e30	12	1.6	.51	.13
12	.08	1.7	.74	5.0	e1.7	11	4.6	e20	8.5	1.4	.64	.98
13	.06	2.3	.63	7.0	e1.6	7.7	4.1	e12	92	1.3	.63	.65
14	.07	2.5	.63	4.3	e10	6.8	3.9	e10	78	1.8	.59	.40
15	.07	2.6	.86	21	e5.0	6.0	8.9	e25	59	1.3	.60	.36
16	.08	2.8	.90	8.8	e6.2	5.0	13	e130	29	13	.54	1.5
17	.07	8.8	.79	4.9	e4.0	4.3	7.0	e55	22	6.2	.46	2.8
18	.07	6.1	.73	3.6	e3.7	4.5	7.2	e25	14	2.9	.43	.75
19	.09	4.6	.69	3.2	e3.4	6.0	26	e17	8.4	2.0	.51	.59
20	.08	11	.72	2.7	e3.6	4.9	11	e13	7.9	9.2	.58	.67
21	.13	3.3	1.0	2.4	e12	13	7.8	e11	13	3.3	.57	.71
22	.05	1.2	1.7	2.2	e27	9.5	6.5	e9.7	9.0	1.9	.62	.65
23	.03	2.0	1.5	2.2	15	6.3	5.2	21	6.8	1.4	.52	.71
24	.02	1.8	1.7	2.2	8.2	82	4.0	51	23	1.1	.47	.70
25	.03	3.2	3.2	2.1	6.0	26	3.8	20	27	.95	.42	.65
26	.02	3.6	2.4	2.1	5.7	12	3.6	15	12	.84	.35	26
27	.02	4.2	1.8	2.1	6.1	8.6	3.2	18	8.5	.72	.38	2.8
28	.03	27	1.7	1.9	4.9	7.2	3.0	15	6.0	.63	.37	.98
29	.04	6.5	1.6	1.9	---	5.9	16	9.6	4.6	.54	.34	.66
30	.02	2.9	1.4	e2.0	---	5.4	15	7.3	3.3	.52	.30	.69
31	.03	---	1.4	e2.3	---	5.7	---	6.5	---	1.6	.26	---
TOTAL	2.17	110.14	38.19	108.6	149.5	353.4	253.7	1327.3	671.5	87.20	23.40	44.72
MEAN	.070	3.67	1.23	3.50	5.34	11.4	8.46	42.8	22.4	2.81	.75	1.49
MAX	.15	27	3.2	21	27	82	26	549	121	13	3.8	26
MIN	.02	.05	.63	1.4	1.6	3.3	3.0	6.5	3.3	.52	.26	.10
CFSM	.01	.48	.16	.46	.70	1.49	1.11	5.60	2.93	.37	.10	.20
IN.	.01	.54	.19	.53	.73	1.72	1.24	6.46	3.27	.42	.11	.22

CAL YR 1988 TOTAL 1456.82 MEAN 3.98 MAX 148 MIN .00 CFSM .52 IN. 7.09
WTR YR 1989 TOTAL 3169.82 MEAN 8.68 MAX 549 MIN .02 CFSM 1.14 IN. 15.43

e Estimated.

01660400 AQUIA CREEK NEAR GARRISONVILLE, VA

LOCATION.--Lat 38°29'25", long 77°26'02", Stafford County, Hydrologic Unit 02070011, on right bank at bridge on State Highway 641, 1.1 mi northwest of Garrisonville, and 3.0 mi upstream from Beaverdam Run.

DRAINAGE AREA.--34.9 mi².

PERIOD OF RECORD.--September 1971 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 120 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for period of doubtful gage-height record, May 17 to June 19, and period of backwater from beaver dam, Aug. 26 to Sept. 25, which are fair. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--18 years, 35.8 ft³/s, 13.93 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,600 ft³/s, June 22, 1972, gage height, 16.32 ft, from rating curve extended above 1,600 ft³/s on basis of contracted-opening measurement of peak flow; no flow part or all of each day Sept. 15-17, 1980, Aug. 24-27, 1983, Aug. 13-19, Sept. 21-24, 1988.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 24	1000	570	3.60	May 16	1530	857	4.28
Apr. 18	2200	534	3.51	June 7	a0530	1,170	b4.96
May 6	0430	*6,240	*11.40				

a About.

b From high-water mark.

Minimum daily discharge, 0.03 ft³/s, Oct. 17-20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.07	12	13	7.8	9.6	19	22	40	e19	8.5	37	e2.3
2	.16	5.2	9.7	11	8.3	17	19	185	e17	7.1	23	e3.5
3	.11	2.0	7.5	10	8.9	15	20	66	e16	6.6	17	e2.2
4	.14	1.7	7.1	10	16	14	22	42	e15	7.1	11	e1.5
5	.10	1.4	6.3	8.8	13	20	34	93	e15	24	8.3	e1.4
6	.10	7.6	5.6	9.9	12	166	94	1810	e43	61	6.4	e1.3
7	.10	3.7	5.4	14	12	122	58	197	e740	28	5.5	e1.4
8	.10	2.7	4.6	13	12	54	69	87	e132	15	5.1	e2.2
9	.08	2.1	5.3	14	11	50	47	61	e132	11	4.2	e2.0
10	.05	1.5	6.3	12	9.1	69	34	121	e84	8.8	3.7	e1.8
11	.07	1.9	6.1	10	8.5	71	27	78	e52	7.3	4.6	e1.7
12	.05	1.1	5.4	21	8.9	62	24	55	e35	6.4	5.5	e15
13	.05	1.6	5.0	27	8.4	47	23	43	e40	8.9	5.6	e14
14	e.04	1.8	4.9	18	14	45	20	35	e75	18	6.4	e4.5
15	e.04	1.7	5.4	104	17	36	41	61	e130	9.8	5.5	e3.5
16	e.04	1.4	5.9	50	23	29	62	541	e66	108	4.9	e50
17	e.03	56	5.2	26	24	23	39	e270	e55	42	49	e20
18	e.03	18	4.9	19	17	38	128	e115	e32	18	18	e7.2
19	e.03	10	4.3	16	15	55	218	e76	e21	12	6.9	e6.0
20	e.03	52	4.0	13	14	35	78	e68	23	54	5.7	e19
21	1.4	25	5.4	11	111	93	52	e49	64	25	5.0	e25
22	9.3	13	9.8	9.9	137	62	40	e39	37	13	5.0	e6.5
23	1.3	8.1	9.3	8.7	77	40	33	e49	63	9.8	5.2	e18
24	1.1	7.1	9.6	8.1	42	355	28	e69	65	7.3	4.7	e8.0
25	.70	5.6	17	8.1	29	129	25	e46	77	6.2	4.0	e7.6
26	.42	3.9	12	8.5	25	65	24	e35	31	5.3	e3.5	152
27	.37	9.1	9.0	8.3	24	47	23	e31	20	5.0	e3.3	34
28	.33	147	7.8	8.0	20	38	21	e26	15	5.0	e3.1	17
29	.30	46	7.0	7.5	---	31	31	e23	13	4.7	e3.1	14
30	.28	20	7.0	8.7	---	29	49	e21	10	5.0	e3.0	11
31	.25	---	6.4	11	---	26	---	e20	---	107	e2.7	---
TOTAL	17.17	470.2	222.2	512.3	726.7	1902	1405	4452	2137	654.8	275.9	453.6
MEAN	.55	15.7	7.17	16.5	26.0	61.4	46.8	144	71.2	21.1	8.90	15.1
MAX	9.3	147	17	104	137	355	218	1810	740	108	49	152
MIN	.03	1.1	4.0	7.5	8.3	14	19	20	10	4.7	2.7	1.3
CFSM	.02	.45	.21	.47	.74	1.76	1.34	4.11	2.04	.61	.26	.43
IN.	.02	.50	.24	.55	.77	2.03	1.50	4.75	2.28	.70	.29	.48

CAL YR 1988 TOTAL 7835.73 MEAN 21.4 MAX 634 MIN .00 CFSM .61 IN. 8.35
WTR YR 1989 TOTAL 13228.87 MEAN 36.2 MAX 1810 MIN .03 CFSM 1.04 IN. 14.10

e Estimated.

RAPPAHANNOCK RIVER BASIN

01662800 BATTLE RUN NEAR LAUREL MILLS, VA

LOCATION.--Lat 38°39'20", long 78°04'27", Rappahannock County, Hydrologic Unit 02080103, on left bank just upstream from bridge on State Highway 729, 0.8 mi upstream from mouth, and 1.0 mi northeast of Laurel Mills.

DRAINAGE AREA.--27.6 mi².

PERIOD OF RECORD.--April 1958 to current year.

REVISED RECORDS.--WSP 2103: Drainage area. WDR VA-72-1: 1971. WDR VA-74-1: 1972.

GAGE.--Water-stage recorder. Datum of gage is 374.62 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for period of backwater from beaver dam, Oct. 1-31, and periods with ice effect, Dec. 16-18, Jan. 21-24, and Feb. 11, 25, which are fair. Several measurements of water temperature were made during the year. Water-quality records for some periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--31 years, 25.9 ft³/s, 12.74 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,120 ft³/s, Oct. 9, 1976, gage height, 13.90 ft, from flood-mark, from rating curve extended above 2,500 ft³/s on basis of velocity-area study; no flow many days in September 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 310 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 1	1900	*615	*6.11	May 6	1930	373	5.13
May 6	0230	410	5.29				

Minimum daily discharge, 1.1 ft³/s, Oct. 12-15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.3	9.5	7.2	5.6	6.4	8.9	30	139	16	11	17	5.3
2	e1.3	6.6	6.4	6.3	6.1	8.1	25	172	14	11	15	5.2
3	e1.4	4.4	6.0	6.0	6.5	8.0	23	74	14	10	12	4.8
4	e1.6	4.0	5.7	6.0	7.0	9.2	21	49	13	30	11	4.6
5	e1.5	25	5.4	6.2	6.4	11	23	61	13	38	10	4.8
6	e1.4	16	5.4	6.4	6.3	67	25	236	17	27	13	5.1
7	e1.4	6.7	5.5	6.6	6.5	49	22	122	35	21	11	5.0
8	e1.3	5.3	5.3	7.4	6.1	32	23	73	19	17	10	5.1
9	e1.3	4.5	5.6	11	6.0	26	21	67	32	15	8.8	5.3
10	e1.2	4.3	6.3	9.3	5.8	22	19	93	23	17	8.4	4.8
11	e1.2	4.0	6.0	8.3	e5.7	19	18	73	17	14	9.6	4.6
12	e1.1	3.7	4.6	12	6.3	18	17	60	15	11	9.7	7.2
13	e1.1	4.7	4.0	12	5.9	16	17	58	19	20	8.8	6.4
14	e1.1	5.6	4.8	11	8.3	15	16	45	24	22	10	5.8
15	e1.1	4.3	5.6	18	8.1	15	18	45	30	15	10	5.3
16	e1.2	4.0	e6.0	15	7.9	13	17	118	24	37	10	16
17	e1.2	5.3	e5.4	13	6.8	12	15	78	23	26	8.4	11
18	e1.3	4.8	e4.8	12	6.5	12	15	58	18	20	9.1	6.5
19	e1.5	4.8	4.4	11	6.5	12	30	47	15	17	8.9	6.1
20	e1.3	18	6.0	9.4	6.5	11	20	41	15	70	8.8	6.4
21	e1.5	11	5.6	e9.4	8.2	14	18	36	15	41	9.9	8.8
22	e7.7	8.2	5.8	e9.0	15	12	17	31	47	27	9.1	11
23	e4.2	7.1	5.5	e8.5	15	11	15	30	44	21	9.0	9.2
24	e3.3	6.5	6.3	e8.0	12	67	14	28	23	18	7.9	7.8
25	e2.5	5.9	6.8	7.7	e11	47	14	24	19	18	7.6	6.1
26	e2.1	5.7	5.5	7.4	10	36	14	23	16	22	7.3	22
27	e1.9	5.8	5.3	7.3	9.6	29	13	21	15	20	7.2	10
28	e1.8	12	5.4	6.6	9.3	25	13	19	14	15	7.2	7.7
29	e2.0	8.9	5.3	6.6	---	23	15	17	14	16	6.7	7.3
30	e1.9	7.6	5.2	6.9	---	26	15	17	12	13	6.5	6.8
31	e2.0	---	5.3	6.7	---	50	---	17	---	15	5.4	---
TOTAL	56.7	224.2	172.4	276.6	221.7	724.2	563	1972	615	675	293.3	222.0
MEAN	1.83	7.47	5.56	8.92	7.92	23.4	18.8	63.6	20.5	21.8	9.46	7.40
MAX	7.7	25	7.2	18	15	67	30	236	47	70	17	22
MIN	1.1	3.7	4.0	5.6	5.7	8.0	13	17	12	10	5.4	4.6
CFSM	.07	.27	.20	.32	.29	.85	.68	2.30	.74	.79	.34	.27
IN.	.08	.30	.23	.37	.30	.98	.76	2.66	.83	.91	.40	.30

CAL YR 1988 TOTAL 6976.00 MEAN 19.1 MAX 737 MIN .57 CFSM .69 IN. 9.40
WTR YR 1989 TOTAL 6016.1 MEAN 16.5 MAX 236 MIN 1.1 CFSM .60 IN. 8.11

e Estimated.

01663500 HAZEL RIVER AT RIXEYVILLE, VA

LOCATION.--Lat 38°35'30", long 77°57'55", Culpeper County, Hydrologic Unit 02080103, on right bank at downstream side of bridge on State Highway 229, 0.4 mi upstream from Waterford Run, 1.1 mi northeast of Rixeyville, 2.8 mi downstream from Thornton River, and 9.1 mi upstream from mouth.

DRAINAGE AREA.--287 mi².

PERIOD OF RECORD.--August 1942 to current year.

REVISED RECORDS.--WSP 971: 1942. WSP 1622: 1957-58. WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 288.30 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for period with ice effect, Dec. 12-14, which is fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--47 years, 338 ft³/s, 15.99 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 60,000 ft³/s, Oct. 15, 1942, gage height, 31.8 ft, from rating curve extended above 27,000 ft³/s; minimum, 1.1 ft³/s, Sept. 10-13, 1966; minimum gage height, 1.58 ft, Aug. 18, 19, 1988.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 26, 1937, reached a stage of 28.4 ft, from floodmarks, discharge, 43,500 ft³/s, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	0130	3,390	10.59	May 6	0630	*4,460	*12.29

Minimum discharge, 14 ft³/s, Oct. 8-9, gage height, 1.79 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	46	99	72	86	147	322	711	206	156	367	99
2	21	96	89	82	83	132	268	2520	187	148	325	95
3	21	69	83	82	83	125	251	1200	175	139	269	89
4	23	50	78	81	92	129	243	806	166	154	220	81
5	22	69	73	72	94	177	231	813	154	569	193	78
6	19	351	69	80	86	596	292	3110	188	387	183	80
7	17	164	68	92	86	760	245	2120	752	327	178	84
8	15	105	67	90	86	491	269	1270	420	250	183	85
9	16	81	69	134	76	386	254	936	496	203	153	92
10	16	69	75	162	65	333	226	1510	588	207	139	97
11	18	62	68	135	72	287	208	1160	351	178	148	94
12	18	54	e64	142	83	259	194	929	272	154	163	223
13	19	57	e60	189	83	233	185	767	338	160	153	183
14	20	72	e70	163	97	219	175	654	507	262	138	131
15	21	66	77	244	113	205	178	600	632	191	177	112
16	22	58	79	290	113	190	197	941	435	755	255	305
17	22	66	77	224	105	169	169	989	415	430	204	408
18	22	74	71	193	98	162	184	784	344	281	223	220
19	24	66	69	174	94	168	469	647	283	231	257	174
20	20	189	67	156	91	158	413	563	258	967	221	162
21	27	220	69	138	100	172	324	503	270	909	203	188
22	128	156	80	124	166	173	289	438	264	594	220	237
23	83	123	78	128	271	156	255	424	429	477	203	421
24	47	107	79	129	211	615	230	472	475	380	184	344
25	34	95	92	114	173	684	213	367	325	320	167	259
26	27	86	94	107	175	492	206	324	264	307	156	642
27	25	83	85	104	158	406	194	297	226	605	148	470
28	25	130	79	96	149	356	178	266	202	513	143	331
29	27	141	77	91	---	315	171	243	202	292	133	284
30	25	112	72	91	---	289	201	231	173	257	128	251
31	26	---	70	90	---	404	---	221	---	505	111	---
TOTAL	871	3117	2347	4069	3189	9388	7234	26816	9997	11308	5945	6319
MEAN	28.1	104	75.7	131	114	303	241	865	333	365	192	211
MAX	128	351	99	290	271	760	469	3110	752	967	367	642
MIN	15	46	60	72	65	125	169	221	154	139	111	78
CFSM	.10	.36	.26	.46	.40	1.06	.84	3.01	1.16	1.27	.67	.73
IN.	.11	.40	.30	.53	.41	1.22	.94	3.48	1.30	1.47	.77	.82

CAL YR 1988 TOTAL 80698.1 MEAN 220 MAX 3360 MIN 2.7 CFSM .77 IN. 10.46
WTR YR 1989 TOTAL 90600 MEAN 248 MAX 3110 MIN 15 CFSM .86 IN. 11.74

e Estimated.

RAPPAHANNOCK RIVER BASIN

01664000 RAPPAHANNOCK RIVER AT REMINGTON, VA

LOCATION.--Lat 38°31'50", long 77°48'50", Fauquier County, Hydrologic Unit 02080103, on left bank 80 ft upstream from bridge on alternate U.S. Highway 29, at Remington, 0.3 mi upstream from Tinpot Run, 0.4 mi downstream from Ruffans Run, and 2.5 mi downstream from Hazel River.

DRAINAGE AREA.--620 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1942 to current year.

REVISED RECORDS.--WSP 1171: 1944. WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 252.53 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 21, 1951, nonrecording gage at bridge 80 ft downstream at same datum.

REMARKS.--No estimated daily discharges. Records good. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--47 years, 672 ft³/s, 14.72 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 90,000 ft³/s, Oct. 16, 1942, gage height, 30.0 ft, from flood-marks, from rating curve extended above 43,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 2.8 ft³/s, Sept. 13, 1966, gage height, 2.31 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum flood since at least 1828, that of Oct. 16, 1942.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 6,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	0945	7,300	12.40	May 6	1130	*14,500	*16.35

Minimum discharge, 26 ft³/s, Oct. 15, gage height, 2.60 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	67	178	126	153	253	755	914	377	293	786	163
2	35	113	158	134	145	232	564	5920	347	275	731	146
3	35	129	144	143	144	215	500	2650	323	261	599	135
4	35	94	136	140	155	211	480	1640	307	436	447	126
5	36	88	126	131	167	262	447	1720	291	1130	376	117
6	36	420	120	144	158	920	613	12600	339	1770	335	113
7	33	317	117	157	152	1760	544	6320	1710	975	328	113
8	31	181	117	161	152	986	568	3000	1060	616	345	116
9	31	134	118	205	140	734	532	2090	945	436	295	116
10	32	112	123	290	117	620	473	2910	1400	400	257	124
11	31	100	122	253	130	516	416	2380	816	365	262	126
12	30	91	94	245	138	448	381	1950	562	302	294	217
13	33	90	102	342	135	398	359	1610	630	322	292	308
14	40	107	113	323	164	362	341	1380	1170	743	257	214
15	27	122	115	456	195	341	343	1280	1640	486	349	176
16	27	110	117	595	211	316	397	3200	1010	1530	374	274
17	30	110	114	434	205	279	354	3230	853	1310	339	854
18	33	130	104	346	185	260	349	2050	743	703	323	390
19	35	127	107	301	173	260	937	1560	574	515	388	261
20	39	254	104	266	167	257	996	1290	559	2560	352	229
21	48	421	118	233	186	278	684	1130	624	3250	312	253
22	122	289	137	202	349	303	567	965	564	1670	345	328
23	173	214	142	202	591	265	485	872	1730	1190	328	503
24	93	178	141	205	445	1240	430	1050	950	928	299	538
25	64	158	162	202	339	1910	395	776	694	756	263	356
26	50	144	171	183	306	1150	378	652	522	697	247	1020
27	45	137	154	178	284	880	365	580	433	1100	234	898
28	47	234	140	170	262	735	342	511	381	895	226	502
29	48	282	134	159	---	628	341	445	372	583	217	395
30	51	215	128	156	---	549	393	415	336	482	202	344
31	57	---	125	158	---	764	---	395	---	1020	187	---
TOTAL	1461	5168	3981	7240	5948	18332	14729	67485	22262	27999	10589	9455
MEAN	47.1	172	128	234	212	591	491	2177	742	903	342	315
MAX	173	421	178	595	591	1910	996	12600	1730	3250	786	1020
MIN	27	67	94	126	117	211	341	395	291	261	187	113
CFSM	.08	.28	.21	.38	.34	.95	.79	3.51	1.20	1.46	.55	.51
IN.	.09	.31	.24	.43	.36	1.10	.88	4.05	1.34	1.68	.64	.57

CAL YR 1988 TOTAL 165436 MEAN 452 MAX 6150 MIN 23 CFSM .73 IN. 9.93
WTR YR 1989 TOTAL 194649 MEAN 533 MAX 12600 MIN 27 CFSM .86 IN. 11.68

RAPPAHANNOCK RIVER BASIN

107

01664000 RAPPAHANNOCK RIVER AT REMINGTON, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1951 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1951 to September 1956, October 1965 to October 1986.

WATER TEMPERATURE: May 1951 to September 1956, October 1965 to September 1976, October 1977 to October 1986.

SUSPENDED-SEDIMENT DISCHARGE: April 1951 to current year.

REMARKS.--Daily sediment records based on fragmentary concentration and transport curves due to unreliable observer sampling from October to April.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 150 microsiemens, Sept. 3, 1974; minimum daily, 24 microsiemens, July 6, 1975.

WATER TEMPERATURE: Maximum, 33.0°C, July 6, 1986; minimum, 0.0°C on many days during winter periods.

SEDIMENT CONCENTRATION: Maximum daily mean, 1,910 mg/L, Mar. 15, 1986; minimum daily mean, 1 mg/L on many days during each year.

SEDIMENT LOAD: Maximum daily, 55,600 tons, Sept. 26, 1975; minimum daily, 0.03 ton, Sept. 9, 11, 1983, Oct. 9-12, 1986.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: Maximum daily mean, 754 mg/L, May 2; minimum daily mean, 1 mg/L, Feb. 20, Aug. 31 to Sept. 5, Sept. 8-11, 15.

SEDIMENT LOAD: Maximum daily, 22,000 tons, May 6; minimum daily, 0.31 ton, Sept. 8, 9.

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)	MEAN CONCEN- TRATION (MG/L)	LOADS (T/DAY)
OCTOBER			NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	62	5.7	27	4.9	7	3.4	3	1.0	2	.83	4	2.7
2	62	5.9	36	11	6	2.6	4	1.4	2	.78	4	2.5
3	62	5.9	32	11	6	2.3	4	1.5	2	.78	3	1.7
4	61	5.8	26	6.6	6	2.2	4	1.5	2	.84	2	1.1
5	60	5.8	20	4.8	6	2.0	3	1.1	6	2.7	8	5.7
6	59	5.7	34	39	5	1.6	3	1.2	4	1.7	91	299
7	58	5.2	26	22	5	1.6	4	1.7	4	1.6	110	523
8	57	4.8	16	7.8	5	1.6	4	1.7	4	1.6	44	117
9	56	4.7	12	4.3	5	1.6	5	2.8	3	1.1	17	34
10	54	4.7	10	3.0	5	1.7	11	8.6	3	.95	15	25
11	53	4.4	9	2.4	4	1.3	6	4.1	3	1.1	13	18
12	52	4.2	8	2.0	4	1.0	7	4.6	3	1.1	12	15
13	53	4.7	7	1.7	4	1.1	20	18	3	1.1	10	11
14	54	5.8	8	2.3	4	1.2	8	7.0	3	1.3	8	7.8
15	54	3.9	5	1.6	4	1.2	22	27	4	2.1	7	6.4
16	53	3.9	5	1.5	3	.95	22	35	7	4.0	6	5.1
17	53	4.3	5	1.5	3	.92	10	12	4	2.2	5	3.8
18	53	4.7	6	2.1	3	.84	6	5.6	3	1.5	5	3.5
19	53	5.0	8	2.7	2	.58	5	4.1	2	.93	5	3.5
20	52	5.5	20	14	2	.56	5	3.6	1	.45	5	3.5
21	54	7.0	22	25	3	.96	4	2.5	6	3.0	12	9.0
22	73	24	10	7.8	3	1.1	4	2.2	26	24	7	5.7
23	73	34	10	5.8	3	1.2	4	2.2	39	63	2	1.4
24	70	18	10	4.8	3	1.1	4	2.2	19	23	109	549
25	65	11	9	3.8	3	1.3	3	1.6	9	8.2	111	572
26	62	8.4	8	3.1	4	1.8	3	1.5	5	4.1	54	168
27	63	7.7	7	2.6	4	1.7	3	1.4	4	3.1	25	59
28	58	7.4	17	11	3	1.1	3	1.4	4	2.8	9	18
29	46	6.0	12	9.1	3	1.1	3	1.3	---	---	7	12
30	38	5.2	8	4.6	3	1.0	3	1.3	---	---	4	5.9
31	33	5.1	---	---	3	1.0	2	.85	---	---	22	47
TOTAL	---	234.4	---	223.8	---	43.61	---	161.95	---	159.86	---	2536.3

RAPPAHANNOCK RIVER BASIN

01664000 RAPPAHANNOCK RIVER AT REMINGTON, VA--Continued

SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

[illegible]

01665000 MOUNTAIN RUN NEAR CULPEPER, VA

LOCATION.--Lat 38°28'50", long 78°03'10", Culpeper County, Hydrologic Unit 02080103, on left bank 30 ft upstream from bridge on State Highway 641, 2.4 mi upstream from Bond Branch, and 3.0 mi west of Culpeper.

DRAINAGE AREA.--15.9 mi², of which 10.9 mi² are above flood-detention structures.

PERIOD OF RECORD.--September 1949 to current year.

REVISED RECORDS.--WSP 1332: 1950-51. WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 389.46 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for period of backwater from beaver dam, Oct. 16-19, which is fair. Some regulation since 1959 by two reservoirs, combined flood storage, 2,240 acre-ft; 531 acre-ft additional storage used for low-water regulation for municipal supply for town of Culpeper. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--40 years, 16.6 ft³/s, 14.18 in/yr.

EXTREMES FOR PERIOD OF RECORD (REVISED).--Maximum discharge, 5,940 ft³/s, Dec. 4, 1950, gage height, 11.20 ft, from rating curve extended above 910 ft³/s on basis of slope-area measurements at gage heights 10.52 ft and 11.00 ft; minimum, 0.09 ft³/s, Sept. 30, Oct. 1, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 5	2300	*1,240	*8.10	July 16	0630	1,130	7.89
May 6	1715	330	4.80				

Minimum daily discharge, 2.4 ft³/s, Oct. 11-15.

REVISIONS.--The maximum discharge for period of record has been revised to 5,940 ft³/s, Dec. 4, 1950, gage height, 11.20 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	6.6	9.2	7.4	5.6	8.1	11	30	7.5	5.6	63	5.3
2	2.5	5.8	8.1	8.4	5.6	7.4	9.2	75	6.9	5.2	39	5.0
3	3.0	4.8	7.4	8.2	5.9	6.9	9.2	28	6.8	5.2	27	4.4
4	2.9	4.6	6.9	8.0	6.7	8.0	9.2	18	6.3	14	18	4.1
5	2.9	8.8	6.5	7.1	6.2	9.6	18	139	5.9	29	14	4.1
6	2.6	8.9	6.4	8.4	5.9	34	34	293	11	22	16	4.2
7	2.5	6.2	6.4	9.3	6.1	32	15	206	111	15	14	4.5
8	2.6	5.6	6.2	11	6.2	19	14	124	37	11	12	4.6
9	2.8	5.2	6.7	12	5.9	15	12	50	67	8.8	10	4.7
10	2.6	5.0	6.9	11	5.3	13	11	67	52	8.2	9.3	4.7
11	2.4	5.0	6.5	9.4	5.1	11	9.7	39	25	7.2	11	4.4
12	2.4	4.9	6.0	12	5.4	10	15	28	17	6.2	12	9.8
13	2.4	5.8	5.7	13	5.2	9.2	12	23	22	6.0	11	8.9
14	2.4	6.6	5.8	11	7.6	9.2	12	20	24	7.4	10	7.5
15	2.4	6.0	6.2	24	7.7	8.9	13	23	25	6.5	11	6.4
16	e2.7	5.6	6.2	19	7.9	8.3	13	44	19	306	11	30
17	e2.6	8.1	5.9	14	7.5	7.8	12	39	17	221	9.9	33
18	e2.7	7.3	5.7	11	6.7	7.7	14	26	13	206	9.8	16
19	e3.0	7.7	5.6	9.9	6.4	7.6	28	20	11	142	9.6	11
20	3.3	31	5.6	9.2	6.2	7.1	20	17	11	118	9.0	9.9
21	5.7	17	6.3	8.4	7.5	9.5	16	15	13	69	10	11
22	7.5	11	7.5	7.6	17	9.1	14	13	12	25	11	12
23	4.6	8.7	7.1	7.5	17	8.3	12	12	21	17	10	20
24	4.2	7.6	8.2	7.5	12	70	12	13	15	13	9.0	21
25	4.1	6.9	9.6	7.4	10	38	11	11	12	12	8.4	13
26	4.2	6.4	8.5	7.3	9.1	23	9.3	10	9.7	11	7.9	102
27	4.2	6.8	7.7	7.0	8.2	17	8.2	10	8.7	12	7.5	34
28	4.1	21	7.5	6.0	8.2	14	7.5	8.7	7.8	14	7.4	18
29	3.8	15	7.3	5.8	---	13	9.3	7.8	7.4	11	7.0	13
30	4.1	11	7.2	5.8	---	12	10	7.5	6.2	13	6.7	11
31	4.3	---	7.0	5.8	---	12	---	7.5	---	176	5.9	---
TOTAL	104.0	260.9	213.8	299.4	214.1	465.7	400.6	1424.5	608.2	1523.3	417.4	437.5
MEAN	3.35	8.70	6.90	9.66	7.65	15.0	13.4	46.0	20.3	49.1	13.5	14.6
MAX	7.5	31	9.6	24	17	70	34	293	111	306	63	102
MIN	2.4	4.6	5.6	5.8	5.1	6.9	7.5	7.5	5.9	5.2	5.9	4.1
CFSM	.21	.55	.43	.61	.48	.94	.84	2.89	1.28	3.09	.85	.92
IN.	.24	.61	.50	.70	.50	1.09	.94	3.33	1.42	3.56	.98	1.02

CAL YR 1988 TOTAL 4330.2 MEAN 11.8 MAX 180 MIN 1.4 CFSM .74 IN. 10.13
WTR YR 1989 TOTAL 6369.4 MEAN 17.5 MAX 306 MIN 2.4 CFSM 1.10 IN. 14.90

e Estimated.

RAPPAHANNOCK RIVER BASIN

01665500 RAPIDAN RIVER NEAR RUCKERSVILLE, VA

LOCATION.--Lat 38°16'50", long 78°20'25", Madison County, Hydrologic Unit 02080103, on left bank 250 ft downstream from bridge on U.S. Highway 29, 0.2 mi downstream from Elk Run, 1.7 mi upstream from White Run, 3.6 mi north-east of Ruckersville, and at mile 63.5.

DRAINAGE AREA.--114 mi².

PERIOD OF RECORD.--September 1942 to current year.

REVISED RECORDS.--WSP 1171: 1944-45(M). WSP 1382: 1943(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 439.44 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for period of backwater from beaver dam, Oct. 15 to Nov. 19, which is fair. Diversion 0.4 mi upstream from station since 1973 by Rapidan Service Authority for municipal water supply of Greene County and town of Stanardsville has averaged less than 0.25 ft³/s. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--47 years, 148 ft³/s, 17.63 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,700 ft³/s, Oct. 15, 1942, gage height, 20.8 ft, from flood-mark in gage house, from rating curve extended above 12,000 ft³/s on basis of slope-area measurement at gage height 17.78 ft; minimum daily, 0.90 ft³/s, Sept. 12, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,400 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	0330	1,490	4.61	July 16	0800	2,460	6.04
May 6	0030	3,040	6.83	July 27	2030	1,790	5.06
May 6	1900	2,380	5.92	July 31	0300	*3,420	*7.33

Minimum daily discharge, 9.9 ft³/s, Oct. 8, 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	e17	42	45	37	65	111	339	86	89	241	92
2	12	e24	38	47	36	60	110	928	80	86	339	90
3	14	e21	35	44	38	56	108	479	77	80	156	83
4	14	e19	33	42	45	70	108	319	70	86	113	80
5	13	e20	30	37	38	98	107	542	68	96	106	81
6	11	e70	30	44	36	426	104	1760	83	92	126	83
7	11	e60	29	47	39	357	99	985	392	86	105	86
8	9.9	e35	28	51	37	229	104	618	171	74	101	86
9	10	e25	33	61	33	170	101	529	380	68	97	101
10	11	e21	33	57	30	129	91	1050	348	73	95	91
11	12	e20	28	53	32	116	84	667	219	61	98	81
12	11	e19	23	65	33	114	81	489	167	56	101	100
13	9.9	e20	23	71	32	111	78	371	163	56	96	98
14	11	e22	30	67	43	111	75	290	129	79	93	95
15	e10	e21	30	179	48	111	80	252	138	61	104	92
16	e10	e21	29	127	51	107	80	233	116	594	101	184
17	e11	e22	25	99	53	103	72	207	115	120	101	132
18	e11	e31	24	88	48	100	71	168	107	100	106	104
19	e12	e30	26	80	46	105	104	140	104	95	104	100
20	e12	197	26	74	44	96	106	121	104	347	102	100
21	e12	95	30	68	54	108	100	114	108	157	108	102
22	e20	62	38	63	119	102	97	111	121	114	110	127
23	e29	50	36	60	112	97	92	110	149	113	129	157
24	e22	43	40	56	90	220	87	111	156	108	114	128
25	e18	38	53	52	79	240	87	104	110	176	112	115
26	e15	34	48	49	75	184	105	101	106	145	109	432
27	e13	33	44	47	71	147	97	98	100	294	106	220
28	e12	65	44	43	68	122	89	95	98	149	102	165
29	e13	55	42	42	---	115	91	95	95	103	99	129
30	e13	47	40	41	---	114	91	92	91	104	97	114
31	e14	---	41	39	---	113	---	91	---	929	94	---
TOTAL	406.8	1237	1051	1938	1467	4296	2810	11609	4251	4791	3665	3648
MEAN	13.1	41.2	33.9	62.5	52.4	139	93.7	374	142	155	118	122
MAX	29	197	53	179	119	426	111	1760	392	929	339	432
MIN	9.9	17	23	37	30	56	71	91	68	56	93	80
CFSM	.12	.36	.30	.55	.46	1.22	.82	3.28	1.24	1.36	1.04	1.07
IN.	.13	.40	.34	.63	.48	1.40	.92	3.79	1.39	1.56	1.20	1.19

CAL YR 1988 TOTAL 29964.4 MEAN 81.9 MAX 1280 MIN 7.5 CFSM .72 IN. 9.78
WTR YR 1989 TOTAL 41169.8 MEAN 113 MAX 1760 MIN 9.9 CFSM .99 IN. 13.43

e Estimated.

01666500 ROBINSON RIVER NEAR LOCUST DALE, VA

LOCATION.--Lat 38°19'30", long 78°05'45", Madison County, Hydrologic Unit 02080103, on right bank 100 ft upstream from bridge on State Highway 614, 1.1 mi upstream from Great Run, 1.7 mi upstream from mouth, 2.0 mi southeast of Locust Dale, and 3.4 mi downstream from Crooked Run.

DRAINAGE AREA.--179 mi².

PERIOD OF RECORD.--July 1943 to current year. Prior to October 1965, published as Robertson River near Locust Dale.

REVISED RECORDS.--WSP 1171: 1948(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 283.70 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for period of doubtful gage-height record, Oct. 18 to Nov. 5, and period with ice effect, Dec. 12-15, which are fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--46 years, 220 ft³/s, 16.69 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,500 ft³/s, June 22, 1972, gage height, 20.92 ft, from rating curve extended above 9,100 ft³/s on basis of records for other stations in Rappahannock River basin; minimum, 1.2 ft³/s, Sept. 7, 13, 1954; minimum daily, 1.8 ft³/s, Sept. 13, 27, 1954.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 15, 1942, reached a stage of 23.9 ft, from floodmarks, discharge, about 44,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	0130	*9,900	*17.13	July 16	1230	6,540	16.45
June 7	0900	3,270	11.05	July 31	0600	6,640	14.92

a Affected by backwater from debris.

Minimum daily discharge, 27 ft³/s, Oct. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	e44	91	67	72	118	181	196	125	111	620	91
2	34	e88	83	76	71	108	162	1170	117	105	709	87
3	44	e70	78	70	73	104	159	589	114	100	354	81
4	41	e60	74	68	87	110	152	401	108	167	255	75
5	36	e56	70	60	77	162	154	913	103	244	208	76
6	31	209	68	70	74	701	172	5300	159	352	197	79
7	29	101	66	76	76	649	152	1460	1750	187	175	81
8	30	74	64	80	77	380	175	819	444	150	166	79
9	30	64	66	97	70	300	159	640	685	127	141	102
10	30	58	70	97	71	257	142	1180	781	127	129	83
11	30	55	64	90	73	220	133	801	440	109	137	73
12	29	51	e60	107	68	197	127	631	335	98	148	168
13	27	62	e54	124	66	176	124	512	336	97	135	129
14	28	85	e62	107	87	172	119	434	324	153	121	100
15	31	70	e64	322	95	160	122	409	395	104	189	88
16	33	67	74	252	99	146	128	449	333	2920	185	305
17	36	91	81	178	101	134	114	420	307	574	156	381
18	e35	95	78	151	92	139	112	372	248	288	174	216
19	e32	86	72	134	88	150	194	324	211	212	211	175
20	e34	364	67	120	84	130	190	291	197	702	190	160
21	e36	188	60	109	106	176	162	267	223	422	185	164
22	e120	132	69	100	268	154	151	235	208	292	218	210
23	e72	109	63	97	253	137	142	221	257	295	394	393
24	e58	97	70	94	181	752	134	240	262	221	188	340
25	e40	88	82	91	152	515	124	199	196	203	165	246
26	e35	76	75	87	140	365	131	180	172	204	151	887
27	e33	77	71	85	128	297	122	169	154	210	140	409
28	e32	195	69	80	121	253	115	153	139	225	130	302
29	e33	126	66	78	---	222	113	144	136	161	119	258
30	e33	102	65	77	---	199	120	136	119	159	113	225
31	e34	---	64	76	---	212	---	131	---	2820	98	---
TOTAL	1180	3040	2160	3320	2950	7795	4285	19386	9378	12139	6501	6063
MEAN	38.1	101	69.7	107	105	251	143	625	313	392	210	202
MAX	120	364	91	322	268	752	194	5300	1750	2920	709	887
MIN	27	44	54	60	66	104	112	131	103	97	98	73
CFSM	.21	.57	.39	.60	.59	1.40	.80	3.49	1.75	2.19	1.17	1.13
IN.	.25	.63	.45	.69	.61	1.62	.89	4.03	1.95	2.52	1.35	1.26

CAL YR 1988 TOTAL 53585 MEAN 146 MAX 1510 MIN 27 CFSM .82 IN. 11.14
WTR YR 1989 TOTAL 78197 MEAN 214 MAX 5300 MIN 27 CFSM 1.20 IN. 16.25

e Estimated.

RAPPAHANNOCK RIVER BASIN

01667500 RAPIDAN RIVER NEAR CULPEPER, VA

LOCATION.--Lat 38°21'01", long 77°58'31", Culpeper County, Hydrologic Unit 02080103, on left bank 0.7 mi upstream from Cedar Run and bridge on U.S. Highway 522, 8.5 mi south of Culpeper, and at mile 29.6.

DRAINAGE AREA.--472 mi².

PERIOD OF RECORD.--October 1930 to current year. Monthly discharge only for some periods, published in WSP 1302.

REVISED RECORDS.--WSP 741: 1931. WSP 801: 1934(M), 1936(M). WSP 1081: 1943-46. WSP 1171: 1932(M), 1933-35. WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 241.36 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records fair. Diurnal fluctuation at low flow caused by mill at Rapidan. National Weather Service gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--59 years, 526 ft³/s, 15.13 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 58,100 ft³/s, Oct. 16, 1942, gage height, 30.3 ft, from flood-mark, from rating curve extended above 43,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 2.1 ft³/s, Oct. 4, 5, 11, 1954; minimum daily, 2.2 ft³/s, Oct. 4, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	0600	*16,300	*18.19	July 16	1800	7,700	11.22
June 7	1230	8,420	12.08	July 31	1045	6,030	9.04

Minimum daily discharge, 49 ft³/s, Oct. 13, 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	84	230	155	182	336	477	373	313	349	1250	238
2	58	138	198	183	177	299	419	2580	297	333	1270	227
3	66	110	184	177	178	279	402	1490	299	319	854	213
4	92	93	173	164	219	289	390	1060	284	371	603	193
5	80	94	160	148	209	418	440	1460	269	627	475	190
6	70	341	151	153	192	1610	560	14000	410	869	465	189
7	64	258	146	176	193	1930	439	4510	6050	521	404	195
8	58	163	143	193	202	1060	526	2250	1600	413	397	193
9	59	131	145	216	186	885	464	1650	1620	348	320	221
10	57	115	161	223	164	822	402	3300	1940	346	286	231
11	52	105	153	208	166	689	362	2210	1150	324	293	186
12	53	100	123	242	172	596	335	1650	915	283	342	282
13	49	97	89	323	169	517	318	1310	888	269	320	346
14	49	122	140	275	201	504	303	1100	811	361	281	251
15	50	116	152	786	256	458	308	1020	890	324	318	218
16	54	106	181	781	269	412	338	1150	815	3800	407	491
17	55	117	247	518	314	363	298	1030	773	1480	338	991
18	55	170	262	414	275	355	279	896	674	809	367	502
19	57	144	182	360	255	431	366	791	587	588	430	361
20	55	671	121	316	239	360	442	716	541	1210	397	320
21	60	514	135	279	288	471	371	661	704	1020	365	326
22	187	310	173	253	775	456	350	589	676	773	467	348
23	146	234	169	243	956	379	333	555	884	698	750	673
24	90	202	168	234	626	1790	314	586	904	603	503	793
25	72	177	201	226	487	1420	299	501	660	563	436	514
26	65	163	197	216	426	992	327	447	555	660	402	1970
27	58	163	184	210	385	815	331	421	494	673	370	1160
28	58	631	206	201	347	702	305	381	441	897	340	803
29	60	418	160	192	---	621	289	354	422	472	312	658
30	61	277	151	195	---	556	323	338	377	354	297	558
31	66	---	151	192	---	539	---	325	---	3490	262	---
TOTAL	2114	6364	5236	8452	8508	21354	11110	49704	27243	24147	14321	13841
MEAN	68.2	212	169	273	304	689	370	1603	908	779	462	461
MAX	187	671	262	786	956	1930	560	14000	6050	3800	1270	1970
MIN	49	84	89	148	164	279	279	325	269	269	262	186
CFSM	.14	.45	.36	.58	.64	1.46	.78	3.40	1.92	1.65	.98	.98
IN.	.17	.50	.41	.67	.67	1.68	.88	3.92	2.15	1.90	1.13	1.09

CAL YR 1988 TOTAL 122243 MEAN 334 MAX 2740 MIN 49 CFSM .71 IN. 9.63
WTR YR 1989 TOTAL 192394 MEAN 527 MAX 14000 MIN 49 CFSM 1.12 IN. 15.16

RAPPAHANNOCK RIVER BASIN

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01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA
(National stream-quality accounting network station)

LOCATION.--Lat 38°19'20", long 77°31'05", Spotsylvania County, Hydrologic Unit 02080104, on right bank 1.6 mi upstream from dam of Virginia Power, 2.2 mi downstream from Motts Run, and 3.8 mi upstream from Fredericksburg.
DRAINAGE AREA.--1,596 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1907 to current year. Monthly discharge only for some periods, published in WSP 1302.
REVISED RECORDS.--WSP 801: 1924(M). WSP 951: 1937(M). WSP 1302: 1907-12, 1913(M), 1916(M), 1918(M), 1920-21(M).
WSP 2103: Drainage area.
GAGE.--Water-stage recorder. Datum of gage is 55.18 ft above National Geodetic Vertical Datum of 1929. Prior to Jan. 15, 1922, nonrecording gage, and Jan. 15, 1922, to Aug. 2, 1966, water-stage recorder at same site at datum 1.00 ft higher.
REMARKS.--Records good except those for periods of doubtful or no gage-height record, Oct. 8-11, Nov. 26-28, Jan. 8-17, June 16-27, and July 10-13, 28-31, and period with ice effect, Dec. 13-20, which are fair.
AVERAGE DISCHARGE.--82 years, 1,652 ft³/s, 14.06 in/yr.
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 140,000 ft³/s, Oct. 16, 1942, gage height, 26.9 ft, present datum, from floodmarks, from rating curve extended above 76,000 ft³/s on basis of flow-over-dam and slope-area measurements at gage heights 26.1 ft and 26.9 ft, present datum; minimum, 5 ft³/s, Oct. 11, 12, 1930.
EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1889 was probably several feet lower than that of Oct. 16, 1942.
EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 16,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	1800	*54,600	*15.03	June 7	1530	20,100	9.15

Minimum discharge, 107 ft³/s, Oct. 15-16, 18, gage height, 1.25 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	153	178	592	346	420	733	1460	866	1060	764	4100	520
2	143	201	487	362	407	696	1190	9610	1060	712	2410	469
3	141	248	427	406	399	622	1040	6730	1030	696	2370	443
4	142	305	389	388	409	592	1010	3430	1000	716	1530	422
5	152	262	362	361	455	632	1020	2530	953	1420	1180	393
6	153	270	334	355	454	2250	2120	42000	959	3430	987	380
7	139	745	318	385	439	7390	1670	27800	13800	2410	957	382
8	e130	582	311	e410	429	3360	1710	8020	9000	1420	904	390
9	e126	403	311	e495	436	2180	1570	5150	3100	1010	890	398
10	e123	314	312	e580	403	2330	1260	6410	4780	e870	789	411
11	e121	277	325	e540	343	2040	1060	6280	2860	e790	746	459
12	119	246	330	e600	350	1730	932	4550	1840	e720	782	465
13	115	234	e310	e700	374	1450	867	3630	1530	e695	872	694
14	111	228	e280	e1030	399	1280	829	3040	1950	952	814	756
15	109	232	e272	e1600	498	1190	836	2700	3600	1080	674	572
16	121	269	e269	e2400	618	1060	1230	6550	e2600	2030	822	613
17	117	329	e271	e1420	726	915	1100	8150	e2100	7290	906	1630
18	110	394	e273	1040	689	839	883	4410	e1800	2330	794	1600
19	112	374	e277	865	578	1220	2100	3180	e1520	1570	820	950
20	112	490	e280	758	535	1030	2330	2580	e1390	4160	900	758
21	127	1270	302	659	686	1140	1480	2230	e1490	6090	866	726
22	163	911	320	574	2020	1690	1170	1960	e1700	3300	822	849
23	280	619	376	513	3000	1130	1030	1830	e3100	2140	922	885
24	417	485	389	497	1730	4880	908	2100	e2600	1710	1100	1480
25	276	422	402	496	1200	7450	844	1850	e1900	1390	866	1230
26	211	e360	463	493	963	3350	798	1480	e1380	1260	772	3260
27	181	e340	441	469	883	2310	797	1330	e1100	1780	734	3890
28	162	e980	409	456	801	1830	772	1210	937	e1700	696	1850
29	146	1650	389	434	---	1550	736	1110	880	e1200	664	1340
30	145	836	344	420	---	1360	794	1070	849	e1020	603	1130
31	141	---	330	420	---	1240	---	1070	---	e6200	566	---
TOTAL	4798	14454	10895	20472	20644	61469	35546	174856	73868	62855	32858	29345
MEAN	155	482	351	660	737	1983	1185	5641	2462	2028	1060	978
MAX	417	1650	592	2400	3000	7450	2330	42000	13800	7290	4100	3890
MIN	109	178	269	346	343	592	736	866	849	695	566	380
CFSM	.10	.30	.22	.41	.46	1.24	.74	3.53	1.54	1.27	.66	.61
IN.	.11	.34	.25	.48	.48	1.43	.83	4.08	1.72	1.47	.77	.68

CAL YR 1988 TOTAL 356444 MEAN 974 MAX 12900 MIN 109 CFSM .61 IN. 8.31
WTR YR 1989 TOTAL 542060 MEAN 1485 MAX 42000 MIN 109 CFSM .93 IN. 12.63

e Estimated.

RAPPAHANNOCK RIVER BASIN

01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1929-30, 1956, 1967-74, 1978 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1955 to September 1956, April 1968 to August 1974.

WATER TEMPERATURE: October 1955 to September 1956, April 1968 to August 1974.

COOPERATION.--Chemical data as noted were provided by the Virginia Division of Consolidated Laboratory Services (VDCLS) and reviewed by the U.S. Geological Survey.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	AGENCY ANA-LYZING SAMPLE	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)
OCT											
11...	1000	121	83	6.60	10.0	753	VDCLS	--	10.1	90	--
27...	1130	179	135	7.20	10.5	765	VDCLS	--	9.6	85	--
NOV											
15...	1030	225	86	7.30	9.5	766	VDCLS	--	11.0	96	--
21...	1100	1400	84	7.00	8.5	757	VDCLS	--	11.1	95	--
29...	1000	1600	90	6.50	1.5	768	USGS	76	12.1	86	K11000
29...	1001	1600	90	6.50	1.5	768	VDCLS	--	12.1	86	--
DEC											
14...	0930	330	92	7.70	0.5	760	VDCLS	--	14.8	104	--
29...	1000	399	90	7.20	2.0	767	USGS	6.0	13.4	96	K17
29...	1001	399	90	7.20	2.0	767	VDCLS	--	13.4	96	--
JAN											
10...	1000	605	92	7.70	4.0	772	VDCLS	--	13.9	104	--
15...	1530	1580	96	7.80	4.5	750	VDCLS	--	13.4	105	--
16...	1000	2460	97	7.50	4.0	752	VDCLS	--	13.2	102	--
17...	1045	1440	91	7.70	3.5	761	VDCLS	--	13.6	102	--
26...	1015	501	84	7.80	4.0	761	VDCLS	--	13.3	101	--
FEB											
21...	1100	540	88	7.90	6.0	752	USGS	6.4	13.2	107	35
21...	1101	540	88	7.90	6.0	752	VDCLS	--	13.2	107	--
23...	1230	3030	94	8.10	6.5	759	VDCLS	--	12.1	99	--
MAR											
06...	1500	1950	80	7.70	5.5	768	VDCLS	--	12.7	100	--
07...	1000	8510	79	7.40	3.0	768	VDCLS	--	12.7	94	--
08...	1000	3390	74	7.70	2.5	768	VDCLS	--	13.8	100	--
09...	1000	2180	75	7.60	2.0	772	VDCLS	--	14.1	101	--
10...	1000	2650	76	7.70	3.0	768	VDCLS	--	13.9	102	--
22...	1000	1800	89	7.65	7.5	767	VDCLS	--	11.9	99	--
24...	1545	7570	75	7.80	6.0	765	VDCLS	--	11.6	93	--
25...	1115	7340	80	7.00	6.0	763	VDCLS	--	11.7	94	--
26...	1030	3370	81	7.60	8.0	766	VDCLS	--	10.6	89	--
27...	1130	2230	85	7.60	12.0	762	VDCLS	--	10.3	96	--
APR											
04...	0930	1010	77	6.40	14.0	752	VDCLS	--	9.2	90	--
20...	0900	2490	87	7.40	15.0	765	VDCLS	--	9.4	92	--
24...	1000	915	81	7.80	15.5	757	USGS	3.5	9.6	96	27
24...	1001	915	81	7.80	15.5	757	VDCLS	--	9.6	96	--

RAPPAHANNOCK RIVER BASIN

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01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	AGENCY ANA- LYZING SAMPLE	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
MAY											
02...	1145	12100	80	7.40	17.5	748	VDCLS	--	7.2	77	--
03...	0900	6960	63	7.60	16.0	756	VDCLS	--	8.5	87	--
03...	1430	5540	65	7.40	17.0	755	VDCLS	--	8.8	92	--
04...	1130	3390	63	7.40	16.0	761	VDCLS	--	9.2	93	--
06...	1230	48400	46	7.00	16.0	753	VDCLS	--	9.8	101	--
06...	1630	54100	51	7.30	16.0	753	VDCLS	--	--	--	--
07...	1130	27800	57	7.00	14.5	757	VDCLS	--	8.6	85	--
08...	1130	7760	64	7.20	12.5	759	VDCLS	--	10.7	101	--
09...	1030	5220	69	6.90	12.0	760	VDCLS	--	9.5	88	--
10...	1000	5670	70	7.40	14.0	747	VDCLS	--	9.5	94	--
11...	1130	6120	64	6.80	13.0	755	VDCLS	--	10.2	97	--
12...	1130	4570	72	6.40	14.0	751	VDCLS	--	9.4	93	--
13...	1530	3490	65	6.70	15.0	754	VDCLS	--	10.0	100	--
15...	1030	2650	64	6.70	14.0	755	VDCLS	--	8.8	86	--
17...	1400	7180	83	6.70	15.0	755	VDCLS	--	9.5	95	--
JUN											
07...	1030	14900	59	7.20	20.5	758	VDCLS	--	8.0	89	--
08...	1030	7630	68	7.00	20.5	760	VDCLS	--	8.0	89	--
23...	1130	2360	77	7.40	24.5	762	VDCLS	--	8.3	99	--
28...	1000	934	81	7.20	27.5	758	USGS	7.3	6.9	88	K18
28...	1001	934	81	7.20	27.5	758	VDCLS	--	6.9	88	--
JUL											
05...	1430	1800	76	7.50	25.5	763	VDCLS	--	8.0	97	--
16...	1600	1110	76	7.30	24.5	758	VDCLS	--	8.1	98	--
17...	1030	7500	55	6.73	21.5	761	VDCLS	--	7.6	86	--
18...	0900	2430	70	7.30	21.5	764	VDCLS	--	8.1	92	--
21...	1000	5270	76	7.00	23.5	762	VDCLS	--	7.7	91	--
25...	0900	1440	65	7.10	26.5	768	VDCLS	--	7.7	95	--
31...	1600	10900	60	6.80	22.0	762	VDCLS	--	7.6	87	--
AUG											
01...	1130	3540	60	7.30	22.0	764	VDCLS	--	8.2	93	--
07...	1100	992	80	7.30	27.5	754	VDCLS	--	7.8	100	--
22...	0930	817	138	7.60	24.0	765	USGS	1.1	7.6	90	17
22...	0931	817	138	7.60	24.0	765	VDCLS	--	7.6	90	--
SEP											
05...	1100	394	80	7.30	21.5	751	VDCLS	--	9.8	113	--
27...	1200	3470	79	7.10	15.5	773	VDCLS	--	9.5	94	--

RAPPAHANNOCK RIVER BASIN

01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

[illegible]

01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	RESIDUE VOLA- TILE, SUS- PENDE (MG/L)	RESIDUE FIXED NON FILTER- ABLE (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
OCT										
11...	--	--	4.3	--	--	<1	<1	<1	<0.040	<0.010
27...	--	--	7.3	--	--	1	<1	<1	<0.040	0.010
NOV										
15...	--	--	8.2	--	--	2	1	1	<0.040	<0.010
21...	--	--	8.0	--	--	42	7	35	0.120	<0.010
29...	6.0	0.10	9.9	61	66	100	14	86	0.570	0.010
29...	--	--	9.2	--	--	50	10	40	0.570	0.010
DEC										
14...	--	--	8.5	--	--	2	2	<1	0.560	<0.010
29...	6.5	0.10	6.7	62	57	--	--	--	0.390	<0.010
29...	--	--	6.8	--	--	1	1	<1	0.480	<0.010
JAN										
10...	--	--	7.4	--	--	2	2	<1	0.470	<0.010
15...	--	--	9.8	--	--	16	2	14	0.660	<0.010
16...	--	--	9.1	--	--	125	10	115	0.740	<0.010
17...	--	--	10	--	--	38	4	34	0.810	<0.010
26...	--	--	8.7	--	--	<1	<1	<1	0.680	0.010
FEB										
21...	6.5	0.30	7.2	48	59	3	1	2	0.480	0.020
21...	--	--	6.8	--	--	5	2	3	0.490	<0.010
23...	--	--	9.0	--	--	95	10	85	0.770	<0.010
MAR										
06...	--	--	9.3	--	--	19	4	15	0.680	0.010
07...	--	--	8.0	--	--	660	68	592	0.680	0.010
08...	--	--	8.4	--	--	242	30	212	0.810	0.010
09...	--	--	9.5	--	--	37	7	30	0.920	<0.010
10...	--	--	11	--	--	20	4	16	0.900	<0.010
22...	--	--	9.3	--	--	17	4	13	0.570	<0.010
24...	--	--	8.6	--	--	78	11	67	0.440	0.010
25...	--	--	7.0	--	--	228	36	192	0.650	0.010
26...	--	--	8.6	--	--	119	29	90	0.800	0.010
27...	--	--	9.6	--	--	26	6	20	0.760	0.010
APR										
04...	--	--	9.8	--	--	4	1	3	0.530	<0.010
20...	--	--	7.3	--	--	46	7	39	0.450	0.010
24...	4.8	0.10	7.7	54	48	7	7	0.1	0.260	<0.010
24...	--	--	7.5	--	--	3	1	2	0.230	0.010
MAY										
02...	--	--	7.7	--	--	494	58	436	0.460	0.010
03...	--	--	9.3	--	--	230	30	200	0.470	0.010
03...	--	--	9.8	--	--	197	26	171	0.500	0.010
04...	--	--	11	--	--	83	13	70	0.500	0.010
06...	--	--	4.1	--	--	496	56	440	0.320	0.010
06...	--	--	3.8	--	--	514	54	460	0.380	0.010
07...	--	--	7.3	--	--	184	18	166	0.570	0.010
08...	--	--	9.7	--	--	109	11	98	0.280	<0.010
09...	--	--	10	--	--	79	11	68	0.630	<0.010
10...	--	--	11	--	--	43	7	36	0.660	<0.010
11...	--	--	9.8	--	--	100	12	88	0.560	<0.010
12...	--	--	11	--	--	23	4	19	0.610	<0.010
13...	--	--	12	--	--	29	5	24	0.630	<0.010
15...	--	--	12	--	--	26	5	21	0.650	<0.010
17...	--	--	9.6	--	--	105	15	90	0.500	0.010
JUN										
07...	--	--	5.6	--	--	318	30	288	0.370	0.020
08...	--	--	6.9	--	--	106	14	92	0.780	0.030
23...	--	--	11	--	--	45	7	38	0.650	0.010
28...	4.8	0.10	12	46	53	11	--	--	0.610	<0.010
28...	--	--	12	--	--	10	2	8	0.630	<0.010
JUL										
05...	--	--	11	--	--	3	2	1	0.470	<0.010
16...	--	--	11	--	--	2	2	<1	0.570	<0.010
17...	--	--	6.6	--	--	414	56	358	0.560	0.010
18...	--	--	9.0	--	--	95	13	82	0.670	<0.010
21...	--	--	13	--	--	297	39	258	0.120	0.010
25...	--	--	13	--	--	11	1	10	0.580	<0.010
31...	--	--	6.7	--	--	420	40	380	0.340	<0.010
AUG										
01...	--	--	7.5	--	--	304	36	268	0.270	<0.010
07...	--	--	12	--	--	1	<1	1	0.620	0.010
22...	3.9	0.10	10	48	46	1	<1	1	0.280	<0.010
22...	--	--	--	--	--	2	1	1	--	--
SEP										
05...	--	--	9.4	--	--	2	2	<1	0.100	<0.010
27...	--	--	9.0	--	--	212	32	180	0.610	0.020

RAPPAHANNOCK RIVER BASIN

01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)
OCT										
11...	<0.040	<0.040	--	0.18	<0.100	--	<0.010	--	--	--
27...	<0.040	0.050	--	0.30	<0.100	--	<0.010	--	--	--
NOV										
15...	<0.040	<0.040	--	0.20	0.020	--	<0.010	--	--	--
21...	0.120	0.090	--	0.60	0.100	--	0.010	--	--	--
29...	0.580	0.090	0.130	1.2	0.220	0.050	0.030	130	<1	37
29...	0.580	0.260	--	1.1	0.300	--	0.030	--	--	--
DEC										
14...	0.560	<0.040	--	0.20	0.020	--	0.010	--	--	--
29...	0.390	<0.010	0.020	0.30	0.030	0.020	0.010	--	--	--
29...	0.480	<0.040	--	0.10	0.010	--	0.030	--	--	--
JAN										
10...	0.470	<0.040	--	0.50	0.030	--	0.010	--	--	--
15...	0.660	0.040	--	0.50	0.050	--	0.010	--	--	--
16...	0.740	0.150	--	1.1	0.230	--	0.030	--	--	--
17...	0.810	0.170	--	0.80	0.130	--	0.020	--	--	--
26...	0.690	<0.040	--	0.30	0.030	--	0.010	--	--	--
FEB										
21...	0.500	<0.010	0.010	0.30	0.030	0.020	<0.010	50	<1	19
21...	0.490	0.070	--	0.20	0.030	--	<0.010	--	--	--
23...	0.770	0.150	--	1.3	0.230	--	0.030	--	--	--
MAR										
06...	0.690	0.070	--	0.40	0.060	--	<0.010	--	--	--
07...	0.690	0.220	--	2.6	0.490	--	<0.010	--	--	--
08...	0.820	0.100	--	0.90	0.250	--	<0.010	--	--	--
09...	0.920	0.100	--	0.50	0.100	--	0.020	--	--	--
10...	0.900	0.120	--	0.40	0.070	--	0.020	--	--	--
22...	0.570	<0.040	--	0.50	<0.100	--	0.020	--	--	--
24...	0.450	<0.040	--	0.30	0.050	--	0.010	--	--	--
25...	0.660	0.120	--	1.5	0.400	--	0.020	--	--	--
26...	0.810	0.090	--	0.80	0.200	--	0.020	--	--	--
27...	0.770	0.070	--	0.40	0.080	--	0.020	--	--	--
APR										
04...	0.530	<0.040	--	0.20	0.020	--	<0.010	--	--	--
20...	0.460	0.060	--	0.80	0.170	--	0.010	--	--	--
24...	0.260	0.030	0.030	0.40	0.030	0.020	0.030	30	1	16
24...	0.240	<0.040	--	0.30	0.040	--	0.010	--	--	--
MAY										
02...	0.470	0.090	--	1.8	0.800	--	<0.010	--	--	--
03...	0.480	0.100	--	1.4	0.250	--	0.010	--	--	--
03...	0.510	0.090	--	1.2	0.190	--	0.010	--	--	--
04...	0.510	0.050	--	0.50	0.170	--	0.010	--	--	--
06...	0.330	0.120	--	1.8	0.600	--	0.030	--	--	--
06...	0.390	0.120	--	2.0	0.700	--	0.020	--	--	--
07...	0.580	0.080	--	0.90	0.240	--	0.020	--	--	--
08...	0.280	0.050	--	0.80	0.250	--	0.010	--	--	--
09...	0.630	<0.040	--	0.50	0.170	--	<0.010	--	--	--
10...	0.660	<0.400	--	0.40	0.120	--	0.030	--	--	--
11...	0.560	0.060	--	0.70	0.240	--	0.020	--	--	--
12...	0.610	<0.040	--	0.30	0.060	--	<0.010	--	--	--
13...	0.630	<0.040	--	0.20	0.040	--	0.010	--	--	--
15...	0.650	<0.040	--	0.20	0.070	--	0.010	--	--	--
17...	0.510	0.060	--	1.0	0.140	--	0.010	--	--	--
JUN										
07...	0.390	0.080	--	1.3	0.330	--	0.010	--	--	--
08...	0.810	0.140	--	0.90	0.170	--	0.040	--	--	--
23...	0.660	<0.040	--	0.50	0.080	--	0.010	--	--	--
28...	0.610	0.010	0.030	0.30	0.040	0.050	0.030	--	--	--
28...	0.630	<0.040	--	0.20	0.050	--	0.030	--	--	--
JUL										
05...	0.470	0.050	--	0.20	0.030	--	0.010	--	--	--
16...	0.570	<0.040	--	0.30	0.060	--	<0.010	--	--	--
17...	0.570	0.120	--	1.4	0.500	--	0.020	--	--	--
18...	0.670	0.060	--	0.60	0.110	--	0.020	--	--	--
21...	0.130	0.070	--	1.3	0.420	--	0.010	--	--	--
25...	0.580	<0.040	--	0.20	0.040	--	0.020	--	--	--
31...	0.340	0.060	--	1.8	0.560	--	0.030	--	--	--
AUG										
01...	0.270	0.090	--	1.3	0.480	--	<0.030	--	--	--
07...	0.630	0.040	--	0.40	0.060	--	0.040	--	--	--
22...	0.280	0.040	0.100	0.20	0.020	0.020	0.020	30	<1	13
22...	--	--	--	--	--	--	--	--	--	--
SEP										
05...	0.100	<0.040	--	0.20	0.010	--	0.010	--	--	--
27...	0.630	0.060	--	1.8	0.310	--	0.040	--	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)
OCT										
11...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
NOV										
15...	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--
29...	<0.5	3	2	<3	2	390	<5	<4	12	<0.1
29...	--	--	--	--	--	--	--	--	--	--
DEC										
14...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
JAN										
10...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
FEB										
21...	<0.5	<1	<1	<3	2	230	<5	<4	26	<0.1
21...	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--
MAR										
06...	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
APR										
04...	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--
24...	<0.5	3	2	<3	5	220	<5	<4	19	<0.1
24...	--	--	--	--	--	--	--	--	--	--
MAY										
02...	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--
JUN										
07...	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
JUL										
05...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--
AUG										
01...	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--
22...	<0.5	<1	<1	<3	2	220	1	<4	10	<0.1
22...	--	--	--	--	--	--	--	--	--	--
SEP										
05...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--

RAPPAHANNOCK RIVER BASIN

01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	SEDI- MENT, SUS- PENDED (MG/L)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT										
11...	--	--	--	--	--	--	--	2.9	--	--
27...	--	--	--	--	--	--	--	4.0	--	--
NOV										
15...	--	--	--	--	--	--	--	3.5	--	--
21...	--	--	--	--	--	--	--	3.7	--	--
29...	<10	2	<1	<1.0	36	<6	12	14	101	99
29...	--	--	--	--	--	--	--	7.7	--	--
DEC										
14...	--	--	--	--	--	--	--	3.0	--	--
29...	--	--	--	--	--	--	--	--	4	96
29...	--	--	--	--	--	--	--	2.6	--	--
JAN										
10...	--	--	--	--	--	--	--	4.1	--	--
15...	--	--	--	--	--	--	--	3.7	--	--
16...	--	--	--	--	--	--	--	6.7	--	--
17...	--	--	--	--	--	--	--	5.3	--	--
26...	--	--	--	--	--	--	--	1.5	--	--
FEB										
21...	<10	<1	<1	<1.0	47	<6	<3	3.3	8	86
21...	--	--	--	--	--	--	--	1.4	--	--
23...	--	--	--	--	--	--	--	7.9	--	--
MAR										
06...	--	--	--	--	--	--	--	3.1	--	--
07...	--	--	--	--	--	--	--	7.2	--	--
08...	--	--	--	--	--	--	--	5.5	--	--
09...	--	--	--	--	--	--	--	3.4	--	--
10...	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	3.4	--	--
24...	--	--	--	--	--	--	--	4.8	--	--
25...	--	--	--	--	--	--	--	6.9	--	--
26...	--	--	--	--	--	--	--	4.8	--	--
27...	--	--	--	--	--	--	--	2.9	--	--
APR										
04...	--	--	--	--	--	--	--	5.2	--	--
20...	--	--	--	--	--	--	--	5.8	--	--
24...	<10	1	<1	<1.0	36	<6	16	3.6	5	91
24...	--	--	--	--	--	--	--	3.3	--	--
MAY										
02...	--	--	--	--	--	--	--	6.8	--	--
03...	--	--	--	--	--	--	--	6.9	--	--
03...	--	--	--	--	--	--	--	5.8	--	--
04...	--	--	--	--	--	--	--	3.5	--	--
06...	--	--	--	--	--	--	--	7.3	--	--
06...	--	--	--	--	--	--	--	7.5	--	--
07...	--	--	--	--	--	--	--	5.9	--	--
08...	--	--	--	--	--	--	--	3.7	--	--
09...	--	--	--	--	--	--	--	2.7	--	--
10...	--	--	--	--	--	--	--	2.9	--	--
11...	--	--	--	--	--	--	--	3.9	--	--
12...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	1.9	--	--
15...	--	--	--	--	--	--	--	1.7	--	--
17...	--	--	--	--	--	--	--	5.7	--	--
JUN										
07...	--	--	--	--	--	--	--	10	--	--
08...	--	--	--	--	--	--	--	9.9	--	--
23...	--	--	--	--	--	--	--	4.4	--	--
28...	--	--	--	--	--	--	--	3.3	12	96
28...	--	--	--	--	--	--	--	1.9	--	--
JUL										
05...	--	--	--	--	--	--	--	2.7	--	--
16...	--	--	--	--	--	--	--	4.5	--	--
17...	--	--	--	--	--	--	--	8.7	--	--
18...	--	--	--	--	--	--	--	7.3	--	--
21...	--	--	--	--	--	--	--	8.6	--	--
25...	--	--	--	--	--	--	--	2.7	--	--
31...	--	--	--	--	--	--	--	9.9	--	--
AUG										
01...	--	--	--	--	--	--	--	8.1	--	--
07...	--	--	--	--	--	--	--	3.2	--	--
22...	10	<1	<1	<1.0	33	<6	5	--	2	90
22...	--	--	--	--	--	--	--	2.2	--	--
SEP										
05...	--	--	--	--	--	--	--	3.0	--	--
27...	--	--	--	--	--	--	--	6.4	--	--

01668500 CAT POINT CREEK NEAR MONTROSS, VA

LOCATION.--Lat 38°02'23", long 76°49'38", Richmond County, Hydrologic Unit 02080104, on right bank 200 ft upstream from bridge on State Highway 637, 1.7 mi west of Farmers Fork, 3.8 mi south of Montross, and 11.4 mi upstream from mouth.

DRAINAGE AREA.--45.6 mi².

PERIOD OF RECORD.--September 1943 to current year.

REVISED RECORDS.--WSP 1382: 1944(M), 1945, 1946-51(M), 1952(P), 1953-54(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3.04 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 19, 1953, nonrecording gage near right bank at downstream side of highway bridge at same datum.

REMARKS.--Records good except those for periods of no gage-height record, Dec. 12-15, 17-20, which are fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--46 years, 44.3 ft³/s, 13.19 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,820 ft³/s, Aug. 20, 1969, gage height, 10.45 ft, from rating curve extended above 1,400 ft³/s; no flow at times in 1943, 1957, 1959-60, 1966, and 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in September 1935 exceeded 9.3 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 250 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 28	1400	264	5.50	May 2	1500	377	5.77
Mar. 25	0600	341	5.71	May 7	0100	303	5.56
Apr. 8	1800	357	5.71	July 16	2200	*660	*6.40

Minimum daily discharge, 2.5 ft³/s, Oct. 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.7	23	35	16	13	43	106	46	23	8.4	65	9.0
2	3.2	35	24	18	12	39	75	267	21	6.8	51	8.3
3	2.8	27	20	18	13	36	63	239	19	5.8	36	6.9
4	4.9	20	18	17	16	36	58	119	18	5.3	27	6.2
5	5.0	15	16	16	17	37	55	93	19	10	22	5.6
6	4.2	14	15	17	18	62	111	245	21	35	18	5.5
7	3.7	11	15	21	23	199	140	245	25	36	20	5.3
8	3.4	11	14	21	24	153	327	144	31	26	41	4.9
9	3.2	9.7	15	20	20	88	212	106	48	17	27	4.3
10	3.0	9.6	17	20	17	69	135	131	40	11	22	4.0
11	2.8	9.4	16	18	15	58	105	121	30	8.0	37	5.0
12	2.7	8.5	e14	25	14	51	90	98	24	5.9	43	17
13	2.6	8.7	e13	32	13	46	79	80	26	5.3	45	30
14	2.5	8.5	e12	29	14	59	74	70	36	7.7	42	102
15	2.6	8.2	e13	30	14	56	108	65	31	6.5	43	92
16	2.6	8.5	14	29	16	51	144	87	50	250	44	74
17	2.6	16	e13	25	18	45	112	133	75	569	36	74
18	2.7	21	e12	22	17	44	91	115	52	200	53	62
19	2.7	19	e12	19	18	52	86	81	38	87	51	57
20	2.7	24	e13	17	18	57	74	63	28	55	41	84
21	4.9	22	15	16	52	60	67	54	31	41	34	125
22	14	20	18	15	127	62	60	47	37	33	28	90
23	14	17	18	15	117	57	55	44	43	28	24	56
24	12	15	17	14	82	174	53	42	79	24	21	41
25	9.0	14	19	14	62	282	50	40	46	20	20	33
26	7.4	13	19	14	54	139	48	38	32	17	16	95
27	6.6	22	19	14	50	91	46	36	24	17	14	94
28	6.1	206	18	13	46	72	43	32	20	18	13	70
29	5.9	163	17	13	---	61	43	29	15	20	13	49
30	5.9	67	15	13	---	86	47	27	11	21	12	40
31	6.2	---	15	14	---	163	---	25	---	74	10	---
TOTAL	155.6	866.1	511	585	920	2528	2757	2962	993	1668.7	969	1350.0
MEAN	5.02	28.9	16.5	18.9	32.9	81.5	91.9	95.5	33.1	53.8	31.3	45.0
MAX	14	206	35	32	127	282	327	267	79	569	65	125
MIN	2.5	8.2	12	13	12	36	43	25	11	5.3	10	4.0
CFSM	.11	.63	.36	.41	.72	1.79	2.02	2.10	.73	1.18	.69	.99
IN.	.13	.71	.42	.48	.75	2.06	2.25	2.42	.81	1.36	.79	1.10

CAL YR 1988 TOTAL 11883.1 MEAN 32.5 MAX 295 MIN 1.2 CFSM .71 IN. 9.69
WTR YR 1989 TOTAL 16265.4 MEAN 44.6 MAX 569 MIN 2.5 CFSM .98 IN. 13.27

e Estimated.

RAPPAHANNOCK RIVER BASIN

01669000 PISCATAWAY CREEK NEAR TAPPAHANNOCK, VA

LOCATION.--Lat 37°52'37", long 76°54'03", Essex County, Hydrologic Unit 02080104, on right bank at upstream side of bridge on State Highway 691, 0.6 mi south of Hensley Fork, 2.3 mi downstream from Sturgeon Swamp, and 4.2 mi southwest of Tappahannock.

DRAINAGE AREA.--28.0 mi².

PERIOD OF RECORD.--July 1951 to current year.

REVISED RECORDS.--WSP 2103: Drainage area. WDR VA-79-1: 1970-76(P), 1978(P).

GAGE.--Water-stage recorder. Datum of gage is 2.50 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for period with ice effect, Dec. 18, and period of backwater from debris, Aug. 11 to Sept. 12, which are fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--38 years, 31.5 ft³/s, 15.28 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,380 ft³/s, Aug. 20, 1969, gage height, 7.52 ft, from rating curve extended above 1,400 ft³/s; minimum, 0.01 ft³/s, Oct. 2, 1954; minimum gage height, 0.07 ft, July 24, 25, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 250 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	1930	*283	*3.79	July 17	0700	268	3.73

Minimum daily discharge, 2.0 ft³/s, Oct. 15, 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	21	21	9.8	9.6	34	53	37	22	8.8	25	e5.6
2	2.4	40	16	12	9.6	29	39	183	20	8.2	25	e5.2
3	2.7	27	14	13	9.8	25	34	130	19	7.3	25	e5.0
4	6.9	17	12	12	15	26	32	71	17	7.6	22	e4.7
5	12	13	11	11	20	27	33	73	17	18	18	e4.4
6	10	12	10	11	19	43	67	139	22	40	15	e4.3
7	7.1	11	11	13	21	105	83	114	34	29	13	e4.2
8	4.5	10	10	14	20	67	126	77	57	21	12	e4.2
9	3.8	9.3	11	13	17	46	76	69	50	14	11	e4.0
10	2.7	8.3	12	13	14	40	59	86	36	11	20	e3.8
11	2.4	8.3	13	12	12	35	52	82	30	9.1	e25	e5.0
12	2.3	8.0	11	19	11	32	48	67	22	13	e22	e10
13	2.3	8.4	8.9	32	10	29	44	61	20	9.4	e18	19
14	2.5	8.5	8.3	28	11	38	42	55	23	12	e15	40
15	2.0	8.1	10	24	11	38	61	54	27	12	e12	33
16	2.0	8.2	11	22	13	32	83	63	34	118	e13	48
17	2.3	14	9.7	18	14	27	58	81	54	201	e17	114
18	2.5	22	e8.4	15	16	26	49	67	46	68	e30	66
19	2.4	20	8.0	13	16	26	45	54	28	39	e38	40
20	2.4	19	8.9	12	17	26	42	48	21	29	e33	63
21	5.3	17	9.9	10	55	33	38	44	21	24	e23	86
22	21	15	12	9.6	109	39	36	40	24	20	e18	57
23	23	13	12	9.5	74	32	34	38	25	17	e14	40
24	15	11	11	9.6	50	80	32	36	22	15	e11	36
25	10	9.6	11	10	38	86	32	34	19	14	e10	35
26	7.5	9.0	10	9.7	34	55	31	32	17	13	e10	81
27	6.4	10	9.5	9.4	33	44	30	30	15	94	e9.8	79
28	6.2	54	8.9	9.1	34	39	28	27	13	62	e9.4	50
29	6.3	64	8.7	9.0	---	36	30	25	12	31	e8.5	40
30	6.7	35	8.3	9.0	---	35	36	23	9.7	22	e7.0	36
31	6.6	---	8.5	9.4	---	50	---	23	---	25	e6.0	---
TOTAL	191.8	530.7	335.0	421.1	713.0	1280	1453	1963	776.7	1012.4	535.7	1023.4
MEAN	6.19	17.7	10.8	13.6	25.5	41.3	48.4	63.3	25.9	32.7	17.3	34.1
MAX	23	64	21	32	109	105	126	183	57	201	38	114
MIN	2.0	8.0	8.0	9.0	9.6	25	28	23	9.7	7.3	6.0	3.8
CFSM	.22	.63	.39	.49	.91	1.47	1.73	2.26	.92	1.17	.62	1.22
IN.	.25	.71	.45	.56	.95	1.70	1.93	2.61	1.03	1.35	.71	1.36

CAL YR 1988 TOTAL 6176.2 MEAN 16.9 MAX 102 MIN 1.4 CFSM .60 IN. 8.21
WTR YR 1989 TOTAL 10235.8 MEAN 28.0 MAX 201 MIN 2.0 CFSM 1.00 IN. 13.60

e Estimated.

01669520 DRAGON SWAMP AT MASCOT, VA

LOCATION.--Lat 37°38'01", long 76°41'48", King and Queen County, Hydrologic Unit 02080102, on right bank at upstream side of bridge on State Highway 603, 0.8 mi east of Mascot, 2.1 mi downstream from Church Swamp, and 3.3 mi west of Warner.

DRAINAGE AREA.--108 mi².

PERIOD OF RECORD.--August 1981 to current year.

GAGE.--Water-stage recorder. Datum of gage is 21.60 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for period of backwater from beaver dam, Oct. 25-31, which is fair. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--8 years, 105 ft³/s, 13.20 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,530 ft³/s, Apr. 17, 1983, gage height, 8.85 ft, from rating curve extended above 1,400 ft³/s; minimum, 0.18 ft³/s, July 18-20, 1986.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 9	1300	*745	*6.81	No other peak equal to or greater than base discharge.			

Minimum daily discharge, 4.5 ft³/s, Oct. 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.4	44	72	35	30	149	382	110	37	31	36	20
2	6.0	60	63	39	30	134	444	237	33	28	31	17
3	8.9	58	58	39	31	116	368	273	33	25	30	15
4	18	54	55	39	35	111	272	277	33	22	29	13
5	19	52	51	37	36	106	225	246	33	21	27	12
6	14	51	48	38	44	119	283	287	33	32	23	11
7	12	49	44	39	61	254	348	322	39	68	19	10
8	11	47	41	39	71	331	583	293	81	51	15	9.1
9	10	43	41	40	70	378	727	291	99	37	12	8.1
10	8.8	39	41	40	61	357	663	335	97	34	16	7.6
11	7.8	38	39	40	57	245	466	322	85	52	28	7.0
12	6.7	35	37	45	49	174	329	276	80	71	31	6.0
13	6.6	33	35	57	46	135	251	242	99	59	34	5.7
14	5.5	32	31	67	44	125	205	223	118	65	34	6.6
15	5.2	30	33	77	42	118	214	210	83	56	34	15
16	4.7	28	33	79	41	117	261	204	68	58	35	20
17	4.5	34	33	80	43	109	266	194	63	86	38	17
18	4.8	47	31	71	44	105	279	172	56	94	98	15
19	5.3	86	29	62	50	106	283	159	53	101	200	30
20	5.0	83	30	55	52	97	242	152	74	171	209	66
21	11	68	32	49	92	96	199	144	139	238	174	81
22	29	58	34	44	191	95	168	131	102	203	185	74
23	28	53	35	41	244	102	147	119	73	135	192	66
24	27	49	36	39	285	190	130	107	83	85	152	63
25	e26	45	37	37	300	320	119	92	75	53	105	73
26	e25	43	36	36	244	376	111	81	58	39	71	143
27	e24	41	35	35	194	378	103	70	51	31	51	140
28	e23	58	35	33	164	280	96	60	45	26	40	117
29	e22	75	34	31	---	195	92	51	40	22	33	101
30	e21	82	32	30	---	173	102	46	35	23	28	97
31	e20	---	32	30	---	323	---	41	---	38	23	---
TOTAL	425.2	1515	1223	1423	2651	5914	8358	5767	1998	2055	2033	1266.1
MEAN	13.7	50.5	39.5	45.9	94.7	191	279	186	66.6	66.3	65.6	42.2
MAX	29	86	72	80	300	378	727	335	139	238	209	143
MIN	4.5	28	29	30	30	95	92	41	33	21	12	5.7
CFSM	.13	.47	.37	.43	.88	1.77	2.58	1.72	.62	.61	.61	.39
IN.	.15	.52	.42	.49	.91	2.04	2.88	1.99	.69	.71	.70	.44

CAL YR 1988 TOTAL 21204.1 MEAN 57.9 MAX 443 MIN 3.4 CFSM .54 IN. 7.30
WTR YR 1989 TOTAL 34628.3 MEAN 94.9 MAX 727 MIN 4.5 CFSM .88 IN. 11.93

e Estimated.

YORK RIVER BASIN

01670400 NORTH ANNA RIVER NEAR PARTLOW, VA

LOCATION.--Lat 38°00'46", long 77°42'06", Spotsylvania County, Hydrologic Unit 02080106, on left downstream side of bridge on State Highway 601, 1.1 mi upstream from Northeast Creek, and 3.8 mi southwest of Partlow.

DRAINAGE AREA.--344 mi².

PERIOD OF RECORD.--October 1978 to current year.

GAGE.--Water-stage recorder. Datum of gage is 168.25 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since January 1972 by Lake Anna, capacity, 373,000 acre-ft, 0.5 mi upstream. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--11 years, 292 ft³/s, 11.53 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,700 ft³/s, Feb. 26, 1979, gage height, 25.30 ft, from rating curve extended above 7,200 ft³/s; minimum, 25 ft³/s, Aug. 1, 1988.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 22, 1972, reached a stage of 36.32 ft, from floodmark.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,680 ft³/s, May 6, gage height, 18.06 ft; minimum, 32 ft³/s, Sept. 10; minimum daily, 38 ft³/s, Jan. 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	59	51	45	47	44	185	277	284	116	127	862	42
2	59	50	45	47	44	185	196	2490	86	48	397	42
3	60	48	45	47	44	185	195	1600	193	48	541	43
4	59	47	45	48	44	185	230	396	47	49	322	195
5	58	47	45	47	44	185	393	546	60	49	53	198
6	52	47	45	47	44	1310	480	5410	220	188	77	144
7	41	45	45	47	131	2940	563	5420	2330	461	101	119
8	42	44	45	47	212	2000	1230	2900	2610	182	46	39
9	42	43	45	46	199	478	485	1130	1660	182	53	39
10	52	44	46	46	44	311	198	1650	567	180	54	39
11	61	44	46	46	43	547	196	362	252	186	54	39
12	60	51	45	46	44	547	196	537	187	210	54	40
13	58	69	46	46	76	547	197	381	289	192	53	40
14	56	53	46	46	152	546	196	185	328	227	56	40
15	55	42	46	47	44	421	403	354	199	180	60	40
16	54	42	46	41	111	312	546	1500	99	1340	61	181
17	54	44	45	38	205	196	497	1190	280	870	61	206
18	53	42	45	39	204	206	243	380	185	183	105	196
19	58	43	45	40	204	477	196	182	183	186	56	195
20	43	44	45	44	204	345	196	271	189	295	55	478
21	45	45	45	44	896	546	196	182	199	423	55	1920
22	46	44	45	43	1670	412	196	182	542	215	55	1340
23	45	44	45	44	555	344	196	358	899	187	71	172
24	45	44	45	44	556	2070	196	196	664	186	48	172
25	46	43	45	45	817	2650	86	176	332	188	48	88
26	46	44	45	46	186	1240	196	185	256	257	48	43
27	46	46	45	54	286	514	196	185	110	1010	48	41
28	47	65	45	45	239	420	108	185	182	185	50	42
29	53	46	46	45	---	234	74	184	182	152	46	43
30	52	46	47	45	---	367	199	183	182	48	41	44
31	50	---	47	45	---	341	---	182	---	1880	42	---
TOTAL	1597	1407	1406	1402	7342	21246	8756	29366	13628	10114	3673	6260
MEAN	51.5	46.9	45.4	45.2	262	685	292	947	454	326	118	209
MAX	61	69	47	54	1670	2940	1230	5420	2610	1880	862	1920
MIN	41	42	45	38	43	185	74	176	47	48	41	39
CFSM	.15	.14	.13	.13	.76	1.99	.85	2.75	1.32	.95	.34	.61
IN.	.17	.15	.15	.15	.79	2.30	.95	3.18	1.47	1.09	.40	.68

CAL YR 1988 TOTAL 62099 MEAN 170 MAX 2470 MIN 38 CFSM .49 IN. 6.72
WTR YR 1989 TOTAL 106197 MEAN 291 MAX 5420 MIN 38 CFSM .85 IN. 11.48

01671020 NORTH ANNA RIVER AT HART CORNER, NEAR DOSWELL, VA

LOCATION.--Lat 37°51'00", long 77°25'41", Hanover County, Hydrologic Unit 02080106, on right bank at downstream side of bridge on State Highway 30, 0.3 mi west of Hart Corner, 2.1 mi east of Doswell, and 5.4 mi upstream from confluence with South Anna River.

DRAINAGE AREA.--463 mi².

PERIOD OF RECORD.--October 1979 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 43 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except for period of no gage-height record, Apr. 10-13, which is fair. Flow regulated since January 1972 by Lake Anna, capacity, 373,000 acre-ft, 27.7 mi upstream. At a point 0.8 mi upstream from station, there is diversion for municipal water supply by Hanover County Department of Public Utilities since June 1975. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--10 years, 383 ft³/s, 11.23 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,100 ft³/s, Mar. 30, 1984, gage height, 21.28 ft; minimum, 39 ft³/s, Aug. 28, 1988.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1969 reached a stage of 28.02 ft, from floodmark, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,610 ft³/s, May 7, gage height, 18.00 ft; minimum, 46 ft³/s, Sept. 11; minimum daily, 47 ft³/s, Sept. 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP			
1	64	74	168	72	75	328	470	283	266	244	1560	54			
2	63	79	117	73	73	290	336	1730	190	184	430	53			
3	67	68	94	74	73	282	299	2590	167	95	586	53			
4	74	66	84	75	86	285	299	1200	254	92	558	53			
5	69	65	78	74	90	297	415	477	132	96	292	217			
6	64	76	75	76	93	471	635	2570	190	120	101	229			
7	66	69	72	83	115	3060	810	6060	1030	396	117	170			
8	52	60	71	87	231	3020	1650	5370	2730	392	139	146			
9	49	56	71	88	292	1730	934	2680	2330	254	71	53			
10	50	55	75	84	258	452	e623	1640	1080	245	76	49			
11	51	53	75	81	113	621	e617	1420	624	241	93	47			
12	67	53	74	90	92	705	e617	683	316	262	87	68			
13	66	52	75	108	86	681	e314	751	296	259	84	76			
14	65	73	95	112	128	701	310	454	411	294	83	207			
15	63	76	77	119	212	681	448	362	377	279	77	150			
16	61	57	69	141	107	520	904	1220	282	1180	86	107			
17	60	62	83	145	186	388	784	2330	229	2460	94	418			
18	62	101	80	112	278	319	591	1060	368	1090	114	362			
19	60	94	73	94	278	472	358	527	279	454	174	286			
20	64	94	64	84	272	554	325	414	271	307	101	266			
21	69	90	66	80	322	650	310	401	275	473	87	1060			
22	107	83	74	79	1820	716	301	328	398	379	82	1690			
23	77	77	77	75	1300	536	294	318	624	279	78	576			
24	65	70	78	76	732	1550	290	481	1180	262	93	318			
25	61	64	87	74	910	3210	279	322	429	251	81	268			
26	60	60	85	73	480	2640	184	290	448	248	77	437			
27	59	60	80	74	348	850	282	290	287	855	72	349			
28	56	359	77	81	404	727	282	282	208	376	68	231			
29	55	408	75	75	---	492	175	276	255	251	68	141			
30	54	287	76	74	---	450	163	272	248	205	68	107			
31	54	---	72	75	---	496	---	269	---	744	57	---			
TOTAL	1954	2941	2517	2708	9454	28174	14299	37350	16174	13267	5754	8241			
MEAN	63.0	98.0	81.2	87.4	338	909	477	1205	539	428	186	275			
MAX	107	408	168	145	1820	3210	1650	6060	2730	2460	1560	1690			
MIN	49	52	64	72	73	282	163	269	132	92	57	47			
(*)	2.6	2.3	2.3	2.3	2.4	3.0	2.6	2.7	3.1	3.3	3.2	3.0			
MEAN‡	65.6	100	83.5	89.7	340	912	480	1208	542	431	189	278			
CFSM‡	.14	.22	.18	.19	.73	1.97	1.04	2.61	1.17	.93	.41	.60			
IN.‡	.16	.24	.21	.22	.76	2.27	1.16	3.01	1.31	1.07	.47	.67			
CAL YR	1988	TOTAL	88015	MEAN	240	MAX	3660	MIN	42	MEAN‡	243	CFSM‡	.52	IN.‡	7.15
WTR YR	1989	TOTAL	142833	MEAN	391	MAX	6060	MIN	47	MEAN‡	394	CFSM‡	.85	IN.‡	11.55

* Average diversion, equivalent in cubic feet per second; provided by Hanover County Department of Public Utilities.

† Adjusted for diversion.

e Estimated.

YORK RIVER BASIN

01671100 LITTLE RIVER NEAR DOSWELL, VA

LOCATION.--Lat 37°52'21", long 77°30'48", Hanover County, Hydrologic Unit 02080106, on left bank at downstream side of bridge on State Highway 685, 0.8 mi southwest of Verdon, 2.9 mi west of Doswell, and 9.6 mi upstream from mouth.

DRAINAGE AREA.--107 mi².

PERIOD OF RECORD.--October 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 132.30 ft above National Geodetic Vertical Datum of 1929 (levels by La Prade Bros., Engineers).

REMARKS.--Records good except those for periods of doubtful gage-height record, Oct. 5-25 and Apr. 12, 13, which are fair. Frequent quarry dewatering by the General Crushed Stone Company upstream from gage adds about 0.5 ft³/s at times. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--28 years, 98.2 ft³/s, 12.46 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,000 ft³/s, Aug. 21, 1969, gage height, 11.09 ft, from rating curve extended above 7,600 ft³/s on basis of contracted-opening measurement of peak flow; minimum, 0.10 ft³/s, Sept. 25, 26, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 650 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 8	0900	696	4.43	May 7	1230	680	4.40
Mar. 25	1200	685	4.41	July 17	2200	*1,010	*4.94

Minimum daily discharge, 2.8 ft³/s, Oct. 18, 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	16	134	39	37	101	93	61	27	25	21	19
2	3.7	26	83	38	37	92	84	247	25	20	29	20
3	3.5	28	62	37	36	84	80	504	24	17	65	19
4	4.6	27	51	37	44	85	77	254	23	16	95	16
5	e7.0	26	43	36	51	94	78	139	25	16	63	15
6	e6.6	34	38	35	57	123	110	418	27	29	44	14
7	e4.8	30	35	36	72	489	188	661	46	38	34	12
8	e4.3	23	34	39	88	649	407	418	120	40	29	12
9	e3.9	21	34	42	91	297	369	208	177	38	24	11
10	e3.6	20	33	44	83	167	208	201	144	33	22	11
11	e3.5	20	33	44	70	135	145	222	105	28	24	11
12	e3.4	19	32	44	63	121	e118	185	80	23	23	18
13	e3.2	19	30	47	58	111	e109	135	58	21	24	17
14	e2.9	18	31	53	56	110	102	109	45	22	25	28
15	e2.9	17	30	61	56	111	125	94	39	22	25	72
16	e2.9	18	30	67	57	109	248	136	44	312	23	107
17	e2.9	22	31	75	61	101	209	272	49	847	22	113
18	e2.8	31	26	73	62	95	140	264	54	759	30	81
19	e2.8	44	30	65	62	146	110	152	53	288	36	66
20	e4.7	53	29	56	62	142	97	108	44	126	68	64
21	e9.0	54	29	53	79	166	87	88	42	82	70	56
22	e16	47	31	45	241	209	78	72	47	61	49	53
23	e27	41	35	42	351	163	71	62	89	49	36	51
24	e29	38	37	41	252	367	64	57	110	42	31	52
25	e20	34	48	40	155	665	60	53	76	35	27	45
26	19	31	50	39	119	451	60	49	52	31	25	169
27	16	30	50	39	109	221	59	47	52	70	24	235
28	15	119	48	38	105	152	61	42	46	38	22	180
29	15	281	46	37	---	124	60	36	37	30	20	120
30	12	277	42	37	---	109	60	32	30	25	21	76
31	9.9	---	40	37	---	101	---	30	---	22	20	---
TOTAL	266.0	1464	1305	1416	2614	6090	3757	5356	1790	3205	1071	1763
MEAN	8.58	48.8	42.1	45.7	93.4	196	125	173	59.7	103	34.5	58.8
MAX	29	281	134	75	351	665	407	661	177	847	95	235
MIN	2.8	16	26	35	36	84	59	30	23	16	20	11
CFSM	.08	.46	.39	.43	.87	1.84	1.17	1.61	.56	.97	.32	.55
IN.	.09	.51	.45	.49	.91	2.12	1.31	1.86	.62	1.11	.37	.61

CAL YR 1988 TOTAL 27054.8 MEAN 73.9 MAX 1050 MIN 1.7 CFSM .69 IN. 9.41
WTR YR 1989 TOTAL 30097.0 MEAN 82.5 MAX 847 MIN 2.8 CFSM .77 IN. 10.46

e Estimated.

01672500 SOUTH ANNA RIVER NEAR ASHLAND, VA

LOCATION.--Lat 37°47'48", long 77°32'57", Hanover County, Hydrologic Unit 02080106, on right bank at downstream side of bridge on State Highway 54, 4.5 mi northwest of Ashland, and 7.6 mi upstream from Newfound River.

DRAINAGE AREA.--394 mi².

PERIOD OF RECORD.--October 1930 to current year.

REVISED RECORDS.--WSP 801: 1935(M). WSP 1502: 1935, 1939. WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 83.74 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for period with ice effect, Dec. 13-20, and periods of doubtful gage-height record, May 15, 16, 19-24, which are fair. Since 1966, diversion 150 ft upstream from station for town of Ashland water supply has averaged less than 0.6 ft³/s. Capacity of the diversion pickup is about 1.5 ft³/s. Small diurnal fluctuation at low flow in some years caused by gristmills upstream from station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--59 years, 366 ft³/s, 12.61 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,100 ft³/s, Aug. 23, 1969, gage height, 24.99 ft; minimum, 0.10 ft³/s, Sept. 12, 1966, caused by diversion upstream from station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Aug. 15, 1928, reached a stage of about 24 ft, discharge, about 14,500 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 9	1530	2,220	8.52	July 16	1830	*4,910	*13.85
May 10	0430	3,580	11.43				

Minimum discharge, 11 ft³/s, Oct. 20, gage height, 1.18 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	60	306	108	106	341	333	212	107	106	151	125
2	20	77	212	108	107	306	281	850	105	94	413	101
3	19	63	164	108	107	269	248	1810	106	85	466	87
4	27	91	136	116	124	277	235	1670	106	83	512	78
5	30	83	118	114	137	298	245	602	152	89	253	71
6	28	75	106	113	175	542	403	1530	155	171	181	67
7	26	60	96	123	214	1580	729	2120	200	1180	144	65
8	25	89	92	137	289	2010	1170	2240	887	1790	121	63
9	23	71	92	165	298	2070	986	3090	1640	1260	109	63
10	21	62	98	149	232	725	650	2900	894	371	104	62
11	19	55	99	139	184	664	482	1290	631	250	127	61
12	18	49	98	145	157	570	387	890	388	181	125	88
13	18	45	e83	170	145	486	331	635	391	149	127	200
14	15	44	e80	205	143	463	295	489	297	155	127	565
15	15	43	e78	243	148	438	495	e390	233	172	124	295
16	15	43	e76	273	189	416	748	e660	239	2080	118	194
17	15	47	e75	430	235	353	580	981	332	3230	113	511
18	16	100	e77	291	273	313	426	783	278	2720	570	508
19	14	371	e79	228	260	384	344	e470	243	2500	442	299
20	13	174	e77	198	228	503	297	e340	180	654	306	212
21	23	123	82	176	377	509	264	e290	155	584	203	184
22	58	124	88	157	1120	614	240	e250	919	589	159	164
23	45	143	94	146	1370	532	222	e220	1140	315	136	153
24	44	115	111	137	874	1150	209	e205	509	232	122	185
25	47	95	135	132	549	1950	197	233	329	187	115	194
26	43	83	144	128	431	1990	197	207	267	163	108	735
27	38	84	181	124	409	866	204	178	262	156	106	1310
28	34	395	147	116	390	579	222	157	171	492	113	681
29	31	1280	126	105	---	473	215	140	142	423	110	347
30	29	651	116	102	---	411	202	125	120	244	218	253
31	27	---	111	104	---	378	---	113	---	172	179	---
TOTAL	816	4795	3577	4990	9271	22460	11837	26070	11578	20877	6202	7921
MEAN	26.3	160	115	161	331	725	395	841	386	673	200	264
MAX	58	1280	306	430	1370	2070	1170	3090	1640	3230	570	1310
MIN	13	43	75	102	106	269	197	113	105	83	104	61
CFSM	.07	.41	.29	.41	.84	1.84	1.00	2.13	.98	1.71	.51	.67
IN.	.08	.45	.34	.47	.88	2.12	1.12	2.46	1.09	1.97	.59	.75

CAL YR 1988 TOTAL 82013 MEAN 224 MAX 2350 MIN 13 CFSM .57 IN. 7.74
WTR YR 1989 TOTAL 130394 MEAN 357 MAX 3230 MIN 13 CFSM .91 IN. 12.31

e Estimated.

YORK RIVER BASIN

01673000 PAMUNKEY RIVER NEAR HANOVER, VA
(National stream-quality accounting network station)

LOCATION.--Lat 37°46'03", long 77°19'57", Hanover County, Hydrologic Unit 02080106, on right bank 100 ft downstream from bridge on State Highway 614, 0.3 mi upstream from Mechumps Creek, 2.0 mi east of Hanover, and 7.0 mi upstream from Millpond Creek.

DRAINAGE AREA.--1,081 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1941 to current year. Monthly discharge only for some periods, published in WSP 1302.

REVISED RECORDS.--WSP 1302: 1944(M). WSP 1382: 1949. WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 14.72 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 15, 1976, nonrecording gage at same site and datum.

REMARKS.--Records good except those for period with ice effect, Dec. 13-20, and period of no gage-height record, Dec. 29 to Jan. 4, which are fair. Some regulation since January 1972 by Lake Anna, capacity, 373,000 acre-ft, and occasional diurnal fluctuation at low flow caused by mill upstream from station. Unknown amount of diversion for irrigation upstream from gage.

AVERAGE DISCHARGE.--48 years, 1,003 ft³/s, 12.60 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,300 ft³/s, Aug. 23, 1969, gage height, 31.12 ft, from flood-marks, from rating curve extended above 22,000 ft³/s; minimum, 12 ft³/s, Sept. 12, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1928 reached a stage of 32.6 ft, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,570 ft³/s, May 9, gage height, 20.60 ft; minimum, 82 ft³/s, Oct. 12, gage height, 2.41 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	92	139	1060	e270	261	1040	1140	588	472	439	1970	267
2	92	265	638	e265	259	884	976	1390	436	398	1450	215
3	91	252	475	e260	260	810	795	4030	308	257	1170	187
4	112	219	388	e268	294	781	748	4730	411	191	1480	168
5	128	244	328	273	341	861	761	3090	454	187	1080	202
6	115	261	294	274	385	1070	1180	2960	397	252	552	334
7	105	250	270	298	462	3460	1740	5020	630	717	386	305
8	104	218	253	317	603	4960	3270	7560	2740	2280	349	257
9	90	224	247	344	782	5800	3690	8370	4070	2350	281	193
10	85	203	262	362	737	4880	2410	7570	4010	1080	235	132
11	85	188	264	337	555	2220	1430	6610	2100	675	336	130
12	83	171	257	344	421	1720	1120	4570	1180	555	322	148
13	93	156	e245	412	374	1540	987	2450	983	519	302	263
14	94	158	e240	448	363	1520	897	1560	946	494	295	638
15	93	192	e230	503	477	1500	1120	1120	888	563	288	733
16	92	169	e220	554	434	1360	2510	1720	772	1760	283	556
17	89	170	e210	661	477	1160	2280	3600	1050	5720	282	846
18	89	198	e210	678	651	934	1750	3590	896	7200	545	1310
19	89	387	e212	531	717	1010	1210	2000	802	6350	1000	957
20	87	532	e215	449	684	1420	966	1200	685	4410	698	735
21	100	398	220	399	796	1480	862	1060	647	1600	544	979
22	215	328	229	366	2340	1850	795	864	911	1460	430	2140
23	235	318	249	339	3970	1690	738	783	1970	961	350	1710
24	162	319	268	318	3090	2430	696	843	2270	706	303	656
25	152	275	313	308	2040	4520	670	807	1530	611	287	642
26	149	242	344	295	1780	5610	599	725	996	547	267	926
27	143	247	355	291	1090	5720	601	654	902	683	246	2240
28	134	643	372	282	1110	3180	667	602	586	1310	240	1970
29	122	1790	e335	280	---	1660	635	561	540	972	238	1030
30	117	2010	e320	263	---	1200	495	532	480	707	243	658
31	112	---	e290	260	---	1270	---	500	---	479	346	---
TOTAL	3549	11166	9813	11249	25753	69540	37738	81659	35062	46433	16798	21527
MEAN	114	372	317	363	920	2243	1258	2634	1169	1498	542	718
MAX	235	2010	1060	678	3970	5800	3690	8370	4070	7200	1970	2240
MIN	83	139	210	260	259	781	495	500	308	187	235	130
CFSM	.11	.34	.29	.34	.85	2.08	1.16	2.44	1.08	1.39	.50	.66
IN.	.12	.38	.34	.39	.89	2.39	1.30	2.81	1.21	1.60	.58	.74

CAL YR 1988 TOTAL 237280 MEAN 648 MAX 6810 MIN 70 CFSM .60 IN. 8.17
WTR YR 1989 TOTAL 370287 MEAN 1014 MAX 8370 MIN 83 CFSM .94 IN. 12.74

e Estimated.

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1968 to January 1976.

WATER TEMPERATURE: October 1945 to September 1946, April 1968 to January 1976.

COOPERATION.--Chemical data as noted were provided by the Virginia Division of Consolidated Laboratory Services (VDCLS) and reviewed by the U.S. Geological Survey.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	AGENCY ANA- LYZING SAMPLE	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, CHEM- ICAL (LOW LEVEL) (MG/L)
NOV 21...	1300	392	114	7.20	9.0	756	USGS	5.8	10.7	93	--
JAN 24...	1300	311	120	7.10	2.5	758	USGS	7.0	13.2	97	--
FEB 23...	0900	4060	71	6.90	7.0	753	USGS	73	11.6	97	--
APR 20...	1330	959	78	6.90	15.5	757	USGS	5.9	9.1	92	--
JUN 28...	1300	554	92	6.90	26.5	751	USGS	7.4	6.2	78	--
JUL 17...	1500	5970	48	6.40	21.5	762	VDCLS	--	6.2	70	33
18...	1300	7300	50	6.30	22.0	763	VDCLS	60	6.4	73	28
19...	0900	6550	52	6.40	21.5	760	VDCLS	43	6.2	70	38
20...	0900	4980	58	6.50	22.0	748	VDCLS	23	6.2	72	19
25...	1245	605	82	6.70	27.0	769	VDCLS	8.4	6.8	84	15
AUG 01...	1400	2190	65	7.20	26.0	764	VDCLS	14	7.3	90	14
23...	1200	352	87	6.80	25.0	751	USGS	3.6	6.8	84	--
23...	1201	352	87	6.80	25.0	751	VDCLS	6.3	6.8	84	29
SEP 18...	1200	1360	80	7.10	23.0	762	VDCLS	--	7.4	86	13
26...	1200	775	85	7.20	17.5	754	VDCLS	--	7.3	77	21
27...	0930	2210	80	6.80	18.0	767	VDCLS	71	7.8	82	15
28...	0900	2140	83	6.70	16.0	760	VDCLS	73	8.4	85	25

[illegible]

YORK RIVER BASIN

01673000 PAMUNKEY RIVER NEAR HANOVER, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	RESIDUE VOLA- TILE, SUS- PENDE (MG/L)	RESIDUE FIXED NON FILTER- ABLE (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
NOV											
21...	16	7.5	0.10	14	80	78	--	--	--	--	<0.010
JAN											
24...	24	6.3	0.10	13	79	80	--	--	--	--	<0.010
FEB											
23...	16	5.8	0.10	11	54	56	--	--	--	--	<0.010
APR											
20...	11	4.7	0.10	11	62	53	--	--	--	--	<0.010
JUN											
28...	13	4.2	0.10	12	60	60	--	--	--	--	--
JUL											
17...	--	--	--	6.5	--	--	64	22	42	0.270	<0.010
18...	--	--	--	7.7	--	--	73	8	65	0.190	<0.010
19...	--	--	--	8.1	--	--	40	7	33	0.140	<0.010
20...	--	--	--	9.1	--	--	14	3	11	0.160	<0.010
25...	--	--	--	11	--	--	9	2	7	0.310	<0.010
AUG											
01...	--	--	--	7.6	--	--	28	4	24	0.100	<0.010
23...	10	4.7	0.10	14	59	63	7	7	--	--	<0.010
23...	--	--	--	13	--	--	2	1	1	0.230	<0.010
SEP											
18...	--	--	--	12	--	--	130	24	106	0.250	<0.010
26...	--	--	--	12	--	--	9	4	5	0.210	0.010
27...	--	--	--	11	--	--	63	11	52	0.250	0.010
28...	--	--	--	12	--	--	72	10	62	0.140	0.020

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)
NOV										
21...	0.100	0.040	0.030	0.50	0.060	0.030	0.020	<10	<1	21
JAN										
24...	0.270	0.070	0.110	0.60	0.050	0.020	0.020	--	--	--
FEB										
23...	0.210	0.020	0.050	1.1	0.180	0.040	0.010	120	<1	26
APR										
20...	0.160	0.030	0.020	0.30	0.030	0.020	0.010	30	<1	26
JUN										
28...	--	--	0.050	0.30	0.040	<0.010	--	--	--	--
JUL										
17...	0.270	0.060	--	0.90	0.180	0.010	0.020	--	--	--
18...	0.190	<0.040	--	0.60	0.090	0.010	0.010	--	--	--
19...	0.140	0.040	--	0.60	0.090	0.020	0.010	--	--	--
20...	0.160	0.050	--	0.60	0.060	0.060	0.020	--	--	--
25...	0.310	0.120	--	0.50	0.060	0.030	0.030	--	--	--
AUG										
01...	0.100	0.060	--	0.40	0.080	0.010	0.010	--	--	--
23...	0.220	0.020	0.030	0.30	0.050	0.030	0.020	<10	<1	23
23...	0.230	<0.040	--	0.30	0.040	0.020	0.020	--	--	--
SEP										
18...	0.250	0.050	--	0.30	0.040	0.020	0.030	--	--	--
26...	0.220	0.040	--	0.30	0.040	0.030	0.030	--	--	--
27...	0.260	0.040	--	0.70	0.120	0.050	0.040	--	--	--
28...	0.160	0.050	--	0.50	0.080	0.020	0.010	--	--	--

YORK RIVER BASIN

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01673000 PAMUNKEY RIVER NEAR HANOVER, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)
NOV										
21...	<0.5	<1	<1	<3	1	450	<5	<4	45	<0.1
JAN										
24...	--	--	--	--	--	--	--	--	--	--
FEB										
23...	<0.5	<1	1	<3	3	280	<5	<4	54	<0.1
APR										
20...	<0.5	<1	<1	<3	2	390	<5	<4	34	<0.1
JUN										
28...	--	--	--	--	--	--	--	--	--	--
JUL										
17...	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
AUG										
01...	--	--	--	--	--	--	--	--	--	--
23...	<0.5	<1	2	<3	2	440	1	<4	41	<0.1
23...	--	--	--	--	--	--	--	--	--	--
SEP										
18...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--

DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	SEDI- MENT, SUS- PENDED (MG/L)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV										
21...	<10	<1	<1	<1.0	39	<6	5	--	10	93
JAN										
24...	--	--	--	--	--	--	--	--	3	97
FEB										
23...	<10	2	<1	<1.0	30	<6	6	--	166	91
APR										
20...	<10	2	<1	1.0	34	<6	7	--	12	86
JUN										
28...	--	--	--	--	--	--	--	--	890	100
JUL										
17...	--	--	--	--	--	--	--	11	--	--
18...	--	--	--	--	--	--	--	10	--	--
19...	--	--	--	--	--	--	--	11	--	--
20...	--	--	--	--	--	--	--	10	--	--
25...	--	--	--	--	--	--	--	6.8	--	--
AUG										
01...	--	--	--	--	--	--	--	5.1	--	--
23...	<10	<1	<1	<1.0	41	<6	9	--	7	84
23...	--	--	--	--	--	--	--	4.6	--	--
SEP										
18...	--	--	--	--	--	--	--	6.9	--	--
26...	--	--	--	--	--	--	--	6.5	--	--
27...	--	--	--	--	--	--	--	7.3	--	--
28...	--	--	--	--	--	--	--	8.2	--	--

YORK RIVER BASIN

01673550 TOTOPOTOMOY CREEK NEAR STUDLEY, VA

LOCATION.--Lat 37°39'44", long 77°15'29", Hanover County, Hydrologic Unit 02080106, on right bank at downstream side of bridge on State Highway 606, 2.0 mi southeast of Studley, 2.4 mi downstream from Hawes millrace, and 4.1 mi upstream from mouth.

DRAINAGE AREA.--26.2 mi².

PERIOD OF RECORD.--October 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is 38.36 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for periods with ice effect, Dec. 12, 13, 18, and period of no gage-height record, July 22, 23, which are fair. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--12 years, 28.4 ft³/s, 14.72 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 802 ft³/s, Aug. 19, 1985, gage height, 8.22 ft; maximum gage height, 8.77 ft, Feb. 25, 1979; minimum daily discharge, 0.35 ft³/s, Oct. 1-7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 160 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 25	0630	*145	*5.03	No peak equal to or greater than base discharge.			

Minimum daily discharge, 2.7 ft³/s, Oct. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	25	20	10	9.6	29	41	25	11	9.4	8.3	6.9
2	2.7	34	17	11	9.3	25	32	53	10	8.7	12	6.4
3	4.3	21	15	11	9.8	22	30	57	10	8.1	23	5.8
4	12	16	13	10	16	23	29	33	10	8.4	30	5.4
5	13	18	12	9.6	18	24	28	30	12	8.8	15	5.2
6	11	18	11	11	15	44	50	100	24	14	10	5.1
7	6.9	16	11	11	18	124	77	114	31	20	8.4	5.1
8	5.5	14	11	12	18	77	128	53	62	23	7.3	5.0
9	4.6	12	12	12	15	42	84	40	35	14	6.2	4.8
10	4.1	10	13	12	13	35	53	59	25	11	9.3	4.7
11	3.8	9.7	13	11	12	30	43	63	20	8.9	17	6.3
12	3.4	8.7	e11	15	12	27	37	46	16	8.8	20	7.6
13	4.2	8.7	e9.8	19	11	26	35	38	24	9.3	18	6.9
14	3.2	8.8	9.5	19	11	30	32	31	41	10	14	11
15	3.6	8.6	10	18	11	30	69	29	31	9.1	12	9.4
16	3.3	9.0	10	18	12	28	122	50	28	60	10	18
17	3.4	15	9.6	16	13	24	70	96	38	94	11	55
18	3.6	17	e8.7	14	15	23	49	53	44	73	28	71
19	4.0	15	9.0	13	16	26	41	38	26	31	52	29
20	4.0	14	9.1	12	16	27	36	32	20	21	43	40
21	9.7	13	9.5	10	32	30	33	29	22	17	23	49
22	18	12	11	9.9	95	33	31	26	29	e14	16	39
23	20	10	10	9.7	68	30	31	24	54	e12	12	25
24	15	9.8	10	9.6	46	95	27	21	42	11	10	18
25	11	9.2	10	9.5	35	120	26	19	31	9.8	9.5	14
26	8.5	8.8	9.6	9.4	32	58	27	17	23	9.1	9.7	46
27	7.0	11	9.3	9.3	29	43	26	16	18	8.9	9.4	54
28	6.8	48	9.3	8.9	29	37	25	14	15	8.5	9.1	33
29	6.1	64	9.2	8.9	---	33	24	13	13	8.7	8.6	21
30	6.0	29	9.1	9.3	---	35	24	12	11	9.1	8.2	16
31	5.8	---	9.3	9.3	---	55	---	11	---	9.2	7.4	---
TOTAL	217.3	513.3	341.0	368.4	636.7	1285	1360	1242	776	567.8	477.4	623.6
MEAN	7.01	17.1	11.0	11.9	22.7	41.5	45.3	40.1	25.9	18.3	15.4	20.8
MAX	20	64	20	19	95	124	128	114	62	94	52	71
MIN	2.7	8.6	8.7	8.9	9.3	22	24	11	10	8.1	6.2	4.7
CFSM	.27	.65	.42	.45	.87	1.58	1.73	1.53	.99	.70	.59	.79
IN.	.31	.73	.48	.52	.90	1.82	1.93	1.76	1.10	.81	.68	.89

CAL YR 1988 TOTAL 6281.6 MEAN 17.2 MAX 184 MIN 2.7 CFSM .66 IN. 8.92
WTR YR 1989 TOTAL 8408.5 MEAN 23.0 MAX 128 MIN 2.7 CFSM .88 IN. 11.94

e Estimated.

01673800 PO RIVER NEAR SPOTSYLVANIA, VA

LOCATION.--Lat 38°10'17", long 77°35'42", Spotsylvania County, Hydrologic Unit 02080105, on right bank at upstream side of bridge on State Highway 208, 1.6 mi north of Snell, 2.0 mi south of Spotsylvania, 4.8 mi downstream from Gladys Run, and 4.9 mi upstream from U.S. Highway 1.

DRAINAGE AREA.--77.4 mi².

PERIOD OF RECORD.--October 1962 to current year.

REVISED RECORDS.--WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 183.76 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 30, 1964, nonrecording gage at same site and datum.

REMARKS.--Records good except for period with backwater from leaves, Oct. 1-31, which is fair. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--27 years, 74.7 ft³/s, 13.11 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,900 ft³/s, June 22, 1972, gage height, 19.03 ft, from rating curve extended above 3,400 ft³/s; minimum daily, 0.05 ft³/s, Oct. 11, 12, 1986.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 900 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 7	0730	*1,740	*9.83	June 8	1230	1,050	7.93

Minimum daily discharge, 0.57 ft³/s, Oct. 16-18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.1	19	42	17	27	58	55	79	20	12	490	8.2
2	e.80	13	28	24	26	52	47	442	18	10	112	7.3
3	e.96	15	21	29	26	47	46	342	17	9.4	102	6.4
4	e1.0	7.0	17	26	33	50	49	102	15	9.7	56	5.3
5	e.94	8.7	14	22	38	69	65	85	16	11	40	5.0
6	e.86	15	12	24	37	208	177	709	37	56	37	4.9
7	e.80	9.1	12	31	42	659	154	1400	259	84	30	4.9
8	e.76	12	11	41	51	331	201	323	841	43	24	4.7
9	e.72	9.3	11	34	48	131	141	137	182	26	20	5.1
10	e.68	7.5	13	30	39	141	96	192	229	19	16	4.7
11	e.64	6.6	14	26	34	173	73	185	108	15	18	4.8
12	e.62	5.7	12	32	31	166	61	118	66	63	21	15
13	e.60	4.5	9.6	65	29	143	55	93	52	40	21	245
14	e.58	5.6	8.7	58	35	141	50	77	47	28	17	97
15	e.58	5.3	12	81	44	128	73	80	44	26	15	39
16	e.57	4.5	13	155	50	107	150	513	47	43	27	222
17	e.57	33	13	85	59	90	107	744	55	66	27	164
18	e.57	106	11	61	56	79	74	248	51	47	28	58
19	e.58	42	9.4	52	46	85	66	118	38	29	21	33
20	e.58	44	9.5	45	40	82	62	93	29	23	18	50
21	e4.5	70	11	39	83	103	53	74	37	27	16	118
22	e14	48	15	34	406	132	47	62	45	25	14	96
23	e3.2	27	18	32	273	94	42	59	43	17	13	62
24	e1.5	18	19	31	129	341	39	66	49	13	13	58
25	e1.4	15	22	30	91	691	34	60	78	11	13	48
26	e1.3	12	24	26	77	210	34	47	40	9.1	12	245
27	e1.2	16	20	25	72	121	33	39	27	129	11	201
28	e1.1	321	18	25	63	95	31	33	22	95	10	72
29	e1.1	322	33	24	---	80	30	28	17	42	9.9	48
30	e1.0	80	13	25	---	69	33	22	14	24	10	36
31	e1.0	---	12	27	---	64	---	20	---	167	9.2	---
TOTAL	45.81	1301.8	498.2	1256	1985	4940	2178	6590	2543	1219.2	1271.1	1968.3
MEAN	1.48	43.4	16.1	40.5	70.9	159	72.6	213	84.8	39.3	41.0	65.6
MAX	14	322	42	155	406	691	201	1400	841	167	490	245
MIN	.57	4.5	8.7	17	26	47	30	20	14	9.1	9.2	4.7
CFSM	.02	.56	.21	.52	.92	2.06	.94	2.75	1.10	.51	.53	.85
IN.	.02	.63	.24	.60	.95	2.37	1.05	3.17	1.22	.59	.61	.95

CAL YR 1988 TOTAL 16979.61 MEAN 46.4 MAX 1110 MIN .31 CFSM .60 IN. 8.16
WTR YR 1989 TOTAL 25796.41 MEAN 70.7 MAX 1400 MIN .57 CFSM .91 IN. 12.40

e Estimated.

YORK RIVER BASIN

01674000 MATTAPONI RIVER NEAR BOWLING GREEN, VA

LOCATION.--Lat 38°03'42", long 77°23'10", Caroline County, Hydrologic Unit 02080105, on right bank 0.1 mi upstream from bridge on State Highway 605, 2.2 mi northwest of Bowling Green, 2.4 mi upstream from South River, and 7.1 mi downstream from confluence of Matta and Poni Rivers.

DRAINAGE AREA.--257 mi².

PERIOD OF RECORD.--September 1942 to current year.

REVISED RECORDS.--WSP 1382: 1943, 1945(M), 1948(M), 1949, 1953(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 85.14 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 17, 1978, gage located on left bank at same datum.

REMARKS.--Records good except for period with ice effect, Dec. 13-19, which is fair. Some diurnal fluctuation from gristmill upstream on Po River. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--47 years, 237 ft³/s, 12.52 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,400 ft³/s, June 23, 1972, gage height, 18.95 ft, from high-water mark in well, from rating curve extended above 8,100 ft³/s; no flow at times in September and October 1954 and September 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1928 reached a stage of 19.5 ft based on relative difference in stage between this flood and flood of Oct. 17, 1942, at Milford 4 mi downstream, discharge, 15,000 ft³/s, from rating curve extended above 8,100 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 8	1800	*2,240	*10.06	Sept. 14	1400	2,140	9.92

Minimum discharge, 2.8 ft³/s, Oct. 2, gage height, 1.33 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.2	18	659	61	70	225	263	156	95	52	294	29
2	3.8	43	267	72	69	195	220	448	85	48	390	25
3	3.8	49	138	80	69	168	197	1010	78	40	504	22
4	6.5	48	105	84	79	159	192	1430	71	35	318	23
5	8.5	50	90	79	86	170	202	917	65	34	207	19
6	7.6	53	75	86	94	230	311	674	218	46	149	15
7	5.4	59	70	99	107	479	489	917	346	93	124	14
8	4.7	48	65	102	118	1010	677	2010	404	137	99	13
9	4.4	38	62	109	118	1440	783	1690	603	114	75	13
10	4.1	35	66	100	107	903	732	989	898	80	61	12
11	4.1	31	72	90	93	582	514	726	601	61	75	12
12	4.4	27	63	90	88	499	355	664	398	75	88	78
13	4.3	26	e58	116	81	479	283	565	232	115	81	326
14	4.6	25	e54	135	86	466	243	416	177	127	74	1760
15	5.2	24	e50	158	95	459	251	324	146	110	64	1310
16	5.0	25	e49	198	105	441	401	472	152	155	58	604
17	5.3	33	e48	247	121	381	499	993	189	331	66	491
18	5.7	98	e50	209	126	317	475	1740	165	263	135	622
19	6.0	127	e48	152	122	329	356	1450	140	181	146	526
20	6.0	115	50	124	112	324	293	878	114	127	113	271
21	9.2	112	53	106	123	328	257	545	100	96	89	315
22	41	110	69	92	299	372	230	367	115	79	72	419
23	52	97	77	86	484	382	203	278	140	72	66	360
24	44	77	78	82	724	487	182	261	127	55	60	358
25	33	60	93	79	653	778	170	257	119	45	57	299
26	25	50	93	79	409	1420	158	226	153	45	50	378
27	17	46	86	76	302	1290	152	193	134	177	46	595
28	12	185	80	75	260	772	146	167	101	167	41	819
29	10	410	74	70	---	495	143	141	79	182	37	657
30	9.2	644	76	69	---	370	151	123	61	107	34	341
31	9.5	---	66	70	---	310	---	108	---	174	32	---
TOTAL	365.5	2763	2984	3275	5200	16260	9528	21135	6306	3423	3705	10726
MEAN	11.8	92.1	96.3	106	186	525	318	682	210	110	120	358
MAX	52	644	659	247	724	1440	783	2010	898	331	504	1760
MIN	3.8	18	48	61	69	159	143	108	61	34	32	12
CFSM	.05	.36	.37	.41	.72	2.04	1.24	2.65	.82	.43	.47	1.39
IN.	.05	.40	.43	.47	.75	2.35	1.38	3.06	.91	.50	.54	1.55

CAL YR 1988 TOTAL 58224.5 MEAN 159 MAX 2400 MIN 2.3 CFSM .62 IN. 8.43
WTR YR 1989 TOTAL 85670.5 MEAN 235 MAX 2010 MIN 3.8 CFSM .91 IN. 12.40

e Estimated.

WATER-QUALITY RECORDS

COOPERATION.--Chemical data as noted were provided by the Virginia Division of Consolidated Laboratory Services (VDCLS) and reviewed by the U.S. Geological Survey.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	AGENCY ANA- LYZING SAMPLE	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, CHEM- ICAL (LOW LEVEL) (MG/L)
NOV 21...	0930	301	64	6.60	8.5	755	USGS	3.0	10.2	88	--
JAN 24...	0900	220	57	6.50	2.0	760	USGS	6.0	13.0	94	--
FEB 23...	1215	805	53	6.40	6.0	753	USGS	10	11.7	95	--
APR 20...	0930	944	50	6.30	15.0	758	USGS	3.5	8.5	85	--
JUN 28...	0900	280	55	6.70	25.5	750	USGS	5.2	6.2	77	--
JUL 14...	0900	--	--	--	--	--	VDCLS	7.3	--	--	20
17...	1315	1950	34	5.70	21.0	762	VDCLS	--	6.3	71	31
18...	1145	2270	36	5.73	21.0	765	VDCLS	19	5.8	65	29
19...	1100	2440	33	6.30	21.5	760	VDCLS	10	6.4	72	31
20...	1115	1350	46	6.00	22.0	748	VDCLS	9.0	5.8	68	26
25...	1215	206	54	6.37	26.5	769	VDCLS	6.0	6.7	82	23
AUG 23...	0900	251	53	6.40	24.0	751	USGS	3.1	6.9	83	--
23...	0901	251	53	6.40	24.0	751	VDCLS	5.4	6.9	83	34
SEP 26...	0915	730	55	6.60	17.0	754	VDCLS	--	7.5	78	26
27...	1000	813	43	6.20	17.5	767	VDCLS	8.4	7.6	79	26

[illegible]

YORK RIVER BASIN

01674500 MATTAPONI RIVER NEAR BEULAHVILLE, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	RESIDUE VOLA- TILE, SUS- PENDE (MG/L)	RESIDUE FIXED NON FILTER- ABLE (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
NOV 21...	12	7.5	<0.10	9.0	45	47	--	--	--	--	<0.010
JAN 24...	15	5.8	0.10	10	45	46	--	--	--	--	<0.010
FEB 23...	15	5.8	0.10	7.5	44	43	--	--	--	--	<0.010
APR 20...	7.0	5.2	0.10	5.9	43	33	--	--	--	--	<0.010
JUN 28...	4.0	4.5	0.10	9.7	46	38	--	--	--	--	<0.010
JUL 14...	--	--	--	9.8	--	--	9	2	7	0.530	<0.010
17...	--	--	--	4.7	--	--	23	7	16	0.140	<0.010
18...	--	--	--	5.2	--	--	9	3	6	0.090	<0.010
19...	--	--	--	6.7	--	--	5	2	3	0.070	<0.010
20...	--	--	--	8.0	--	--	5	2	3	0.100	<0.010
25...	--	--	--	9.9	--	--	6	1	5	0.330	<0.010
AUG 23...	4.0	5.3	0.10	9.2	39	36	8	8	--	--	<0.010
23...	--	--	--	8.8	--	--	2	<1	<1	0.210	<0.010
SEP 26...	--	--	--	11	--	--	6	3	3	0.130	0.010
27...	--	--	--	10	--	--	8	4	4	0.100	0.010

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)
NOV 21...	<0.100	0.030	0.020	0.40	0.030	0.020	<0.010	30	<1	25
JAN 24...	0.170	0.020	0.050	0.20	0.030	0.010	<0.010	--	--	--
FEB 23...	0.160	0.010	0.040	0.50	0.060	0.020	<0.010	90	<1	27
APR 20...	<0.100	0.020	0.020	0.40	0.030	0.020	<0.010	70	<1	31
JUN 28...	0.270	0.030	0.060	0.50	0.060	0.030	0.020	--	--	--
JUL 14...	0.530	<0.040	--	0.20	0.030	--	0.020	--	--	--
17...	0.140	0.060	--	0.70	1.20	--	0.010	--	--	--
18...	0.090	0.040	--	0.70	0.070	--	0.010	--	--	--
19...	0.070	<0.040	--	0.60	0.060	0.020	<0.010	--	--	--
20...	0.100	0.050	--	0.60	0.060	0.010	0.020	--	--	--
25...	0.330	0.080	--	0.70	0.040	0.030	0.010	--	--	--
AUG 23...	0.160	0.030	0.030	0.60	0.050	0.030	0.020	10	<1	26
23...	0.210	0.040	--	0.40	0.040	0.010	0.020	--	--	--
SEP 26...	0.140	0.060	--	0.40	0.030	0.030	0.030	--	--	--
27...	0.110	0.040	--	0.50	0.060	0.030	0.010	--	--	--

YORK RIVER BASIN

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01674500 MATTAPONI RIVER NEAR BEULAHVILLE, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)
NOV 21...	<0.5	<1	<1	<3	<1	540	<5	<4	26	<0.1
JAN 24...	--	--	--	--	--	--	--	--	--	--
FEB 23...	<0.5	<1	<1	<3	1	440	<5	<4	66	<0.1
APR 20...	<0.5	<1	2	<3	<1	580	<5	<4	74	<0.1
JUN 28...	--	--	--	--	--	--	--	--	--	--
JUL 14...	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
AUG 23...	<0.5	<1	<1	<3	1	730	<1	<4	56	<0.1
23...	--	--	--	--	--	--	--	--	--	--
SEP 26...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--

DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	SEDI- MENT, SUS- PENDED (MG/L)	SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 21...	<10	<1	<1	1.0	22	<6	5	--	8	82
JAN 24...	--	--	--	--	--	--	--	--	3	93
FEB 23...	<10	2	<1	<1.0	21	<6	9	--	23	81
APR 20...	<10	7	<1	1.0	23	<6	9	--	10	71
JUN 28...	--	--	--	--	--	--	--	--	7	68
JUL 14...	--	--	--	--	--	--	--	5.8	--	--
17...	--	--	--	--	--	--	--	12	--	--
18...	--	--	--	--	--	--	--	11	--	--
19...	--	--	--	--	--	--	--	12	--	--
20...	--	--	--	--	--	--	--	12	--	--
25...	--	--	--	--	--	--	--	10	--	--
AUG 23...	<10	<1	<1	<1.0	25	<6	8	--	7	92
23...	--	--	--	--	--	--	--	7.0	--	--
SEP 26...	--	--	--	--	--	--	--	11	--	--
27...	--	--	--	--	--	--	--	8.9	--	--

YORK RIVER BASIN

01677000 WARE CREEK NEAR TOANO, VA

LOCATION.--Lat 37°26'17", long 76°47'12", New Kent County, Hydrologic Unit 02080107, on left bank at upstream side of bridge on State Highway 600, 0.8 mi upstream from France Swamp, and 4.9 mi north of Toano.

DRAINAGE AREA.--6.29 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1979 to October 1981, March 1982 to current year.

REVISED RECORDS.--WDR VA-83-1: 1981.

GAGE.--Water-stage recorder. Elevation of gage is 10 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records fair except those for periods of backwater from debris, Oct. 14 to Dec. 14 and Jan. 23-26, which are poor.

AVERAGE DISCHARGE.--9 years, 6.23 ft³/s, 13.45 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 260 ft³/s, Sept. 27, 1985, gage height, 2.60 ft, from flood-mark, from rating curve extended above 120 ft³/s; no flow at times September 1980 and July to September 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 91 ft³/s, May 2, gage height, 1.74 ft; minimum, 1.3 ft³/s, Oct. 16, 17; minimum gage height, 0.65 ft, Aug. 9-10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	20	4.0	4.2	2.2	7.6	11	7.7	2.8	2.0	4.8	2.0
2	2.5	6.7	3.5	6.6	2.1	4.9	6.5	48	2.7	2.0	3.9	1.8
3	5.8	3.2	3.6	5.9	2.4	3.7	6.0	17	4.0	1.9	3.5	1.8
4	12	3.9	3.3	5.3	3.4	5.1	5.7	8.8	4.0	2.1	3.3	1.8
5	7.6	5.9	2.5	4.5	3.7	5.6	5.6	9.6	4.5	3.0	3.0	1.8
6	3.4	6.8	2.1	4.6	4.7	6.1	18	16	9.8	13	2.8	1.9
7	2.8	6.2	2.0	5.2	7.0	19	18	11	11	12	2.4	2.4
8	2.5	6.0	4.1	5.4	5.8	9.1	28	8.0	13	5.9	1.9	2.8
9	3.1	6.8	8.3	6.3	3.6	5.6	12	6.7	7.5	3.5	1.6	3.0
10	3.4	7.3	12	8.0	2.7	4.6	7.8	12	5.9	2.6	3.4	3.3
11	3.5	8.0	10	12	2.5	3.8	6.3	10	4.0	2.4	9.2	3.3
12	2.6	7.4	8.3	19	2.5	3.5	5.4	7.1	3.2	2.2	7.6	3.3
13	2.0	6.5	7.2	30	2.5	3.5	5.4	5.8	5.0	2.7	8.6	3.3
14	2.0	4.9	6.3	28	3.3	6.3	5.0	5.2	6.7	15	7.1	3.5
15	1.9	e4.4	3.5	11	3.1	5.6	12	5.2	4.8	9.8	6.0	4.4
16	1.8	e4.1	3.7	9.7	2.7	7.2	15	5.6	5.2	6.5	5.7	5.7
17	1.4	3.8	3.1	6.9	2.8	6.0	8.3	6.3	9.3	12	8.6	5.1
18	1.5	8.5	2.6	5.0	3.2	4.9	6.6	6.5	6.7	7.7	33	4.4
19	1.9	8.9	2.0	4.3	4.3	6.9	6.0	5.6	4.4	4.7	24	5.8
20	2.3	9.2	2.0	4.2	4.4	5.1	5.8	4.8	3.9	3.8	9.0	11
21	3.7	8.2	2.2	3.8	12	6.3	5.2	4.5	12	3.2	5.5	13
22	9.1	6.3	2.6	3.6	20	6.6	4.9	4.2	12	2.7	5.4	8.1
23	4.6	5.2	2.5	e3.5	11	5.3	4.5	4.3	6.8	2.7	4.9	4.5
24	2.5	4.9	2.3	e3.3	6.7	22	4.5	5.4	5.5	6.2	3.9	3.6
25	1.9	5.4	3.1	e3.0	5.2	16	4.3	4.7	6.8	5.7	3.2	3.2
26	2.2	5.1	2.6	e2.8	4.6	8.1	4.7	4.1	5.6	3.6	2.8	20
27	3.0	5.0	2.0	2.4	5.0	6.7	4.7	4.0	3.9	3.1	2.8	12
28	4.0	14	2.2	2.1	7.0	6.0	4.3	3.5	3.1	3.2	2.8	6.1
29	5.9	12	2.2	2.0	---	5.6	5.3	3.0	2.7	3.1	2.8	4.1
30	6.4	4.3	2.2	2.3	---	9.2	11	2.8	2.2	2.5	2.7	3.4
31	7.4	---	2.5	2.7	---	26	---	3.0	---	3.7	2.5	---
TOTAL	116.8	208.9	120.5	217.6	140.4	241.9	247.8	250.4	179.0	154.5	188.7	150.4
MEAN	3.77	6.96	3.89	7.02	5.01	7.80	8.26	8.08	5.97	4.98	6.09	5.01
MAX	12	20	12	30	20	26	28	48	13	15	33	20
MIN	1.4	3.2	2.0	2.0	2.1	3.5	4.3	2.8	2.2	1.9	1.6	1.8
CFSM	.60	1.11	.62	1.12	.80	1.24	1.31	1.28	.95	.79	.97	.80
IN.	.69	1.24	.71	1.29	.83	1.43	1.47	1.48	1.06	.91	1.12	.89

CAL YR 1988 TOTAL 1506.96 MEAN 4.12 MAX 35 MIN .10 CFSM .65 IN. 8.91
WTR YR 1989 TOTAL 2216.9 MEAN 6.07 MAX 48 MIN 1.4 CFSM .97 IN. 13.11

e Estimated.

YORK RIVER BASIN

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01677000 WARE CREEK NEAR TOANO, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1979-81, October 1985 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	ALKA- LINITY LAB (MG/L AS CACO3)
NOV 30...	1035	8.7	120	7.30	9.0	771	8.7	74	31
FEB 10...	1145	2.5	98	7.70	5.0	775	12.2	94	31
MAR 20...	0945	5.2	105	7.50	13.0	779	10.2	95	24
MAY 16...	1030	5.6	155	7.20	19.0	762	8.4	91	30
JUL 20...	1100	3.6	110	8.20	25.0	762	7.8	94	37
AUG 21...	1100	5.2	90	7.50	27.0	769	7.2	90	27

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC TOTAL (MG/L AS C)
NOV 30...	<0.010	<0.100	0.020	0.40	<0.010	0.020	300	50	7.9
FEB 10...	<0.010	<0.100	0.020	0.50	0.040	0.020	280	30	5.1
MAR 20...	0.030	<0.100	0.010	0.40	0.030	<0.010	280	30	6.4
MAY 16...	<0.010	<0.100	0.010	0.50	0.060	0.020	1300	10	6.9
JUL 20...	<0.010	<0.100	0.040	0.90	0.080	<0.010	1600	50	8.6
AUG 21...	<0.010	<0.100	<0.010	0.90	0.080	0.020	670	20	12

SOUTH ATLANTIC SLOPE BASINS

JAMES RIVER BASIN

02011400 JACKSON RIVER NEAR BACOVA, VA

LOCATION.--Lat 38°02'32", long 79°52'54", Bath County, Hydrologic Unit 02080201, on left bank 0.1 mi downstream from ford, 1.8 mi upstream from Back Creek, and 2.2 mi southwest of Bacova.

DRAINAGE AREA.--158 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,639.20 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for periods with ice effect, Dec. 12-20 and Feb. 10-12, which are fair. U.S. Army Corps of Engineers gage-height transmitter at station, receiver at Gathright Dam.

AVERAGE DISCHARGE.--15 years, 169 ft³/s, 14.53 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,000 ft³/s, Nov. 4, 1985, gage height, 22.25 ft, from flood-mark, from rating curve extended above 1,300 ft³/s on basis of slope-area measurements at gage heights 8.88 ft, 11.40 ft, 13.88 ft, and 22.25 ft; minimum, 15 ft³/s, part of each day Aug. 17-19, Sept. 16, 17, 23, 1988; minimum gage height, 2.42 ft, Aug. 18, 19, 1988.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 21, 1972, reached a stage of 11.40 ft, discharge, 4,800 ft³/s, and flood of Dec. 26, 1973, reached a stage of 13.88 ft, discharge, 7,560 ft³/s, from rating curve extended as explained above.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 26	0830	*3,250	*9.77	May 10	0345	1,730	7.71
May 6	0245	2,960	9.42				

Minimum discharge, 16 ft³/s, Oct. 13, 14, gage height, 2.45 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	20	59	80	64	121	236	633	86	121	91	92
2	21	20	52	93	61	108	203	1270	82	110	75	85
3	22	19	47	87	83	102	195	862	80	101	68	78
4	23	19	44	88	124	102	182	590	82	104	63	71
5	21	88	40	72	111	122	167	773	80	124	63	66
6	19	127	38	79	103	526	154	2120	160	108	60	64
7	18	69	36	87	103	654	146	1100	405	233	63	63
8	18	49	35	127	98	428	145	727	383	156	56	61
9	18	39	37	238	86	325	153	714	321	144	51	58
10	18	33	36	200	e75	271	143	1400	295	163	48	55
11	18	30	32	165	e68	229	134	896	225	123	50	54
12	18	27	e30	212	e72	202	127	646	186	117	57	112
13	17	27	e27	290	77	179	122	496	253	258	53	99
14	17	30	e33	243	103	170	116	396	203	226	48	87
15	17	28	e35	605	308	152	119	345	206	153	46	79
16	17	26	e34	531	320	133	118	322	366	138	49	623
17	17	35	e32	362	255	117	106	278	775	138	49	641
18	17	45	e30	276	218	116	100	243	499	130	57	348
19	17	43	e28	225	191	131	98	216	352	113	60	244
20	18	170	e32	185	168	128	93	203	385	105	59	193
21	22	200	47	154	185	305	88	194	351	96	224	167
22	28	128	69	126	237	311	85	174	302	85	489	350
23	26	95	64	112	221	265	82	172	255	78	308	422
24	24	75	105	102	192	570	78	165	273	90	309	299
25	22	63	223	94	168	566	96	144	476	76	313	239
26	21	55	157	88	163	437	2160	131	314	94	230	280
27	20	52	121	84	154	347	1060	123	243	234	190	232
28	19	81	102	77	138	288	750	111	199	138	153	191
29	19	74	89	72	---	250	836	102	169	104	129	170
30	19	63	76	70	---	232	755	97	140	88	120	153
31	18	---	68	68	---	284	---	91	---	93	108	---
TOTAL	610	1830	1858	5292	4146	8171	8847	15734	8146	4041	3739	5676
MEAN	19.7	61.0	59.9	171	148	264	295	508	272	130	121	189
MAX	28	200	223	605	320	654	2160	2120	775	258	489	641
MIN	17	19	27	68	61	102	78	91	80	76	46	54
CFSM	.12	.39	.38	1.08	.94	1.67	1.87	3.21	1.72	.83	.76	1.20
IN.	.14	.43	.44	1.25	.98	1.92	2.08	3.70	1.92	.95	.88	1.34

CAL YR 1988 TOTAL 28066 MEAN 76.7 MAX 1190 MIN 16 CFSM .49 IN. 6.61
WTR YR 1989 TOTAL 68090 MEAN 187 MAX 2160 MIN 17 CFSM 1.18 IN. 16.03

e Estimated.

JAMES RIVER BASIN

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02011400 JACKSON RIVER NEAR BACOVA, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: March 1978 to September 1981, October 1982 to current year.

INSTRUMENTATION.--Water-temperature recorder March 1978 to September 1981, and since October 1982.

REMARKS.--Some record in prior years fragmentary due to instrument malfunction.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum recorded (water years 1978-81, 1983-89), 31.0°C, July 16, 1988; minimum recorded (water years 1978-81, 1984-89), 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 26.5°C, July 22, 24, Aug. 6; minimum, 0.0°C on many days during winter period.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	20.5	17.0	18.5	8.5	6.0	7.0	4.5	3.0	3.5	4.0	3.0	3.5
2	18.5	17.0	18.0	8.0	6.0	7.0	3.5	2.0	2.5	6.0	3.5	4.5
3	18.0	16.5	17.0	8.5	4.5	6.5	4.0	1.0	2.5	5.0	2.5	3.5
4	18.5	15.0	16.5	10.0	6.0	8.0	4.0	2.0	3.5	2.0	.5	1.5
5	15.5	12.5	14.0	11.5	10.0	11.0	2.5	1.0	2.0	1.0	.0	.5
6	14.0	10.5	12.0	10.5	9.0	10.0	3.0	.5	2.0	2.0	.5	1.0
7	12.5	10.0	11.5	8.5	7.0	8.0	3.5	.5	2.0	4.0	2.0	3.0
8	12.5	8.5	10.0	7.5	6.0	7.0	3.5	2.0	3.0	5.5	4.0	4.5
9	11.5	8.0	10.0	8.0	5.0	6.5	3.5	.5	2.0	4.5	3.0	4.0
10	12.0	9.0	10.5	7.5	5.5	6.5	.5	.0	.0	3.5	2.5	3.0
11	12.5	10.0	11.0	9.0	6.0	7.5	.5	.0	.0	4.0	1.5	3.0
12	10.5	7.5	9.5	6.5	3.5	5.0	.0	.0	.0	5.5	3.5	4.5
13	9.5	5.5	7.5	7.0	4.5	6.0	.0	.0	.0	5.5	3.5	5.0
14	10.0	5.0	7.5	7.5	4.5	6.0	.0	.0	.0	3.5	2.0	2.5
15	11.5	6.5	8.5	7.5	4.0	6.0	.0	.0	.0	5.5	2.0	4.0
16	12.5	8.0	10.5	9.5	6.0	8.0	.0	.0	.0	6.0	4.0	5.5
17	13.5	10.0	11.5	9.5	7.0	8.5	.0	.0	.0	4.5	2.5	3.5
18	13.0	11.0	12.0	7.0	4.5	6.0	.0	.0	.0	4.5	2.5	3.5
19	12.5	9.0	11.0	5.5	5.0	5.5	.0	.0	.0	6.0	3.5	4.5
20	11.0	7.5	9.0	7.5	5.0	6.5	.0	.0	.0	4.5	3.0	3.5
21	9.0	7.5	8.0	8.0	5.5	7.0	.0	.0	.0	3.5	1.5	2.5
22	8.5	7.5	8.0	6.5	4.0	5.0	2.0	.0	1.0	3.0	.0	1.5
23	9.5	6.5	8.0	4.5	3.0	4.0	3.0	1.5	2.0	3.5	.0	2.0
24	11.5	8.0	9.5	6.0	4.0	5.0	6.0	3.0	4.5	3.5	1.0	2.5
25	9.5	6.5	8.0	5.0	3.0	4.0	6.5	4.5	5.5	6.0	2.5	4.0
26	9.5	6.5	8.0	5.5	3.0	4.5	4.5	2.5	4.0	6.0	4.5	5.0
27	8.5	4.5	6.5	8.0	5.5	7.5	5.0	3.0	4.0	6.5	4.5	5.5
28	9.0	6.0	7.0	8.0	5.5	7.5	5.5	3.5	4.5	5.5	2.5	4.5
29	8.5	4.5	6.5	6.0	4.0	5.0	3.0	1.5	2.5	5.5	3.0	4.5
30	8.5	5.0	6.5	4.0	3.0	3.5	3.0	2.0	2.5	6.5	5.5	6.0
31	6.5	6.0	6.0	---	---	---	3.5	1.5	2.5	7.5	4.0	6.0
MONTH	20.5	4.5	10.5	11.5	3.0	6.5	6.5	.0	2.0	7.5	.0	3.5

02011400 JACKSON RIVER NEAR BACOVA, VA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	8.0	4.0	6.0	5.5	1.5	3.5	9.5	6.5	8.0	14.5	13.0	13.5
2	9.0	6.0	7.5	5.5	2.0	4.0	10.5	5.5	8.0	13.0	11.5	12.0
3	9.0	7.5	8.5	4.5	3.0	3.5	13.0	8.5	10.5	11.5	9.5	10.5
4	7.5	5.0	6.0	6.5	4.5	5.5	15.0	11.0	12.5	13.0	9.0	11.0
5	5.0	4.0	4.5	8.0	6.0	7.0	13.5	11.0	12.5	12.5	11.5	12.0
6	5.0	3.5	4.0	8.0	5.5	7.0	11.0	9.0	10.0	11.5	10.0	10.5
7	6.0	4.5	5.0	5.5	3.5	4.0	9.0	7.0	8.0	10.0	8.0	9.0
8	4.0	2.0	3.0	4.0	3.0	3.5	7.0	5.0	5.5	11.0	7.5	9.5
9	2.0	.0	.5	7.0	3.0	4.5	8.5	4.5	6.5	10.5	9.0	9.5
10	.5	.0	.0	8.0	4.5	6.0	9.5	5.5	7.5	10.0	9.0	9.5
11	1.5	.0	.5	9.5	5.0	7.0	11.0	5.0	8.0	10.0	9.5	9.5
12	2.5	.0	1.0	10.0	5.5	7.5	11.0	5.0	8.0	9.5	8.5	9.0
13	1.0	.0	.0	7.5	5.5	6.5	10.5	6.0	8.5	11.0	9.0	10.0
14	3.0	.0	1.5	7.5	5.0	6.0	11.5	6.0	9.0	13.5	10.5	11.5
15	7.0	3.0	5.0	10.0	6.0	8.0	10.5	9.5	10.0	13.0	11.5	12.0
16	7.0	5.5	6.5	11.5	7.0	9.5	14.5	9.0	11.5	12.0	11.0	11.5
17	5.5	3.5	4.5	11.5	6.0	9.0	15.5	9.0	12.5	14.5	11.0	12.5
18	4.5	3.0	4.0	11.0	8.0	10.0	16.5	11.0	14.0	18.0	12.5	15.0
19	6.0	2.5	4.0	10.0	7.0	8.5	18.0	13.0	15.5	19.0	13.5	16.0
20	5.5	3.0	4.0	7.5	5.0	5.5	17.0	11.0	14.5	16.5	15.0	15.5
21	8.0	5.0	6.5	6.0	4.5	5.5	15.5	11.0	13.5	19.5	14.0	16.5
22	7.5	6.0	7.0	8.5	4.5	6.0	14.5	10.5	12.5	18.5	14.0	16.5
23	6.0	3.5	5.0	6.0	5.0	5.5	16.0	10.0	13.0	18.5	15.5	17.0
24	4.0	1.5	2.5	6.5	5.0	5.5	15.5	10.0	13.0	20.0	15.0	17.5
25	3.5	.0	1.5	10.5	6.5	8.0	14.0	11.0	13.0	20.5	15.0	18.0
26	3.5	1.0	2.0	12.0	8.0	10.0	13.5	11.0	12.0	20.5	16.5	18.5
27	4.5	2.0	3.0	13.5	9.5	11.5	12.5	11.0	12.0	22.5	18.0	20.0
28	5.0	3.0	4.0	15.5	11.5	13.0	13.5	11.0	12.5	21.5	16.0	19.0
29	---	---	---	14.0	12.0	13.0	12.5	12.0	12.5	20.5	15.0	18.0
30	---	---	---	13.0	11.5	12.5	15.0	12.0	13.5	22.5	17.5	20.0
31	---	---	---	12.5	9.5	11.5	---	---	---	23.5	18.0	21.0
MONTH	9.0	.0	4.0	15.5	1.5	7.5	18.0	4.5	11.0	23.5	7.5	14.0
	JUNE			JULY			AUGUST			SEPTEMBER		
1	24.5	19.5	22.0	23.0	18.0	21.0	24.0	20.5	22.5	22.0	19.0	21.0
2	23.0	20.0	22.0	22.5	19.0	21.0	24.5	21.5	23.0	23.0	19.5	21.5
3	24.0	20.0	21.5	21.5	19.5	21.0	25.5	20.5	23.0	22.0	19.5	20.5
4	24.5	20.5	22.5	21.0	19.5	20.0	26.0	22.0	24.0	19.5	17.0	18.5
5	22.0	20.0	21.0	20.0	19.0	19.5	26.0	23.0	24.5	18.5	17.5	18.0
6	22.0	19.0	20.5	22.0	18.5	20.5	26.5	23.0	24.5	19.0	17.5	18.0
7	20.0	16.0	17.5	22.0	19.5	21.0	24.5	22.0	23.5	19.5	18.0	18.5
8	18.5	15.5	17.0	24.0	19.5	21.5	22.5	19.5	21.0	22.0	18.5	20.0
9	18.5	17.0	18.0	22.5	19.0	21.0	22.0	17.5	19.5	23.5	20.5	22.0
10	19.5	16.0	17.5	24.0	19.0	21.0	21.5	18.0	20.0	24.5	21.0	22.5
11	20.5	16.0	18.0	25.5	20.0	22.5	20.0	18.5	19.5	24.5	22.0	23.0
12	19.0	16.5	17.5	25.0	22.0	23.5	20.5	18.0	19.0	23.0	21.0	22.0
13	18.0	16.5	17.0	23.0	20.0	21.5	23.0	18.5	20.5	21.5	20.5	21.0
14	20.0	16.5	18.0	22.0	18.5	20.0	23.5	20.0	22.0	22.0	20.0	21.0
15	20.0	17.5	18.5	20.5	18.0	19.5	23.0	21.0	22.0	22.0	20.0	21.0
16	18.0	16.5	17.5	20.0	18.5	19.0	24.5	20.5	22.5	21.0	17.0	19.0
17	17.0	15.0	16.5	21.0	18.0	19.5	24.0	21.5	22.5	17.0	15.5	16.5
18	16.5	14.5	15.5	22.0	18.0	20.0	21.5	19.0	20.5	16.5	15.0	16.0
19	18.0	15.0	16.5	22.5	19.0	20.5	22.0	18.5	20.0	17.0	15.0	16.0
20	18.0	17.0	17.0	24.5	20.0	22.0	23.0	19.0	21.0	18.0	16.0	17.0
21	18.0	17.0	17.5	25.5	21.5	23.5	22.0	19.0	21.0	19.5	17.0	18.0
22	19.5	17.0	18.0	26.5	22.0	24.5	19.5	18.0	18.5	19.5	18.0	18.5
23	20.0	17.5	18.5	25.5	23.0	24.5	20.5	19.0	19.5	17.5	14.5	17.0
24	20.5	18.0	19.0	26.5	22.0	24.0	20.5	19.0	19.5	14.0	12.0	13.0
25	20.5	18.0	19.5	25.0	23.0	24.0	19.5	17.5	19.0	13.0	11.5	12.5
26	21.0	18.5	19.5	25.0	22.5	23.5	19.5	17.0	18.0	15.5	12.0	13.5
27	23.0	18.5	20.5	23.0	20.0	21.5	22.5	18.5	20.0	15.5	12.5	13.5
28	20.5	19.5	20.0	23.0	19.0	20.5	23.5	19.5	21.5	14.5	11.0	12.5
29	23.0	18.0	20.0	24.0	19.0	21.5	22.5	19.5	21.0	15.5	12.0	13.5
30	23.5	18.0	20.5	23.0	20.5	22.0	24.0	20.0	21.5	15.0	14.0	14.5
31	---	---	---	23.0	20.5	22.0	23.5	19.0	21.5	---	---	---
MONTH	24.5	14.5	19.0	26.5	18.0	21.5	26.5	17.0	21.0	24.5	11.0	18.0
YEAR	26.5	.0	11.5									

02011460 BACK CREEK NEAR SUNRISE, VA

LOCATION.--Lat 38°14'43", long 79°46'08", Bath County, Hydrologic Unit 02080201, on right bank 900 ft upstream from bridge on State Highway 600, 0.8 mi upstream from Gap Run, and 4.8 mi northeast of Sunrise.

DRAINAGE AREA.--60.1 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1974 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,200.02 ft above National Geodetic Vertical Datum of 1929 (levels by Virginia Department of Transportation).

REMARKS.--Records good except those for period of doubtful or no gage-height record, Nov. 29, 30, and periods with ice effect, Dec. 10-15, 18, 19, and Feb. 10-12, which are fair. Virginia Power gage-height transmitter at station, receiver at Back Creek Dam.

AVERAGE DISCHARGE.--15 years, 91.3 ft³/s, 20.63 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,500 ft³/s, Nov. 4, 1985, gage height, 10.01 ft, from rating curve extended above 3,800 ft³/s; minimum, 1.5 ft³/s, Sept. 13, 14, 1980; minimum gage height, 0.07 ft, July 21, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 850 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	1315	948	3.87	May 5	2400	1,740	4.73
Apr. 26	0645	*3,130	*5.73	Aug. 21	1930	1,080	4.04

Minimum discharge, 6.9 ft³/s, Oct. 14, gage height, 0.68 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	11	48	54	36	63	147	243	30	38	20	41
2	13	11	41	56	34	55	128	574	28	33	17	37
3	13	11	36	69	43	53	122	337	27	30	15	32
4	12	11	33	71	105	53	114	203	26	28	13	27
5	11	61	29	66	113	86	106	467	34	33	14	24
6	9.5	125	27	60	98	600	98	1080	56	35	16	23
7	9.2	76	25	61	87	429	94	417	190	89	16	22
8	8.8	51	24	184	77	225	87	254	159	56	13	21
9	8.6	37	24	262	69	165	87	244	146	41	11	19
10	8.3	29	e19	166	e50	135	92	643	135	57	10	17
11	8.1	25	e16	126	e43	115	94	342	109	45	11	23
12	7.8	21	e14	147	e45	101	94	215	92	35	14	58
13	7.7	21	e13	251	48	87	90	166	141	134	13	39
14	7.2	23	e15	189	110	81	84	139	114	105	11	32
15	7.5	22	e17	335	262	73	81	123	137	73	11	29
16	7.5	22	17	313	267	65	77	113	230	59	17	142
17	7.4	36	15	200	201	57	69	104	404	71	16	190
18	7.5	46	e14	149	158	57	65	95	253	67	14	123
19	7.6	47	e13	121	130	65	64	88	160	55	15	90
20	8.0	232	15	99	110	64	58	84	142	48	16	72
21	10	220	23	82	112	143	54	79	123	39	450	62
22	14	130	52	68	137	181	51	71	109	37	429	91
23	16	92	71	62	145	153	49	69	106	32	291	218
24	15	70	105	55	128	280	45	65	121	29	282	163
25	16	53	223	49	109	357	58	57	102	28	177	122
26	16	43	152	45	102	232	1670	52	83	25	133	130
27	15	40	113	43	90	171	425	49	69	26	104	118
28	14	50	92	39	76	141	228	42	64	24	81	103
29	13	e65	73	36	---	123	250	37	53	21	66	88
30	13	e55	60	38	---	119	315	34	44	19	63	74
31	12	---	52	39	---	157	---	32	---	21	51	---
TOTAL	337.7	1736	1471	3535	2985	4686	4996	6518	3487	1433	2410	2230
MEAN	10.9	57.9	47.5	114	107	151	167	210	116	46.2	77.7	74.3
MAX	16	232	223	335	267	600	1670	1080	404	134	450	218
MIN	7.2	11	13	36	34	53	45	32	26	19	10	17
CFSM	.18	.96	.79	1.90	1.77	2.52	2.77	3.50	1.93	.77	1.29	1.24
IN.	.21	1.07	.91	2.19	1.85	2.90	3.09	4.03	2.16	.89	1.49	1.38

CAL YR 1988 TOTAL 16574.2 MEAN 45.3 MAX 806 MIN 3.1 CFSM .75 IN. 10.26
WTR YR 1989 TOTAL 35824.7 MEAN 98.1 MAX 1670 MIN 7.2 CFSM 1.63 IN. 22.17

e Estimated.

JAMES RIVER BASIN

02011460 BACK CREEK NEAR SUNRISE, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1984 to current year.

INSTRUMENTATION.--Water-temperature recorder since October 1984.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 27.0°C, July 22, 1987, July 15-17, 1988; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 25.0°C, Aug. 4, 5; minimum, 0.0°C on many days during winter period.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	19.0	15.0	16.5	8.5	5.5	7.0	4.5	3.0	3.5	3.0	2.0	2.5
2	17.0	16.0	16.5	6.5	5.0	6.0	4.0	2.0	3.0	4.5	2.5	3.5
3	16.5	15.0	15.5	7.5	4.0	5.5	5.0	2.0	3.5	3.0	1.5	2.5
4	17.0	13.5	15.0	9.0	5.5	7.5	4.5	2.0	3.5	1.0	.0	.5
5	14.5	11.0	12.5	11.0	9.0	10.0	3.5	1.5	2.0	1.0	.0	.5
6	13.5	9.0	11.0	9.0	7.0	8.0	4.5	1.0	2.5	2.0	.0	1.0
7	11.0	9.0	10.0	7.0	6.0	6.5	4.5	1.0	2.5	3.5	2.0	3.0
8	11.0	7.0	9.0	8.0	5.0	6.0	4.5	3.0	3.5	4.5	2.5	3.5
9	11.0	7.0	9.0	8.5	5.0	6.5	3.5	1.0	2.5	3.0	2.5	2.5
10	10.5	7.5	9.0	8.0	5.5	6.5	1.5	.0	.5	3.0	2.0	2.5
11	11.5	9.0	10.0	8.0	5.5	7.0	1.0	.0	.5	3.5	1.0	2.5
12	9.5	7.5	8.5	6.0	3.5	5.0	.0	.0	.0	5.0	3.5	4.0
13	9.5	5.5	7.5	8.5	4.5	6.0	.0	.0	.0	5.0	2.5	4.0
14	9.5	4.5	7.0	8.0	4.0	6.0	.5	.0	.0	2.5	1.0	2.0
15	11.0	6.0	8.0	8.0	4.0	5.5	1.0	.0	.5	5.5	2.5	4.0
16	11.5	7.5	9.5	9.0	5.5	7.5	1.0	.0	.5	5.0	3.0	4.5
17	13.0	8.5	10.5	8.5	5.5	7.5	.5	.0	.0	4.0	2.0	3.0
18	13.0	10.0	11.0	6.5	4.0	5.0	.0	.0	.0	4.5	1.5	3.0
19	11.5	8.5	10.0	5.5	5.0	5.0	1.0	.0	.0	5.0	3.0	4.0
20	10.5	7.0	8.5	8.0	5.0	6.5	1.5	.0	.5	3.5	1.5	2.5
21	8.0	6.5	7.5	7.5	5.0	6.5	2.5	1.0	1.5	2.5	.0	1.5
22	8.0	7.0	7.0	6.0	3.5	5.0	2.5	.0	1.5	3.0	.0	1.0
23	9.0	6.0	7.5	6.0	3.0	4.5	3.5	2.0	2.5	4.0	.0	2.0
24	10.0	7.5	8.5	5.5	3.0	4.5	5.0	3.0	4.0	3.5	.5	2.0
25	8.0	6.0	7.0	5.5	3.0	4.0	5.0	3.0	4.0	6.0	2.5	4.0
26	9.0	6.0	7.0	6.5	3.0	5.0	4.0	2.0	3.0	5.5	3.5	4.5
27	8.5	4.0	6.0	8.5	6.5	7.5	4.5	3.0	3.5	5.5	3.0	4.0
28	8.5	5.5	7.0	8.0	4.5	6.5	5.0	2.5	3.5	5.0	1.5	3.0
29	8.0	4.5	6.5	5.0	3.0	4.0	2.5	.5	2.0	5.5	2.0	3.5
30	7.5	4.5	6.0	4.5	2.5	3.5	2.5	1.5	2.0	6.0	4.0	5.0
31	6.0	4.5	5.5	---	---	---	3.5	1.5	2.5	6.5	3.0	4.5
MONTH	19.0	4.0	9.5	11.0	2.5	6.0	5.0	.0	2.0	6.5	.0	3.0

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	7.0	2.5	4.5	4.5	.5	2.5	6.5	4.5	5.5	12.0	10.5	11.5
2	8.0	4.5	6.0	4.0	.5	2.5	9.5	4.0	6.5	11.0	9.0	10.0
3	8.5	6.5	7.5	3.5	1.5	2.5	11.0	6.5	8.5	10.5	7.5	9.0
4	6.0	3.0	4.5	5.0	3.0	4.0	12.5	8.5	10.5	13.5	7.0	10.0
5	3.0	2.5	2.5	6.5	4.5	5.0	10.5	8.0	9.5	10.5	9.0	10.0
6	4.5	2.5	3.5	6.0	4.0	5.0	8.5	6.0	7.5	10.0	7.5	9.0
7	5.0	2.5	4.0	4.0	3.0	3.5	6.5	4.5	5.5	9.0	7.0	7.5
8	3.0	1.0	2.0	3.5	2.0	2.5	5.0	4.0	4.0	9.5	6.5	8.0
9	.5	.0	.0	6.5	2.0	4.0	8.5	4.0	5.5	8.0	7.0	7.5
10	.5	.0	.0	7.5	2.0	4.5	7.5	4.0	5.5	8.5	8.0	8.0
11	1.5	.0	.5	8.0	3.0	5.5	9.5	3.0	6.0	8.5	7.5	8.0
12	3.0	.0	1.0	8.5	4.0	6.0	9.0	3.5	6.0	9.0	7.0	8.0
13	.0	.0	.0	5.5	4.0	4.5	8.5	4.0	6.0	10.0	7.5	8.5
14	4.0	.0	1.5	6.5	3.5	5.0	9.5	4.0	7.0	12.5	8.0	10.0
15	5.5	2.5	4.0	8.5	5.0	6.5	8.0	7.0	7.5	11.5	9.0	10.0
16	5.0	3.0	4.5	9.5	4.5	7.0	12.5	6.5	9.0	10.0	9.0	9.5
17	3.5	2.0	3.0	10.5	3.5	7.0	13.0	6.0	9.5	14.5	9.0	11.5
18	4.0	2.0	3.0	9.0	6.0	7.5	14.0	8.5	11.0	17.0	9.5	13.0
19	5.0	1.5	3.0	8.5	4.0	6.0	15.5	10.5	12.5	16.5	11.0	13.5
20	4.5	2.0	3.5	5.5	3.5	4.0	14.5	7.5	11.0	14.0	12.0	13.0
21	7.0	4.5	5.5	5.0	3.5	4.5	13.5	8.0	10.5	18.5	12.0	14.5
22	6.5	4.0	5.0	7.5	2.5	4.5	12.0	8.0	10.0	17.0	11.0	14.0
23	4.0	1.5	3.0	4.5	3.0	4.0	14.0	6.5	10.0	17.0	13.0	15.0
24	3.5	.0	1.5	6.0	3.5	4.5	13.5	7.0	10.0	18.0	12.5	15.0
25	3.5	.0	1.0	10.0	5.0	7.0	11.5	8.0	10.0	18.0	12.0	15.0
26	2.0	.5	1.5	11.0	5.0	8.0	10.5	8.5	9.5	19.5	14.0	16.5
27	3.0	1.0	2.0	12.0	6.0	9.0	11.0	8.5	9.5	21.0	15.5	17.5
28	3.5	2.0	2.5	12.5	7.5	10.0	12.5	9.0	10.5	20.0	13.0	16.0
29	---	---	---	11.5	8.5	10.0	11.5	9.5	10.5	19.0	12.5	15.5
30	---	---	---	11.5	9.0	10.0	15.0	9.5	12.0	21.5	14.5	17.5
31	---	---	---	10.0	6.5	9.0	---	---	---	22.0	15.0	18.0
MONTH	8.5	.0	3.0	12.5	.5	5.5	15.5	3.0	8.5	22.0	6.5	12.0
	JUNE			JULY			AUGUST			SEPTEMBER		
1	22.5	16.0	19.0	22.0	16.0	19.0	24.5	19.5	21.5	19.5	16.5	18.0
2	21.5	17.0	19.0	21.5	16.5	19.0	23.5	19.5	21.0	21.5	17.0	19.0
3	23.0	16.5	19.5	20.5	17.0	19.0	24.5	18.0	21.0	18.5	16.5	17.5
4	22.0	18.0	19.5	19.0	17.5	18.5	25.0	19.5	22.0	17.5	14.0	16.0
5	20.0	16.5	18.0	18.5	17.0	18.0	25.0	20.5	22.5	17.5	15.5	16.5
6	19.0	16.0	17.5	20.5	17.5	18.5	24.0	20.0	22.0	18.0	16.0	17.0
7	17.0	14.0	15.0	21.5	16.5	19.0	22.5	19.5	20.5	18.5	16.5	17.5
8	18.5	13.5	15.5	23.0	17.0	19.5	21.5	16.5	18.5	21.0	17.0	19.0
9	16.5	14.5	15.5	20.5	16.5	18.5	21.0	14.5	17.5	23.0	17.5	20.0
10	18.5	13.5	16.0	23.0	17.0	19.5	21.0	15.5	18.0	23.5	18.0	20.5
11	19.0	12.5	15.5	24.5	19.0	21.5	18.5	17.0	17.5	22.0	19.0	20.5
12	16.5	13.5	15.0	23.5	19.5	21.5	19.5	16.0	17.5	20.0	18.0	18.5
13	15.0	13.5	14.5	21.5	17.0	18.5	21.5	16.5	19.0	18.5	17.5	18.0
14	17.0	13.5	15.0	20.0	15.5	17.5	23.5	18.0	20.0	20.0	17.0	18.5
15	16.5	14.5	15.5	18.5	15.0	17.0	21.0	18.5	19.5	20.0	17.5	18.5
16	14.5	13.5	14.0	17.5	16.5	16.5	22.5	18.0	20.0	18.0	15.5	17.0
17	15.0	12.5	13.5	18.5	16.0	17.5	21.5	18.5	20.0	16.5	14.5	15.5
18	15.0	11.5	13.0	21.0	16.5	18.5	19.0	17.5	18.5	15.0	13.5	14.5
19	16.5	12.5	14.5	21.0	17.5	19.0	22.0	17.0	19.0	16.5	14.0	15.0
20	17.0	14.0	15.5	23.0	18.0	20.0	22.5	17.5	19.5	16.5	15.0	15.5
21	17.5	14.5	15.5	24.0	18.5	21.0	19.5	15.5	17.5	19.5	15.5	17.0
22	18.5	15.0	17.0	24.5	19.0	21.5	17.5	15.0	16.0	17.5	16.5	17.0
23	18.0	15.5	17.0	22.0	19.5	20.5	18.0	15.5	16.5	16.0	12.0	15.0
24	19.5	15.0	17.0	24.0	18.5	21.0	18.5	15.5	16.5	14.0	10.0	12.0
25	20.0	15.5	17.5	23.0	19.5	21.0	16.5	16.0	16.0	12.0	10.5	11.5
26	21.5	16.0	18.5	23.5	19.5	21.5	19.0	15.5	17.0	14.5	12.0	13.0
27	22.5	16.0	19.0	22.5	20.0	21.0	20.5	16.5	18.5	14.0	10.5	12.0
28	20.0	17.5	18.5	23.0	18.5	20.5	20.5	16.5	18.5	13.0	9.0	11.5
29	22.5	16.0	18.5	24.0	18.0	20.5	20.0	17.0	18.5	14.5	11.0	12.5
30	22.0	15.5	18.5	22.0	19.5	20.5	22.0	17.5	19.5	13.5	12.5	13.0
31	---	---	---	23.0	19.0	20.5	21.5	16.0	18.5	---	---	---
MONTH	23.0	11.5	16.5	24.5	15.0	19.5	25.0	14.5	19.0	23.5	9.0	16.0
YEAR	25.0	.0	10.0									

JAMES RIVER BASIN

02011470 BACK CREEK AT SUNRISE, VA

LOCATION.--Lat 38°11'25", long 79°48'43", Bath County, Hydrologic Unit 02080201, on left bank 75 ft upstream from bridge on State Highway 600 at Sunrise, 180 ft upstream from Beaver Run, 0.5 mi downstream from Back Creek Dam, and 7.6 mi northeast of Mountain Grove.

DRAINAGE AREA.--76.1 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1984 to current year.

GAGE.--Water-stage recorder. Concrete control since Oct. 24, 1984. Datum of gage is 1,968.52 ft above National Geodetic Vertical Datum of 1929 (Virginia Power bench mark).

REMARKS.--Records good except those for periods of doubtful or no gage-height record, July 16-22, 25, 26, which are fair. Flow regulated since October 1984 by Back Creek Lake 0.5 mi upstream, amount unknown. Virginia Power gage-height transmitter at station, receiver at Back Creek Dam.

AVERAGE DISCHARGE.--5 years, 98.7 ft³/s, 17.61 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,100 ft³/s, Nov. 5, 1985, gage height, 11.37 ft, from rating curve extended above 960 ft³/s on basis of release from Back Creek Lake at peak flow; minimum daily, 5.2 ft³/s, Nov. 3, 1984.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,980 ft³/s, Apr. 26, gage height, 9.98 ft, from rating curve extended as explained above; minimum, 10 ft³/s, Apr. 4, gage height, 3.89 ft; minimum daily, 12 ft³/s, Aug. 9, 10, 12-14, 17, 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	14	69	39	44	73	202	644	29	51	18	39
2	14	14	71	48	43	42	196	1260	29	51	17	38
3	14	14	73	50	56	33	115	974	29	35	16	27
4	14	14	57	61	66	54	72	349	28	30	17	20
5	14	18	22	68	84	72	198	538	30	30	17	20
6	14	16	14	71	89	900	199	1920	85	30	17	20
7	14	15	14	75	90	918	210	1010	431	96	17	20
8	14	15	14	124	92	240	94	561	328	45	17	17
9	14	14	14	227	96	177	86	477	652	42	12	14
10	14	14	14	300	99	226	68	1300	206	52	12	14
11	14	14	14	265	99	221	88	811	196	60	13	15
12	14	14	14	284	91	143	130	417	150	60	12	30
13	14	14	14	295	35	118	129	300	169	230	12	37
14	14	14	14	302	86	130	101	233	162	142	12	38
15	14	14	14	487	311	52	87	196	201	139	15	39
16	14	14	14	705	530	21	70	171	682	e120	14	159
17	14	16	14	356	371	21	59	178	989	e70	12	240
18	14	15	14	231	200	28	66	165	494	e45	12	198
19	14	16	14	175	190	49	63	90	203	e35	13	135
20	14	25	14	121	188	60	61	67	188	e30	13	133
21	15	21	16	107	195	121	61	79	217	e28	724	61
22	14	17	25	107	96	260	62	82	239	e27	705	167
23	14	15	68	43	180	333	39	85	213	38	204	226
24	14	15	96	34	192	596	20	82	159	36	321	209
25	14	14	248	34	182	688	40	81	146	e25	178	171
26	14	23	263	35	175	488	2490	63	125	e27	104	172
27	14	38	197	36	105	202	820	56	85	32	63	78
28	14	53	197	39	99	197	632	53	73	19	47	125
29	14	71	144	42	---	163	488	52	62	19	39	103
30	14	70	80	43	---	117	729	41	50	18	41	93
31	14	---	36	45	---	162	---	29	---	18	40	---
TOTAL	435	641	1872	4849	4084	6905	7675	12364	6650	1680	2754	2658
MEAN	14.0	21.4	60.4	156	146	223	256	399	222	54.2	88.8	88.6
MAX	15	71	263	705	530	918	2490	1920	989	230	724	240
MIN	14	14	14	34	35	21	20	29	28	18	12	14

CAL YR 1988 TOTAL 20233 MEAN 55.3 MAX 1370 MIN 13
WTR YR 1989 TOTAL 52567 MEAN 144 MAX 2490 MIN 12

e Estimated.

JAMES RIVER BASIN

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02011470 BACK CREEK AT SUNRISE, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1984 to current year.

INSTRUMENTATION.--Water-temperature recorder since October 1984.

REMARKS.--Interruption in the record was due to malfunction of the instrument.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum recorded, 27.5°C, Aug. 10, 1985; minimum, 0.0°C, Jan. 20, 21, 1985.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 27.0°C, Aug. 1, 4; minimum, 1.5°C, Feb. 13.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	21.5	18.5	19.5	15.0	12.0	13.0	10.5	9.5	10.0	6.5	6.0	6.5
2	19.5	18.5	19.0	13.0	11.5	12.0	10.0	9.5	10.0	7.0	6.0	6.5
3	19.5	18.5	19.0	15.0	11.0	12.5	10.5	9.5	9.5	6.5	5.0	6.0
4	21.0	17.5	19.0	15.5	12.0	13.5	10.0	8.5	9.5	6.0	5.5	5.5
5	---	---	---	14.0	11.0	13.0	9.0	7.5	8.5	6.5	5.5	5.5
6	---	---	---	13.0	11.0	11.5	10.0	7.0	8.0	6.0	5.5	6.0
7	---	---	---	12.0	10.5	11.0	9.5	7.0	8.0	6.5	6.0	6.0
8	---	---	---	13.5	11.0	11.5	9.5	8.0	8.5	6.0	5.0	6.0
9	---	---	---	14.5	11.0	12.0	8.5	6.5	7.5	5.5	5.0	5.5
10	---	---	---	13.0	11.0	12.0	8.0	6.0	7.0	6.0	5.5	5.5
11	---	---	---	13.5	10.5	12.0	8.0	5.5	6.5	6.0	5.5	5.5
12	---	---	---	13.0	10.0	11.0	7.5	5.0	6.0	6.0	5.5	5.5
13	---	---	---	13.5	10.5	12.0	6.5	5.5	6.0	6.0	5.5	5.5
14	---	---	---	14.5	10.5	12.0	8.0	6.0	6.5	5.5	5.0	5.5
15	---	---	---	14.5	10.5	11.5	8.0	6.5	7.0	6.0	5.0	5.5
16	---	---	---	13.5	11.0	12.0	8.0	6.0	6.5	5.5	5.5	5.5
17	---	---	---	12.5	9.5	11.0	7.0	5.0	6.0	5.5	5.0	5.5
18	---	---	---	12.0	9.0	10.5	7.0	5.0	5.5	5.5	5.0	5.5
19	---	---	---	10.5	9.5	10.0	8.5	5.0	6.5	6.0	5.0	5.5
20	---	---	---	9.5	8.0	8.5	8.0	5.5	6.5	6.0	5.0	5.0
21	---	---	---	9.5	8.0	8.5	7.0	6.0	6.5	5.5	4.5	5.0
22	---	---	---	10.5	7.5	9.0	7.5	5.0	6.5	5.5	5.0	5.0
23	---	---	---	11.0	8.0	9.5	7.0	6.5	7.0	6.5	4.0	5.0
24	---	---	---	11.5	9.0	9.5	7.5	6.5	7.0	6.0	4.5	5.0
25	---	---	---	11.0	8.5	9.5	7.0	6.0	6.5	7.0	5.0	5.5
26	---	---	---	11.5	8.5	10.0	7.0	6.0	6.5	6.0	5.5	5.5
27	15.5	11.5	13.0	11.0	10.5	11.0	7.0	6.5	6.5	6.5	5.0	5.5
28	14.5	12.0	13.0	10.5	10.0	10.5	7.0	6.5	6.5	6.5	5.0	5.5
29	15.5	11.5	13.0	11.0	10.0	10.5	7.0	6.0	6.5	6.5	5.0	5.5
30	15.5	11.5	13.0	10.5	10.0	10.0	7.0	6.5	6.5	6.5	5.5	6.0
31	13.0	11.5	12.0	---	---	---	7.5	6.0	6.5	7.0	5.0	5.5
MONTH	21.5	11.5	15.5	15.5	7.5	11.0	10.5	5.0	7.0	7.0	4.0	5.5

JAMES RIVER BASIN

02011470 BACK CREEK AT SUNRISE, VA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	7.0	5.0	6.0	6.0	4.0	4.5	7.0	6.5	7.0	10.0	10.0	10.0
2	7.5	5.5	6.5	6.5	4.0	4.5	7.5	6.5	7.0	10.0	10.0	10.0
3	7.5	6.0	6.5	5.5	4.0	5.0	8.5	7.0	7.5	10.0	10.0	10.0
4	6.0	5.5	5.5	5.5	5.0	5.0	13.5	7.5	9.5	10.5	10.0	10.0
5	5.5	5.5	5.5	6.0	5.0	5.5	8.0	7.5	7.5	10.5	10.0	10.0
6	6.0	5.5	5.5	6.5	5.0	5.0	8.0	7.5	7.5	10.5	10.0	10.0
7	6.5	5.0	5.5	5.0	4.5	5.0	7.5	7.0	7.5	10.0	9.0	10.0
8	6.0	4.5	5.0	5.0	4.0	4.5	7.0	6.5	7.0	10.0	9.5	10.0
9	5.0	4.0	4.5	5.5	4.0	4.5	8.5	6.5	7.0	10.0	9.5	10.0
10	5.5	4.0	4.5	5.5	4.5	5.0	8.0	6.5	7.0	10.0	10.0	10.0
11	5.5	4.0	4.5	5.5	4.5	5.0	8.5	6.0	7.5	10.0	10.0	10.0
12	5.5	4.0	4.5	6.5	4.5	5.5	8.0	6.5	7.5	10.0	9.5	10.0
13	4.0	1.5	3.5	5.0	5.0	5.0	8.5	6.5	7.5	10.0	9.5	10.0
14	5.5	3.5	4.5	6.0	5.0	5.5	8.5	6.5	7.5	10.0	9.5	10.0
15	5.5	4.5	5.0	9.5	5.0	6.5	8.0	7.5	8.0	10.0	9.5	10.0
16	5.0	5.0	5.0	10.0	5.0	7.0	9.5	7.5	8.0	10.0	9.5	10.0
17	5.0	5.0	5.0	11.0	4.5	7.0	9.5	7.5	8.5	10.5	10.0	10.0
18	5.0	4.5	5.0	10.0	6.0	7.0	10.0	8.0	9.0	10.5	10.0	10.5
19	5.5	4.5	5.0	7.5	5.0	6.0	11.0	8.5	9.5	10.5	10.0	10.5
20	5.5	4.5	5.0	5.5	5.0	5.5	11.0	8.0	9.0	10.5	10.5	10.5
21	5.5	5.0	5.5	5.5	5.0	5.5	10.5	8.0	9.0	11.0	10.5	10.5
22	5.5	5.0	5.5	6.0	5.0	5.5	11.0	8.5	9.0	11.0	10.5	10.5
23	5.5	4.5	5.0	5.5	5.5	5.5	14.5	8.0	10.0	11.0	10.5	11.0
24	5.5	4.0	4.5	5.5	5.5	5.5	13.5	7.5	10.0	11.0	10.5	11.0
25	5.0	4.0	4.5	6.0	5.5	5.5	12.0	8.0	10.0	11.0	11.0	11.0
26	4.5	4.0	4.5	6.5	5.5	6.0	9.5	9.0	9.0	13.0	11.0	12.0
27	5.0	4.0	4.5	7.0	6.0	6.5	9.5	9.0	9.5	13.0	12.0	12.5
28	5.0	4.0	4.5	7.5	6.5	7.0	10.0	9.5	9.5	13.5	12.0	12.5
29	---	---	---	8.0	7.0	7.0	10.0	9.5	9.5	13.5	12.0	12.5
30	---	---	---	8.5	7.0	7.5	10.0	9.5	10.0	15.5	12.5	13.5
31	---	---	---	7.5	7.0	7.5	---	---	---	16.0	12.5	14.0
MONTH	7.5	1.5	5.0	11.0	4.0	5.5	14.5	6.0	8.5	16.0	9.0	10.5
	JUNE			JULY			AUGUST			SEPTEMBER		
1	16.5	13.0	14.5	21.0	19.5	20.5	27.0	20.5	23.0	24.0	22.5	23.5
2	16.0	13.0	14.5	21.0	19.5	20.5	25.5	21.0	22.5	24.5	23.0	23.5
3	17.0	13.5	15.0	22.0	20.0	20.5	26.5	20.5	23.0	23.0	20.0	22.0
4	16.5	14.0	15.0	21.0	19.5	20.0	27.0	21.5	23.5	22.0	18.5	20.0
5	16.0	13.5	14.5	21.0	19.5	20.0	26.0	21.5	23.5	22.0	20.0	20.5
6	14.5	12.5	13.0	22.0	19.5	20.5	26.5	21.5	23.5	22.0	20.5	21.0
7	15.0	13.0	14.5	20.5	18.0	19.0	25.0	21.0	23.0	22.5	20.0	21.0
8	15.5	14.0	15.0	22.0	20.0	21.0	25.0	20.0	22.0	23.0	20.5	21.5
9	16.0	15.5	15.5	22.0	20.0	21.0	24.5	19.0	21.5	25.5	20.0	22.0
10	16.0	15.0	15.5	22.0	20.0	21.0	24.0	16.5	20.0	24.0	20.5	22.0
11	16.5	15.5	16.0	22.0	18.5	20.5	19.5	18.0	19.0	25.0	20.5	22.5
12	16.5	15.0	16.0	22.0	18.5	20.0	22.5	18.0	20.0	23.5	20.5	22.0
13	18.0	15.5	16.5	21.5	19.5	21.5	25.5	18.0	21.0	23.0	22.0	22.5
14	17.5	16.0	17.0	19.5	18.5	19.0	24.5	19.0	21.5	24.0	22.0	22.5
15	18.5	16.5	17.5	19.0	18.5	19.0	23.0	19.0	20.5	23.5	22.0	22.5
16	18.5	18.0	18.0	19.0	19.0	19.0	24.5	18.5	21.0	22.5	22.0	22.5
17	18.5	18.0	18.5	19.5	19.0	19.0	24.0	18.5	21.0	22.5	20.5	21.5
18	18.5	18.0	18.5	22.5	19.0	21.5	20.0	18.5	19.5	22.0	20.0	21.5
19	18.5	17.0	18.0	22.5	21.5	22.0	24.0	18.5	20.5	22.0	21.0	21.5
20	18.5	16.5	18.0	23.5	21.5	22.0	24.0	18.5	21.0	22.0	21.5	21.5
21	19.0	18.5	18.5	23.5	21.5	22.5	22.5	18.5	20.5	22.5	21.0	21.5
22	19.0	18.5	19.0	24.0	21.5	22.5	23.0	20.5	22.0	21.5	21.0	21.5
23	19.0	18.5	19.0	24.0	21.5	22.5	23.0	21.5	22.5	21.5	20.5	21.0
24	19.5	18.0	19.0	24.5	21.5	22.5	22.5	22.0	22.5	20.5	18.0	19.5
25	19.0	17.5	18.0	24.5	21.5	22.5	22.5	22.0	22.5	20.0	19.0	20.0
26	18.5	17.5	17.5	24.5	22.0	23.0	23.0	22.0	22.5	20.0	18.5	19.5
27	18.5	17.5	18.0	23.5	21.0	22.5	23.5	22.0	22.5	20.0	12.5	17.5
28	20.0	17.5	18.5	24.0	19.5	21.5	23.5	22.5	23.0	20.0	19.0	19.5
29	20.5	19.5	20.0	25.5	19.0	21.5	24.0	22.5	23.0	20.0	19.0	19.5
30	21.5	19.0	20.0	24.5	20.5	21.5	24.0	22.5	23.0	19.5	19.0	19.0
31	---	---	---	24.5	20.5	22.0	24.5	22.5	23.5	---	---	---
MONTH	21.5	12.5	17.0	25.5	18.0	21.0	27.0	16.5	22.0	25.5	12.5	21.0
YEAR	27.0	1.5	12.5									

02011490 LITTLE BACK CREEK NEAR SUNRISE, VA

LOCATION.--Lat 38°12'52", long 79°50'16", Bath County, Hydrologic Unit 02080201, in George Washington National Forest, on right bank 600 ft downstream from Long Spring Run, 1.2 mi downstream from Little Back Creek Dam, and 8.5 mi northeast of Mountain Grove.

DRAINAGE AREA.--4.91 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1984 to current year.

GAGE.--Water-stage recorder. Concrete control with rectangular weir plate. Datum of gage is 2,638.48 ft above National Geodetic Vertical Datum of 1929 (Virginia Power bench mark).

REMARKS.--Records good except for period of doubtful or no gage-height record, May 18-23, which is fair. Flow regulated since January 1985 by Little Back Creek Lake 1.2 mi upstream, amount unknown.

AVERAGE DISCHARGE.--5 years, 4.95 ft³/s, 13.69 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 580 ft³/s, Nov. 4, 1985, gage height, 4.06 ft, from rating curve extended above 30 ft³/s on basis of slope-area measurement of peak flow; minimum, 0.89 ft³/s, Oct. 12, 13, 1984, gage height, 0.66 ft; minimum daily, 0.90 ft³/s, Oct. 13, 1984.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 216 ft³/s, Apr. 26, gage height, 3.40 ft, from rating curve extended as explained above; minimum, 1.8 ft³/s, Nov. 15, gage height, 0.76 ft; minimum daily, 2.4 ft³/s, Nov. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	2.7	4.1	4.0	3.6	4.4	5.5	12	3.5	3.6	3.1	3.4
2	3.0	2.7	3.9	4.0	3.6	4.3	5.4	22	3.4	3.7	3.0	3.5
3	3.0	2.6	3.6	4.4	4.4	4.2	5.7	17	3.4	3.6	3.2	3.3
4	3.0	2.4	3.5	4.4	6.3	4.3	5.5	11	3.3	3.9	3.1	3.1
5	2.8	4.2	3.5	4.1	6.6	5.2	5.3	20	3.6	4.1	3.1	3.2
6	2.8	4.6	3.4	4.1	6.1	20	5.1	40	4.4	4.1	3.1	3.2
7	2.7	3.8	3.6	4.3	5.6	22	4.9	19	7.2	4.2	3.0	3.1
8	2.7	3.4	3.3	13	5.3	12	4.8	13	14	3.9	2.8	3.0
9	2.7	3.2	3.3	16	5.0	8.3	4.8	13	12	3.5	3.0	3.1
10	2.7	2.9	3.2	9.9	4.9	6.5	5.4	29	9.9	3.6	2.7	2.9
11	2.8	2.8	3.2	7.2	4.8	5.5	5.3	17	8.4	3.5	3.1	3.1
12	2.8	2.9	3.2	9.3	4.5	5.1	5.3	11	7.0	3.4	3.0	3.8
13	2.7	3.1	3.2	16	4.4	4.9	5.1	8.9	6.6	3.4	3.3	3.4
14	2.7	5.4	3.1	12	5.5	4.7	5.1	7.6	5.9	3.4	3.5	3.3
15	2.7	3.0	2.9	15	12	4.4	5.2	7.3	7.4	3.4	3.0	3.3
16	2.7	2.8	2.9	16	14	4.3	4.9	6.8	14	3.5	4.3	6.0
17	2.7	3.8	2.9	11	11	4.3	4.9	6.5	26	3.5	2.7	8.0
18	2.8	4.1	2.9	7.7	8.7	4.4	4.8	e5.5	14	3.4	3.2	6.5
19	2.7	3.9	3.0	6.2	7.0	4.5	4.6	e5.0	9.0	3.4	3.1	6.4
20	2.7	9.2	3.0	5.4	6.1	4.6	4.5	e4.0	9.7	3.3	3.0	4.5
21	2.8	11	3.7	4.9	6.2	11	4.3	e4.5	8.1	3.2	22	4.4
22	2.8	6.9	5.5	4.5	7.9	13	4.2	e4.8	7.0	3.2	20	10
23	2.7	5.1	5.7	4.3	8.4	9.8	4.1	e4.6	7.0	3.7	11	18
24	2.9	4.2	8.0	4.1	7.3	14	4.0	4.3	8.0	3.8	8.7	11
25	2.9	3.8	15	4.0	6.5	16	6.7	4.1	7.4	3.4	7.2	7.6
26	2.9	3.7	9.8	3.9	5.7	11	91	4.0	6.3	3.0	5.9	7.4
27	2.6	3.8	6.9	3.9	5.3	8.5	23	3.8	5.3	3.4	4.9	7.2
28	2.6	4.3	5.7	3.8	4.9	7.0	13	3.6	4.8	3.1	4.5	6.5
29	2.7	4.3	4.9	3.7	---	6.0	12	3.7	4.3	3.4	4.8	5.8
30	2.7	4.2	4.4	3.9	---	5.6	14	3.8	3.9	4.2	4.0	5.0
31	2.7	---	4.0	3.8	---	5.5	---	3.6	---	3.8	3.7	---
TOTAL	85.9	124.8	139.3	218.8	181.6	245.3	278.4	320.4	234.8	110.6	159.0	163.0
MEAN	2.77	4.16	4.49	7.06	6.49	7.91	9.28	10.3	7.83	3.57	5.13	5.43
MAX	3.0	11	15	16	14	22	91	40	26	4.2	22	18
MIN	2.6	2.4	2.9	3.7	3.6	4.2	4.0	3.6	3.3	3.0	2.7	2.9

CAL YR 1988 TOTAL 1489.1 MEAN 4.07 MAX 33 MIN 2.4
WTR YR 1989 TOTAL 2261.9 MEAN 6.20 MAX 91 MIN 2.4

e Estimated.

JAMES RIVER BASIN

02011490 LITTLE BACK CREEK NEAR SUNRISE, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1984 to current year.

INSTRUMENTATION.--Water-temperature recorder since October 1984.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 25.0°C, July 18, 1986, July 24, 1987, Aug. 17, 1988; minimum, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 23.0°C, July 11, 22, 24, Aug. 5; minimum, 1.0°C, Dec. 12, Feb. 13.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	18.0	16.5	17.5	8.5	8.0	8.0	5.5	5.0	5.5	4.0	3.0	4.0
2	17.5	17.0	17.5	8.0	7.5	8.0	5.0	4.5	4.5	4.0	3.5	4.0
3	17.0	16.5	17.0	8.5	7.0	7.5	5.0	4.5	4.5	4.0	3.0	3.5
4	16.5	16.0	16.5	9.5	8.0	8.5	5.0	4.0	4.5	3.0	2.0	2.5
5	15.5	15.0	15.5	10.0	8.5	9.5	4.5	4.0	4.0	2.5	1.5	2.0
6	15.0	14.0	14.5	8.5	8.0	8.5	4.0	3.5	4.0	3.0	2.0	2.5
7	14.5	13.5	14.0	8.0	7.5	8.0	4.5	3.5	4.0	3.5	3.0	3.0
8	13.5	12.5	13.0	8.0	7.5	7.5	4.5	4.0	4.5	4.5	3.5	4.0
9	13.5	12.5	13.0	8.0	7.0	7.5	4.0	3.0	3.5	4.0	3.5	4.0
10	13.0	12.5	12.5	8.5	7.5	8.0	3.5	2.5	3.0	4.0	3.5	4.0
11	12.5	12.0	12.5	8.0	7.0	7.5	3.0	2.0	2.5	4.0	3.5	4.0
12	12.0	11.0	11.5	7.5	7.0	7.0	2.0	1.0	1.5	5.0	4.0	4.5
13	11.0	10.0	10.5	8.0	7.0	7.5	2.5	2.0	2.5	5.0	4.0	4.5
14	11.0	10.0	10.5	8.0	7.0	7.5	3.0	2.0	2.5	4.0	3.5	4.0
15	11.5	10.0	11.0	8.5	7.0	8.0	3.0	2.5	3.0	5.0	4.0	4.5
16	12.0	11.0	11.5	9.5	7.5	8.5	2.5	2.5	2.5	5.0	4.5	5.0
17	12.0	11.5	12.0	9.5	7.0	8.0	3.0	2.5	2.5	4.5	4.0	4.5
18	12.5	12.0	12.0	7.5	6.5	7.0	2.5	2.0	2.5	4.5	4.0	4.0
19	11.5	11.0	11.5	7.5	7.0	7.0	3.0	2.5	2.5	5.0	4.0	4.5
20	11.5	10.5	11.0	8.0	7.0	7.5	3.5	3.0	3.0	4.5	3.5	4.0
21	11.0	10.0	10.5	7.5	6.5	7.5	3.5	3.5	3.5	3.5	2.5	3.0
22	10.0	9.5	10.0	7.0	6.0	6.5	4.0	3.5	3.5	3.5	2.5	3.0
23	10.0	9.0	9.5	7.0	6.0	6.5	4.5	4.0	4.0	4.0	3.0	3.0
24	10.0	9.0	9.5	6.5	6.0	6.5	5.0	4.5	5.0	4.5	3.0	4.0
25	9.5	8.5	9.0	7.0	6.0	6.5	5.0	4.5	5.0	5.0	4.0	4.5
26	9.0	8.5	8.5	7.5	6.0	7.0	5.0	4.0	4.5	5.0	4.5	5.0
27	9.0	8.0	8.5	8.5	7.5	8.0	5.0	4.5	4.5	5.0	4.0	4.5
28	9.5	8.5	9.0	8.0	6.0	7.0	5.5	4.0	5.0	5.0	4.0	4.5
29	9.0	8.0	8.0	6.0	5.5	6.0	4.0	3.5	3.5	5.5	4.5	5.0
30	8.5	8.0	8.0	6.0	5.5	5.5	4.0	3.5	4.0	5.5	5.0	5.5
31	8.0	8.0	8.0	---	---	---	4.0	3.5	3.5	5.5	4.5	5.0
MONTH	18.0	8.0	11.5	10.0	5.5	7.5	5.5	1.0	3.5	5.5	1.5	4.0

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	6.0	5.0	5.5	4.0	2.0	3.0	8.5	7.0	8.0	12.5	11.0	11.5
2	7.5	6.0	6.5	4.0	2.5	3.0	9.0	6.5	7.5	11.0	9.5	10.5
3	7.5	6.0	7.0	4.0	3.0	3.5	9.5	8.0	8.5	10.0	9.0	9.5
4	6.5	5.5	6.0	4.5	4.0	4.5	10.5	9.0	9.5	11.5	8.5	10.0
5	5.5	5.0	5.0	6.0	4.5	5.0	10.0	9.0	9.5	11.0	9.5	10.5
6	5.5	5.0	5.0	6.0	4.5	5.5	9.0	8.0	8.5	9.5	8.5	9.0
7	5.0	4.0	5.0	4.5	4.0	4.5	8.0	7.0	7.5	8.0	7.5	8.0
8	4.5	3.0	4.0	4.0	3.5	3.5	7.0	6.5	6.5	9.0	7.0	8.0
9	3.0	2.0	2.5	5.5	3.0	4.0	7.5	6.0	6.5	8.0	8.0	8.0
10	2.5	2.0	2.5	6.0	4.0	4.5	7.5	6.0	6.5	8.0	8.0	8.0
11	2.5	1.5	2.0	6.5	4.5	5.5	8.0	5.5	6.5	8.0	8.0	8.0
12	3.0	2.0	2.5	7.5	5.5	6.0	8.0	6.0	7.0	8.0	7.5	8.0
13	2.5	1.0	2.0	6.0	5.5	5.5	8.0	6.5	7.0	8.5	7.5	8.0
14	3.5	2.0	2.5	6.5	5.5	6.0	8.5	6.5	7.5	10.0	8.5	9.5
15	5.5	3.0	4.5	7.5	6.0	6.5	8.5	8.0	8.0	11.0	9.5	10.0
16	5.0	4.5	5.0	7.5	5.5	6.5	10.0	7.5	8.5	10.0	9.5	10.0
17	4.5	4.0	4.0	8.5	6.0	7.5	10.5	8.0	9.5	12.5	9.5	11.0
18	4.0	3.5	4.0	8.5	7.5	8.0	11.5	9.5	10.5	15.0	11.0	13.0
19	4.5	3.0	4.0	7.5	6.5	7.0	13.0	10.5	11.5	16.0	12.5	14.0
20	5.0	4.0	4.5	6.5	5.5	6.0	12.5	10.0	11.0	15.0	14.0	14.0
21	6.0	5.0	5.5	6.0	5.5	5.5	12.5	10.0	11.5	16.0	13.5	14.5
22	5.5	4.5	5.0	7.0	5.0	6.0	12.0	10.0	11.0	15.5	13.5	14.5
23	4.5	3.5	4.0	5.5	5.0	5.5	13.0	9.5	11.0	15.5	14.5	15.0
24	3.5	2.5	3.0	6.0	5.0	5.5	12.5	10.0	11.5	15.5	13.5	14.5
25	3.5	2.0	2.5	7.5	5.5	6.5	12.0	9.5	11.0	16.0	14.0	15.0
26	3.0	2.5	3.0	9.0	6.5	8.0	10.0	9.0	9.5	17.0	15.5	16.0
27	3.5	2.5	3.0	10.5	8.0	9.5	10.5	9.0	9.5	17.5	16.0	17.0
28	3.5	2.5	3.0	11.0	9.5	10.5	11.5	9.5	10.5	18.0	15.0	16.5
29	---	---	---	11.5	10.5	11.0	11.0	10.5	10.5	17.5	15.5	16.5
30	---	---	---	11.0	10.5	11.0	14.0	10.0	12.0	18.5	16.5	17.5
31	---	---	---	10.5	8.5	10.0	---	---	---	19.0	17.0	18.0
MONTH	7.5	1.0	4.0	11.5	2.0	6.5	14.0	5.5	9.0	19.0	7.0	12.0
	JUNE			JULY			AUGUST			SEPTEMBER		
1	20.0	18.0	19.0	20.0	18.0	19.0	21.5	20.0	21.0	20.0	19.0	19.5
2	20.0	19.0	19.5	20.0	18.0	19.0	21.0	20.0	20.5	20.5	19.0	19.5
3	20.0	18.5	19.5	20.0	19.0	19.5	22.0	19.5	21.0	19.5	18.5	19.0
4	20.0	19.0	19.5	19.5	18.5	19.0	22.0	20.5	21.5	18.5	17.5	18.0
5	19.5	19.0	19.0	19.0	18.5	18.5	23.0	21.0	22.0	18.0	17.5	18.0
6	19.5	18.5	18.5	19.5	18.5	19.0	22.5	21.0	22.0	18.0	17.5	18.0
7	18.0	17.0	18.0	20.5	18.5	19.5	21.5	20.5	21.5	18.0	17.5	18.0
8	17.0	15.5	16.5	21.5	19.0	20.0	20.5	19.0	20.0	19.0	17.5	18.5
9	15.5	14.5	15.0	21.0	19.0	20.0	20.5	18.5	19.5	19.5	18.0	19.0
10	15.5	14.0	14.5	21.0	19.5	20.0	20.0	18.5	19.5	20.5	18.5	19.5
11	16.5	14.0	15.0	23.0	20.5	21.5	19.5	19.0	19.0	20.5	19.5	20.0
12	16.0	14.5	15.5	22.5	21.5	22.0	19.5	18.5	19.0	20.0	19.0	19.5
13	15.5	15.0	15.5	22.0	20.5	21.0	20.5	18.0	19.0	19.5	19.0	19.5
14	16.0	15.0	15.5	21.0	19.5	20.0	20.0	19.0	19.5	19.5	19.0	19.5
15	16.0	14.5	15.5	20.5	19.0	20.0	19.5	19.0	19.5	19.5	18.5	19.0
16	14.5	14.0	14.5	20.0	19.5	19.5	20.5	18.5	19.5	19.0	16.5	18.0
17	14.0	13.5	13.5	20.0	19.0	19.5	20.0	19.0	19.5	16.5	16.0	16.5
18	14.0	12.5	13.5	21.0	19.0	19.5	19.5	18.5	19.0	16.5	15.5	16.0
19	16.0	13.5	14.5	20.5	19.5	20.0	19.5	18.0	18.5	17.5	16.0	16.5
20	15.0	14.0	14.5	21.0	19.5	20.0	19.5	18.0	19.0	17.0	16.5	17.0
21	16.0	14.5	15.0	21.5	20.0	21.0	19.5	15.5	17.5	18.0	17.0	17.5
22	16.5	15.0	15.5	23.0	20.5	21.5	17.0	16.0	16.5	18.0	16.0	17.0
23	16.5	15.5	16.0	22.0	20.5	21.5	17.0	16.5	17.0	16.0	14.0	15.5
24	16.5	15.0	15.5	23.0	19.5	21.0	17.5	16.5	17.0	14.0	13.0	13.5
25	18.0	15.5	16.5	22.5	20.5	21.5	17.0	17.0	17.0	13.5	13.0	13.5
26	19.0	16.5	17.5	22.5	20.5	21.5	18.0	16.5	17.0	14.5	13.5	13.5
27	19.5	17.0	18.0	22.0	21.0	21.0	19.5	17.5	18.0	13.5	12.5	13.0
28	19.0	18.0	18.5	21.0	20.0	20.5	19.5	17.5	18.5	13.5	12.5	13.0
29	19.5	17.5	18.5	21.5	19.5	20.5	19.5	18.5	19.0	14.0	13.0	13.5
30	20.0	17.5	18.5	21.0	20.0	20.5	20.5	19.0	19.5	14.0	14.0	14.0
31	---	---	---	21.0	20.0	20.5	20.5	18.5	19.5	---	---	---
MONTH	20.0	12.5	16.5	23.0	18.0	20.0	23.0	15.5	19.0	20.5	12.5	17.0
YEAR	23.0	1.0	11.0									

JAMES RIVER BASIN

02011500 BACK CREEK NEAR MOUNTAIN GROVE, VA

LOCATION.--Lat 38°04'10", long 79°53'50", Bath County, Hydrologic Unit 02080201, on left bank 0.3 mi downstream from Cummings Run, 0.8 mi downstream from bridge on State Highway 39, and 2.1 mi south of Mountain Grove.

DRAINAGE AREA.--134 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1951 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,701.45 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for periods with ice effect, Dec. 12-15, 17-19, and period of doubtful or no gage-height record, July 10-16, which are fair. Flow regulated since October 1984 by Back Creek Lake 11.3 mi upstream, amount unknown, and since January 1985 by Little Back Creek Lake 14.4 mi upstream, amount unknown. U.S. Army Corps of Engineers gage-height transmitter at station, receiver at Gathright Dam.

AVERAGE DISCHARGE.--38 years, 182 ft³/s, 18.44 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,200 ft³/s, Nov. 4, 1985, gage height, 11.24 ft, from rating curve extended above 4,000 ft³/s on basis of slope-area measurements at gage heights 7.39 ft, 9.05 ft, and 9.35 ft; minimum, 1.5 ft³/s, Aug. 18, 1967.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,600 ft³/s, Apr. 26, gage height, 8.53 ft, from rating curve extended as explained above; minimum, 16 ft³/s, Dec. 19, gage height, 2.03 ft, result of freezeup; minimum daily, 21 ft³/s, Dec. 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	25	98	77	67	134	311	689	42	59	42	72
2	26	24	96	97	65	97	289	1390	41	58	38	68
3	26	24	95	101	88	76	220	1070	39	48	33	56
4	25	24	85	111	157	87	140	486	38	37	32	32
5	22	43	49	115	172	119	261	716	44	44	35	30
6	22	47	33	119	167	934	260	2540	97	41	34	29
7	22	40	31	138	159	1170	267	1170	406	126	32	29
8	22	35	30	286	156	510	187	685	466	75	33	29
9	22	31	31	433	151	324	151	635	648	58	30	24
10	22	29	29	443	149	335	149	1730	320	e70	23	24
11	23	27	27	374	144	312	167	982	266	e75	24	27
12	23	26	e25	450	134	239	204	576	223	e90	25	37
13	22	28	e23	564	96	185	198	420	206	e300	23	50
14	23	26	e24	491	127	188	173	335	208	e200	22	49
15	23	25	e25	803	521	132	148	285	237	e190	22	48
16	23	26	26	959	750	68	133	245	628	e180	29	226
17	23	35	e24	586	593	62	109	238	1180	125	25	343
18	22	38	e23	374	354	64	111	222	665	82	34	233
19	22	40	e21	293	308	95	111	168	336	57	47	156
20	22	126	25	208	276	107	104	125	309	40	39	141
21	28	144	31	169	288	405	101	131	293	36	552	88
22	28	94	58	158	240	516	99	129	279	35	879	231
23	26	65	107	103	290	501	86	137	260	44	308	390
24	27	50	203	73	301	910	52	129	211	51	482	289
25	26	42	466	68	273	905	66	121	196	35	356	217
26	27	41	420	66	259	699	4220	106	172	36	223	228
27	26	54	287	65	190	369	1050	86	124	55	150	141
28	26	76	263	64	157	317	779	79	101	48	104	151
29	25	104	206	66	---	269	609	72	82	44	86	137
30	24	103	147	66	---	224	804	68	64	40	83	115
31	24	---	74	67	---	280	---	45	---	43	79	---
TOTAL	748	1492	3082	7987	6632	10633	11559	15810	8181	2422	3924	3690
MEAN	24.1	49.7	99.4	258	237	343	385	510	273	78.1	127	123
MAX	28	144	466	959	750	1170	4220	2540	1180	300	879	390
MIN	22	24	21	64	65	62	52	45	38	35	22	24

CAL YR 1988 TOTAL 32762 MEAN 89.5 MAX 1770 MIN 16
WTR YR 1989 TOTAL 76160 MEAN 209 MAX 4220 MIN 21

e Estimated.

JAMES RIVER BASIN

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02011500 BACK CREEK NEAR MOUNTAIN GROVE, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: June 1978 to current year.

INSTRUMENTATION.--Water-temperature recorder since June 1978.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. Some record in prior years fragmentary due to instrument malfunction.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum recorded, 33.5°C, Aug. 14, 1988; minimum recorded, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 28.0°C, July 22; minimum recorded, 0.5°C, Dec. 12, 13, Feb. 9, 10, but may have been lower during instrument malfunction Dec. 30 to Jan. 4, Jan. 11-25.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	22.5	18.0	20.0	11.5	7.0	8.5	8.0	6.0	7.0	---	---	---
2	19.5	17.5	18.5	9.0	7.5	8.0	7.5	5.0	6.5	---	---	---
3	19.0	17.5	18.0	11.0	5.5	8.0	7.0	4.0	6.0	---	---	---
4	22.5	16.0	18.0	13.5	6.5	9.5	8.0	6.5	7.5	---	---	---
5	19.0	11.5	14.5	14.0	11.5	12.5	7.5	3.5	5.5	5.0	1.0	3.0
6	17.5	9.0	12.5	12.0	9.0	10.5	6.0	2.5	4.0	5.5	4.0	5.0
7	13.5	10.5	12.0	10.0	7.5	9.0	6.0	2.0	4.0	6.5	5.5	6.0
8	15.5	8.0	11.0	10.5	6.5	8.0	6.5	4.0	5.0	7.5	5.0	6.5
9	15.0	8.0	11.0	10.5	6.0	8.0	6.5	3.0	5.0	6.0	4.5	5.0
10	13.5	9.5	11.0	10.0	6.0	8.0	4.0	1.0	2.0	6.5	5.0	5.5
11	16.0	11.0	13.0	10.0	7.0	8.5	2.5	1.0	2.0	---	---	---
12	12.0	9.0	10.5	7.0	4.0	6.0	2.5	.5	1.0	---	---	---
13	13.5	6.0	9.0	10.0	5.5	7.5	1.5	.5	1.0	---	---	---
14	14.0	5.5	8.5	9.5	5.0	7.5	2.5	1.0	1.5	---	---	---
15	14.5	6.5	10.0	9.5	5.0	7.5	2.5	1.5	2.0	---	---	---
16	16.0	9.0	12.0	9.5	6.0	7.5	2.5	1.5	1.5	---	---	---
17	15.5	10.5	13.0	11.5	7.0	10.0	1.5	1.0	1.5	---	---	---
18	15.5	12.0	13.5	11.0	5.5	9.0	2.0	1.0	1.5	---	---	---
19	13.5	10.0	12.0	8.0	4.5	6.0	3.0	1.0	1.5	---	---	---
20	14.0	8.0	10.5	7.0	6.0	6.5	2.5	1.0	2.0	---	---	---
21	9.5	8.0	8.5	10.0	7.0	8.5	3.0	2.0	2.0	---	---	---
22	10.0	8.0	9.0	9.5	5.0	7.5	5.5	3.0	4.0	---	---	---
23	12.5	7.0	9.5	8.5	4.5	6.0	6.5	5.0	5.5	---	---	---
24	14.0	9.0	11.0	7.5	4.5	6.0	8.5	6.5	7.5	---	---	---
25	12.0	7.0	9.5	8.5	4.0	6.0	8.0	5.5	7.0	---	---	---
26	12.5	7.0	9.0	8.0	4.0	5.5	8.0	5.0	6.5	7.5	5.0	6.5
27	11.5	5.0	7.5	10.0	4.5	8.0	8.5	5.5	6.5	7.5	5.0	6.5
28	10.0	6.5	8.0	11.5	9.0	11.0	8.5	4.5	6.5	7.0	2.5	5.0
29	11.0	5.5	7.5	9.0	5.0	7.0	6.5	4.0	5.0	8.0	3.5	6.0
30	11.5	5.5	8.0	8.0	5.0	6.5	---	---	---	9.0	6.5	7.5
31	7.5	6.5	7.0	---	---	---	---	---	---	8.5	4.5	6.5
MONTH	22.5	5.0	11.5	14.0	4.0	8.0	8.5	.5	4.0	9.0	1.0	6.0

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	9.5	4.0	6.5	7.5	2.5	4.5	8.5	6.0	7.0	13.5	11.5	12.5
2	11.5	6.5	8.5	6.5	2.0	4.5	12.0	5.5	8.0	13.0	11.0	12.0
3	9.5	7.5	9.0	5.5	3.0	4.0	13.5	7.5	10.0	12.5	10.0	11.0
4	7.0	5.0	5.5	7.5	5.5	6.5	15.0	9.0	11.5	16.5	8.5	12.0
5	5.5	4.5	5.0	8.5	6.0	7.0	12.0	8.5	10.0	12.5	11.0	12.0
6	6.5	5.0	5.5	7.5	5.5	6.5	10.0	7.0	8.5	12.0	10.0	11.0
7	7.0	4.0	6.0	5.5	4.5	5.0	8.5	5.5	7.0	11.5	8.5	10.0
8	5.5	2.5	4.0	5.5	3.5	4.5	6.0	5.0	5.5	13.5	8.5	10.5
9	3.5	.5	2.0	9.5	3.0	5.5	10.0	5.5	7.0	10.5	9.5	10.0
10	4.5	.5	2.5	10.5	3.0	6.0	9.5	5.0	7.0	11.0	10.0	10.5
11	6.5	1.0	3.5	11.0	4.0	6.5	12.0	4.0	7.5	11.0	10.5	10.5
12	6.5	2.5	4.5	11.0	4.0	7.0	12.0	3.5	7.5	11.5	9.0	10.5
13	3.0	1.0	2.0	6.0	4.5	5.0	11.5	4.5	7.5	13.0	9.5	11.0
14	7.0	2.5	5.0	8.0	5.0	6.0	12.5	4.5	8.5	15.5	10.5	12.5
15	8.5	5.0	6.5	11.5	5.5	8.0	9.5	8.0	9.0	14.5	10.5	12.0
16	6.5	5.0	6.0	12.5	5.5	9.0	15.5	7.5	10.5	12.5	10.5	11.5
17	6.0	4.5	5.0	13.5	4.0	8.5	16.5	6.0	11.0	17.5	11.5	14.0
18	6.0	4.0	5.0	11.0	7.0	9.0	16.5	8.5	12.5	20.0	11.0	15.0
19	8.5	3.5	5.5	10.5	5.0	7.5	17.5	11.0	13.5	20.0	11.5	15.5
20	7.0	3.5	5.0	6.0	4.0	4.5	17.0	7.0	12.0	16.5	13.5	15.0
21	9.0	6.0	7.0	6.5	4.5	5.5	15.5	7.5	11.5	22.5	13.5	17.0
22	7.5	5.0	6.5	10.0	4.0	6.0	14.0	7.5	11.0	20.0	12.0	16.0
23	6.0	3.5	5.0	6.0	4.5	5.5	17.5	7.0	12.0	19.0	15.0	17.0
24	6.5	2.5	3.5	7.5	5.5	6.5	17.0	7.5	12.0	21.0	14.0	17.0
25	7.0	1.5	3.5	11.5	6.0	8.0	13.5	9.0	12.0	21.0	13.0	17.5
26	5.0	3.0	4.0	12.5	5.5	8.5	12.5	10.0	11.5	22.0	15.0	18.5
27	6.0	3.5	4.5	14.5	6.0	9.5	13.0	10.0	11.5	24.0	17.0	20.0
28	6.0	4.0	5.0	15.5	7.5	11.0	15.0	10.5	12.0	23.0	13.5	18.0
29	---	---	---	12.5	8.0	10.0	13.5	11.0	12.0	22.0	13.5	18.0
30	---	---	---	12.0	8.5	10.0	16.0	11.0	13.0	24.5	16.5	20.0
31	---	---	---	11.0	7.0	9.5	---	---	---	26.0	17.0	21.0
MONTH	11.5	.5	5.0	15.5	2.0	7.0	17.5	3.5	10.0	26.0	8.5	14.0
	JUNE			JULY			AUGUST			SEPTEMBER		
1	27.0	18.5	22.5	25.5	18.5	21.5	26.0	21.0	23.5	23.0	19.5	21.5
2	24.0	19.0	21.5	24.0	19.0	21.5	25.5	21.0	23.5	25.5	20.0	22.5
3	26.5	19.5	22.0	23.0	19.5	21.5	26.5	20.0	23.0	22.5	19.5	21.0
4	26.5	20.0	22.5	22.0	20.0	21.0	27.5	21.5	24.0	20.5	16.5	18.5
5	23.5	19.0	20.5	21.5	19.5	20.5	27.0	22.5	24.5	19.5	17.5	18.5
6	22.0	18.5	20.0	25.5	19.5	22.0	27.5	22.5	24.5	20.0	18.0	19.0
7	19.5	15.5	17.0	25.5	20.0	22.5	25.0	21.5	23.0	21.0	19.0	19.5
8	21.0	15.5	17.5	27.0	19.5	23.0	24.0	18.5	21.0	24.5	19.0	21.5
9	19.0	16.0	17.0	23.5	19.0	21.5	23.5	16.5	20.0	25.5	20.5	23.0
10	22.0	15.5	18.0	27.5	20.0	23.5	24.0	17.5	20.5	26.0	21.0	23.5
11	22.5	14.0	18.0	27.5	21.5	24.5	21.0	19.0	19.5	25.0	21.5	23.0
12	19.5	14.5	17.0	26.0	22.0	24.0	23.0	18.5	20.0	23.0	21.0	22.0
13	19.5	16.0	17.5	24.0	21.5	22.5	25.5	19.0	22.0	22.0	20.5	21.0
14	22.5	16.0	18.5	25.0	19.5	22.0	25.5	20.0	22.5	23.5	20.5	21.5
15	20.0	17.0	18.5	22.5	19.0	21.0	23.0	20.5	22.0	23.0	20.5	21.5
16	18.0	16.5	17.0	21.5	20.0	20.5	26.0	20.5	23.0	21.0	19.0	19.5
17	18.5	15.5	17.0	24.0	20.0	21.5	24.5	20.5	22.5	21.0	19.0	19.5
18	19.0	15.0	16.5	25.0	20.0	22.0	21.0	18.0	20.0	20.5	18.0	19.0
19	21.0	15.0	17.5	24.5	20.5	22.5	22.0	17.5	19.0	21.0	18.5	19.5
20	20.5	16.5	18.0	27.0	21.0	23.5	24.0	18.5	21.0	21.5	19.0	20.5
21	21.0	16.5	18.5	26.5	22.0	24.0	22.0	20.0	21.0	22.5	20.0	21.5
22	21.5	17.0	19.0	28.0	22.0	24.5	23.0	20.5	21.5	22.0	19.0	20.5
23	21.5	17.5	19.0	26.5	22.0	24.0	23.0	20.0	21.5	19.5	16.0	18.5
24	23.0	17.5	20.0	27.5	21.5	24.0	22.5	20.5	21.5	19.0	15.0	16.5
25	24.5	18.0	21.0	26.5	22.5	24.5	21.0	20.0	20.5	17.0	15.5	16.0
26	24.5	18.5	21.0	26.5	22.0	24.0	23.5	20.0	21.5	19.5	16.5	17.5
27	25.5	18.0	21.5	24.5	22.0	23.0	25.5	20.5	22.5	17.5	14.0	16.0
28	23.0	19.5	21.0	26.0	20.5	23.0	25.0	20.0	22.5	18.0	13.0	15.5
29	26.0	18.0	21.5	26.0	20.5	23.0	23.5	20.5	22.0	19.0	15.5	17.0
30	26.0	17.5	21.5	24.5	21.5	23.0	25.5	21.0	23.0	18.0	16.0	17.0
31	---	---	---	24.0	21.5	22.5	25.5	19.5	22.5	---	---	---
MONTH	27.0	14.0	19.5	28.0	18.5	22.5	27.5	16.5	22.0	26.0	13.0	19.5
YEAR	28.0	.5	13.0									

JAMES RIVER BASIN

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02011795 LAKE MOOMAW NEAR HOT SPRINGS, VA

LOCATION.--Lat 37°57'04", long 79°59'21", Alleghany County, Hydrologic Unit 02080201, in control tower at Gathright Dam on Jackson River, 0.9 mi upstream from Cedar Creek, 7.6 mi southwest of Hot Springs, and 19 mi upstream from Covington.

DRAINAGE AREA.--344 mi².

PERIOD OF RECORD.--December 1979 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark).

REMARKS.--Lake is formed by rolled rockfill dam with an impervious compacted earth (clay) core. Spillway with crest at elevation 1,667.5 ft is in a divide about 2.5 mi south of the dam, ungated, and 2,450 ft long with a base width of 100 ft. Except for flood flows, all discharge will be through a diversion tunnel with the invert of the entrance being in an intake tower 260 ft high. Elevation of invert is 1,430.5 ft. Portals in the tower at nine levels permit oxygenated water from the surface and cold water from the bottom of the lake to be mixed for water-quality control. Sluice gates in the tower control flood flow releases. Storage began Dec. 10, 1979. Total capacity at top of dam, elevation 1,684.5 ft, is 502,600 acre-ft of which 81,100 acre-ft is above spillway crest. Capacity at maximum conservation pool, elevation 1,582.0 ft, is 123,700 acre-ft; capacity at minimum conservation pool, elevation 1,554.0 ft, is 63,000 acre-ft. Lake is used for flood control, low-water augmentation for water-quality control, and recreation.

COOPERATION.--Records were provided by the U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 160,300 acre-ft, Apr. 18, 1987, elevation, 1,595.6 ft; minimum, (after first filling to minimum conservation pool), 73,300 acre-ft, Nov. 17-19, 1988, elevation, 1,559.5 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 140,700 acre-ft, May 3, elevation, 1,588.5 ft; minimum, 73,300 acre-ft, Nov. 17-19, elevation, 1,559.5 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1,563.0	80,300	-
Oct. 31.....	1,560.0	74,300	-6,000
Nov. 30.....	1,560.7	75,600	+1,300
Dec. 31.....	1,563.1	80,500	+4,900
CAL YR 1988.....	-	-	-43,200
Jan. 31.....	1,574.6	105,700	+25,200
Feb. 28.....	1,582.0	123,700	+18,000
Mar. 31.....	1,582.1	124,000	+300
Apr. 30.....	1,587.5	138,000	+14,000
May 31.....	1,581.9	123,500	-14,500
June 30.....	1,581.8	123,200	-300
July 31.....	1,581.4	122,200	-1,000
Aug. 31.....	1,581.9	123,500	+1,300
Sept. 30.....	1,582.0	123,700	+200
WTR YR 1989.....	-	-	+43,400

JAMES RIVER BASIN

02011800 JACKSON RIVER BELOW GATHRIGHT DAM, NEAR HOT SPRINGS, VA

LOCATION.--Lat 37°56'54", long 79°56'58", Alleghany County, Hydrologic Unit 02080201, on right bank 0.4 mi upstream from Cedar Creek, 0.5 mi downstream from Gathright Dam and Moomaw Lake, and 7.3 mi southwest of Hot Springs.

DRAINAGE AREA.--345 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1973 to current year.

REVISED RECORDS.--WDR VA-81-1: 1980.

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). Prior to Dec. 20, 1973, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since December 1979 by Moomaw Lake (station 02011795) 0.5 mi upstream; since October 1984 by Back Creek Lake 28.5 mi upstream, amount unknown; and since January 1985 by Little Back Creek Lake 31.6 mi upstream, amount unknown. U.S. Army Corps of Engineers water-quality and gage-height transmitters at station, receiver at Gathright Dam.

AVERAGE DISCHARGE.--16 years, 446 ft³/s, 17.56 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,000 ft³/s, Dec. 26, 1973, result of cofferdam failure during construction of Gathright Dam, gage height, 18.77 ft, from rating curve extended above 9,200 ft³/s on basis of slope-area measurement of peak flow; minimum, 3.0 ft³/s, July 12, 1979, result of gate closure at Gathright Dam, gage height, 7.78 ft; minimum daily, 47 ft³/s, Sept. 2, 1981.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 21, 1972, reached a stage of 17.20 ft, from floodmark.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,740 ft³/s, May 8, gage height, 13.26 ft; minimum, 6.7 ft³/s, Oct. 19, gage height, 7.81 ft; minimum daily, 150 ft³/s, Nov. 1-4, 15-18, Jan. 1-3, 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	175	150	153	150	155	352	622	1620	248	261	255	271		
2	175	150	153	150	155	233	481	1260	254	261	250	255		
3	175	150	153	150	156	189	660	3710	256	261	250	243		
4	175	150	153	151	156	230	613	4620	254	261	250	243		
5	175	152	153	151	156	314	441	3700	254	264	250	243		
6	175	151	153	153	156	787	445	2290	256	263	250	243		
7	175	151	153	153	156	2320	485	3310	357	261	250	243		
8	175	152	153	153	156	1660	485	4420	514	261	250	243		
9	175	151	153	153	156	1120	485	1840	719	261	250	243		
10	175	151	153	153	156	834	446	2390	1120	261	250	243		
11	175	152	153	153	156	591	382	4550	739	261	250	244		
12	175	152	153	153	156	524	356	3150	503	261	250	243		
13	175	151	153	152	156	449	354	1100	536	262	250	243		
14	175	151	153	150	156	494	354	879	550	263	250	243		
15	175	150	153	152	156	439	355	721	601	261	250	243		
16	175	150	153	153	158	304	355	673	601	261	250	185		
17	175	150	153	153	158	220	311	604	1350	263	250	693		
18	175	150	153	153	158	189	243	587	2090	261	250	1130		
19	153	151	153	153	158	271	243	524	1550	261	251	1130		
20	175	152	153	153	158	297	243	461	919	261	250	735		
21	177	151	153	153	158	770	243	339	919	261	250	280		
22	178	153	153	153	158	1120	243	286	782	261	250	151		
23	177	153	153	153	160	1120	243	404	662	261	250	732		
24	177	153	153	153	161	1790	243	383	611	261	362	1150		
25	177	153	153	153	192	1860	210	313	622	261	847	1150		
26	176	152	153	153	455	1480	660	293	641	261	888	860		
27	177	151	154	154	567	800	2800	279	558	262	510	593		
28	178	152	155	155	477	553	3320	279	361	264	371	441		
29	176	153	157	155	---	731	1370	279	263	263	305	357		
30	175	153	158	155	---	640	2920	266	261	261	271	357		
31	166	---	154	155	---	677	---	250	---	261	271	---		
TOTAL	5412	4541	4756	4734	5456	23358	20611	45780	19351	8107	9581	13630		
MEAN	175	151	153	153	195	753	687	1477	645	262	309	454		
MAX	178	153	158	155	567	2320	3320	4620	2090	264	888	1150		
MIN	153	150	153	150	155	189	210	250	248	261	250	151		
(*)	-98	+22	+80	+410	+324	+5	+235	-236	-5	-16	+21	+3		
MEAN†	76.6	173	233	563	519	758	922	1241	640	246	330	457		
CFSM†	.22	.50	.68	1.63	1.50	2.20	2.67	3.60	1.86	.71	.96	1.32		
IN.‡	.26	.56	.78	1.88	1.57	2.54	2.98	4.15	2.07	.82	1.10	1.48		
CAL YR 1988	TOTAL	103331	MEAN	282	MAX	3270	MIN	150	MEAN†	222	CFSM†	.64	IN.‡	8.77
WTR YR 1989	TOTAL	165317	MEAN	453	MAX	4620	MIN	150	MEAN†	513	CFSM†	1.49	IN.‡	20.19

* Change in contents, equivalent in cubic feet per second, in Moomaw Lake; provided by U.S. Army Corps of Engineers.

† Adjusted for change in contents.

02011800 JACKSON RIVER BELOW GATHRIGHT DAM, NEAR HOT SPRINGS, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1979 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1978 to current year.

pH: October 1978 to current year.

WATER TEMPERATURE: October 1978 to current year.

DISSOLVED OXYGEN: October 1978 to current year.

INSTRUMENTATION.--Water-quality monitor since October 1978.

REMARKS.--Interruptions in the record were due to malfunctions of the instruments. The intake tower at Gathright Dam permits selective withdrawal of water from one or more reservoir depths. Some record in prior years fragmentary due to instrument malfunction.

EXTREMES FOR PERIOD OF RECORD.--

SPECIFIC CONDUCTANCE (water years 1979, 1981-89): Maximum recorded, 249 microsiemens, Nov. 5, 1985; minimum recorded, 78 microsiemens, May 14, 1979.

pH (water years 1979, 1981-89): Maximum recorded, 8.60 units, Jan. 29, 1982, Jan. 13, 1983; minimum recorded, 6.90 units, Aug. 14-17, 1984, Nov. 5-7, 1985.

WATER TEMPERATURE (water years 1979, 1981-89): Maximum recorded, 28.0°C, Aug. 1, 2, 1979; minimum recorded, 0.0°C, Feb. 16-19, 1979.

DISSOLVED OXYGEN (water years 1979, 1981, 1984-89): Maximum recorded, 19.5 mg/L, Jan. 16, 1979; minimum recorded, 5.7 mg/L, Aug. 1, 3, 1987.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 199 microsiemens, Oct. 4; minimum, 108 microsiemens, June 18, 19.

pH: Maximum recorded, 8.16 units, Oct. 4, but may have been higher during instrument malfunction Oct. 6 to Nov. 2; minimum, 6.95 units, June 10.

WATER TEMPERATURE: Maximum, 24.0°C, Aug. 7; minimum, 4.0°C, Feb. 13.

DISSOLVED OXYGEN: Maximum, 14.2 mg/L, Mar. 8, 24; minimum, 7.1 mg/L, Aug. 29, 30.

SPECIFIC CONDUCTANCE, (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	190	181	184	156	152	153	162	156	159	164	159	161
2	186	182	184	162	155	159	161	156	157	164	160	161
3	196	184	186	160	152	156	160	150	155	165	162	163
4	199	184	187	159	153	155	152	144	147	169	162	166
5	188	183	186	160	156	158	146	144	145	170	161	165
6	186	182	183	161	156	157	160	144	151	162	160	161
7	192	176	182	162	151	157	160	148	154	163	159	161
8	189	176	183	152	147	148	165	157	159	160	158	159
9	193	178	184	174	147	157	---	---	---	160	158	159
10	193	182	184	165	151	156	---	---	---	159	157	158
11	194	179	184	176	160	166	---	---	---	161	159	159
12	180	173	177	166	156	162	---	---	---	164	159	160
13	176	169	173	175	159	164	---	---	---	160	159	159
14	192	171	175	187	167	176	---	---	---	160	159	160
15	176	169	173	178	168	173	---	---	---	160	160	160
16	180	169	173	171	164	167	158	151	154	160	159	159
17	182	172	176	183	162	171	154	152	152	161	159	159
18	182	173	177	178	164	171	153	151	152	161	159	160
19	198	168	175	179	169	171	156	152	153	162	160	161
20	173	167	170	177	169	174	159	154	156	163	160	162
21	170	168	169	173	168	170	158	154	156	161	159	160
22	170	167	169	179	165	168	159	156	158	160	159	160
23	171	166	168	182	166	169	160	157	159	162	159	160
24	170	163	165	167	163	164	164	159	162	160	158	159
25	164	155	161	168	164	165	179	160	165	160	159	160
26	156	154	155	166	161	164	174	161	165	160	159	159
27	155	153	154	165	162	164	162	158	159	160	159	159
28	159	153	154	178	159	163	175	159	165	161	159	160
29	160	153	154	161	157	158	181	157	171	161	160	161
30	162	152	153	162	157	159	164	158	161	161	160	161
31	158	151	152	---	---	---	162	158	160	161	161	161
MONTH	199	151	173	187	147	163	181	144	157	170	157	160

SPECIFIC CONDUCTANCE, (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	161	161	161	153	149	151	142	141	142	149	139	143
2	161	161	161	157	151	154	144	142	142	146	140	143
3	161	161	161	157	154	156	144	141	142	140	136	138
4	161	161	161	158	156	157	144	142	142	136	133	135
5	163	161	162	158	155	157	144	142	143	135	132	133
6	162	162	162	158	153	155	143	141	142	135	133	134
7	162	162	162	153	150	152	142	141	142	133	125	129
8	163	162	162	197	150	154	142	141	141	125	118	122
9	162	158	160	152	149	151	142	141	141	138	117	129
10	158	157	157	154	150	152	142	141	141	137	115	126
11	157	156	157	155	151	153	142	141	142	115	113	114
12	157	156	156	155	152	154	143	142	142	118	110	114
13	156	155	156	153	151	152	144	142	143	117	116	117
14	156	155	156	152	150	151	144	141	142	118	116	116
15	159	155	157	152	151	152	143	142	142	117	115	115
16	159	158	158	153	151	152	142	141	142	117	115	116
17	158	157	158	154	152	153	144	141	142	146	115	117
18	167	157	163	154	152	153	144	143	143	116	115	115
19	165	163	164	153	150	152	144	142	143	115	114	115
20	163	161	162	151	151	151	144	143	144	116	114	115
21	168	162	163	151	147	149	144	143	144	119	116	117
22	170	166	169	147	147	147	144	143	143	118	117	118
23	171	167	169	147	146	147	144	143	144	118	114	117
24	170	166	168	147	146	146	144	143	144	119	114	117
25	165	160	163	146	145	146	146	143	145	118	117	118
26	160	153	156	146	145	146	152	143	146	120	117	119
27	152	148	150	147	145	146	143	140	142	120	119	119
28	151	148	149	147	144	146	142	139	140	120	119	119
29	---	---	---	146	144	145	142	141	142	120	118	119
30	---	---	---	145	144	145	142	139	140	120	118	119
31	---	---	---	145	141	143	---	---	---	120	118	119
MONTH	171	148	160	197	141	151	152	139	142	149	110	122
	JUNE			JULY			AUGUST			SEPTEMBER		
1	123	120	121	132	130	131	139	137	138	147	146	146
2	123	121	122	131	130	131	139	138	139	147	146	147
3	123	122	122	131	130	131	138	137	138	147	146	146
4	124	123	123	131	130	131	140	138	139	148	146	147
5	124	123	123	132	130	131	141	140	141	147	146	147

02011800 JACKSON RIVER BELOW GATHRIGHT DAM, NEAR HOT SPRINGS, VA--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	7.96	7.79	7.88	---	---	---	7.40	7.34	7.37	7.47	7.40	7.42
2	7.91	7.81	7.84	---	---	---	7.38	7.35	7.36	7.44	7.39	7.41
3	7.89	7.75	7.81	7.56	7.48	7.51	7.35	7.28	7.32	7.46	7.38	7.42
4	8.16	7.73	7.89	7.58	7.48	7.52	7.36	7.33	7.34	7.46	7.38	7.41
5	7.96	7.74	7.84	7.55	7.49	7.51	7.35	7.26	7.31	7.51	7.36	7.43
6	---	---	---	7.58	7.49	7.52	7.33	7.28	7.31	7.51	7.45	7.47
7	---	---	---	7.57	7.46	7.51	7.35	7.28	7.32	7.53	7.45	7.48
8	---	---	---	7.52	7.44	7.47	7.35	7.31	7.33	7.54	7.46	7.49
9	---	---	---	7.50	7.43	7.46	---	---	---	7.55	7.47	7.50
10	---	---	---	7.52	7.43	7.46	---	---	---	7.55	7.47	7.49
11	---	---	---	7.51	7.42	7.47	---	---	---	7.55	7.45	7.48
12	---	---	---	7.50	7.38	7.44	---	---	---	7.54	7.46	7.49
13	---	---	---	7.47	7.39	7.43	---	---	---	7.54	7.45	7.49
14	---	---	---	7.45	7.37	7.40	---	---	---	7.54	7.45	7.48
15	---	---	---	7.45	7.37	7.40	---	---	---	7.55	7.46	7.49
16	---	---	---	7.47	7.31	7.36	7.47	7.43	7.45	7.55	7.47	7.49
17	---	---	---	7.58	7.32	7.46	7.47	7.38	7.44	7.52	7.46	7.49
18	---	---	---	7.58	7.43	7.50	7.45	7.37	7.42	7.51	7.45	7.48
19	---	---	---	7.50	7.43	7.46	7.48	7.38	7.44	7.52	7.46	7.49
20	---	---	---	7.48	7.42	7.44	7.49	7.44	7.46	7.54	7.46	7.49
21	---	---	---	7.53	7.43	7.47	7.48	7.44	7.46	7.52	7.47	7.49
22	---	---	---	7.50	7.41	7.45	7.50	7.44	7.46	7.54	7.46	7.49
23	---	---	---	7.49	7.39	7.43	7.48	7.43	7.45	7.52	7.46	7.49
24	---	---	---	7.44	7.38	7.41	7.50	7.43	7.46	7.69	7.47	7.56
25	---	---	---	7.46	7.38	7.41	7.48	7.43	7.46	7.72	7.64	7.67
26	---	---	---	7.44	7.37	7.40	7.49	7.42	7.45	7.73	7.64	7.67
27	---	---	---	7.45	7.38	7.40	7.47	7.43	7.45	7.71	7.65	7.68
28	---	---	---	7.48	7.39	7.42	7.49	7.43	7.45	7.72	7.64	7.67
29	---	---	---	7.44	7.40	7.41	7.48	7.42	7.44	7.73	7.64	7.67
30	---	---	---	7.42	7.34	7.38	7.48	7.41	7.43	7.74	7.64	7.67
31	---	---	---	---	---	---	7.45	7.40	7.42	7.71	7.65	7.67
MONTH	8.16	7.73	7.85	7.58	7.31	7.45	7.50	7.26	7.41	7.74	7.36	7.52
	FEBRUARY			MARCH			APRIL			MAY		
1	7.71	7.64	7.67	7.62	7.57	7.59	7.56	7.51	7.53	7.48	7.20	7.33
2	7.75	7.65	7.69	7.65	7.57	7.60	7.55	7.49	7.52	7.39	7.14	7.24
3	7.72	7.65	7.67	7.64	7.56	7.59	7.54	7.49	7.51	7.21	7.14	7.17
4	7.72	7.64	7.67	7.64	7.56	7.59	7.57	7.48	7.52	7.31	7.19	7.25
5	7.72	7.64	7.66	7.63	7.56	7.59	7.55	7.47	7.51	7.28	7.21	7.25
6	7.74	7.63	7.67	7.60	7.56	7.57	7.57	7.49	7.53	7.24	7.21	7.22
7	7.74	7.65	7.68	7.58	7.55	7.56	7.54	7.48	7.51	7.24	7.20	7.22
8	7.73	7.64	7.67	7.64	7.55	7.57	7.54	7.48	7.51	7.21	7.16	7.18
9	7.70	7.63	7.66	7.59	7.57	7.58	7.56	7.48	7.52	7.40	7.13	7.28
10	7.72	7.62	7.67	7.60	7.57	7.59	7.58	7.48	7.53	7.37	7.09	7.21
11	7.72	7.63	7.68	7.61	7.58	7.59	7.58	7.50	7.54	7.14	7.12	7.13
12	7.73	7.65	7.68	7.62	7.56	7.59	7.69	7.50	7.60	7.34	7.14	7.21
13	7.73	7.65	7.67	7.60	7.57	7.59	7.68	7.58	7.63	7.29	7.25	7.27
14	7.75	7.66	7.69	7.65	7.57	7.60	7.67	7.57	7.62	7.31	7.25	7.27
15	7.67	7.57	7.64	7.70	7.57	7.64	7.63	7.58	7.60	7.35	7.24	7.28
16	7.64	7.56	7.59	7.69	7.63	7.67	7.67	7.58	7.61	7.40	7.27	7.33
17	7.65	7.55	7.59	7.67	7.61	7.64	7.67	7.54	7.61	7.46	7.29	7.35
18	7.65	7.54	7.58	7.67	7.59	7.63	7.66	7.52	7.59	7.39	7.26	7.33
19	7.64	7.54	7.58	7.64	7.59	7.61	7.66	7.51	7.58	7.33	7.22	7.28
20	7.66	7.55	7.59	7.60	7.56	7.58	7.62	7.50	7.56	7.36	7.21	7.28
21	7.68	7.56	7.60	7.59	7.56	7.57	7.59	7.49	7.54	7.43	7.26	7.34
22	7.68	7.57	7.61	7.60	7.57	7.59	7.59	7.48	7.53	7.38	7.25	7.31
23	7.69	7.55	7.61	7.57	7.55	7.56	7.58	7.46	7.52	7.38	7.22	7.29
24	7.65	7.55	7.59	7.57	7.52	7.54	7.56	7.43	7.50	7.40	7.22	7.29
25	7.66	7.56	7.60	7.55	7.53	7.54	7.56	7.43	7.48	7.33	7.18	7.25
26	7.62	7.57	7.59	7.54	7.51	7.52	7.54	7.27	7.39	7.37	7.19	7.25
27	7.62	7.58	7.60	7.59	7.48	7.54	7.28	7.25	7.26	7.41	7.17	7.27
28	7.62	7.58	7.60	7.59	7.52	7.55	7.27	7.24	7.25	7.34	7.19	7.26
29	---	---	---	7.56	7.50	7.54	7.24	7.21	7.23	7.32	7.16	7.25
30	---	---	---	7.57	7.52	7.54	7.22	7.20	7.21	7.63	7.15	7.35
31	---	---	---	7.57	7.50	7.54	---	---	---	7.66	7.26	7.43
MONTH	7.75	7.54	7.64	7.70	7.48	7.58	7.69	7.20	7.50	7.66	7.09	7.27

02011800 JACKSON RIVER BELOW GATHRIGHT DAM, NEAR HOT SPRINGS, VA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER				NOVEMBER			DECEMBER			JANUARY		
1	18.0	17.5	18.0	10.5	10.5	10.5	8.5	8.0	8.5	5.5	5.5	5.5
2	18.0	17.5	18.0	10.5	10.5	10.5	8.0	8.0	8.0	5.5	5.0	5.5
3	18.0	17.5	17.5	10.5	10.0	10.5	8.0	8.0	8.0	5.5	5.0	5.5
4	18.0	17.5	17.5	10.5	10.0	10.5	8.0	8.0	8.0	5.0	5.0	5.0
5	17.5	16.5	17.0	10.5	10.5	10.5	8.0	7.5	8.0	5.0	5.0	5.0
6	17.0	16.5	16.5	10.5	10.5	10.5	8.0	7.5	7.5	5.0	5.0	5.0
7	16.5	16.0	16.5	10.5	10.0	10.0	8.0	7.5	7.5	5.0	5.0	5.0
8	16.0	15.5	16.0	10.0	10.0	10.0	8.0	7.5	7.5	5.5	5.0	5.0
9	15.5	15.0	15.5	10.0	10.0	10.0	---	---	---	5.0	5.0	5.0
10	15.5	15.0	15.0	10.0	10.0	10.0	---	---	---	5.0	5.0	5.0
11	15.0	14.5	15.0	10.0	9.5	10.0	---	---	---	5.0	5.0	5.0
12	14.5	14.0	14.5	10.0	9.5	9.5	---	---	---	5.0	5.0	5.0
13	14.0	13.5	14.0	10.0	9.5	9.5	---	---	---	5.0	4.5	5.0
14	14.0	13.5	13.5	9.5	9.5	9.5	---	---	---	5.0	4.5	5.0
15	13.5	13.5	13.5	10.0	9.5	9.5	---	---	---	5.0	5.0	5.0
16	13.5	13.0	13.5	10.0	7.5	9.0	6.0	6.0	6.0	5.0	4.5	5.0
17	13.5	13.0	13.0	10.0	7.5	9.5	6.0	5.5	6.0	5.0	4.5	5.0
18	13.5	13.0	13.5	9.5	9.0	9.5	6.0	5.5	6.0	5.0	4.5	4.5
19	13.5	13.0	13.0	9.5	9.5	9.5	6.0	5.5	5.5	5.0	4.5	5.0
20	13.0	13.0	13.0	9.5	9.5	9.5	6.0	5.5	5.5	5.0	4.5	4.5
21	13.0	12.5	12.5	9.5	9.0	9.5	6.0	5.5	6.0	4.5	4.5	4.5
22	12.5	12.0	12.5	9.0	9.0	9.0	6.0	5.5	5.5	4.5	4.5	4.5
23	12.5	12.0	12.0	9.0	9.0	9.0	5.5	5.5	5.5	4.5	4.5	4.5
24	12.0	12.0	12.0	9.0	8.5	9.0	6.0	5.5	5.5	4.5	4.5	4.5
25	12.0	11.5	12.0	9.0	8.5	9.0	6.0	5.5	5.5	4.5	4.5	4.5
26	11.5	11.5	11.5	9.0	8.5	8.5	5.5	5.5	5.5	5.0	4.5	4.5
27	11.5	11.0	11.5	9.0	8.5	9.0	5.5	5.5	5.5	4.5	4.5	4.5
28	11.5	11.0	11.0	9.0	8.5	9.0	6.0	5.5	5.5	5.0	4.5	4.5
29	11.0	11.0	11.0	8.5	8.5	8.5	5.5	5.5	5.5	5.0	4.5	5.0
30	11.0	10.5	11.0	8.5	8.0	8.5	5.5	5.5	5.5	5.0	5.0	5.0
31	10.5	10.5	10.5	---	---	---	5.5	5.0	5.5	5.0	4.5	5.0
MONTH	18.0	10.5	14.0	10.5	7.5	9.5	8.5	5.0	6.5	5.5	4.5	5.0
FEBRUARY				MARCH			APRIL			MAY		
1	5.0	5.0	5.0	4.5	4.5	4.5	7.5	6.5	7.5	9.5	7.0	8.5
2	5.5	5.0	5.5	5.0	4.5	4.5	7.5	6.5	7.0	9.0	6.5	7.5
3	5.5	5.5	5.5	5.0	4.5	4.5	7.5	6.5	7.0	8.0	6.5	7.0
4	5.5	5.0	5.5	5.0	4.5	4.5	8.0	6.5	7.0	8.5	8.0	8.0
5	5.5	5.0	5.0	4.5	4.5	4.5	7.5	6.0	6.5	8.5	8.0	8.5
6	5.5	5.0	5.5	4.5	4.5	4.5	8.0	7.5	7.5	8.5	8.0	8.0
7	5.5	5.0	5.0	4.5	4.5	4.5	7.5	7.0	7.5	10.0	8.5	9.0
8	5.0	5.0	5.0	6.5	4.5	4.5	7.5	7.0	7.5	10.5	10.0	10.0
9	5.0	4.5	4.5	4.5	4.5	4.5	7.5	7.0	7.5	11.0	10.5	11.0
10	5.0	4.5	4.5	4.5	4.5	4.5	8.0	7.0	7.5	10.5	9.0	10.5
11	5.0	4.5	4.5	5.0	4.5	4.5	8.0	7.0	7.5	11.0	10.5	11.0
12	5.0	4.5	4.5	5.0	4.5	5.0	7.5	7.5	7.5	12.0	11.0	11.0
13	4.5	4.0	4.5	5.0	4.5	5.0	8.0	7.0	7.5	11.5	11.5	11.5
14	5.0	4.5	4.5	5.0	5.0	5.0	8.0	7.0	7.5	11.5	11.0	11.5
15	5.0	4.5	5.0	5.0	5.0	5.0	7.5	7.5	7.5	12.0	11.0	11.5
16	5.0	4.5	5.0	5.5	5.0	5.5	8.0	7.5	8.0	12.0	11.5	11.5
17	5.0	4.5	5.0	6.0	5.5	5.5	8.5	7.5	8.0	12.5	11.5	12.0
18	5.0	4.5	5.0	6.0	5.5	6.0	8.5	7.5	8.0	12.0	11.5	12.0
19	5.0	4.5	5.0	6.0	5.5	6.0	9.0	8.0	8.5	12.0	11.0	11.5
20	5.0	4.5	5.0	5.5	5.5	5.5	9.0	7.5	8.5	11.5	11.0	11.5
21	5.0	5.0	5.0	5.5	5.5	5.5	8.5	7.5	8.0	12.5	11.5	12.0
22	5.0	5.0	5.0	5.5	5.5	5.5	8.5	8.0	8.5	12.0	11.5	12.0
23	5.0	5.0	5.0	5.5	5.5	5.5	9.0	8.5	8.5	12.5	11.5	12.0
24	5.0	4.5	5.0	5.5	5.5	5.5	9.0	8.0	8.5	13.0	11.5	12.0
25	5.0	4.5	4.5	5.5	5.5	5.5	9.0	8.0	8.5	12.5	11.5	12.0
26	4.5	4.5	4.5	5.5	5.0	5.5	9.0	5.5	7.5	12.5	11.5	12.0
27	4.5	4.5	4.5	6.0	5.0	5.5	6.5	5.5	6.0	13.5	12.0	12.5
28	4.5	4.5	4.5	7.0	5.5	6.0	6.5	6.0	6.5	13.0	12.0	12.5
29	---	---	---	6.5	5.5	6.0	6.5	6.0	6.0	13.0	12.0	12.5
30	---	---	---	6.5	6.0	6.5	7.0	6.0	6.5	15.5	12.0	13.5
31	---	---	---	7.5	6.0	7.0	---	---	---	16.0	14.0	14.5
MONTH	5.5	4.0	5.0	7.5	4.5	5.0	9.0	5.5	7.5	16.0	6.5	11.0

02011800 JACKSON RIVER BELOW GATHRIGHT DAM, NEAR HOT SPRINGS, VA--Continued

OXYGEN, DISSOLVED (MG/L), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	8.1	7.7	7.8	10.3	9.8	10.0	---	---	---	12.0	11.7	11.8
2	7.9	7.6	7.7	10.3	9.8	10.1	---	---	---	12.1	11.8	11.9
3	8.0	7.6	7.8	10.4	10.1	10.2	---	---	---	12.0	11.8	11.9
4	8.0	7.7	7.8	10.4	10.1	10.3	---	---	---	12.2	11.9	12.1
5	8.6	7.6	8.1	10.3	10.0	10.1	---	---	---	12.1	11.5	11.8
6	8.8	8.4	8.6	10.4	10.0	10.2	---	---	---	11.7	11.5	11.6
7	9.1	8.5	8.8	10.6	10.1	10.3	---	---	---	11.9	11.6	11.7
8	9.1	8.7	8.9	10.6	10.3	10.4	---	---	---	11.9	11.5	11.7
9	9.2	8.8	9.0	10.8	10.5	10.6	---	---	---	12.0	11.7	11.8
10	9.1	8.7	8.9	10.7	10.4	10.6	---	---	---	12.1	11.8	11.9
11	9.2	8.7	8.9	10.9	10.5	10.7	---	---	---	12.1	11.8	11.9
12	9.3	8.9	9.1	11.0	10.5	10.7	---	---	---	12.0	11.7	11.8
13	9.5	9.1	9.3	10.8	10.5	10.6	---	---	---	12.0	11.7	11.8
14	9.5	9.2	9.3	10.8	10.5	10.7	---	---	---	12.0	11.7	11.9
15	9.6	9.2	9.4	10.8	10.6	10.7	---	---	---	12.0	11.7	11.8
16	9.6	9.3	9.5	---	---	---	10.9	10.6	10.7	12.1	11.7	11.9
17	9.7	9.3	9.4	---	---	---	10.8	10.5	10.6	12.0	11.8	11.9
18	9.5	9.2	9.4	---	---	---	10.9	10.6	10.7	12.0	11.7	11.8
19	9.7	9.2	9.4	---	---	---	11.0	10.7	10.8	12.0	11.7	11.8
20	9.8	9.4	9.6	---	---	---	11.1	10.9	11.0	12.0	11.7	11.8
21	9.6	9.4	9.5	---	---	---	11.1	10.9	11.0	12.2	11.8	12.0
22	9.7	9.4	9.5	---	---	---	11.3	11.0	11.1	12.2	12.0	12.1
23	9.9	9.5	9.6	---	---	---	11.3	11.0	11.1	12.1	11.9	12.0
24	9.8	9.5	9.6	---	---	---	11.2	11.0	11.1	12.2	11.4	11.8
25	9.9	9.5	9.7	---	---	---	11.3	11.1	11.2	11.7	11.4	11.5
26	9.8	9.5	9.6	---	---	---	11.6	11.3	11.4	11.7	11.4	11.5
27	9.8	9.6	9.7	---	---	---	11.6	11.4	11.5	11.6	11.4	11.5
28	10.1	9.7	9.9	---	---	---	11.6	11.3	11.4	11.8	11.4	11.6
29	10.1	9.8	10.0	---	---	---	11.8	11.5	11.6	11.8	11.4	11.6
30	10.2	10.0	10.0	---	---	---	11.9	11.6	11.7	11.7	11.4	11.5
31	10.3	10.0	10.1	---	---	---	11.9	11.7	11.7	11.8	11.4	11.6
MONTH	10.3	7.6	9.2	11.0	9.8	10.4	11.9	10.5	11.2	12.2	11.4	11.8
	FEBRUARY			MARCH			APRIL			MAY		
1	11.7	11.4	11.5	12.7	12.4	12.5	12.1	11.6	11.8	13.7	10.2	11.9
2	11.9	11.5	11.7	12.5	12.2	12.4	11.8	11.6	11.8	12.5	10.2	11.4
3	11.8	11.5	11.6	12.4	12.2	12.3	12.0	11.7	11.9	13.8	12.3	13.2
4	12.0	11.6	11.7	12.6	12.3	12.4	12.0	11.6	11.8	13.8	13.2	13.5
5	12.0	11.7	11.8	12.3	12.1	12.2	11.9	11.4	11.7	13.3	12.0	12.7
6	12.0	11.6	11.8	12.8	12.2	12.5	11.6	11.4	11.5	12.2	11.9	12.0
7	12.1	11.7	11.9	14.0	12.8	13.4	11.6	11.4	11.5	12.6	11.9	12.3
8	12.1	11.8	11.9	14.2	11.9	13.5	11.5	11.3	11.4	13.0	12.5	12.7
9	12.1	11.8	11.9	13.4	13.2	13.3	11.7	11.3	11.5	12.9	10.0	11.2
10	12.2	11.7	11.9	13.3	12.8	13.1	11.8	11.5	11.6	12.9	10.0	11.5
11	12.1	11.9	12.0	12.9	12.6	12.8	11.7	11.5	11.6	12.9	12.8	12.8
12	12.3	12.0	12.1	12.7	12.5	12.6	11.6	10.9	11.3	12.8	10.8	12.0
13	12.3	12.0	12.1	12.6	12.4	12.5	11.2	11.0	11.1	10.9	10.8	10.9
14	12.5	12.0	12.3	13.1	12.4	12.7	11.3	11.2	11.3	10.9	10.7	10.8
15	12.3	11.8	12.1	13.1	12.3	12.6	11.3	11.1	11.2	10.7	10.5	10.6
16	12.0	11.8	11.9	12.5	12.2	12.3	11.4	11.1	11.2	10.7	10.5	10.6
17	12.2	11.8	12.0	12.3	12.0	12.2	11.3	11.0	11.2	10.7	10.3	10.6
18	12.1	11.7	11.9	12.1	11.9	12.0	11.3	10.9	11.1	10.7	10.6	10.6
19	12.0	11.7	11.8	12.3	11.9	12.1	11.3	10.9	11.1	10.7	10.5	10.6
20	12.1	11.7	11.8	12.1	12.0	12.0	11.3	10.8	11.1	10.6	10.3	10.5
21	12.1	11.5	11.7	12.8	11.9	12.4	11.2	10.9	11.1	10.5	10.1	10.3
22	11.8	11.5	11.7	12.9	12.7	12.8	11.2	10.8	11.0	10.5	10.1	10.3
23	12.1	11.7	11.9	13.3	12.8	12.9	11.1	10.8	10.9	10.4	10.1	10.2
24	12.3	12.0	12.1	14.2	12.7	13.2	11.1	10.8	10.9	11.7	10.2	10.9
25	12.3	12.0	12.1	13.5	13.1	13.3	11.1	10.6	10.9	11.4	11.0	11.2
26	12.5	12.1	12.3	13.3	13.0	13.1	12.0	10.5	11.3	11.2	9.8	10.8
27	12.5	12.4	12.5	13.1	12.2	12.6	13.6	11.9	12.9	10.2	9.6	9.9
28	12.5	12.4	12.4	12.5	12.2	12.3	13.5	11.9	13.1	10.2	9.6	9.9
29	---	---	---	12.5	12.3	12.4	12.1	11.8	12.0	10.3	9.7	10.0
30	---	---	---	12.4	11.9	12.1	13.7	12.1	13.1	10.1	9.4	9.8
31	---	---	---	12.1	11.8	11.9	---	---	---	9.8	9.3	9.6
MONTH	12.5	11.4	11.9	14.2	11.8	12.6	13.7	10.5	11.5	13.8	9.3	11.1

JAMES RIVER BASIN

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02012800 JACKSON RIVER AT FILTRATION PLANT, AT COVINGTON, VA

LOCATION.--Lat 37°48'39", long 79°59'19", Covington City, Hydrologic Unit 02080201, on left bank 250 ft upstream from Dry Run and 1.7 mi upstream from Dunlap Creek and bridge on U.S. Highway 60.

DRAINAGE AREA.--439 mi².

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: June 1978 to current year.

INSTRUMENTATION.--Water-temperature recorder since June 1978.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. Some record in prior years fragmentary due to instrument malfunction.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum recorded, 30.5°C, July 21, 1980; minimum recorded, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 27.0°C, July 23, Aug. 4-6; minimum recorded, 0.0°C, Dec. 12-14, and maybe several days during instrument malfunction Dec. 17 to Feb. 8.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	21.0	17.5	19.0	10.0	7.0	8.5	6.0	4.5	5.0			
2	19.0	17.0	18.0	9.0	7.5	8.5	5.5	4.0	5.0			
3	17.5	16.0	17.0	9.0	6.5	8.0	5.5	3.5	4.5			
4	18.0	16.0	17.0	10.5	7.5	9.0	6.5	4.5	5.5			
5	16.0	13.5	15.0	12.5	10.5	12.0	5.0	3.5	4.0			
6	15.5	12.5	13.5	11.5	9.0	10.5	4.5	2.5	3.5			
7	14.0	12.5	13.0	9.5	8.5	9.0	5.0	3.0	4.0			
8	13.5	11.5	12.5	9.0	7.5	8.0	6.0	4.0	5.0			
9	13.5	11.5	12.5	9.0	7.0	8.0	6.0	3.0	4.0			
10	13.5	12.0	12.5	9.0	7.5	8.5	3.0	1.5	2.5			
11	15.0	12.5	13.5	9.5	7.5	8.5	3.0	2.0	2.5			
12	13.0	10.5	12.0	7.5	6.5	7.0	1.5	.0	.5			
13	12.0	9.0	10.5	9.0	6.5	7.5	.0	.0	.0			
14	12.0	9.0	10.0	9.0	7.0	8.0	2.5	.0	1.0			
15	12.5	9.5	11.0	9.0	7.0	8.0	4.0	2.0	3.0			
16	14.0	11.0	12.5	10.5	8.0	9.5	4.0	2.5	3.5			
17	14.0	12.0	13.0	12.0	9.0	10.0	---	---	---			
18	13.0	12.0	12.5	9.0	6.5	7.5	---	---	---			
19	13.0	11.0	12.0	7.0	6.5	6.5	---	---	---			
20	12.0	9.5	10.5	8.5	7.0	7.5	---	---	---			
21	10.5	9.5	10.0	9.0	7.0	8.0	---	---	---			
22	11.0	9.0	10.0	7.0	5.5	6.5	---	---	---			
23	11.5	9.0	10.5	6.5	5.5	6.0	---	---	---			
24	12.5	10.0	11.0	7.0	5.5	6.0	---	---	---			
25	11.0	9.0	10.0	7.0	5.0	6.0	---	---	---			
26	11.0	9.0	9.5	7.5	5.0	6.0	---	---	---			
27	9.5	7.5	8.5	10.0	7.5	9.0	---	---	---			
28	10.0	8.5	9.0	9.5	7.0	8.5	---	---	---			
29	9.5	7.5	9.0	7.0	5.5	6.0	---	---	---			
30	9.5	7.5	8.5	5.5	4.5	5.0	---	---	---			
31	9.0	7.5	8.5	---	---	---	---	---	---			
MONTH	21.0	7.5	12.0	12.5	4.5	8.0	6.5	.0	3.5			

02013000 DUNLAP CREEK NEAR COVINGTON, VA

LOCATION.--Lat 37°48'10", long 80°02'50", Alleghany County, Hydrologic Unit 02080201, on right bank 20 ft downstream from bridge on U.S. Highway 60, 2.2 mi downstream from Ogle Creek, and 3.0 mi west of Covington.

DRAINAGE AREA.--164 mi².

PERIOD OF RECORD.--October 1928 to current year. Monthly discharge only for some periods, published in WSP 1303. REVISED RECORDS.--WSP 972: 1929-30, 1932-34, 1942. WSP 1303: 1929-35(M), 1937-38(M), 1941-48(M). WSP 2104: Drainage area. WDR VA-74-1: 1969(M), 1972, 1973(P).

GAGE.--Water-stage recorder. Datum of gage is 1,294.70 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 8, 1949, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 13, 16-19, and Feb. 10-12, which are fair. Occasional diurnal fluctuation caused by dam 7.9 mi upstream from station. U.S. Army Corps of Engineers gage-height transmitter at station, receiver at Gathright Dam. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--61 years, 167 ft³/s, 13.83 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,400 ft³/s, June 21, 1972, gage height, 15.65 ft, from rating curve extended above 4,500 ft³/s on basis of step-backwater computations and contracted-opening measurement at gage height 15.65 ft; minimum, 2.0 ft³/s, July 4, 1970; minimum daily, 7.0 ft³/s, Sept. 9, 1966; minimum gage height, 0.69 ft, June 6, July 14, 1969.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1913 reached a stage of 18 ft, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 28	2130	3,860	7.23	May 10	0430	2,250	5.61
May 2	0700	3,310	6.70	Sept. 16	1800	2,380	5.76
May 6	0600	3,000	6.40	Sept. 22	2300	*4,110	*7.48

Minimum discharge, 7.8 ft³/s, Sept. 8, gage height, 1.16 ft; minimum daily, 16 ft³/s, Oct. 10-13, 16, 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	25	87	85	63	134	147	1360	49	64	39	38
2	21	24	72	100	61	120	123	2620	47	56	38	38
3	21	23	61	110	65	117	112	1030	48	52	35	37
4	21	22	54	104	149	118	105	562	45	53	33	36
5	19	199	48	93	167	119	98	619	43	303	41	36
6	18	188	44	105	152	201	91	2280	47	235	46	35
7	18	99	41	241	142	348	88	1010	74	157	39	36
8	17	69	39	260	137	292	92	628	79	113	35	31
9	17	53	41	206	128	239	105	593	72	90	33	28
10	16	45	38	163	e110	203	142	1790	74	77	30	26
11	16	39	35	134	e85	176	159	872	61	64	31	25
12	16	36	29	149	e88	158	151	555	54	54	31	202
13	16	34	e27	303	96	141	139	406	53	76	29	129
14	17	31	32	304	113	136	126	314	51	69	27	90
15	17	29	31	1190	365	124	123	259	49	56	26	75
16	16	28	e30	796	345	113	116	220	56	57	27	1850
17	16	29	e29	423	284	101	103	186	401	160	30	1050
18	17	28	e28	289	248	103	94	158	236	98	58	388
19	17	32	e27	218	215	137	91	136	143	74	130	228
20	17	222	37	173	185	166	87	123	512	64	136	163
21	26	210	51	141	179	374	81	114	379	56	78	132
22	40	129	262	115	229	480	78	103	350	49	95	1290
23	42	92	215	103	254	360	75	105	531	43	95	1660
24	36	74	231	93	234	792	71	95	304	40	117	532
25	32	61	493	85	200	736	77	85	218	41	125	320
26	29	52	283	78	187	475	795	78	171	47	96	472
27	27	50	186	73	173	337	511	76	135	44	73	420
28	25	88	144	67	151	263	1290	68	110	42	59	292
29	24	122	115	62	---	220	2490	61	91	39	49	223
30	23	104	94	63	---	190	1470	56	75	39	45	185
31	22	---	83	67	---	170	---	53	---	39	41	---
TOTAL	682	2237	2987	6393	4805	7643	9230	16615	4558	2451	1767	10067
MEAN	22.0	74.6	96.4	206	172	247	308	536	152	79.1	57.0	336
MAX	42	222	493	1190	365	792	2490	2620	531	303	136	1850
MIN	16	22	27	62	61	101	71	53	43	39	26	25
CFSM	.13	.45	.59	1.26	1.05	1.50	1.88	3.27	.93	.48	.35	2.05
IN.	.15	.51	.68	1.45	1.09	1.73	2.09	3.77	1.03	.56	.40	2.28

CAL YR 1988 TOTAL 27242 MEAN 74.4 MAX 1490 MIN 12 CFSM .45 IN. 6.18
WTR YR 1989 TOTAL 69435 MEAN 190 MAX 2620 MIN 16 CFSM 1.16 IN. 15.75

e Estimated.

02013100 JACKSON RIVER BELOW DUNLAP CREEK, AT COVINGTON, VA

LOCATION.--Lat 37°47'19", long 80°00'03", Covington City, Hydrologic Unit 02080201, on left bank in city recreation park and 0.5 mi downstream from Dunlap Creek.

DRAINAGE AREA.--614 mi².

PERIOD OF RECORD.--October 1974 to current year.

REVISED RECORDS.--WDR VA-76-1: 1975(M).

GAGE.--Water-stage recorder. Datum of gage is 1,206.53 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Small diurnal fluctuation at low flow caused by Westvaco plant 0.8 mi upstream and occasionally by dam on Dunlap Creek 12.7 mi upstream. Flow regulated since December 1979 by Moomaw Lake (station 02011795) 19.9 mi upstream; since October 1984 by Back Creek Lake 47.9 mi upstream, amount unknown; and since January 1985 by Little Back Creek Lake 51.0 mi upstream, amount unknown. Diversion by Westvaco plant averages 47 ft³/s for industrial use of which approximately 42 ft³/s is returned upstream from station. Diversion 2.0 mi upstream from station for city of Covington water supply averages less than 4.0 ft³/s. U.S. Army Corps of Engineers gage-height transmitter at station, receiver at Gathright Dam. Several measurements of water temperature were made during the year.

AVERAGE DISCHARGE.--15 years, 717 ft³/s, 15.86 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 31,300 ft³/s, Nov. 4, 1985, gage height, 23.31 ft, from rating curve extended above 19,000 ft³/s; minimum, 41 ft³/s, Jan. 5, 1981, gage height, 4.38 ft, result of freezeup; minimum daily, 67 ft³/s, Sept. 3, 27-29, 1981.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 21, 1972, reached a stage of 24.36 ft, discharge, 34,000 ft³/s, from floodmarks, and flood of Dec. 27, 1973, reached a stage of 22.09 ft, from floodmarks, discharge, 28,300 ft³/s, from rating curve extended above 19,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,330 ft³/s, Apr. 28, gage height, 12.12 ft; minimum, 106 ft³/s, Oct. 19, gage height, 4.57 ft; minimum daily, 180 ft³/s, Nov. 3, 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	214	192	264	271	260	614	919	4040	320	382	345	329		
2	214	187	243	298	258	483	650	4180	324	369	327	316		
3	212	180	230	309	269	377	734	4660	327	363	317	289		
4	209	180	221	304	363	412	822	5170	323	375	313	287		
5	209	425	213	281	398	480	615	4820	322	970	335	289		
6	204	469	210	292	379	999	543	5550	328	733	334	287		
7	204	305	205	458	364	2370	598	4430	381	592	326	302		
8	199	256	202	511	355	2460	607	4980	679	504	321	293		
9	199	233	213	441	342	1490	625	3460	584	462	318	290		
10	199	221	202	375	322	1270	638	3950	1180	455	315	286		
11	194	214	198	341	322	918	601	5560	1000	408	322	299		
12	199	207	190	367	315	813	547	4420	528	388	321	605		
13	194	206	191	611	310	724	537	1770	645	473	317	550		
14	194	202	195	596	321	695	522	1470	589	444	310	428		
15	194	198	194	1720	714	712	528	1180	678	407	308	390		
16	194	197	192	1360	689	531	516	1050	693	400	309	2740		
17	194	201	194	817	582	427	496	926	1450	515	317	2170		
18	199	198	196	608	525	372	394	898	2290	436	366	1760		
19	182	214	193	500	481	448	394	767	1930	398	463	1490		
20	188	487	198	426	441	547	392	715	1610	382	550	1170		
21	214	496	211	378	435	1080	389	585	1430	367	406	636		
22	225	342	472	335	503	1750	388	469	1250	355	411	1570		
23	220	282	441	314	548	1600	385	527	1340	344	412	2690		
24	220	254	450	300	519	2700	378	597	1060	338	493	1910		
25	209	236	883	286	478	2920	375	452	1040	334	885	1600		
26	204	223	583	277	618	2210	2580	433	1000	368	1130	1640		
27	206	222	422	272	864	1510	3330	405	850	388	718	1240		
28	206	267	358	264	759	877	5520	387	640	357	484	938		
29	203	307	315	259	---	1010	4910	376	434	341	413	710		
30	204	285	283	263	---	992	4360	361	401	343	347	651		
31	204	---	267	262	---	853	---	336	---	347	334	---		
TOTAL	6310	7886	8829	14096	12734	34644	34293	68924	25626	13338	12867	28155		
MEAN	204	263	285	455	455	1118	1143	2223	854	430	415	938		
MAX	225	496	883	1720	864	2920	5520	5560	2290	970	1130	2740		
MIN	182	180	190	259	258	372	375	336	320	334	308	286		
(*)	-98	+22	+80	+410	+324	+5	+235	-236	-5	-16	+21	+3		
MEAN†	106	285	365	865	779	1123	1378	1987	849	414	436	942		
CFSM†	.17	.46	.59	1.41	1.27	1.83	2.24	3.24	1.38	.67	.71	1.53		
IN.†	.20	.52	.69	1.62	1.32	2.11	2.50	3.73	1.54	.78	.82	1.71		
CAL YR 1988	TOTAL	142593	MEAN	390	MAX	4250	MIN	180	MEAN†	330	CFSM†	.54	IN.†	7.31
WTR YR 1989	TOTAL	267702	MEAN	733	MAX	5560	MIN	180	MEAN†	793	CFSM†	1.29	IN.†	17.55

* Change in contents, equivalent in cubic feet per second, in Moomaw Lake; provided by U.S. Army Corps of Engineers.

† Adjusted for change in contents.

02014000 POTTS CREEK NEAR COVINGTON, VA

LOCATION.--Lat 37°43'44", long 80°02'33", Alleghany County, Hydrologic Unit 02080201, on left bank at downstream side of bridge on State Highway 18, 0.8 mi downstream from Blue Spring Creek, and 5.2 mi southwest of Covington.

DRAINAGE AREA.--153 mi².

PERIOD OF RECORD.--October 1928 to September 1956, October 1965 to current year.

REVISED RECORDS.--WSP 1723: 1935, 1936(M), 1940(M), 1942(M), 1948-49(M), 1951-52(M), 1954(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,273.93 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 30, 1956, nonrecording gage at site 1.3 mi downstream at different datum.

REMARKS.--Records good except for period with ice effect, Feb. 11-13, which is fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--52 years, 179 ft³/s, 15.89 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,400 ft³/s, Nov. 4, 1985, gage height, 13.46 ft, from rating curve extended above 12,000 ft³/s; minimum observed, 13 ft³/s, Nov. 29, 1930.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,400 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 16	1930	4,000	8.42	Sept. 22	2230	*5,040	*9.08

Minimum discharge, 26 ft³/s, Feb. 13, gage height, 2.63 ft, result of freezeup; minimum daily, 28 ft³/s, Oct. 13-20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35	43	72	92	91	161	178	1160	84	107	68	50
2	36	46	69	92	87	147	156	1910	80	98	61	47
3	39	45	64	87	85	142	145	1000	77	91	55	44
4	46	42	61	87	85	141	138	634	79	94	51	42
5	44	200	59	80	87	141	131	654	76	425	61	41
6	38	216	56	96	88	189	125	1660	79	268	57	40
7	35	137	54	188	92	250	122	1070	97	202	49	44
8	34	108	52	178	97	244	130	713	94	157	45	47
9	33	91	55	162	92	227	140	630	127	129	43	45
10	32	80	54	145	79	207	138	1100	147	113	41	41
11	31	72	49	132	e82	188	136	800	114	99	43	39
12	30	65	40	144	e84	174	132	605	99	91	44	60
13	28	61	37	186	e86	162	131	473	98	187	43	105
14	28	57	46	183	106	165	128	374	98	120	41	82
15	28	54	53	442	175	155	133	323	94	101	42	133
16	28	51	52	423	190	145	134	274	99	95	46	2970
17	28	51	48	316	176	134	125	233	152	145	44	1600
18	28	49	43	259	170	133	119	201	158	110	74	584
19	28	54	44	221	166	167	117	176	133	95	101	343
20	28	108	50	189	162	171	113	162	453	93	75	247
21	42	91	53	165	172	255	109	152	380	89	62	208
22	75	81	83	143	278	283	106	139	273	82	128	1990
23	74	76	112	133	271	263	103	154	578	72	106	2370
24	64	73	124	124	246	416	100	143	315	68	101	837
25	55	69	169	116	212	450	108	128	419	64	91	513
26	49	65	154	110	206	380	248	120	274	70	80	1100
27	45	62	134	105	194	318	195	115	210	67	74	720
28	41	68	122	100	176	271	272	108	168	75	67	483
29	40	75	113	95	---	239	585	99	144	73	61	360
30	39	73	101	94	---	215	963	94	122	63	60	299
31	33	---	94	95	---	198	---	89	---	64	55	---
TOTAL	1219	2363	2317	4982	4035	6731	5460	15493	5321	3607	1969	15484
MEAN	39.3	78.8	74.7	161	144	217	182	500	177	116	63.5	516
MAX	75	216	169	442	278	450	963	1910	578	425	128	2970
MIN	28	42	37	80	79	133	100	89	76	63	41	39
CFSM	.26	.51	.49	1.05	.94	1.42	1.19	3.27	1.16	.76	.42	3.37
IN.	.30	.57	.56	1.21	.98	1.64	1.33	3.77	1.29	.88	.48	3.76

CAL YR 1988 TOTAL 29215 MEAN 79.8 MAX 497 MIN 20 CFSM .52 IN. 7.10
WTR YR 1989 TOTAL 68981 MEAN 189 MAX 2970 MIN 28 CFSM 1.24 IN. 16.77

e Estimated.

JAMES RIVER BASIN

02015700 BULLPASTURE RIVER AT WILLIAMSVILLE, VA

LOCATION.--Lat 38°11'43", long 79°34'14", Bath County, Hydrologic Unit 02080201, on left bank 15 ft downstream from bridge on State Highway 614 at Williamsville and 0.62 mi upstream from mouth.

DRAINAGE AREA.--110 mi².

PERIOD OF RECORD.--August 1960 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,610.14 ft above National Geodetic Vertical Datum of 1929. Prior to July 12, 1974, at site 700 ft upstream at datum 11.84 ft higher.

REMARKS.--Records good except those for periods with ice effect, Dec. 11-13 and Feb. 10-12, and periods of doubtful gage-height record, Apr. 2-17, July 7, and Aug. 21, 22, which are fair. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--29 years, 148 ft³/s, 18.27 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,900 ft³/s, Nov. 4, 1985, gage height, 14.39 ft, from flood-marks, from rating curve extended above 3,300 ft³/s on basis of slope-area measurement of peak flow; minimum, 19 ft³/s, Jan. 4, 1981, result of freezeup; minimum daily, 23 ft³/s, Sept. 8, 9, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 26	0500	2,500	5.00	Aug. 21	1300	2,230	4.79
May 5	2400	*2,870	*5.28	Aug. 24	1830	2,240	4.80

Minimum discharge, 20 ft³/s, Dec. 12, gage height, 1.26 ft, result of freezeup; minimum daily, 27 ft³/s, Oct. 13-19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	31	62	70	68	114	210	682	75	99	84	107
2	32	31	56	80	65	101	e180	1310	73	93	75	101
3	32	30	52	91	66	97	e160	665	70	86	66	90
4	32	30	48	86	75	97	e145	420	70	90	63	80
5	31	79	45	66	73	118	e135	993	95	105	60	75
6	30	110	43	80	72	594	e125	1720	230	183	60	73
7	30	66	42	78	73	515	e120	796	480	e299	72	72
8	28	50	42	151	73	330	e120	510	434	146	57	70
9	28	44	40	240	60	263	e130	691	316	122	51	68
10	28	40	35	178	e55	234	e125	1240	296	213	48	63
11	28	38	e34	143	e55	208	e120	672	216	127	52	78
12	28	35	e32	193	e57	190	e115	470	195	105	88	115
13	27	38	e32	257	58	170	e110	356	284	208	63	103
14	27	44	39	200	90	166	e105	287	186	196	56	84
15	27	40	39	486	276	150	e108	275	286	138	51	91
16	27	38	38	420	275	136	e108	254	458	148	58	1190
17	27	43	33	278	210	120	e97	221	877	226	89	600
18	27	51	32	213	183	120	91	193	434	176	125	319
19	27	48	33	183	163	134	91	173	302	141	99	232
20	28	207	35	153	143	125	86	160	462	168	86	188
21	31	188	39	127	174	262	80	158	457	127	e749	166
22	42	114	51	110	218	251	78	136	390	110	e465	250
23	36	88	52	105	200	223	75	146	316	95	360	340
24	34	73	93	97	168	636	72	143	284	88	546	242
25	33	63	205	91	146	510	104	120	223	80	418	200
26	31	57	132	88	150	376	1540	116	208	124	260	266
27	30	56	105	84	138	302	570	110	168	248	213	208
28	30	82	93	77	127	254	368	97	143	160	254	178
29	30	73	78	72	---	226	534	90	129	107	173	160
30	30	65	72	72	---	216	495	86	112	90	160	143
31	30	---	66	70	---	245	---	82	---	95	125	---
TOTAL	933	1952	1798	4639	3511	7483	6397	13372	8269	4393	5126	5952
MEAN	30.1	65.1	58.0	150	125	241	213	431	276	142	165	198
MAX	42	207	205	486	276	636	1540	1720	877	299	749	1190
MIN	27	30	32	66	55	97	72	82	70	80	48	63
CFSM	.27	.59	.53	1.36	1.14	2.19	1.94	3.92	2.51	1.29	1.50	1.80
IN.	.32	.66	.61	1.57	1.19	2.53	2.16	4.52	2.80	1.49	1.73	2.01

CAL YR 1988 TOTAL 29406 MEAN 80.3 MAX 1450 MIN 25 CFSM .73 IN. 9.94
WTR YR 1989 TOTAL 63825 MEAN 175 MAX 1720 MIN 27 CFSM 1.59 IN. 21.58

e Estimated.

02016000 COWPASTURE RIVER NEAR CLIFTON FORGE, VA

LOCATION.--Lat 37°47'30", long 79°45'35", Alleghany County, Hydrologic Unit 02080201, on left bank 100 ft downstream from bridge on State Highway 633, 2.5 mi upstream from confluence with Jackson River, and 4.0 mi southeast of Clifton Forge.

DRAINAGE AREA.--461 mi².

PERIOD OF RECORD.--March 1925 to current year. Records for May 1907 to August 1908, published in WSP 242, are unreliable and should not be used.

REVISED RECORDS.--WSP 952: 1925-41. WSP 2104: Drainage area. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 1,006.93 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to October 1934, nonrecording gage at site 100 ft upstream at present datum.

REMARKS.--Records good except those for period with ice effect, Dec. 18-20, and periods of no gage-height record, Apr. 26 to May 24 and June 7-12, which are fair. Low flow affected by springs and by occasional regulation from unknown source. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--64 years, 530 ft³/s, 15.61 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,900 ft³/s, Nov. 5, 1985, gage height, 19.15 ft, from rating curve extended above 13,000 ft³/s on basis of slope-area measurements at gage heights 15.70 ft and 19.15 ft; minimum, 38 ft³/s, Sept. 2, 1932; minimum daily, 40 ft³/s, Sept. 1, 1932; minimum gage height, 1.43 ft, Jan. 31, 1981, result of freezeup.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1913 reached a stage of 20.8 ft, from floodmarks, discharge, about 45,000 ft³/s, from rating curve extended above 13,000 ft³/s on basis of records for other stations in James River basin.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 5,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 26	Unknown	a6,800	Unknown	May 6	Unknown	*10,500	*b9.98
Apr. 29	Unknown	a5,740	Unknown	May 10	Unknown	a5,730	Unknown
May 2	Unknown	a7,920	Unknown	Sept. 16	1730	7,210	8.39

a Daily mean discharge; actual peak is known to be greater than value shown.

b From high-water mark.

Minimum discharge, 77 ft³/s, Oct. 14-15, 16, 19-21, gage height, 1.60 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	111	92	254	268	215	423	614	e5740	225	290	321	321
2	112	93	234	279	205	373	519	e7920	213	262	293	268
3	117	92	212	301	204	339	471	e4850	204	243	238	239
4	115	90	195	315	236	325	464	e2890	196	287	203	212
5	106	164	178	295	270	330	434	e3150	192	346	200	191
6	98	364	167	285	262	2030	399	e10000	232	341	180	180
7	93	429	158	346	262	3200	379	e5730	e581	1600	171	186
8	89	277	152	383	268	1740	380	e3390	e1320	995	174	180
9	87	205	162	589	261	1170	402	e3400	e1360	545	158	178
10	86	170	157	745	234	915	411	e5730	e1250	920	144	168
11	85	149	145	594	232	754	392	e4340	e1010	663	146	154
12	84	135	117	552	246	646	371	e3340	e600	443	155	298
13	80	132	115	853	246	571	357	e1930	596	795	180	579
14	77	130	144	893	258	521	342	e1510	679	982	168	410
15	77	129	140	1910	573	478	342	e1150	508	708	152	381
16	79	128	135	3070	1410	430	343	e1050	706	522	146	4890
17	79	137	130	1650	1050	381	325	e851	2810	513	152	4000
18	80	133	e122	1080	818	359	299	e705	1940	597	213	1600
19	79	159	e122	811	687	374	287	e545	1070	468	267	968
20	77	847	e125	644	591	385	282	e504	842	399	229	698
21	91	910	134	527	545	560	268	e491	1190	390	203	568
22	117	681	179	434	625	1150	256	e441	1630	323	1230	934
23	116	450	243	375	758	936	247	e400	1210	278	866	1400
24	111	342	339	348	745	2300	239	e426	952	250	713	1140
25	98	280	834	322	629	2610	258	389	823	251	1870	825
26	91	237	844	296	566	1770	e6800	348	711	241	1000	1090
27	87	214	587	278	535	1270	e4440	328	596	302	635	1000
28	85	233	462	259	479	975	e3390	294	470	438	710	741
29	84	261	383	240	---	802	e5740	267	394	324	836	605
30	83	275	326	233	---	687	e3740	250	339	264	532	524
31	83	---	283	225	---	646	---	238	---	242	411	---
TOTAL	2857	7938	7778	19400	13410	29450	33191	72597	24849	15222	12896	24928
MEAN	92.2	265	251	626	479	950	1106	2342	828	491	416	831
MAX	117	910	844	3070	1410	3200	6800	10000	2810	1600	1870	4890
MIN	77	90	115	225	204	325	239	238	192	241	144	154
CFSM	.20	.57	.54	1.36	1.04	2.06	2.40	5.08	1.80	1.07	.90	1.80
IN.	.23	.64	.63	1.57	1.08	2.38	2.68	5.86	2.01	1.23	1.04	2.01

CAL YR 1988 TOTAL 105018 MEAN 287 MAX 3680 MIN 67 CFSM .62 IN. 8.47
WTR YR 1989 TOTAL 264516 MEAN 725 MAX 10000 MIN 77 CFSM 1.57 IN. 21.34

e Estimated.

JAMES RIVER BASIN

02016500 JAMES RIVER AT LICK RUN, VA

LOCATION.--Lat 37°46'25", long 79°47'05", Botetourt County, Hydrologic Unit 02080201, on right bank at community of Lick Run, 1,000 ft downstream from bridge on U.S. Highway 220, 0.9 mi downstream from confluence of Cowpasture and Jackson Rivers, 1.8 mi south of Iron Gate, and at mile 342.3.

DRAINAGE AREA.--1,373 mi².

PERIOD OF RECORD.--April 1925 to current year.

REVISED RECORDS.--WSP 852: 1936-37. WSP 972: 1927, 1930(M), 1932(M), 1935-36. WSP 1303: 1927-28(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 978.30 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Oct. 26, 1928, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since December 1979 by Moomaw Lake (station 02011795) 43.7 mi upstream from station; since October 1984 by Back Creek Lake 71.7 mi upstream; and since January 1985 by Little Back Creek Lake 74.8 mi upstream, amount unknown. National Weather Service gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--64 years, 1,614 ft³/s, 15.96 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 87,500 ft³/s, Nov. 5, 1985, gage height, 30.22 ft, from rating curve extended above 66,000 ft³/s; minimum, 133 ft³/s, Jan. 6, 1981, result of freezeup; minimum daily, 156 ft³/s, Oct. 12, 1930.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in November 1877 reached a stage of about 33 ft, discharge, about 120,000 ft³/s. Flood in March 1913 reached a stage of 30.4 ft, from floodmarks, discharge, about 98,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 21,200 ft³/s, May 6, gage height, 13.69 ft; minimum, 258 ft³/s, Oct. 20, gage height, 1.57 ft; minimum daily, 308 ft³/s, Oct. 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	422	386	690	742	622	1320	2000	12200	704	885	795	741		
2	401	366	640	763	592	1110	1510	15600	681	817	741	670		
3	417	352	590	802	591	962	1410	11700	678	772	657	602		
4	416	353	555	812	660	939	1620	9670	665	840	605	558		
5	396	635	521	764	795	988	1340	9590	649	1560	623	533		
6	377	1400	497	765	781	3050	1170	19200	712	1870	620	521		
7	365	1060	482	1020	764	6240	1210	12500	1180	2130	581	550		
8	359	772	467	1210	760	5890	1220	10100	2330	1970	563	564		
9	355	622	497	1330	743	3270	1280	8330	2310	1310	540	540		
10	351	545	484	1410	686	2870	1310	12000	2870	1620	519	518		
11	351	499	451	1200	674	2110	1260	11900	2360	1310	527	507		
12	342	461	407	1180	711	1800	1170	9300	1350	1050	547	939		
13	338	448	368	1570	707	1600	1140	4640	1360	1630	559	1520		
14	331	437	420	1670	728	1450	1110	3730	1420	1720	547	1130		
15	334	425	435	4420	1380	1480	1120	2950	1340	1330	525	959		
16	335	419	434	6280	2580	1230	1110	2640	1550	1120	525	10900		
17	335	438	424	3510	2020	1060	1070	2240	3420	1250	524	10400		
18	334	424	397	2390	1650	971	955	2010	4270	1270	665	4940		
19	338	464	396	1840	1460	1010	904	1660	3830	1070	910	3350		
20	308	1660	423	1480	1310	1170	883	1540	3140	969	956	2610		
21	382	1790	444	1220	1240	1660	856	1370	3720	940	770	1690		
22	455	1320	688	1050	1460	3650	830	1170	3750	851	1700	3090		
23	455	969	966	949	1700	3220	810	1170	3580	769	1460	8870		
24	439	803	1050	891	1660	5870	784	1300	2770	722	1330	4860		
25	404	695	2110	827	1440	7350	819	1090	2630	704	2690	3500		
26	384	622	1930	770	1370	5360	10700	1010	2310	703	2480	4560		
27	373	585	1370	729	1700	3970	8840	964	1920	790	1590	3710		
28	367	636	1130	689	1520	2500	10200	884	1480	954	1320	2660		
29	360	724	975	656	---	2360	12500	827	1120	808	1410	1970		
30	357	741	854	643	---	2260	10100	791	986	725	1020	1670		
31	358	---	765	639	---	1850	---	748	---	719	865	---		
TOTAL	11539	21051	21860	44221	32304	80570	81231	174824	61085	35178	29164	79632		
MEAN	372	702	705	1426	1154	2599	2708	5639	2036	1135	941	2654		
MAX	455	1790	2110	6280	2580	7350	12500	19200	4270	2130	2690	10900		
MIN	308	352	368	639	591	939	784	748	649	703	519	507		
(*)	-98	+22	+80	+410	+324	+5	+235	-236	-5	-16	+21	+3		
MEAN†	274	724	785	1836	1478	2604	2943	5403	2031	1119	962	2657		
CFSM†	.20	.53	.57	1.34	1.08	1.90	2.14	3.94	1.48	.82	.70	1.94		
IN.†	.23	.59	.66	1.54	1.12	2.19	2.39	4.54	1.65	.94	.81	2.16		
CAL YR 1988	TOTAL	312833	MEAN	895	MAX	7350	MIN	308	MEAN†	795	CFSM†	.58	IN.†	7.88
WTR YR 1989	TOTAL	672659	MEAN	1843	MAX	19200	MIN	308	MEAN†	1903	CFSM†	1.39	IN.†	18.82

* Change in contents, equivalent in cubic feet per second, in Moomaw Lake; provided by U.S. Army Corps of Engineers.

† Adjusted for change in contents.

JAMES RIVER BASIN

173

02017500 JOHNS CREEK AT NEW CASTLE, VA

LOCATION.--Lat 37°30'22", long 80°06'25", Craig County, Hydrologic Unit 02080201, on right bank 20 ft downstream from bridge on State Highway 615 at New Castle and 1,700 ft upstream from mouth.

DRAINAGE AREA.--104 mi².

PERIOD OF RECORD.--April 1926 to current year.

REVISED RECORDS.--WSP 972: 1935-36(M), 1940(M). WSP 1203: 1928, 1935. WSP 1303: 1927(M), 1928, 1929-34(M), 1935. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,254.30 ft above National Geodetic Vertical Datum of 1929. Prior to June 7, 1937, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 12, 13, 17-20, and Feb. 10-12, which are fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--63 years, 127 ft³/s, 16.58 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,000 ft³/s, Jan. 23, 1935, from rating curve extended above 3,200 ft³/s on basis of slope-area measurement of peak flow; maximum gage height, 12.48 ft, June 21, 1972; minimum discharge, 6.0 ft³/s, Dec. 5, 1946, result of freezeup; minimum daily, 6.6 ft³/s, Oct. 1, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 16	1530	2,500	8.80	Sept. 22	2030	*3,060	*9.27

Minimum daily discharge, 13 ft³/s, Oct. 19, 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	20	39	51	49	124	141	484	54	92	27	21
2	20	21	38	56	46	111	123	1030	48	75	27	20
3	26	20	36	56	44	105	112	630	44	62	25	19
4	27	20	34	58	45	104	104	487	51	64	23	18
5	24	134	32	52	46	102	97	549	44	343	22	18
6	20	112	31	74	48	243	89	1240	49	175	20	18
7	18	77	30	163	51	356	88	772	72	139	19	19
8	18	61	29	150	52	254	100	588	71	112	19	21
9	17	51	31	137	52	213	118	582	105	95	18	21
10	16	43	31	125	e49	187	135	1130	103	81	17	19
11	16	38	29	117	e49	166	129	727	70	68	17	19
12	15	34	e21	143	e54	150	120	577	56	78	17	23
13	14	32	e22	186	55	138	116	483	76	105	17	112
14	14	31	31	166	60	141	112	415	76	61	17	109
15	14	29	28	241	116	132	117	360	73	52	17	97
16	14	28	29	270	144	124	115	308	76	52	20	1460
17	14	34	e28	213	126	115	105	255	95	67	21	929
18	14	33	e27	183	120	115	99	208	98	55	63	537
19	13	32	e25	160	116	134	95	173	97	50	64	376
20	13	38	e27	139	119	153	89	153	272	47	45	319
21	17	41	30	120	173	313	84	137	272	42	36	289
22	28	39	38	104	278	300	79	122	232	37	46	1470
23	27	38	57	93	233	270	75	154	273	33	39	1080
24	29	38	73	83	203	418	70	139	271	30	37	580
25	25	36	100	76	178	401	67	124	397	28	31	440
26	23	34	100	70	165	321	80	113	284	26	30	894
27	20	34	92	65	150	273	85	102	220	24	33	572
28	19	40	82	59	137	235	136	88	180	23	29	430
29	19	40	71	55	---	202	305	77	145	23	27	359
30	18	39	59	53	---	180	476	69	116	23	26	308
31	18	---	50	51	---	162	---	62	---	28	23	---
TOTAL	589	1267	1350	3569	2958	6242	3661	12338	4020	2190	872	10597
MEAN	19.0	42.2	43.5	115	106	201	122	398	134	70.6	28.1	353
MAX	29	134	100	270	278	418	476	1240	397	343	64	1470
MIN	13	20	21	51	44	102	67	62	44	23	17	18
CFSM	.18	.41	.42	1.11	1.02	1.94	1.17	3.83	1.29	.68	.27	3.40
IN.	.21	.45	.48	1.28	1.06	2.23	1.31	4.41	1.44	.78	.31	3.79

CAL YR 1988 TOTAL 23107 MEAN 63.1 MAX 497 MIN 10 CFSM .61 IN. 8.27
WTR YR 1989 TOTAL 49653 MEAN 136 MAX 1470 MIN 13 CFSM 1.31 IN. 17.76

e Estimated.

JAMES RIVER BASIN

02018000 CRAIG CREEK AT PARR, VA

LOCATION.--Lat 37°39'57", long 79°54'42", Botetourt County, Hydrologic Unit 02080201, on right bank 12 ft upstream from Chesapeake and Ohio Railway bridge, 700 ft downstream from Stony Run, 0.2 mi northeast of Horton, 0.4 mi northwest of Parr, and 12 mi upstream from mouth.

DRAINAGE AREA.--329 mi².

PERIOD OF RECORD.--April 1925 to current year.

REVISED RECORDS.--WSP 852: 1937. WSP 892: 1935-36. WSP 1303: 1929-30(M), 1932-35(M), 1937-38(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 992.50 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to June 7, 1937, nonrecording gage at same site and datum.

REMARKS.--Records good except those for period of backwater from leaves, Oct. 1 to Nov. 4, and periods with ice effect, Dec. 12, 13, 19, which are fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--64 years, 385 ft³/s, 15.89 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 58,500 ft³/s, Nov. 4, 1985, gage height, 24.76 ft, from high-water mark in gage house, from rating curve extended above 11,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 20 ft³/s, probably occurred Dec. 21, 25, 1980, or Jan. 4, 1981, gage height, 3.20 ft, result of freezeup; minimum daily, 25 ft³/s, Sept. 4, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	1600	6,360	10.35	Sept. 17	0400	5,380	9.71
May 10	1500	4,340	8.95	Sept. 23	0630	*7,530	*11.07

Minimum daily discharge, 41 ft³/s, Oct. 19, 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e78	e58	139	184	151	335	388	1460	142	217	89	55
2	e65	e58	135	186	144	295	337	3630	129	182	85	52
3	e76	e60	127	188	139	271	301	2130	119	157	78	49
4	e84	e60	120	194	136	264	280	1250	113	152	71	48
5	e77	186	113	197	136	264	263	1130	128	1750	69	46
6	e67	781	106	195	136	346	248	5020	136	1350	66	45
7	e55	377	102	304	139	1270	235	3340	290	895	62	50
8	e54	266	98	404	141	970	250	1880	318	618	55	52
9	e54	209	101	392	140	729	307	1350	303	456	51	53
10	e50	173	103	355	134	603	385	3360	483	367	50	51
11	e48	150	99	319	134	511	408	2450	357	290	50	49
12	e47	134	e83	317	151	442	370	1540	271	236	51	64
13	e43	121	e64	463	157	396	341	1140	265	634	50	74
14	e42	113	90	497	157	382	319	925	334	378	50	179
15	e42	106	88	535	172	359	311	782	281	263	50	157
16	e42	98	85	781	313	340	310	680	249	230	50	1750
17	e42	109	86	676	318	353	283	574	251	246	54	3570
18	e42	123	81	568	303	343	258	492	258	258	89	1270
19	e41	122	e73	482	305	395	243	414	236	218	126	805
20	e41	134	98	411	305	448	231	364	404	192	123	617
21	e44	157	101	357	343	682	217	333	616	174	101	535
22	e50	157	106	305	797	876	207	294	609	153	116	1080
23	e67	151	131	269	759	738	197	314	527	134	125	4890
24	e75	147	164	244	616	1010	187	335	537	119	102	1660
25	e68	141	220	225	514	1190	188	283	563	109	99	1030
26	e64	132	281	207	451	977	317	254	646	101	82	1910
27	e60	126	282	192	414	782	299	230	473	99	76	1730
28	e58	131	263	180	371	655	375	207	388	89	73	1060
29	e54	141	244	168	---	566	651	184	326	83	68	822
30	e52	142	217	160	---	495	1010	168	265	81	64	679
31	e52	---	195	155	---	442	---	154	---	86	60	---
TOTAL	1734	4863	4195	10110	7976	17729	9716	36667	10017	10317	2335	24432
MEAN	55.9	162	135	326	285	572	324	1183	334	333	75.3	814
MAX	84	781	282	781	797	1270	1010	5020	646	1750	126	4890
MIN	41	58	64	155	134	264	187	154	113	81	50	45
CFSM	.17	.49	.41	.99	.87	1.74	.98	3.60	1.01	1.01	.23	2.48
IN.	.20	.55	.47	1.14	.90	2.00	1.10	4.15	1.13	1.17	.26	2.76

CAL YR 1988 TOTAL 64856 MEAN 177 MAX 1380 MIN 40 CFSM .54 IN. 7.33
WTR YR 1989 TOTAL 140091 MEAN 384 MAX 5020 MIN 41 CFSM 1.17 IN. 15.84

e Estimated.

02018500 CATAWBA CREEK NEAR CATAWBA, VA

LOCATION.--Lat 37°28'05", long 80°00'20", Botetourt County, Hydrologic Unit 02080201, on right bank 80 ft upstream from bridge on State Highway 779, 1.0 mi downstream from Little Catawba Creek, 1.9 mi west of Haymakertown, and 8.2 mi northeast of Catawba.

DRAINAGE AREA.--34.3 mi².

PERIOD OF RECORD.--September 1943 to current year.

REVISED RECORDS.--WSP 1303: 1944-45(M). WSP 2104: Drainage area. WDR VA-72-1: 1954, 1955(P), 1957-58(P), 1959, 1960-62(P), 1963, 1964(M), 1965-67(P), 1968(M), 1969, 1970(M), 1971.

GAGE.--Water-stage recorder. Datum of gage is 1,299.96 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 1, 1953, nonrecording gage at site 80 ft downstream at same datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 13, Feb. 5, 10, and period of doubtful gage-height record, June 20 to July 3, which are fair. At a point 5.3 mi upstream from station, there is transmountain diversion through a tunnel into Roanoke River basin for municipal water supply of city of Roanoke since December 1974. Prior to October 1976, monthly means adjusted for pumpage by Citadel Cement Corporation. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--46 years, 36.7 ft³/s, 14.53 in/yr, adjusted for pumpage from October 1952 to September 1976, and transmountain diversion since December 1974.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,200 ft³/s, Nov. 4, 1985, gage height, 19.19 ft, from high-water mark, from rating curve extended above 1,700 ft³/s on basis of slope-area measurements at gage heights 10.35 ft and 19.19 ft; minimum, 0.28 ft³/s, Aug. 21, 1987, gage height, 0.99 ft, cause unknown; minimum daily, 0.67 ft³/s, Aug. 14, 1981.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of 13.26 ft, from information by observer.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,180 ft³/s, Sept. 16, gage height, 5.98 ft; minimum, 3.2 ft³/s, Dec. 12, result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	7.7	7.7	9.4	6.0	5.8	8.6	16	236	20	e11	16	5.6		
2	8.0	6.0	8.9	5.9	5.8	8.1	14	248	20	e11	15	5.4		
3	9.8	5.5	8.4	5.6	6.0	7.9	14	66	19	e11	14	5.3		
4	11	5.2	8.1	5.7	6.0	9.5	13	58	18	21	13	5.2		
5	9.1	14	8.2	5.7	e6.5	15	14	271	18	523	12	5.2		
6	7.1	12	7.5	6.8	6.9	28	13	683	19	177	12	5.5		
7	6.3	11	7.3	7.9	7.1	32	13	321	26	118	10	6.4		
8	5.5	9.8	7.3	8.0	6.9	26	15	176	19	74	5.4	5.9		
9	5.2	9.1	8.2	7.8	6.3	22	18	193	27	56	5.2	5.5		
10	5.2	9.4	7.2	7.3	e5.4	19	20	368	25	44	5.1	5.3		
11	4.7	8.8	7.5	7.5	5.6	17	19	206	19	35	5.4	5.2		
12	5.5	8.0	5.4	8.6	5.7	15	18	137	16	31	5.4	8.1		
13	4.4	8.3	e5.2	9.3	6.0	15	16	108	24	64	5.2	8.0		
14	4.4	7.7	7.0	8.9	5.9	14	15	87	20	36	5.0	7.5		
15	4.4	7.1	7.0	10	6.7	13	15	76	16	30	5.0	12		
16	4.4	8.3	7.8	11	7.5	15	13	68	15	32	4.7	734		
17	4.4	11	7.1	11	7.6	13	13	57	14	41	4.6	209		
18	4.4	8.8	6.2	11	7.9	14	12	47	13	30	7.1	81		
19	4.1	7.4	7.1	9.7	7.9	13	12	42	12	27	7.1	51		
20	4.7	7.7	6.9	9.3	9.1	16	12	38	e20	25	5.7	41		
21	7.4	8.0	7.7	9.0	14	24	11	35	e32	23	12	35		
22	7.4	5.4	8.6	8.6	17	22	11	32	e28	21	8.9	497		
23	6.9	5.2	9.0	8.6	15	21	11	38	e22	19	6.9	266		
24	6.3	5.2	9.3	8.4	14	33	10	31	e17	19	6.6	116		
25	5.5	4.9	8.9	7.5	12	33	10	28	e15	21	6.3	79		
26	5.0	5.4	8.3	6.6	11	28	11	27	e14	22	6.3	212		
27	4.7	7.6	8.5	6.2	10	25	13	25	e13	24	6.0	117		
28	4.4	10	9.4	6.3	9.5	23	14	24	e13	19	5.2	82		
29	4.7	9.4	8.3	6.1	---	21	17	23	e12	17	4.8	61		
30	4.7	10	7.7	6.2	---	19	20	22	e12	16	5.0	54		
31	5.0	---	7.3	5.9	---	17	---	21	---	19	5.6	---		
TOTAL	182.3	243.9	240.7	242.4	235.1	587.1	423	3792	558	1617	236.5	2731.1		
MEAN	5.88	8.13	7.76	7.82	8.40	18.9	14.1	122	18.6	52.2	7.63	91.0		
MAX	11	14	9.4	11	17	33	20	683	32	523	16	734		
MIN	4.1	4.9	5.2	5.6	5.4	7.9	10	21	12	11	4.6	5.2		
(*)	0	.22	0	4.06	8.49	30.2	13.5	10.5	1.43	0	0	3.17		
MEAN‡	5.88	8.35	7.76	11.9	16.9	49.1	27.6	132	20.0	52.2	7.63	94.2		
CFSM‡	.17	.24	.23	.35	.49	1.43	.80	3.85	.58	1.52	.22	2.75		
IN.‡	.20	.27	.26	.40	.51	1.65	.90	4.44	.65	1.75	.26	3.06		
CAL YR 1988	TOTAL	5090.4	MEAN	13.9	MAX	92	MIN	1.9	MEAN‡	15.1	CFSM‡	.44	IN.‡	5.99
WTR YR 1989	TOTAL	11089.1	MEAN	30.4	MAX	734	MIN	4.1	MEAN‡	36.4	CFSM‡	1.06	IN.‡	14.41

* Average diversion, equivalent in cubic feet per second, provided by city of Roanoke.

† Adjusted for diversion.

‡ Estimated.

JAMES RIVER BASIN

02019500 JAMES RIVER AT BUCHANAN, VA

LOCATION.--Lat 37°31'50", long 79°40'45", Botetourt County, Hydrologic Unit 02080201, on left bank 300 ft upstream from bridge on U.S. Highway 11 at Buchanan, 1,000 ft upstream from Purgatory Creek, 1.5 mi downstream from Looney Creek, and at mile 306.4.

DRAINAGE AREA.--2,075 mi².

PERIOD OF RECORD.--February 1898 to current year. Monthly discharge only for some periods, published in WSP 1303. Records for August 1895 to Feb. 11, 1898, published in WSP 11, 15, and 27 are in error and should not be used.

Gage-height records collected at this site since 1893 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 602: 1917-24. WSP 972: 1935-36. WSP 1303: 1898-1916, 1917-20(M), 1922(M), 1924(M).

WSP 1383: 1927. WSP 2104: Drainage area. WDR VA-72-1: 1913(M). See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 802.90 ft above National Geodetic Vertical Datum of 1929. Prior to July 1, 1927, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since December 1979 by Moomaw Lake (station 02011795) 79.6 mi upstream; since October 1984 by Back Creek Lake 107.6 mi upstream, amount unknown; and since January 1985 by Little Back Creek Lake 110.7 mi upstream, amount unknown. National Weather Service gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--91 years, 2,478 ft³/s, 16.22 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 179,000 ft³/s, Nov. 5, 1985, gage height, 38.84 ft, from floodmarks, from rating curve extended above 110,000 ft³/s; minimum, 202 ft³/s, Sept. 8, 1966, gage height, 1.44 ft; minimum daily, 207 ft³/s, Sept. 12, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in November 1877 reached a stage of 34.9 ft, from floodmark, discharge, about 142,000 ft³/s, from rating curve extended above 110,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 35,000 ft³/s, May 6, gage height, 16.29 ft; minimum, 450 ft³/s, Oct. 21, gage height, 2.08 ft; minimum daily, 480 ft³/s, Oct. 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	775	580	1240	1300	1070	2370	3060	18000	1310	1560	1170	1160
2	693	597	1160	1280	1030	2050	2730	25400	1240	1400	1240	1040
3	715	559	1080	1310	995	1800	2370	19200	1210	1300	1130	957
4	733	540	1000	1330	1010	1650	2420	13600	1180	1390	1020	872
5	717	610	940	1320	1160	1660	2360	11700	1150	3470	976	825
6	663	2430	889	1280	1240	2290	2070	29500	1310	5960	1010	806
7	628	2300	855	1460	1220	8610	1950	23600	1680	4180	958	826
8	596	1670	827	2060	1200	8720	2020	15100	2760	4330	894	884
9	576	1320	856	2170	1190	5450	2220	12500	3470	2780	865	846
10	565	1110	885	2340	1130	4500	2320	16300	4020	2690	829	819
11	553	989	828	2140	1060	3690	2360	18000	3680	2500	836	786
12	538	902	763	2000	1120	3130	2230	13600	2760	2050	854	902
13	516	846	670	2410	1160	2800	2090	8880	2250	3670	850	1870
14	504	817	665	3130	1190	2580	2000	6270	2440	3780	865	1880
15	495	780	740	3660	1340	2480	1970	5130	2270	2680	837	1540
16	496	747	747	8770	3130	2310	1960	4540	2150	2280	819	8270
17	494	778	737	5810	3220	2030	1890	4030	3420	2130	810	20400
18	497	832	704	4080	2710	1860	1760	3510	5910	2360	1010	8730
19	496	816	665	3270	2450	1830	1580	3140	4740	2090	1140	5510
20	490	1540	704	2740	2250	2080	1530	2810	3900	1830	1410	4270
21	480	2470	755	2300	2160	2530	1480	2610	4720	1670	1390	3320
22	624	2310	840	1970	2680	4740	1420	2320	5220	1550	1460	2960
23	674	1730	1320	1730	3370	4960	1380	2200	4610	1410	2490	14900
24	685	1430	1560	1590	3200	6760	1340	2280	4230	1320	1880	9180
25	659	1250	2360	1490	2840	10600	1340	2170	3680	1250	2440	5960
26	609	1120	3120	1380	2540	8320	9410	1910	3710	1290	3440	6850
27	579	1040	2460	1310	2650	6280	12300	1800	3170	1260	2520	8000
28	558	1120	2020	1230	2650	4570	11200	1650	2620	1400	1880	5310
29	545	1200	1760	1160	---	3820	15000	1540	2150	1350	1940	4090
30	532	1290	1560	1120	---	3580	13100	1460	1760	1200	1660	3410
31	528	---	1390	1100	---	3210	---	1390	---	1180	1310	---
TOTAL	18213	35723	36100	70240	52965	123260	110860	276140	88720	69310	41933	127173
MEAN	588	1191	1165	2266	1892	3976	3695	8908	2957	2236	1353	4239
MAX	775	2470	3120	8770	3370	10600	15000	29500	5910	5960	3440	20400
MIN	480	540	665	1100	995	1650	1340	1390	1150	1180	810	786
(*)	-98	+22	+80	+410	+324	+5	+235	-236	-5	-16	+21	+3
MEAN†	490	1213	1245	2676	2216	3981	3930	8672	2952	2220	1374	4242
CFSM†	.24	.58	.60	1.29	1.07	1.92	1.89	4.18	1.42	1.07	.66	2.04
IN.†	.27	.65	.69	1.49	1.11	2.21	2.11	4.82	1.59	1.23	.76	2.28

CAL YR 1988 TOTAL 516052 MEAN 14101 MAX 11900 MIN 480 MEAN† 1350 CFSM† .65 IN.† 8.86
WTR YR 1989 TOTAL 1050637 MEAN 2878 MAX 29500 MIN 480 MEAN† 2938 CFSM† 1.42 IN.† 19.23

* Change in contents, equivalent in cubic feet per second, in Moomaw Lake; provided by U.S. Army Corps of Engineers.

† Adjusted for change in contents.

02020500 CALFPASTURE RIVER ABOVE MILL CREEK, AT GOSHEN, VA

LOCATION.--Lat 37°59'16", long 79°29'38", Rockbridge County, Hydrologic Unit 02080202, on left bank 20 ft upstream from bridge on State Highway 42 at Goshen and 400 ft upstream from Mill Creek.

DRAINAGE AREA.--144 mi².

PERIOD OF RECORD.--October 1938 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,384.84 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for period with ice effect, Feb. 9-11, which is fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--51 years, 165 ft³/s, 15.56 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 56,300 ft³/s, Nov. 4, 1985, gage height, 20.23 ft, from rating curve extended above 9,200 ft³/s on basis of slope-area measurements at gage heights 12.78 ft and 20.23 ft; no flow Sept. 5, 6, 1957, Sept. 28, 1959, result of diversion.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 26	1200	2,790	5.71	May 6	0800	2,590	5.49
May 2	0800	2,810	5.73	Aug. 25	0130	*3,540	*6.49

Minimum daily discharge, 5.7 ft³/s, Oct. 13, 14, 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	14	34	60	34	127	159	1440	46	57	48	146
2	13	15	32	61	32	109	137	2490	43	50	43	115
3	13	14	31	58	36	99	124	1310	41	44	37	93
4	12	12	28	62	43	92	117	727	39	48	32	76
5	11	33	27	63	40	91	108	689	39	53	29	66
6	9.6	74	24	60	37	874	100	2250	53	52	26	58
7	8.7	83	23	63	39	1250	94	1480	746	260	36	53
8	8.3	58	21	68	41	669	95	820	881	149	29	48
9	8.3	45	22	158	e39	413	104	586	704	112	25	44
10	7.8	38	20	208	e37	297	93	1530	841	271	22	40
11	7.2	32	18	164	e38	232	89	997	421	152	22	41
12	6.5	28	14	151	43	192	89	604	260	109	37	178
13	5.7	28	14	198	49	165	89	414	322	278	39	102
14	5.7	28	15	214	53	149	86	312	247	342	32	78
15	6.4	25	13	1050	255	133	87	263	192	250	29	65
16	6.8	22	13	1010	352	117	86	241	167	177	27	500
17	6.9	22	12	542	282	103	78	197	925	165	25	684
18	7.2	21	10	338	238	98	73	166	640	154	57	340
19	7.0	23	10	232	203	109	75	145	342	132	97	215
20	5.7	72	11	170	175	106	74	133	401	117	93	160
21	9.5	202	12	132	163	185	70	125	347	94	291	135
22	17	150	14	103	185	305	69	110	323	75	900	318
23	15	100	16	87	241	277	68	106	263	62	393	851
24	11	71	25	74	252	803	67	102	290	70	423	451
25	10	56	158	66	213	1080	71	90	204	59	1700	286
26	10	46	238	58	189	712	1880	82	184	110	675	305
27	9.8	40	163	53	168	455	1210	75	133	98	488	282
28	9.8	40	122	48	146	324	667	66	101	71	793	228
29	9.8	36	94	44	---	253	925	60	81	56	477	184
30	10	34	75	41	---	208	1110	56	66	47	303	152
31	10	---	63	37	---	188	---	51	---	48	200	---
TOTAL	293.7	1462	1372	5673	3623	10215	8094	17717	9342	3762	7428	6294
MEAN	9.47	48.7	44.3	183	129	330	270	572	311	121	240	210
MAX	17	202	238	1050	352	1250	1880	2490	925	342	1700	851
MIN	5.7	12	10	37	32	91	67	51	39	44	22	40
CFSM	.07	.34	.31	1.27	.90	2.29	1.87	3.97	2.16	.84	1.66	1.46
IN.	.08	.38	.35	1.47	.94	2.64	2.09	4.58	2.41	.97	1.92	1.63

CAL YR 1988 TOTAL 24991.5 MEAN 68.3 MAX 1220 MIN 3.0 CFSM .47 IN. 6.46
WTR YR 1989 TOTAL 75275.7 MEAN 206 MAX 2490 MIN 5.7 CFSM 1.43 IN. 19.45

e Estimated.

JAMES RIVER BASIN

02021500 MAURY RIVER AT ROCKBRIDGE BATHS, VA

LOCATION.--Lat 37°54'26", long 79°25'20", Rockbridge County, Hydrologic Unit 02080202, on right bank at Rockbridge Baths, 1,200 ft upstream from bridge on State Highway 39, and 1.0 mi upstream from Hays Creek.

DRAINAGE AREA.--329 mi².

PERIOD OF RECORD.--October 1928 to current year. Monthly discharge only for some periods, published in WSP 1303. Prior to October 1945, published as North River at Rockbridge Baths.

REVISED RECORDS.--WSP 972: 1929-40, 1941(M). WSP 1002: 1930(m). WSP 1553: 1931(m).

GAGE.--Water-stage recorder. Datum of gage is 1,100.33 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--Records good except those for periods with ice effect, Dec. 12, 13, 17-19, which are fair. Since 1966, some regulation at times by Lake Merriweather on Little Calpasture River. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--61 years, 377 ft³/s, 15.56 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 87,700 ft³/s, Nov. 5, 1985, gage height, 19.19 ft, from flood-mark, from rating curve extended above 16,000 ft³/s on basis of slope-area measurement at peak flow; minimum, 5.8 ft³/s, Sept. 10, 1966, gage height, 0.79 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	0600	7,460	7.80	May 6	0730	*7,990	*8.00

Minimum discharge, 34 ft³/s, Oct. 1-2, gage height, 1.18 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35	70	138	181	132	313	379	3950	99	135	171	248
2	36	54	128	192	123	267	331	6430	94	118	130	201
3	51	46	118	180	129	242	299	2890	91	105	105	166
4	84	46	111	179	197	233	282	1700	89	123	92	140
5	81	243	100	163	181	235	267	1730	86	203	84	123
6	60	343	102	174	168	1830	240	6480	148	161	78	112
7	74	214	101	203	169	2490	228	3830	874	886	81	107
8	96	148	97	221	171	1400	241	2170	1150	499	81	102
9	86	110	101	312	158	949	272	1650	1230	293	71	96
10	61	91	97	396	146	741	247	3120	1510	694	65	91
11	66	80	91	337	165	600	230	2290	768	467	65	86
12	78	70	e73	331	165	512	219	1450	468	321	79	650
13	76	71	e68	425	160	436	208	1070	482	699	91	394
14	84	75	59	435	191	405	203	866	424	809	81	250
15	56	69	57	1880	648	367	186	669	331	615	75	189
16	46	63	56	1990	886	331	187	683	296	464	74	2420
17	58	70	e54	1110	726	299	170	611	1150	428	70	2260
18	72	68	e60	766	608	288	152	509	970	377	139	1180
19	77	70	e57	584	525	300	152	430	579	314	196	756
20	75	572	63	460	449	289	149	387	575	264	173	521
21	81	579	72	366	439	428	140	371	606	215	155	610
22	93	400	131	296	548	618	137	308	723	186	1100	862
23	78	281	147	258	642	589	134	303	531	159	608	1330
24	60	217	201	229	602	1600	128	277	602	152	428	823
25	74	177	509	208	508	1930	129	240	436	146	2160	603
26	52	148	528	190	464	1360	2530	214	494	202	983	767
27	61	139	390	177	418	1020	2580	195	398	207	728	720
28	61	176	310	160	360	881	1900	157	239	166	1120	574
29	69	159	255	148	---	615	1990	138	193	135	832	469
30	50	141	210	146	---	417	2270	125	157	114	471	386
31	47	---	186	142	---	375	---	109	---	118	328	---
TOTAL	2078	4990	4670	12839	10078	22360	16580	45352	15793	9775	10914	17236
MEAN	67.0	166	151	414	360	721	553	1463	526	315	352	575
MAX	96	579	528	1990	886	2490	2580	6480	1510	886	2160	2420
MIN	35	46	54	142	123	233	128	109	86	105	65	86
CFSM	.20	.51	.46	1.26	1.09	2.19	1.68	4.45	1.60	.96	1.07	1.75
IN.	.23	.56	.53	1.45	1.14	2.53	1.87	5.13	1.79	1.11	1.23	1.95

CAL YR 1988 TOTAL 62835 MEAN 172 MAX 2400 MIN 15 CFSM .52 IN. 7.10
WTR YR 1989 TOTAL 172665 MEAN 473 MAX 6480 MIN 35 CFSM 1.44 IN. 19.52

e Estimated.

02022500 KERRS CREEK NEAR LEXINGTON, VA

LOCATION.--Lat 37°49'32", long 79°26'36", Rockbridge County, Hydrologic Unit 02080202, on right bank 100 ft upstream from bridge on Interstate Highway 64, 1.4 mi upstream from mouth, and 2.9 mi north of Lexington.

DRAINAGE AREA.--35.0 mi².

PERIOD OF RECORD.--October 1926 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 1203: 1927-29, 1930-34(M), 1935-40, 1941(M), 1942, 1943-48(M), 1949. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 980.32 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Jan. 27, 1927, to Sept. 30, 1953, nonrecording gage at site 1,000 ft downstream at different datum.

REMARKS.--No estimated daily discharges. Records good. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--63 years, 35.8 ft³/s, 13.89 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,000 ft³/s, Sept. 10, 1950, gage height, 13.8 ft, from flood-marks, site and datum then in use, from rating curve extended above 800 ft³/s on basis of contracted-opening and slope-area measurements of peak flow; minimum, 0.90 ft³/s, July 22, 1966 (result of temporary dam upstream); minimum daily, 4.0 ft³/s many days in August and September 1932, Nov. 21, 1938, July 22, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	0945	720	5.20	May 6	1600	1,080	5.82
Apr. 27	1630	725	5.21	May 9	2115	1,090	5.83
May 1	1415	1,370	6.19	Sept. 12	1100	610	4.98
May 1	2115	1,420	6.25	Sept. 16	0315	*3,190	*7.85
May 5	2315	3,120	7.80	Sept. 16	1500	1,710	6.56

Minimum discharge, 2.8 ft³/s, Feb. 9, gage height, 1.93 ft, result of freezeup; minimum daily, 6.2 ft³/s, Oct. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.8	9.9	14	13	12	21	28	652	19	13	26	13
2	7.4	9.2	12	13	12	19	25	559	18	13	48	13
3	8.3	8.6	11	12	12	19	24	192	18	13	26	12
4	7.6	8.5	11	12	14	19	23	114	17	23	21	12
5	6.9	52	10	11	13	22	24	482	18	23	18	11
6	6.7	25	10	13	13	274	21	768	19	19	22	12
7	6.6	16	9.8	16	13	138	22	288	32	29	19	12
8	6.5	13	9.6	16	12	73	25	157	21	20	15	12
9	6.6	12	11	16	12	55	31	298	100	17	14	12
10	6.5	11	9.9	16	12	45	29	387	67	34	13	11
11	6.5	10	9.3	15	12	39	28	178	38	20	14	18
12	6.3	9.5	8.4	17	12	35	26	118	30	33	14	178
13	6.2	10	8.8	19	13	31	24	90	27	53	13	49
14	6.3	9.5	8.8	18	16	30	23	72	24	33	13	33
15	6.4	8.8	9.0	134	52	27	23	65	26	26	13	38
16	6.3	8.6	9.0	79	43	24	21	56	23	33	13	964
17	6.3	11	8.6	49	38	22	20	49	22	29	51	223
18	6.6	10	8.1	37	33	23	19	43	20	28	91	96
19	7.2	10	8.3	30	30	22	18	39	19	24	52	66
20	7.0	66	8.5	26	26	24	17	37	20	23	35	52
21	8.5	27	9.2	22	31	42	16	35	33	20	28	46
22	9.8	19	14	19	41	40	15	31	27	18	24	74
23	8.2	16	15	18	40	38	15	32	23	16	21	64
24	7.9	14	20	16	34	147	14	29	21	16	20	49
25	7.8	12	32	16	30	88	17	27	19	17	22	45
26	7.8	12	22	15	28	64	195	25	18	18	20	141
27	7.8	12	19	15	26	51	216	25	16	15	18	72
28	8.0	21	17	14	24	44	223	22	15	14	16	56
29	8.1	16	15	13	---	39	219	21	15	13	15	47
30	8.0	15	14	14	---	35	146	21	14	13	15	43
31	7.9	---	13	13	---	32	---	20	---	43	14	---
TOTAL	224.8	482.6	385.3	737	654	1582	1547	4932	779	709	744	2474
MEAN	7.25	16.1	12.4	23.8	23.4	51.0	51.6	159	26.0	22.9	24.0	82.5
MAX	9.8	66	32	134	52	274	223	768	100	53	91	964
MIN	6.2	8.5	8.1	11	12	19	14	20	14	13	13	11
CFSM	.21	.46	.36	.68	.67	1.46	1.47	4.55	.74	.65	.69	2.36
IN.	.24	.51	.41	.78	.70	1.68	1.64	5.24	.83	.75	.79	2.63

CAL YR 1988 TOTAL 5722.0 MEAN 15.6 MAX 192 MIN 5.6 CFSM .45 IN. 6.08
WTR YR 1989 TOTAL 15250.7 MEAN 41.8 MAX 964 MIN 6.2 CFSM 1.19 IN. 16.21

JAMES RIVER BASIN

02024000 MAURY RIVER NEAR BUENA VISTA, VA

LOCATION.--Lat 37°45'45", long 79°23'30", Rockbridge County, Hydrologic Unit 02080202, on right bank 0.5 mi downstream from South River and 2.8 mi northwest of Buena Vista.

DRAINAGE AREA.--646 mi².

PERIOD OF RECORD.--October 1938 to current year. Monthly discharge only for some periods, published in WSP 1303. Prior to October 1945, published as North River near Buena Vista.

REVISED RECORDS.--WSP 952: 1940-41. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 846.58 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for period with ice effect, Dec. 13-17, which is fair. Since 1966, some regulation at times by Lake Merriweather on Little Calpasture River. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--51 years, 661 ft³/s, 13.90 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 105,000 ft³/s, Aug. 20, 1969, gage height, 31.23 ft, from flood-marks, from rating curve extended above 17,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 20 ft³/s, Oct. 10, 1941, occurred during filling of a small reservoir 2 mi upstream; unqualified minimum, 37 ft³/s, Sept. 9, 1966; minimum gage height, 0.98 ft, Jan. 5, 1981.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 18, 1936, reached a stage of about 22 ft, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 6,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	0230	11,100	10.74	May 6	0700	*11,300	*10.84

Minimum discharge, 98 ft³/s, Oct. 2, gage height, 1.21 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	107	151	290	302	243	543	626	5510	328	326	636	382
2	110	161	267	307	228	476	581	9480	311	297	415	328
3	123	130	246	294	228	441	533	4760	305	276	317	288
4	148	118	230	284	296	445	510	2760	294	393	274	255
5	160	266	214	269	310	453	507	2650	326	504	248	234
6	143	712	199	277	289	2100	471	9830	370	426	275	220
7	133	433	203	311	290	3690	449	6240	1080	927	233	215
8	150	316	194	324	293	2120	474	3630	1350	710	217	212
9	172	248	215	362	278	1500	517	2790	2030	514	198	201
10	148	212	207	479	251	1190	490	4410	1930	781	190	191
11	128	188	187	450	273	986	463	3460	1110	684	200	185
12	144	165	158	435	293	855	442	2410	765	501	217	846
13	145	163	e132	504	283	749	419	1870	729	780	217	706
14	149	168	e130	546	317	696	408	1560	675	954	210	453
15	145	159	e125	1780	621	631	396	1320	587	777	196	358
16	125	146	e120	2600	1110	581	385	1270	541	759	198	3200
17	118	191	e120	1550	997	527	359	1140	1290	682	202	3300
18	132	203	123	1090	868	514	335	989	1050	601	468	1730
19	149	185	131	855	767	532	323	869	734	532	429	1210
20	149	644	136	688	670	518	318	787	792	473	380	869
21	158	800	144	574	674	608	302	760	936	390	381	789
22	180	611	226	483	872	817	291	676	892	348	949	1330
23	184	459	282	430	1010	813	283	666	749	323	820	1930
24	145	375	334	390	961	1730	274	615	783	323	600	1330
25	133	313	593	360	830	2380	279	561	725	325	1860	1010
26	134	272	742	332	742	1850	2420	516	819	366	1200	1410
27	120	256	590	310	681	1430	3370	491	706	337	859	1300
28	122	378	484	289	604	1240	2960	437	501	294	978	1040
29	135	367	421	270	---	1020	2650	393	421	258	1070	869
30	134	314	360	264	---	743	2820	374	364	265	630	748
31	112	---	320	263	---	664	---	347	---	586	465	---
TOTAL	4335	9104	8123	17672	15279	32842	24655	73571	23493	15712	15532	27139
MEAN	140	303	262	570	546	1059	822	2373	783	507	501	905
MAX	184	800	742	2600	1110	3690	3370	9830	2030	954	1860	3300
MIN	107	118	120	263	228	441	274	347	294	258	190	185
CFSM	.22	.47	.41	.88	.84	1.64	1.27	3.67	1.21	.78	.78	1.40
IN.	.25	.52	.47	1.02	.88	1.89	1.42	4.24	1.35	.90	.89	1.56

CAL YR 1988 TOTAL 115885 MEAN 317 MAX 2760 MIN 60 CFSM .49 IN. 6.67
WTR YR 1989 TOTAL 267457 MEAN 733 MAX 9830 MIN 107 CFSM 1.13 IN. 15.40

e Estimated.

02025500 JAMES RIVER AT HOLCOMBS ROCK, VA

LOCATION.--Lat 37°30'04", long 79°15'46", Bedford County, Hydrologic Unit 02080203, on right bank at Holcombs Rock, 0.9 mi downstream from Pedlar River, and at mile 268.6.

DRAINAGE AREA.--3,259 mi².

PERIOD OF RECORD.--January 1900 to September 1915 (gage heights only), October 1926 to current year. Monthly discharge only for some periods, published in WSP 1303. Published as "at Salt Creek" December 1926 to June 1931.

REVISED RECORDS.--WSP 972: 1913(M), 1932-33, 1935(M), 1936. WSP 1303: 1928(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 548.53 ft above National Geodetic Vertical Datum of 1929. January 1900 to September 1915, nonrecording gage in powerhouse of Owens Illinois Glass Company 1,000 ft upstream at different datum. December 1926 to June 1931, water-stage recorder at site 2 mi downstream at different datum.

REMARKS.--Records good except for period of no gage-height record, Dec. 15 to Jan. 11, which is fair. Some diurnal fluctuation caused by powerplants upstream from station. Flow regulated since December 1979 by Moomaw Lake (station 02011795) 117.4 mi upstream; since October 1984 by Back Creek Lake 145.4 mi upstream; and since January 1985 by Little Back Creek Lake 148.5 mi upstream, amount unknown. National Weather Service gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--63 years, 3,588 ft³/s, 14.95 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 207,000 ft³/s, Nov. 5, 1985, gage height, 42.15 ft, from high-water mark in gage house, from rating curve extended above 73,000 ft³/s on basis of records for other stations in James River basin; minimum, 20 ft³/s, Oct. 29, 1987, gage height, 2.80 ft; minimum daily, 223 ft³/s, July 28, 1930.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1913 reached a stage of 31.3 ft, from floodmarks, discharge, 118,000 ft³/s, from rating curve extended as explained above.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 25,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	0400	44,300	19.18	Sept. 17	0545	27,200	15.01
May 6	2100	*45,900	*19.52				

Minimum discharge, 68 ft³/s, Dec. 6, gage height, 3.01 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	997	872	1580	e1800	1380	2840	3440	24700	1800	2070	2100	1720		
2	951	919	1490	e1900	1300	2530	3360	40000	1770	1850	2390	1510		
3	847	890	1450	e2000	1310	2300	2850	27800	1660	1730	1890	1410		
4	907	845	1250	e1780	1270	2160	2710	17900	1700	1750	1590	1340		
5	976	982	1330	e1650	1430	2190	2900	16400	1580	2510	1490	1140		
6	946	1910	1100	e2150	1640	3450	2610	40200	1820	6310	1460	1030		
7	920	2850	1150	e1700	1490	12000	2440	35000	2610	4600	1550	1240		
8	859	2100	1130	e2050	1540	11100	2520	21200	3880	5090	1380	1200		
9	971	1660	1180	e2700	1440	7960	2730	16800	5020	3480	1210	1220		
10	873	1380	1200	e2600	1440	5820	2840	21200	6830	3150	1140	1130		
11	776	1250	1160	e2950	1400	4860	2780	22900	5340	3240	1320	1120		
12	799	1170	1110	2280	1380	3990	2700	17500	4060	2660	1260	1570		
13	797	1130	1060	2300	1470	3670	2550	12700	3190	3460	1260	2410		
14	808	1050	979	2940	1540	3230	2410	8710	3100	4750	1220	2380		
15	814	1050	e960	3530	1670	2990	2390	7270	3020	3720	1280	2080		
16	783	1030	e900	9390	2830	2900	2360	6260	2810	4000	1290	7800		
17	783	1120	e1000	7890	3980	2580	2260	5540	3140	3360	1190	24400		
18	773	1120	e1100	5190	3410	2380	2150	4800	6410	3150	1270	12200		
19	769	1140	e970	4020	3040	2360	1990	4280	5570	2910	1700	7200		
20	786	1230	e990	3310	2800	2390	1910	3820	4600	2650	1770	5240		
21	811	2690	e870	2820	2660	2800	1850	3570	5390	2360	1860	4290		
22	837	2750	e990	2400	3020	4010	1800	3220	6230	2160	2090	4270		
23	924	2220	e1200	2200	3930	5450	1750	3090	5500	1970	2980	13000		
24	950	1880	e1450	1960	4020	7130	1710	2930	5060	1860	2570	11900		
25	931	1680	e2000	1850	3640	12500	1650	2890	4300	1790	3540	7320		
26	897	1480	e2500	1780	3180	10800	9620	2550	4290	1780	4450	8060		
27	857	1260	e3300	1580	3000	8140	17700	2400	4060	1770	3570	9880		
28	833	1590	e2700	1570	3110	6310	15200	2270	3320	1800	2730	6870		
29	783	1630	e2500	1600	---	4900	17600	2120	2730	1800	2880	5210		
30	840	1610	e2250	1410	---	4280	16600	2000	2310	1620	2520	4250		
31	834	---	e2100	1400	---	3960	---	1900	---	1820	1970	---		
TOTAL	26632	44488	44949	84700	64320	153980	137380	383920	113100	87170	60920	154390		
MEAN	859	1483	1450	2732	2297	4967	4579	12380	3770	2812	1965	5146		
MAX	997	2850	3300	9390	4020	12500	17700	40200	6830	6310	4450	24400		
MIN	769	845	870	1400	1270	2160	1650	1900	1580	1620	1140	1030		
(*)	-98	+22	+80	+410	+324	+5	+235	-236	-5	-16	+21	+3		
MEAN†	761	1505	1530	3142	2621	4972	4814	12140	3765	2796	1986	5149		
CFSM†	.23	.46	.47	.96	.80	1.53	1.48	3.73	1.16	.86	.61	1.58		
IN.‡	.27	.52	.54	1.11	.84	1.76	1.65	4.30	1.29	.99	.70	1.76		
CAL YR 1988	TOTAL	656375	MEAN	1793	MAX	15300	MIN	526	MEAN†	1733	CFSM†	.53	IN.‡	7.24
WTR YR 1989	TOTAL	1355949	MEAN	3715	MAX	40200	MIN	769	MEAN†	3775	CFSM†	1.16	IN.‡	15.73

* Change in contents, equivalent in cubic feet per second, in Moomaw Lake; provided by U.S. Army Corps of Engineers.

† Adjusted for change in contents.

e Estimated.

JAMES RIVER BASIN

02026000 JAMES RIVER AT BENT CREEK, VA

LOCATION.--Lat 37°32'10", long 78°49'30", Nelson County, Hydrologic Unit 02080203, on left bank at town of Bent Creek, 150 ft downstream from Bent Creek, 525 ft upstream from bridge on U.S. Highway 60, 1.3 mi southeast of Gladstone, and at mile 227.8.

DRAINAGE AREA.--3,683 mi².

PERIOD OF RECORD.--October 1924 to current year. Monthly discharge only for some periods, published in WSP 1303. Prior to 1926, published as "at Bent Creek, near Gladstone."

REVISED RECORDS.--WSP 742: 1931(m). WSP 972: 1935-36. WSP 1066: 1940. WSP 1203: 1942. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 381.39 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 12, 1930, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Large diurnal fluctuation caused by powerplants upstream from station. Flow regulated since December 1979 by Moomaw Lake (station 02011795) 158.3 mi upstream; since October 1984 by Back Creek Lake 186.3 mi upstream; and since January 1985 by Little Back Creek Lake 189.4 mi upstream, amount unknown. National Weather Service gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--65 years, 4,185 ft³/s, 15.43 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 226,000 ft³/s, Nov. 5, 1985, gage height, 30.76 ft, from floodmarks, from rating curve extended above 177,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 222 ft³/s, Oct. 13, 14, 1930, gage height, 2.21 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 26,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	1030	47,500	13.83	Sept. 16	0515	27,900	10.59
May 6	0445	*49,600	*14.13	Sept. 17	1500	27,700	10.55
May 8	0545	27,600	10.53				

Minimum daily discharge, 686 ft³/s, Oct. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	1350	958	1760	1750	1280	4200	4080	19800	2150	2640	3670	2070		
2	761	1090	1730	1790	1650	3420	4340	42400	2150	2460	2780	2110		
3	912	915	1350	2040	1390	3130	4160	33200	1930	2200	3120	1720		
4	1140	843	1550	1660	1280	2580	3600	20500	1960	2150	2050	1610		
5	755	914	1310	1520	1460	2730	3670	16800	2010	3790	1840	1610		
6	1110	1520	1440	2150	1750	5270	3610	45000	2050	8770	1800	1420		
7	900	3220	1230	1520	1980	14800	3450	42900	9560	7880	2000	1300		
8	921	2910	1060	1960	1710	13600	3150	25000	5100	6070	1970	1540		
9	751	2390	1170	2690	1820	11200	3980	18500	6600	5280	1720	1650		
10	1060	1660	1440	2620	1580	7550	4060	21000	7720	4250	1520	1290		
11	973	1290	1120	3120	1270	6840	3690	24500	7360	3900	1550	1370		
12	692	1060	1290	2810	1490	5450	3560	19800	5840	3810	1970	2500		
13	686	1160	1050	3010	1780	4970	3530	15300	5550	3900	1590	3220		
14	905	1080	1040	2650	1810	4640	3290	10600	4350	5980	1480	3090		
15	859	1060	1060	4270	1760	3980	2680	9020	4240	5040	1740	2970		
16	703	1030	850	7920	2770	4140	2990	8120	3980	5750	1800	17600		
17	751	1500	1140	10300	5280	3730	3230	7100	3940	5390	1440	23300		
18	858	1490	978	7160	4800	2950	2980	6480	5880	4050	2340	16900		
19	849	1110	915	5560	4020	3200	2640	5450	7400	3980	1780	9650		
20	754	1080	989	4690	3710	3520	2060	4860	6450	4590	2010	6980		
21	889	2180	836	3280	3920	3740	2680	4470	5930	3490	2400	6270		
22	965	3450	1100	3200	4140	4370	1830	4200	6760	2610	3010	4810		
23	836	3120	1400	2950	4540	6420	2230	3880	7380	2610	3670	7790		
24	1000	2220	1630	2460	5660	8640	2330	4150	6500	2530	3840	15700		
25	1020	2050	2120	2190	4880	13000	2220	3750	5720	2260	3960	9410		
26	940	1800	3500	1960	4480	13100	5040	3510	5060	2200	5870	14200		
27	988	1440	4050	1920	4160	10300	19100	2550	5290	2550	5190	11500		
28	749	2680	3360	1530	3790	8190	16800	3020	4720	2240	3610	9210		
29	879	2540	2780	1460	---	6620	17400	2550	3640	2320	3430	7260		
30	783	1970	2690	1990	---	5890	18500	2930	2820	2170	3580	5880		
31	785	---	1750	1510	---	5090	---	2410	---	2220	2800	---		
TOTAL	27524	51730	49688	95640	80160	197260	156880	433750	150040	119080	81530	195930		
MEAN	888	1724	1603	3085	2863	6363	5229	13990	5001	3841	2630	6531		
MAX	1350	3450	4050	10300	5660	14800	19100	45000	9560	8770	5870	23300		
MIN	686	843	836	1460	1270	2580	1830	2410	1930	2150	1440	1290		
(*)	-98	+22	+80	+410	+324	+5	+235	-236	-5	-16	+21	+3		
MEAN†	790	1746	1683	3495	3187	6368	5464	13754	4996	3825	2651	6534		
CFSM†	.21	.47	.46	.95	.87	1.73	1.48	3.73	1.36	1.04	.72	1.77		
IN.†	.25	.53	.53	1.09	.90	1.99	1.66	4.31	1.51	1.20	.83	1.98		
CAL YR 1988	TOTAL	799630	MEAN	2185	MAX	14500	MIN	636	MEAN†	2125	CFSM†	.58	IN.†	7.86
WTR YR 1989	TOTAL	1639212	MEAN	4491	MAX	45000	MIN	686	MEAN†	4551	CFSM†	1.24	IN.†	16.78

* Change in contents, equivalent in cubic feet per second, in Moomaw Lake; provided by U.S. Army Corps of Engineers.

† Adjusted for change in contents.

02027000 TYE RIVER NEAR LOVINGSTON, VA

LOCATION.--Lat 37°42'55", long 78°58'55", Nelson County, Hydrologic Unit 02080203, on right bank at downstream side of bridge on State Highway 158, 3.5 mi downstream from Hat Creek, 4.8 mi upstream from Piney River, and 6.8 mi southwest of Lovingsston.

DRAINAGE AREA.--92.8 mi².

PERIOD OF RECORD.--August 1938 to current year.

REVISED RECORDS.--WSP 892: 1938. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 578.39 ft above National Geodetic Vertical Datum of 1929. Sept. 15, 1969, to Oct. 15, 1970, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 13, 14, and Feb. 11, and period of doubtful gage-height record, Sept. 27-29, which are fair. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--51 years, 154 ft³/s, 22.54 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 80,000 ft³/s, Aug. 20, 1969, gage height, 29.0 ft, from flood-marks, from rating curve extended above 7,600 ft³/s on basis of slope-area measurement of peak flow; minimum, 0.50 ft³/s, Sept. 10, 11, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 30	2330	1,840	4.93	May 5	2400	2,200	5.60
May 1	1900	1,740	4.72	July 16	0800	*2,430	*6.02

Minimum discharge, 14 ft³/s, Oct. 13-14, gage height, -0.33 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	29	85	69	63	128	179	e1120	92	99	206	115
2	19	37	80	68	59	115	160	1300	85	92	174	117
3	23	26	74	64	62	108	152	822	82	86	148	117
4	28	23	69	62	71	151	143	580	78	117	132	97
5	24	195	66	57	66	164	160	788	75	189	121	95
6	19	264	62	63	64	420	143	1600	99	218	106	95
7	18	143	59	74	71	490	137	1140	293	146	102	97
8	17	102	56	72	72	351	160	814	169	124	93	97
9	17	83	62	72	64	289	167	759	267	189	86	93
10	17	74	62	68	57	250	155	885	286	207	82	88
11	17	66	55	66	e55	221	146	688	219	132	97	86
12	16	59	45	78	64	198	141	568	188	145	121	239
13	14	60	e42	88	62	176	137	477	172	164	95	174
14	14	67	e48	80	80	169	130	405	150	132	86	132
15	15	56	50	182	102	160	132	361	141	113	117	124
16	15	54	48	201	124	143	126	325	139	927	104	939
17	15	80	45	174	141	132	117	295	143	458	116	633
18	15	85	40	155	130	135	110	267	115	322	233	443
19	15	78	45	139	124	141	108	242	101	264	214	354
20	15	102	44	124	117	128	101	219	117	315	184	306
21	18	108	46	110	143	150	97	198	174	267	164	322
22	32	99	75	97	184	143	95	184	246	234	160	514
23	26	93	64	95	191	139	92	191	289	237	186	549
24	21	88	72	86	186	294	88	169	256	229	162	424
25	19	80	95	83	167	364	86	150	208	206	188	374
26	18	75	85	80	162	344	312	139	179	203	169	578
27	17	75	83	78	150	292	320	128	160	219	150	e428
28	17	132	80	71	139	264	364	117	143	229	141	e354
29	17	99	77	67	---	237	351	108	128	186	137	e284
30	17	88	72	66	---	211	406	102	110	174	137	256
31	17	---	71	67	---	193	---	99	---	186	124	---
TOTAL	571	2620	1957	2856	2970	6700	5015	15240	4904	6809	4335	8524
MEAN	18.4	87.3	63.1	92.1	106	216	167	492	163	220	140	284
MAX	32	264	95	201	191	490	406	1600	293	927	233	939
MIN	14	23	40	57	55	108	86	99	75	86	82	86
CFSM	.20	.94	.68	.99	1.14	2.33	1.80	5.30	1.76	2.37	1.51	3.06
IN.	.23	1.05	.78	1.14	1.19	2.69	2.01	6.11	1.97	2.73	1.74	3.42

CAL YR 1988 TOTAL 31001.3 MEAN 84.7 MAX 513 MIN 9.0 CFSM .91 IN. 12.43
WTR YR 1989 TOTAL 62501 MEAN 171 MAX 1600 MIN 14 CFSM 1.85 IN. 25.05

e Estimated.

JAMES RIVER BASIN

02027500 PINEY RIVER AT PINEY RIVER, VA

LOCATION.--Lat 37°42'08", long 79°01'40", Nelson County, Hydrologic Unit 02080203, on left bank at upstream side of bridge on State Highway 151, 0.2 mi southwest of Piney River post office, 1.7 mi downstream from Indian Creek, and 2.5 mi southeast of Lowesville.

DRAINAGE AREA.--47.6 mi².

PERIOD OF RECORD.--July 1949 to current year.

REVISED RECORDS.--WSP 2104: Drainage area. WDR VA-72-1: 1971(M).

GAGE.--Water-stage recorder. Datum of gage is 633.58 ft above National Geodetic Vertical Datum of 1929. Prior to May 27, 1969, water-stage recorder, and Nov. 4, 1969, to Feb. 26, 1970, nonrecording gage at site 20 ft downstream from former highway bridge at same datum. Feb. 26, 1970, to Sept. 20, 1973, on right bank 20 ft upstream from bridge at same datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 13, 14, and Feb. 11, and period of doubtful gage-height record, Mar. 8-14, which are fair. Periodic dewatering of upstream quarries adds small amount of inflow. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--40 years, 94.4 ft³/s, 26.93 in./yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 38,000 ft³/s, Aug. 20, 1969, gage height, 13.8 ft, from floodmarks, from rating curve extended above 6,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 1.1 ft³/s, Sept. 13, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1949 reached a stage of 9.9 ft, from floodmarks.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 650 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 1	2345	1,300	3.92	July 16	0645	886	3.23
May 5	2400	*1,620	*4.42	Sept. 16	0330	735	2.94
May 9	2145	800	3.07				

Minimum discharge, 15 ft³/s, Oct. 12, 18, 19, 20, gage height, 0.15 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	28	74	69	49	96	118	772	49	84	128	49
2	24	26	72	64	47	89	107	979	47	74	256	46
3	27	21	69	61	47	86	101	601	44	67	154	44
4	27	20	65	57	51	105	94	434	42	94	124	41
5	23	146	60	53	47	108	105	571	40	134	105	40
6	20	240	57	62	46	217	90	1300	48	192	92	40
7	20	171	53	60	51	311	91	891	121	168	84	40
8	19	132	50	63	48	e266	96	600	63	135	75	39
9	19	105	57	60	45	e227	99	534	160	121	68	36
10	18	89	48	61	44	e195	95	630	192	122	64	34
11	18	76	45	62	e42	e171	94	523	149	93	73	33
12	17	66	40	74	46	e148	93	425	129	94	66	59
13	16	68	e38	73	47	e133	91	349	119	99	58	46
14	17	60	e40	71	59	e126	88	291	102	87	54	39
15	17	54	40	108	59	112	91	253	95	78	52	40
16	16	50	38	111	74	101	84	217	90	462	49	509
17	16	75	36	115	81	90	80	189	86	343	59	391
18	16	69	35	114	81	90	77	165	70	272	105	280
19	16	70	35	107	82	87	75	146	62	230	88	218
20	17	88	34	102	82	83	71	133	75	319	76	187
21	20	89	39	93	100	92	68	119	103	283	80	191
22	25	92	54	87	114	85	65	107	122	234	78	249
23	20	92	50	82	121	88	62	109	246	207	71	318
24	18	87	60	76	125	222	59	93	380	180	77	279
25	18	80	76	71	123	248	63	84	257	157	89	244
26	17	73	78	67	120	231	127	78	202	146	77	344
27	17	72	81	62	111	206	154	72	170	134	71	274
28	17	99	81	59	104	185	240	65	138	112	66	243
29	17	79	77	56	---	165	265	61	114	97	62	211
30	17	77	74	55	---	148	269	57	97	104	57	186
31	17	---	70	52	---	133	---	53	---	116	52	---
TOTAL	590	2494	1726	2307	2046	4644	3212	10901	3612	5038	2610	4750
MEAN	19.0	83.1	55.7	74.4	73.1	150	107	352	120	163	84.2	158
MAX	27	240	81	115	125	311	269	1300	380	462	256	509
MIN	16	20	34	52	42	83	59	53	40	67	49	33
CFSM	.40	1.75	1.17	1.56	1.54	3.15	2.25	7.39	2.53	3.41	1.77	3.33
IN.	.46	1.95	1.35	1.80	1.60	3.63	2.51	8.52	2.82	3.94	2.04	3.71

CAL YR 1988 TOTAL 18712.7 MEAN 51.1 MAX 240 MIN 4.5 CFSM 1.07 IN. 14.62
WTR YR 1989 TOTAL 43930 MEAN 120 MAX 1300 MIN 16 CFSM 2.53 IN. 34.33

e Estimated.

02027800 BUFFALO RIVER NEAR TYE RIVER, VA

LOCATION.--Lat 37°36'20", long 78°55'25", Nelson County, Hydrologic Unit 02080203, on right bank 35 ft upstream from bridge on State Highway 657, 2.1 mi upstream from mouth, and 3.5 mi southeast of town of Tye River.

DRAINAGE AREA.--147 mi².

PERIOD OF RECORD.--August 1960 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 444.39 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for periods with ice effect, Dec. 13, 14, and Feb. 11, and periods of doubtful or no gage-height record, Feb. 16 to Mar. 13, May 13-26, June 11-15, and Aug. 4-9, which are fair. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--29 years, 170 ft³/s, 15.70 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 45,000 ft³/s, Aug. 20, 1969, gage height, 27.95 ft, from flood-mark, from rating curve extended above 1,800 ft³/s on basis of computation of flow over dam at gage height 11.03 ft and slope-area measurement at gage height 27.95 ft; minimum, 3.2 ft³/s, Sept. 8-13, 1966; minimum gage height, 0.28 ft, Sept. 9-13, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,400 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 7	Unknown	a1,200	Unknown	July 6	0300	1,520	5.82
May 6	0300	*9,520	*13.13	July 16	1115	2,030	6.87
May 10	0400	1,420	5.58	Sept. 16	0745	3,700	8.90
June 7	0615	1,750	6.31				

a Daily mean discharge; actual peak is known to be greater than value shown.

Minimum discharge, 26 ft³/s, Oct. 14, gage height, 0.65 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	56	96	84	66	e135	183	430	98	109	250	132
2	35	61	90	84	65	e130	174	1110	95	104	713	129
3	41	45	85	80	65	e125	169	703	102	99	586	127
4	53	40	81	76	75	e160	165	531	94	106	e260	126
5	47	49	77	71	71	e180	169	884	89	438	e195	123
6	37	105	74	78	73	e370	168	3880	102	794	e175	125
7	34	75	72	91	81	e1200	157	1400	1030	476	e160	126
8	34	62	69	86	84	e580	176	962	354	298	e150	131
9	34	57	77	85	73	e400	187	768	395	235	e143	127
10	33	52	90	80	69	e350	170	1160	671	356	156	123
11	32	50	78	78	e67	e280	159	831	e327	220	167	118
12	30	46	67	86	71	e210	166	685	e232	190	172	356
13	29	46	e66	92	67	e170	175	e540	e297	212	159	202
14	27	51	e77	84	74	191	176	e450	e222	220	152	153
15	28	45	77	96	82	164	164	e385	e200	185	148	140
16	29	42	71	105	e120	159	157	e350	203	1000	145	1860
17	29	73	75	103	e158	155	139	e300	264	589	139	708
18	29	79	71	99	e150	152	134	e270	178	406	144	387
19	28	67	74	95	e140	160	131	e230	152	313	161	275
20	27	69	74	91	e130	150	126	e210	155	353	152	229
21	32	76	69	86	e150	169	122	e190	174	290	150	222
22	52	71	82	82	e180	150	120	e170	205	245	162	245
23	41	70	80	82	e210	145	114	e180	249	218	144	253
24	34	75	82	77	e190	530	112	e150	191	203	138	224
25	32	69	98	75	e180	434	112	e140	168	199	184	207
26	30	66	97	73	e170	292	213	e135	160	237	173	854
27	30	67	93	72	e155	236	182	127	179	357	158	412
28	30	205	91	70	e145	216	244	116	149	229	152	295
29	31	127	89	68	---	211	240	111	134	185	147	248
30	31	106	85	68	---	205	258	107	119	174	150	223
31	31	---	83	68	---	197	---	103	---	248	137	---
TOTAL	1046	2102	2490	2565	3161	8206	4962	17608	6988	9288	6022	8880
MEAN	33.7	70.1	80.3	82.7	113	265	165	568	233	300	194	296
MAX	53	205	98	105	210	1200	258	3880	1030	1000	713	1860
MIN	27	40	66	68	65	125	112	103	89	99	137	118
CFSM	.23	.48	.55	.56	.77	1.80	1.13	3.86	1.58	2.04	1.32	2.01
IN.	.26	.53	.63	.65	.80	2.08	1.26	4.46	1.77	2.35	1.52	2.25

CAL YR 1988 TOTAL 31053 MEAN 84.8 MAX 410 MIN 21 CFSM .58 IN. 7.86
WTR YR 1989 TOTAL 73318 MEAN 201 MAX 3880 MIN 27 CFSM 1.37 IN. 18.55

e Estimated.

JAMES RIVER BASIN

02028500 ROCKFISH RIVER NEAR GREENFIELD, VA

LOCATION.--Lat 37°52'10", long 78°49'25", Nelson County, Hydrologic Unit 02080203, on left bank 50 ft downstream from bridge on State Highway 634, 2.8 mi downstream from confluence of North and South Forks, and 4.1 mi south of Greenfield.

DRAINAGE AREA.--94.6 mi².

PERIOD OF RECORD.--April 1943 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 530.29 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 21, 1943, nonrecording gage at same site and datum.

REMARKS.--Records good. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--46 years, 140 ft³/s, 20.10 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 70,000 ft³/s, Aug. 20, 1969, gage height, 31.2 ft, from floodmarks, from rating curve extended above 8,500 ft³/s on basis of contracted-opening measurement at gage height 18.11 ft, slope-area measurements at gage heights 17.2 ft, 23.4 ft, and 31.2 ft, and peak runoff comparison with nearby stations; minimum, 0.20 ft³/s, Sept. 8-12, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 15, 1942, reached a stage of 23.4 ft, from floodmarks, discharge, about 30,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 1	1900	1,860	5.75	July 16	0900	2,390	6.45
May 6	0130	*2,530	*6.61	Sept. 16	0600	1,780	5.64

Minimum discharge, 9.0 ft³/s, Oct. 13-14, gage height, 0.39 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	34	50	47	48	91	133	781	64	53	150	109
2	12	30	48	47	47	83	123	1010	61	51	131	101
3	19	22	46	46	48	81	118	600	58	49	112	93
4	22	20	46	42	51	99	113	422	56	69	102	85
5	16	62	43	36	47	110	118	560	53	152	93	83
6	12	80	41	45	46	524	110	1450	62	120	86	81
7	12	50	41	51	50	493	109	790	240	88	83	81
8	12	42	41	50	50	330	126	594	194	72	80	81
9	12	38	48	50	45	255	126	543	483	63	69	91
10	12	36	46	45	41	209	117	616	408	80	66	73
11	12	33	39	45	41	181	113	483	250	57	110	72
12	10	31	36	55	45	158	110	402	185	52	112	197
13	9.1	36	e36	58	45	142	107	341	156	56	93	126
14	9.1	40	e37	51	62	137	102	288	131	88	81	102
15	9.5	34	37	122	83	126	104	250	121	61	83	96
16	10	32	38	112	99	117	102	229	118	956	85	902
17	12	51	36	94	112	110	94	194	118	346	70	533
18	12	49	35	89	99	113	93	166	97	224	372	346
19	12	46	41	83	91	115	91	150	86	170	271	263
20	12	70	35	75	86	107	85	137	89	439	214	221
21	17	69	38	64	96	113	81	128	97	276	162	245
22	30	60	52	60	128	107	80	118	94	206	144	475
23	19	54	48	61	133	105	77	118	110	232	144	453
24	16	51	49	60	121	432	72	112	93	216	246	352
25	14	48	56	58	112	341	80	102	83	235	390	296
26	14	45	51	54	107	285	232	96	78	232	276	578
27	14	47	50	54	102	239	188	91	67	216	219	380
28	14	80	50	51	97	206	197	86	63	174	181	313
29	14	60	46	51	---	181	190	81	62	142	152	258
30	14	54	46	50	---	162	203	78	54	128	139	229
31	14	---	47	49	---	144	---	72	---	139	120	---
TOTAL	428.7	1404	1353	1855	2132	5896	3594	11088	3831	5442	4636	7315
MEAN	13.8	46.8	43.6	59.8	76.1	190	120	358	128	176	150	244
MAX	30	80	56	122	133	524	232	1450	483	956	390	902
MIN	9.1	20	35	36	41	81	72	72	53	49	66	72
CFSM	.15	.49	.46	.63	.80	2.01	1.27	3.78	1.35	1.86	1.58	2.58
IN.	.17	.55	.53	.73	.84	2.32	1.41	4.36	1.51	2.14	1.82	2.88

CAL YR 1988 TOTAL 26368.8 MEAN 72.0 MAX 584 MIN 4.8 CFSM .76 IN. 10.37
WTR YR 1989 TOTAL 48974.7 MEAN 134 MAX 1450 MIN 9.1 CFSM 1.42 IN. 19.26

e Estimated.

02029000 JAMES RIVER AT SCOTTSVILLE, VA

LOCATION.--Lat 37°47'50", long 78°29'30", Albemarle County, Hydrologic Unit 02080203, on left bank 900 ft downstream from bridge on State Highway 20 at Scottsville, 6.8 mi upstream from Hardware River, and at mile 188.6. DRAINAGE AREA.--4,584 mi².

PERIOD OF RECORD.--October 1924 to current year. Monthly discharge only for some periods, published in WSP 1303. REVISED RECORDS.--WSP 727: 1931(M). WSP 972: 1936(M), 1940(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 253.18 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 28, 1928, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Large diurnal fluctuation caused by powerplants upstream from station. Flow regulated since December 1979 by Moomaw Lake (station 02011795) 197.5 mi upstream; since October 1984 by Back Creek Lake 225.5 mi upstream; and since January 1985 by Little Back Creek Lake 228.6 mi upstream, amount unknown. National Weather Service gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--65 years, 5,164 ft³/s, 15.30 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 301,000 ft³/s, June 22, 1972, gage height, 34.02 ft, from floodmarks, from rating curve extended above 120,000 ft³/s on basis of slope-conveyance study; minimum daily, 300 ft³/s, Sept. 13, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in October 1870 reached a stage of 30.7 ft, discharge, about 215,000 ft³/s, and flood in November 1877 reached a stage of 27.9 ft, discharge, about 160,000 ft³/s, from information by local resident. Flood in March 1913 reached a stage of 25.16 ft, from floodmarks, discharge, 121,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 35,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	1915	54,500	17.95	Sept. 16	1515	36,300	14.67
May 6	1130	*71,900	*20.35				

Minimum discharge, 756 ft³/s, Oct. 14; minimum daily, 797 ft³/s, Oct. 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	1320	1250	2280	2190	1890	4540	6000	21600	3010	3180	4540	3130		
2	1290	1560	2260	2310	1770	4160	4550	45900	2810	2970	4530	2960		
3	931	1590	2240	2500	2000	3730	4990	43000	2590	2710	4550	2210		
4	1140	1270	1710	2340	1880	3420	4550	27900	2190	3180	3950	2180		
5	1380	1230	2090	1970	1760	3190	4580	22000	2500	3280	2670	2110		
6	954	1870	1640	2330	1990	5590	4960	63600	2550	11300	2470	2110		
7	1280	2770	1890	2370	2390	20100	4610	56800	10100	10900	2520	1820		
8	1050	4660	1670	2450	2530	17400	4980	35500	8860	8000	3120	1880		
9	1080	3060	1390	2450	2200	14200	4860	25100	8210	7180	2480	2170		
10	898	2520	1740	3300	2180	10300	5030	26600	11100	7070	2150	1940		
11	1230	2160	1870	3220	2000	8250	5070	29200	10100	5220	1990	1890		
12	1150	1720	1540	3590	1620	7380	4510	26300	8070	4880	2970	2770		
13	815	1250	1630	3450	1910	5750	4390	20700	7330	4670	2270	4770		
14	797	1560	1360	3570	2300	5730	4290	15400	6260	5510	2260	3910		
15	1070	1540	1480	3740	2340	4870	3880	12300	5490	7090	2480	4200		
16	1020	1410	1380	5510	2620	4780	3540	11600	5210	10300	2510	18200		
17	895	1900	1240	11900	5290	4470	3710	9750	5750	11200	2180	23800		
18	944	2530	1400	9060	6130	4240	3790	8560	5090	6950	4700	25200		
19	1080	1620	1310	7050	5080	3650	3580	7630	8650	6020	3760	14100		
20	1070	1630	1210	5350	4100	3690	3240	6580	7650	6740	3300	10100		
21	988	1850	1370	4970	4270	4290	2720	5840	7630	5970	3160	8530		
22	1270	3500	1290	3740	5380	5030	3350	5700	7820	5100	4060	7710		
23	1360	3920	1830	3170	5510	6320	2350	5490	9170	3960	4380	7920		
24	1150	3330	1770	3390	6420	10900	2780	5010	8610	4190	4820	17600		
25	1340	2550	2470	2790	6110	14400	2950	4920	7530	4140	5540	13200		
26	1320	2310	2960	2640	5410	16400	4290	4510	6380	3600	6490	19000		
27	1220	2200	4400	2430	4820	13500	16000	4040	6220	4270	6980	15400		
28	1290	3270	4350	2490	4750	10700	21200	3500	6220	3870	5200	13600		
29	969	4140	3690	1860	---	8710	19100	3400	5020	3410	4890	10100		
30	1160	2890	2990	2110	---	7360	21600	3290	4080	3060	4450	8450		
31	1040	---	3020	2200	---	6400	---	3490	---	3130	4040	---		
TOTAL	34501	69060	63470	112440	96650	243450	185450	565210	192200	173050	115410	252960		
MEAN	1113	2302	2047	3627	3452	7853	6182	18230	6407	5582	3723	8432		
MAX	1380	4660	4400	11900	6420	20100	21600	63600	11100	11300	6980	25200		
MIN	797	1230	1210	1860	1620	3190	2350	3290	2190	2710	1990	1820		
(*)	-98	+22	+80	+410	+324	+5	+235	-236	-5	-16	+21	+3		
MEAN†	1015	2324	2127	4037	3776	7858	6417	17994	6402	5566	3744	8435		
CFSM†	.22	.51	.46	.88	.82	1.71	1.40	3.93	1.40	1.21	.82	1.84		
IN.†	.26	.57	.54	1.02	.86	1.98	1.56	4.53	1.56	1.40	.94	2.05		
CAL YR 1988	TOTAL	998238	MEAN	2727	MAX	17300	MIN	728	MEAN†	2667	CFSM†	.58	IN.†	7.92
WTR YR 1989	TOTAL	2103851	MEAN	5764	MAX	63600	MIN	797	MEAN†	5824	CFSM†	1.27	IN.†	17.25

* Change in contents, equivalent in cubic feet per second, in Moomaw Lake; provided by U.S. Army Corps of Engineers.

† Adjusted for change in contents.

JAMES RIVER BASIN

02030000 HARDWARE RIVER BELOW BRIERY RUN, NEAR SCOTTSVILLE, VA

LOCATION.--Lat 37°48'45", long 78°27'20", Fluvanna County, Hydrologic Unit 02080203, on left bank 75 ft upstream from bridge on State Highway 637, 0.8 mi downstream from Briery Run, 2.4 mi northeast of Scottsville, and 10.8 mi upstream from mouth.

DRAINAGE AREA.--116 mi².

PERIOD OF RECORD.--October 1938 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 952: 1941(M). WSP 1002: 1940, 1943. WSP 1032: 1940, 1944.

GAGE.--Water-stage recorder. Datum of gage is 294.96 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for period of doubtful gage-height record, July 21-31, which is fair. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--51 years, 128 ft³/s, 14.98 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 52,000 ft³/s, Aug. 20, 1969, gage height, 31.0 ft, from flood-marks, from rating curve extended above 18,000 ft³/s on basis of slope-area measurements at gage heights 23.8 ft and 31.0 ft; minimum, 0.10 ft³/s, Sept. 5-8, 1966; minimum gage height, 0.81 ft, Sept. 8, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	2100	2,100	10.45	June 7	1200	1,720	9.49
May 2	0330	1,760	9.61	July 6	0530	1,540	8.85
May 6	0230	*6,900	*16.60	July 16	1700	2,660	11.49

Minimum discharge, 15 ft³/s, Oct. 13, gage height, 1.45 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	50	53	41	37	83	89	533	62	70	108	76
2	17	54	46	43	36	73	84	1070	65	69	102	70
3	20	31	42	41	38	67	84	328	72	69	92	65
4	31	26	40	44	61	72	82	200	60	76	78	62
5	25	35	38	37	55	79	160	600	55	188	75	61
6	20	58	35	42	51	686	186	3950	69	723	73	64
7	18	41	35	50	68	844	135	1000	1200	150	75	64
8	18	30	35	49	74	288	192	454	303	85	88	66
9	18	27	39	48	58	213	158	356	372	67	69	61
10	18	27	48	43	e42	197	119	620	274	76	65	58
11	18	25	41	41	46	160	101	357	161	60	96	55
12	17	24	36	49	47	136	95	278	128	62	131	103
13	16	26	e35	63	44	118	87	229	124	60	89	101
14	16	31	e36	52	58	119	82	192	108	84	76	74
15	17	29	39	88	83	107	84	190	105	62	74	69
16	25	26	36	100	121	98	83	258	112	1600	78	397
17	21	61	39	72	217	86	73	185	127	485	79	305
18	20	47	38	61	121	95	72	154	98	155	198	147
19	18	37	37	56	93	127	68	134	88	87	181	105
20	18	53	34	51	77	98	65	125	101	393	110	97
21	24	65	38	46	149	113	62	116	298	e200	89	121
22	46	48	60	41	235	100	61	105	189	e160	83	123
23	32	40	54	44	226	94	59	186	173	e120	78	119
24	24	37	51	42	152	622	58	125	118	e150	75	107
25	22	34	67	42	119	384	59	101	93	e130	198	93
26	21	32	57	40	109	229	186	93	86	e110	152	652
27	21	35	50	39	98	170	170	96	80	e175	115	251
28	23	190	46	38	88	144	182	79	77	e135	100	162
29	23	96	43	37	---	125	120	73	86	e100	124	132
30	23	63	41	38	---	113	110	70	74	e82	148	115
31	24	---	40	38	---	103	---	67	---	e80	91	---
TOTAL	672	1378	1329	1516	2603	5943	3166	12324	4958	6063	3190	3975
MEAN	21.7	45.9	42.9	48.9	93.0	192	106	398	165	196	103	132
MAX	46	190	67	100	235	844	192	3950	1200	1600	198	652
MIN	16	24	34	37	36	67	58	67	55	60	65	55
CFSM	.19	.40	.37	.42	.80	1.65	.91	3.43	1.42	1.69	.89	1.14
IN.	.22	.44	.43	.49	.83	1.91	1.02	3.95	1.59	1.94	1.02	1.27

CAL YR 1988 TOTAL 28578 MEAN 78.1 MAX 833 MIN 10 CFSM .67 IN. 9.16
WTR YR 1989 TOTAL 47117 MEAN 129 MAX 3950 MIN 16 CFSM 1.11 IN. 15.11

e Estimated.

02030500 SLATE RIVER NEAR ARVONIA, VA

LOCATION.--Lat 37°42'10", long 78°22'40", Buckingham County, Hydrologic Unit 02080203, on left bank 250 ft upstream from bridge on State Highway 676, 1.8 mi northwest of Arvonias, 2.9 mi upstream from Hunts Creek, and 3.8 mi upstream from mouth.

DRAINAGE AREA.--226 mi².

PERIOD OF RECORD.--April 1926 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 972: 1928-29, 1932, 1933-34(M), 1935. WSP 2104: 1928(M), 1935-37(M), 1940(M), 1944(M), 1949(M), 1955(M), drainage area. WDR VA-72-1: 1935, 1937, 1944, 1949, 1971(M).

GAGE.--Water-stage recorder. Datum of gage is 238.78 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Feb. 15, 1936, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--63 years, 228 ft³/s, 13.70 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,200 ft³/s, June 22, 1972, gage height, 25.10 ft, from high-water mark in gage house, from rating curve extended above 5,900 ft³/s on basis of slope-area measurement of peak flow; minimum, 2.0 ft³/s, Sept. 28 to Oct. 2, 1930; minimum gage height, 1.35 ft, Sept. 12, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 7	0600	2,690	9.43	July 6	0500	3,210	10.15
May 2	0600	3,190	10.12	Aug. 18	1230	2,850	9.65
May 6	0600	4,100	11.26	Sept. 17	0200	3,310	10.28
June 21	1900	2,610	9.31	Sept. 26	0800	*4,860	*12.10

Minimum discharge, 22 ft³/s, Oct. 14, gage height, 2.13 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	59	122	65	66	195	138	358	92	92	138	97
2	23	133	98	70	63	169	122	2810	87	88	159	89
3	25	84	83	72	64	148	119	1140	104	86	130	88
4	35	57	75	68	87	153	118	381	116	93	113	84
5	45	57	69	62	93	187	131	350	97	167	103	80
6	40	111	65	65	95	739	217	3680	94	1620	96	80
7	31	84	63	84	161	2280	269	2420	647	409	129	84
8	27	62	62	90	177	618	597	709	610	218	192	85
9	26	52	65	83	137	329	418	419	454	155	110	83
10	27	47	80	77	108	252	287	1380	624	608	95	79
11	27	46	81	72	94	196	220	678	278	285	116	74
12	26	44	69	77	88	169	187	406	172	172	142	280
13	25	44	71	103	84	152	167	311	336	168	126	462
14	23	47	72	100	88	167	154	259	338	185	112	212
15	23	47	69	104	99	163	156	243	277	193	163	143
16	26	46	68	128	112	159	184	296	244	306	358	1540
17	28	173	69	114	213	160	162	261	376	921	182	2380
18	27	253	79	96	186	140	145	208	289	337	1330	607
19	27	118	66	88	153	167	136	181	185	222	473	321
20	27	89	63	81	147	163	129	163	150	314	211	219
21	32	89	62	75	353	239	123	154	660	291	272	212
22	56	79	68	70	713	322	118	145	760	185	299	215
23	68	67	68	69	525	213	115	146	378	182	197	228
24	47	65	67	68	365	1430	110	157	229	358	147	253
25	39	64	79	68	262	816	110	147	172	194	183	162
26	34	59	80	66	225	376	651	128	144	165	242	3820
27	33	67	71	66	231	259	527	120	129	308	171	2490
28	32	824	66	65	207	201	613	118	118	205	136	570
29	33	390	67	63	---	175	377	108	112	160	120	314
30	34	174	69	63	---	157	318	99	100	138	182	240
31	34	---	63	66	---	151	---	96	---	132	115	---
TOTAL	1003	3531	2249	2438	5196	11045	7118	18071	8372	8957	6542	15591
MEAN	32.4	118	72.5	78.6	186	356	237	583	279	289	211	520
MAX	68	824	122	128	713	2280	651	3680	760	1620	1330	3820
MIN	23	44	62	62	63	140	110	96	87	86	95	74
CFSM	.14	.52	.32	.35	.82	1.58	1.05	2.58	1.23	1.28	.93	2.30
IN.	.17	.58	.37	.40	.86	1.82	1.17	2.97	1.38	1.47	1.08	2.57

CAL YR 1988	TOTAL 44354	MEAN 121	MAX 1370	MIN 13	CFSM .54	IN. 7.30
WTR YR 1989	TOTAL 90113	MEAN 247	MAX 3820	MIN 23	CFSM 1.09	IN. 14.83

JAMES RIVER BASIN

02031000 MECHUMS RIVER NEAR WHITE HALL, VA

LOCATION.--Lat 38°06'09", long 78°35'35", Albemarle County, Hydrologic Unit 02080204, on right bank 20 ft downstream from bridge on State Highway 614, 1.5 mi downstream from Rocky Run, 4.0 mi southeast of White Hall, and 4.9 mi upstream from confluence with Moormans River.

DRAINAGE AREA.--95.4 mi².

PERIOD OF RECORD.--October 1942 to September 1951, October 1979 to current year. Prior to September 1951, published as Mechum River near Ivy.

GAGE.--Water-stage recorder. Datum of gage is 429.75 ft above National Geodetic Vertical Datum of 1929. Oct. 1, 1942, to Sept. 30, 1951, on right bank 20 ft downstream from former highway bridge at different datum.

REMARKS.--Records good except those for period of no gage-height record, Nov. 11-17, and periods with ice effect, Dec. 12, 13, 17, 18, and Feb. 11, which are fair. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--19 years, 107 ft³/s, 15.23 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,000 ft³/s, Oct. 15, 1942, gage height, 30.3 ft, datum then in use, from floodmarks, from rating curve extended above 8,000 ft³/s; minimum, 0.6 ft³/s, Sept. 9, 1944.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Sept. 6, 1979, reached a stage of 24.5 ft, from floodmarks, discharge, about 13,500 ft³/s, from rating curve extended above 8,300 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 1	0030	2,220	10.85	May 6	1930	1,360	9.12
May 1	1930	2,650	11.70	July 16	1000	1,960	10.32
May 6	0100	*2,690	*11.78				

Minimum discharge, 8.7 ft³/s, Oct. 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	32	34	33	32	60	79	1300	47	35	74	70
2	15	29	31	34	32	55	74	922	47	34	66	63
3	21	19	30	32	34	51	71	393	48	34	57	56
4	25	16	29	33	43	68	70	263	46	60	51	51
5	20	30	28	29	39	82	72	396	44	120	47	50
6	15	54	28	31	36	599	70	1400	56	130	48	50
7	14	32	28	36	37	444	66	600	271	76	53	50
8	14	24	27	35	38	245	75	368	311	57	56	52
9	14	22	31	35	34	175	72	329	422	53	45	66
10	14	18	36	32	32	140	64	514	358	64	40	54
11	14	e17	31	31	e30	115	61	330	195	48	92	48
12	13	e16	e30	35	35	100	58	256	142	41	92	86
13	12	e20	e27	41	34	87	56	207	118	63	68	72
14	12	e27	28	37	42	85	55	175	98	146	57	58
15	13	e23	29	95	54	79	56	158	86	72	53	52
16	14	e20	34	81	65	73	58	161	80	682	53	284
17	14	e28	e33	61	91	65	53	140	84	296	47	231
18	14	29	e31	55	85	67	52	120	70	181	110	142
19	13	25	28	50	65	85	54	104	61	127	110	108
20	14	56	28	46	58	67	52	94	58	209	81	97
21	19	51	29	43	61	71	50	91	68	158	70	135
22	35	39	42	38	102	66	48	80	61	120	68	169
23	19	32	39	38	118	63	48	79	58	108	70	161
24	14	31	39	38	91	340	45	78	58	113	65	125
25	14	29	42	37	79	265	47	71	51	101	339	113
26	13	27	39	36	72	189	92	66	48	101	177	383
27	13	28	36	35	66	151	82	63	44	131	128	216
28	14	49	34	34	63	130	81	57	41	108	104	160
29	14	42	34	33	---	113	74	53	50	72	94	133
30	14	36	32	33	---	101	215	51	39	61	108	115
31	15	---	32	34	---	91	---	50	---	61	81	---
TOTAL	484	901	999	1261	1568	4322	2050	8969	3160	3662	2604	3450
MEAN	15.6	30.0	32.2	40.7	56.0	139	68.3	289	105	118	84.0	115
MAX	35	56	42	95	118	599	215	1400	422	682	339	383
MIN	12	16	27	29	30	51	45	50	39	34	40	48
CFSM	.16	.31	.34	.43	.59	1.46	.72	3.03	1.10	1.24	.88	1.21
IN.	.19	.35	.39	.49	.61	1.69	.80	3.50	1.23	1.43	1.02	1.35

CAL YR 1988 TOTAL 21646.6 MEAN 59.1 MAX 467 MIN 9.6 CFSM .62 IN. 8.44
WTR YR 1989 TOTAL 33430 MEAN 91.6 MAX 1400 MIN 12 CFSM .96 IN. 13.04

e Estimated.

02032250 MOORMANS RIVER NEAR FREE UNION, VA

LOCATION.--Lat 38°08'26", long 78°33'22", Albemarle County, Hydrologic Unit 02080204, on right bank 130 ft upstream from bridge on State Highway 601, 0.4 mi upstream from confluence with Mechums River, 0.8 mi downstream from Wards Creek, and 1.1 mi southeast of Free Union.

DRAINAGE AREA.--74.6 mi².

PERIOD OF RECORD.--October 1979 to current year.

GAGE.--Water-stage recorder. Datum of gage is 403.11 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for period of doubtful gage-height record, Feb. 24 to Mar. 3, which is fair.

Flow regulated by Rivanna Water and Sewer Authority at Sugar Hollow Reservoir 12.0 mi upstream from station, capacity, 1,320 acre-ft, from which an average of 5.6 ft³/s is diverted for industrial use. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--10 years, 99.7 ft³/s, 18.15 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,500 ft³/s, Nov. 4, 1985, gage height, 20.41 ft, from high-water mark, from rating curve extended above 5,600 ft³/s on basis of slope-area measurement of peak flow; minimum, 0.58 ft³/s, Sept. 5, 1987.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 21, 1972, reached a stage of 20.2 ft, from floodmarks, discharge, 15,100 ft³/s, and flood of Sept. 6, 1979, reached a stage of 21.55 ft, from floodmarks, discharge, about 16,500 ft³/s, from rating curve extended as explained above.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	1200	1,600	7.15	May 9	1030	2,080	8.02
May 1	0530	2,530	8.85	May 10	1200	1,200	6.43
May 2	0400	1,200	6.42	June 8	0300	1,170	6.37
May 3	1100	1,160	6.35	June 9	1530	1,250	6.52
May 5	1300	*2,850	*9.43	Sept. 16	1800	725	5.56
May 6	0630	2,520	8.83	Sept. 21	1330	750	5.61

Minimum daily discharge, 4.6 ft³/s, Oct. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.6	24	26	21	21	e54	70	1020	27	22	94	63
2	5.2	26	24	22	20	e50	62	1450	25	20	94	58
3	7.6	20	24	19	21	e48	60	760	28	20	46	51
4	12	19	21	17	28	67	55	403	24	32	31	41
5	9.6	26	21	15	28	115	56	497	21	63	26	38
6	7.6	44	20	16	26	798	53	1890	33	74	28	36
7	6.7	29	20	17	27	686	50	1050	169	48	30	35
8	6.1	23	20	18	29	350	55	675	387	34	34	37
9	6.1	18	21	17	26	194	53	660	434	28	27	73
10	7.0	15	25	17	24	135	44	1140	309	41	26	40
11	8.3	13	21	16	e22	105	39	676	149	30	37	36
12	8.3	12	17	14	25	92	39	445	103	26	72	106
13	6.7	12	e15	24	26	76	39	277	92	37	53	81
14	7.0	13	17	20	30	75	36	200	72	33	38	49
15	7.6	9.0	19	82	37	69	39	173	62	26	33	47
16	8.3	8.3	20	80	43	59	42	158	55	296	30	418
17	8.3	10	20	62	48	51	36	125	54	135	31	322
18	7.6	12	17	52	48	50	40	101	43	83	121	273
19	9.0	10	19	46	46	50	39	88	36	62	120	262
20	9.0	65	19	40	43	43	39	76	34	278	97	109
21	13	48	21	37	45	50	34	70	44	170	92	248
22	23	35	24	33	90	46	33	63	42	118	115	264
23	14	30	26	30	140	44	33	59	49	107	146	462
24	12	27	26	28	e96	280	32	55	56	92	120	258
25	9.6	25	30	27	e78	328	31	47	42	95	427	155
26	10	24	30	26	e70	234	76	44	35	90	368	364
27	11	24	26	24	e64	176	90	39	32	78	240	314
28	12	31	24	24	e58	135	90	35	28	63	155	234
29	12	30	24	22	---	115	83	32	28	44	113	158
30	12	27	22	22	---	95	85	31	24	39	105	109
31	13	---	21	23	---	86	---	29	---	68	78	---
TOTAL	294.2	709.3	680	911	1259	4756	1533	12368	2537	2352	3027	4741
MEAN	9.49	23.6	21.9	29.4	45.0	153	51.1	399	84.6	75.9	97.6	158
MAX	23	65	30	82	140	798	90	1890	434	296	427	462
MIN	4.6	8.3	15	14	20	43	31	29	21	20	26	35
CFSM	.13	.32	.29	.39	.60	2.06	.68	5.35	1.13	1.02	1.31	2.12
IN.	.15	.35	.34	.45	.63	2.37	.76	6.17	1.27	1.17	1.51	2.36

CAL YR 1988 TOTAL 17340.9 MEAN 47.4 MAX 758 MIN 1.7 CFSM .64 IN. 8.65
WTR YR 1989 TOTAL 35167.5 MEAN 96.3 MAX 1890 MIN 4.6 CFSM 1.29 IN. 17.54

e Estimated.

JAMES RIVER BASIN

02032400 BUCK MOUNTAIN CREEK NEAR FREE UNION, VA

LOCATION.--Lat 38°09'16", long 78°32'22", Albemarle County, Hydrologic Unit 02080204, on left bank at downstream side of bridge on State Highway 665, 0.2 mi downstream from Piney Creek, 1.6 mi east of Free Union, and 2.0 mi upstream from mouth.

DRAINAGE AREA.--37.0 mi².

PERIOD OF RECORD.--October 1979 to current year.

GAGE.--Water-stage recorder. Datum of gage is 408.71 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for periods of doubtful gage-height record, Oct. 5 to Nov. 17 and May 12-24, which are fair. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--10 years, 43.0 ft³/s, 15.78 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,200 ft³/s, Sept. 8, 1987, gage height, 9.50 ft, from rating curve extended above 1,200 ft³/s on basis of contracted-opening measurement of peak flow; minimum, 0.35 ft³/s, Aug. 21, 1987.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Aug. 22, 1979, reached a stage of 11.12 ft, from floodmarks, discharge, about 6,600 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	1145	763	4.27	June 9	1445	878	4.53
May 1	1715	1,710	6.10	July 16	0530	1,640	5.98
May 2	0130	1,330	5.45	July 20	0145	711	4.14
May 5	2400	*1,780	*6.20	July 26	1900	559	3.74
May 6	1845	910	4.60	Aug. 1	2345	1,140	5.08
May 9	2330	1,130	5.06	Sept. 26	0500	635	3.95
June 8	0130	1,150	5.11				

Minimum discharge, 2.5 ft³/s, Oct. 1, 2, gage height, 0.45 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	e11	10	11	9.1	21	23	545	13	12	116	24
2	4.3	e15	9.5	11	9.2	19	20	723	12	12	169	20
3	6.1	e11	9.0	9.4	10	17	19	355	13	12	54	18
4	7.0	e8.5	8.3	9.0	15	25	19	231	12	19	37	17
5	e4.8	e13	8.0	8.0	12	42	19	364	12	35	29	18
6	e4.0	e24	8.0	9.7	12	373	19	849	20	37	26	19
7	e3.8	e15	7.8	11	14	182	20	519	115	36	26	20
8	e3.5	e11	7.8	11	13	87	22	310	251	22	23	24
9	e3.4	e8.5	9.2	12	11	61	20	336	280	22	19	35
10	e3.5	e7.5	9.4	11	e10	46	17	674	134	28	17	21
11	e4.2	e6.2	8.2	11	e9.4	37	16	426	72	17	33	19
12	e3.8	e5.0	7.0	16	10	31	16	e240	55	16	33	60
13	e3.1	e6.0	e6.0	17	11	27	16	e150	52	22	22	38
14	e3.4	e7.0	7.6	16	15	26	15	e110	41	21	19	28
15	e4.0	e5.4	8.2	74	19	23	16	e90	34	16	18	24
16	e4.6	e4.6	7.9	50	23	20	17	e85	32	424	18	137
17	e5.1	e9.2	7.4	32	24	18	14	e65	32	84	19	118
18	e5.2	7.4	6.8	25	21	18	14	e52	25	64	43	70
19	e4.5	7.6	7.0	23	20	18	17	e45	22	48	32	55
20	e4.8	53	7.4	20	18	17	14	e42	22	151	25	52
21	e6.0	24	8.3	17	22	20	15	e38	30	54	36	70
22	e10	16	9.7	17	57	18	12	e34	27	35	43	118
23	e13	13	9.1	15	56	19	11	e32	25	72	78	131
24	e8.0	11	11	14	39	144	11	e28	22	58	51	95
25	e6.0	9.8	13	13	30	100	13	20	19	51	112	87
26	e5.8	8.8	12	12	27	68	25	19	17	92	90	317
27	e5.4	8.9	11	11	23	52	20	18	16	74	69	151
28	e5.4	18	11	10	22	41	17	16	15	51	53	103
29	e5.8	13	9.9	11	---	35	19	15	15	31	42	92
30	e6.0	11	9.4	10	---	30	67	15	13	27	34	76
31	e7.0	---	9.3	9.6	---	27	---	14	---	65	26	---
TOTAL	164.1	369.4	274.2	526.7	561.7	1662	563	6460	1448	1708	1412	2057
MEAN	5.29	12.3	8.85	17.0	20.1	53.6	18.8	208	48.3	55.1	45.5	68.6
MAX	13	53	13	74	57	373	67	849	280	424	169	317
MIN	2.6	4.6	6.0	8.0	9.1	17	11	14	12	12	17	17
CFSM	.14	.33	.24	.46	.54	1.45	.51	5.63	1.30	1.49	1.23	1.85
IN.	.16	.37	.28	.53	.56	1.67	.57	6.49	1.46	1.72	1.42	2.07

CAL YR 1988 TOTAL 7064.3 MEAN 19.3 MAX 180 MIN 1.3 CFSM .52 IN. 7.10
WTR YR 1989 TOTAL 17206.1 MEAN 47.1 MAX 849 MIN 2.6 CFSM 1.27 IN. 17.30

e Estimated.

02032515 SOUTH FORK RIVANNA RIVER NEAR CHARLOTTESVILLE, VA

LOCATION.--Lat 38°06'06", long 78°27'39", Albemarle County, Hydrologic Unit 02080204, on left bank at downstream side of bridge on U.S. Highway 29, 0.4 mi downstream from South Fork Rivanna River dam, 2.5 mi northeast of Charlottesville city limits, and 2.9 mi upstream from mouth.

DRAINAGE AREA.--260 mi².

PERIOD OF RECORD.--August 1979 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 330 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except for period of no gage-height record, Jan. 17-24, which is fair. Flow regulated by Rivanna Water and Sewer Authority at South Fork Rivanna and Sugar Hollow Reservoirs, combined capacity, 6,540 acre-ft, from which an average of 15.6 ft³/s is diverted for industrial and municipal use. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--10 years, 283 ft³/s, 14.78 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,200 ft³/s, Sept. 6, 1979, gage height, 23.50 ft, from flood-marks, from rating curve extended above 12,000 ft³/s; minimum, 2.7 ft³/s, Dec. 16, 1988, result of regulation; minimum daily, 3.6 ft³/s, Aug. 31, 1987.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,820 ft³/s, May 6, gage height, 13.29 ft; minimum, 2.7 ft³/s, Dec. 16, gage height, 1.85 ft, result of regulation; minimum daily, 3.9 ft³/s, Oct. 25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP			
1	17	42	55	104	79	216	183	2090	101	45	139	173			
2	18	66	61	37	64	175	201	3240	96	85	443	186			
3	28	10	10	85	93	55	212	1400	128	56	329	108			
4	35	21	60	50	145	245	110	933	125	76	194	148			
5	30	36	17	16	48	399	193	689	123	210	188	107			
6	22	121	65	68	8.6	1160	204	3380	101	416	81	107			
7	17	122	31	85	108	1930	166	2420	919	178	146	108			
8	17	48	41	94	152	1050	239	1330	1000	104	145	134			
9	17	8.9	38	86	110	635	237	1060	980	97	144	261			
10	17	39	79	46	35	428	192	2300	1230	165	106	106			
11	16	15	101	87	60	391	161	1460	575	142	119	105			
12	15	53	11	101	62	235	162	885	440	42	296	231			
13	16	36	58	127	66	254	104	690	336	109	151	250			
14	13	47	91	99	132	271	118	545	295	275	195	168			
15	11	76	66	242	75	248	96	474	157	133	141	105			
16	16	28	117	319	168	174	153	486	154	1330	115	743			
17	20	99	42	e230	201	196	145	432	218	1020	255	954			
18	22	74	75	e160	239	112	127	351	100	483	535	520			
19	23	15	70	e135	167	234	161	227	148	330	435	265			
20	19	226	77	e130	99	201	76	355	120	663	272	325			
21	60	92	81	e100	252	145	163	215	162	547	258	454			
22	104	107	94	e115	204	174	90	126	213	372	225	544			
23	39	11	9.3	e80	346	168	88	222	128	269	412	792			
24	28	113	41	e150	320	733	71	263	170	413	202	554			
25	3.9	36	52	69	248	897	61	169	154	297	802	452			
26	5.0	15	128	98	195	615	188	193	102	404	795	1120			
27	9.8	45	93	117	206	451	299	124	90	477	553	884			
28	17	95	76	84	148	392	222	124	102	339	424	632			
29	18	46	31	73	---	350	222	125	79	252	321	548			
30	20	48	107	92	---	270	190	96	100	228	341	306			
31	38	---	34	70	---	178	---	121	---	43	221	---			
TOTAL	731.7	1790.9	1911.3	3349	4030.6	12982	4834	26525	8646	9600	8983	11390			
MEAN	23.6	59.7	61.7	108	144	419	161	856	288	310	290	380			
MAX	104	226	128	319	346	1930	299	3380	1230	1330	802	1120			
MIN	3.9	8.9	9.3	16	8.6	55	61	96	79	42	81	105			
*F ³ /S	16.0	14.9	14.4	14.3	15.1	14.8	16.2	15.7	16.6	16.3	16.1	17.0			
CAL YR	1988	TOTAL	50369.9	MEAN	138	MAX	1350	MIN	3.9	CFSM	.53	IN.	7.23	*FT ³ /S	15.6
WTR YR	1989	TOTAL	94773.5	MEAN	260	MAX	3380	MIN	3.9	CFSM	1.00	IN.	13.58	*FT ³ /S	15.6

* Average diversion, in cubic feet per second, at South Fork Rivanna and Sugar Hollow Reservoirs; provided by Rivanna Water and Sewer Authority.
e Estimated.

JAMES RIVER BASIN

02032680 NORTH FORK RIVANNA RIVER NEAR PROFFIT, VA

LOCATION.--Lat 38°05'16", long 78°24'44", Albemarle County, Hydrologic Unit 02080204, on left bank 50 ft downstream from bridge on State Highway 649, 1.9 mi southeast of Proffit, and 2.2 mi upstream from confluence with South Fork.

DRAINAGE AREA.--176 mi².

PERIOD OF RECORD.--April 1970 to current year.

GAGE.--Water-stage recorder. Datum of gage is 323.43 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for periods with ice effect, Dec. 12-14, 18, and Feb. 10, 11, and period of doubtful gage-height record, May 5-11, which are fair. Rivanna Water and Sewer Authority diverts about 0.2 ft³/s daily for municipal water supply 7.8 mi upstream from station. Several measurements of water temperature were made during the year.

AVERAGE DISCHARGE.--19 years, 241 ft³/s, 18.60 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 31,800 ft³/s, June 21, 1972, gage height, 30.4 ft, from floodmarks, from rating curve extended above 9,000 ft³/s; minimum, 1.8 ft³/s, Oct. 6, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	1700	2,090	7.39	June 9	2000	1,880	6.88
May 2	0630	3,180	9.92	July 16	1200	2,250	7.76
May 6	Unknown	*8,100	*a16.80	July 27	0130	1,760	6.59
May 10	Unknown	b2,200	Unknown	Sept. 26	0930	1,640	6.31
June 7	0700	4,230	12.31				

a From floodmarks.

b Daily mean discharge; actual peak is known to be greater than value shown.

Minimum discharge, 23 ft³/s, Oct. 14, gage height, 1.05 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	44	70	57	58	124	157	773	87	78	309	92
2	27	50	62	62	55	111	137	2270	89	75	561	87
3	32	39	58	58	60	106	133	846	93	74	316	81
4	35	35	55	62	73	117	129	493	86	78	209	77
5	31	44	50	58	68	164	143	e1200	83	105	157	77
6	28	100	49	64	64	1060	159	e4500	365	133	131	77
7	26	68	50	72	71	1010	142	e2400	2940	106	135	77
8	26	53	55	74	70	489	172	e1400	743	84	125	77
9	26	46	60	76	59	361	159	e1300	1080	78	99	111
10	26	43	66	76	e56	317	138	e2200	827	87	91	90
11	25	41	59	79	e54	255	124	e1000	439	82	118	80
12	25	39	e54	93	61	223	115	638	324	80	146	173
13	24	41	e52	108	58	195	111	480	300	81	113	131
14	24	48	e60	97	73	190	107	376	245	94	98	103
15	25	43	70	271	92	171	111	335	205	78	93	93
16	26	41	70	244	108	151	116	364	184	912	95	327
17	25	53	67	171	126	132	104	308	186	383	102	443
18	26	62	e62	133	112	141	99	268	152	198	171	236
19	27	53	67	114	103	163	108	218	131	133	143	171
20	26	186	62	100	96	137	109	194	128	593	107	151
21	32	139	57	88	118	168	100	176	149	283	109	175
22	64	92	67	77	296	157	96	153	173	182	154	220
23	41	74	59	78	296	146	92	160	176	135	297	312
24	34	66	62	74	214	647	90	163	172	125	160	263
25	30	58	70	72	177	561	89	133	136	121	379	196
26	29	53	67	70	159	392	131	118	118	240	250	873
27	29	57	64	64	142	310	129	112	106	814	189	464
28	29	171	61	55	130	262	116	100	95	365	153	318
29	29	100	58	59	---	225	116	95	93	199	129	258
30	29	77	55	60	---	200	129	93	83	146	116	208
31	29	---	54	58	---	184	---	91	---	374	100	---
TOTAL	911	2016	1872	2824	3049	8869	3661	22957	9988	6516	5355	6041
MEAN	29.4	67.2	60.4	91.1	109	286	122	741	333	210	173	201
MAX	64	186	70	271	296	1060	172	4500	2940	912	561	873
MIN	24	35	49	55	54	106	89	91	83	74	91	77
CFSM	.17	.38	.34	.52	.62	1.63	.69	4.21	1.89	1.19	.98	1.14
IN.	.19	.43	.40	.60	.64	1.87	.77	4.85	2.11	1.38	1.13	1.28

CAL YR 1988 TOTAL 39748.8 MEAN 109 MAX 989 MIN 9.8 CFSM .62 IN. 8.40
WTR YR 1989 TOTAL 74059 MEAN 203 MAX 4500 MIN 24 CFSM 1.15 IN. 15.65

e Estimated.

02034000 RIVANNA RIVER AT PALMYRA, VA

LOCATION.--Lat 37°51'28", long 78°15'58", Fluvanna County, Hydrologic Unit 02080204, on left bank 10 ft upstream from bridge on U.S. Highway 15 at Palmyra, 0.5 mi upstream from Cunningham Creek, and 15 mi upstream from mouth.

DRAINAGE AREA.--664 mi².

PERIOD OF RECORD.--October 1933 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 802: 1936(M). WSP 852: 1937. WSP 892: 1934-35. WSP 1303: 1945-46(M). WSP 1503: 1956. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 210.39 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 24, 1942, water-stage recorder at site 200 ft downstream at same datum. Oct. 24, 1942, to Dec. 18, 1947, nonrecording gage 10 ft downstream at same datum.

REMARKS.--Records good. Some diurnal fluctuation at times mostly at low and medium flow by South Fork Rivanna River Reservoir. Combined diversion of water supply and discharge from waste-water treatment plant upstream at Charlottesville resulted in an average gain of about 1.3 ft³/s upstream from the gage. National Weather Service gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--56 years, 720 ft³/s, 14.73 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 86,000 ft³/s, Aug. 20, 1969, gage height, 39.85 ft, from rating curve extended above 76,000 ft³/s on basis of contracted-opening measurement of peak flow and velocity-area study; minimum, 5.2 ft³/s, Sept. 9-11, 1966, gage height, 2.13 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 6,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	2300	7,510	13.45	June 7	1430	8,190	14.39
May 2	0930	9,990	16.57	July 6	1100	9,510	16.06
May 6	1030	*31,100	*26.33	July 16	1930	14,600	19.92

Minimum discharge, 48 ft³/s, Oct. 17, gage height, 2.47 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57	145	229	146	173	374	442	1840	e299	265	455	319
2	58	201	211	205	163	387	430	7750	262	213	1800	304
3	64	164	192	200	167	340	445	3310	318	240	1010	301
4	89	98	146	199	264	264	382	1930	297	236	682	225
5	103	107	207	177	297	488	463	1580	273	e480	420	254
6	90	259	153	154	191	2250	860	22900	302	4920	360	229
7	73	289	180	218	183	4930	563	8400	5510	1160	310	233
8	65	229	211	219	288	1920	739	3240	2740	487	344	240
9	60	140	206	234	266	1280	643	2150	2020	323	301	284
10	60	110	251	219	243	1160	546	4210	2840	365	267	389
11	61	109	244	188	166	943	470	3120	1430	367	255	241
12	59	92	216	235	183	785	440	2000	1010	304	454	602
13	55	112	137	306	189	605	405	1540	795	235	413	714
14	51	125	182	297	238	619	357	1260	716	410	304	428
15	54	124	208	448	327	588	357	1110	569	520	309	329
16	53	133	185	841	350	440	390	1390	546	6390	434	1210
17	50	230	149	593	566	480	374	1180	648	4190	328	2160
18	55	230	150	400	453	410	367	892	460	1310	1230	1190
19	61	185	188	359	432	523	316	773	371	738	1110	738
20	66	235	149	340	362	497	376	629	400	1840	565	608
21	76	555	155	256	437	445	276	679	553	1360	452	819
22	189	299	262	214	912	481	351	485	739	848	457	1030
23	198	249	229	219	1100	445	286	827	639	537	621	1060
24	98	170	223	230	886	2020	280	720	475	535	629	1120
25	74	207	268	217	650	2400	277	591	476	575	911	794
26	78	148	225	201	509	1420	389	437	406	847	1390	2600
27	63	157	269	207	467	1100	587	413	337	2250	939	1960
28	56	753	219	190	423	903	580	357	300	1130	650	1250
29	65	487	222	172	---	772	461	329	300	630	513	1030
30	72	255	152	176	---	751	452	319	275	452	532	796
31	78	---	187	170	---	478	---	e280	---	416	460	---
TOTAL	2331	6597	6205	8230	10885	30498	13304	76641	26306	34573	18905	23457
MEAN	75.2	220	200	265	389	984	443	2472	877	1115	610	782
MAX	198	753	269	841	1100	4930	860	22900	5510	6390	1800	2600
MIN	50	92	137	146	163	264	276	280	262	213	255	225
CFSM	.11	.33	.30	.40	.59	1.48	.67	3.72	1.32	1.68	.92	1.18
IN.	.13	.37	.35	.46	.61	1.71	.75	4.29	1.47	1.94	1.06	1.31

CAL YR 1988 TOTAL 151512 MEAN 414 MAX 3240 MIN 37 CFSM .62 IN. 8.49
WTR YR 1989 TOTAL 257932 MEAN 707 MAX 22900 MIN 50 CFSM 1.06 IN. 14.45

e Estimated.

JAMES RIVER BASIN

02035000 JAMES RIVER AT CARTERSVILLE, VA
(National stream-quality accounting network station)

LOCATION.--Lat 37°40'15", long 78°05'10", Goochland County, Hydrologic Unit 02080205, on left bank 200 ft downstream from bridge on State Highway 45 at Cartersville, 1.8 mi downstream from Willis River, and at mile 156.4.

DRAINAGE AREA.--6,257 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1898 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 972: 1936(M). WSP 1203: 1901-2(M), 1923-25(M), 1928(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 163.90 ft above National Geodetic Vertical Datum of 1929. Prior to June 4, 1927, nonrecording gage at same site and datum.

REMARKS.--Records good except for period of doubtful gage-height record, May 22-26, which is fair. Moderate diurnal fluctuation caused by powerplants upstream from station. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--91 years, 7,062 ft³/s, 15.33 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 362,000 ft³/s, June 22, 1972, gage height, 37.87 ft, from flood-marks, from rating curve extended above 160,000 ft³/s on basis of slope-conveyance study; minimum, 316 ft³/s, Sept. 13, 14, 1966, gage height, 0.02 ft; minimum daily, 330 ft³/s, Sept. 14, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 40,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 3	0100	66,000	19.23	May 7	0330	*93,800	*23.38

Minimum discharge, 845 ft³/s, Oct. 15, gage height, 0.67 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1550	1220	3780	3180	2730	6270	7420	23100	4060	4650	4480	4770
2	1700	1710	2880	2480	2480	6310	6190	50200	3890	4060	6640	3660
3	1420	2040	2920	2680	2600	5540	6180	58900	3850	3710	6740	3620
4	1190	1830	2720	2880	2610	5150	6090	38400	3600	3560	5740	2810
5	1560	1500	2060	2540	3030	5020	5510	26300	3360	4240	4730	2760
6	1640	1640	2500	2400	2690	6340	6860	65800	3670	17600	3730	2730
7	1210	2790	1910	2840	3250	33500	6830	87200	9650	16600	3220	2720
8	1460	3920	2210	2670	4100	24200	8410	56600	20300	11100	3730	2350
9	1230	4590	2040	2890	3810	18900	7760	33700	11100	8350	3910	2670
10	1240	3540	1850	3220	3320	15000	7530	33900	15800	8520	3150	2990
11	1060	2460	2250	3510	3060	11300	6790	36500	13700	7530	3000	2310
12	1340	2400	2160	3840	2790	9920	6130	33500	11100	6090	2980	3220
13	1220	1990	1830	4130	2550	8010	5660	26100	9240	5730	4250	6260
14	896	1470	1740	4190	2780	7520	5450	20300	8870	6040	3070	6230
15	870	1830	1760	4220	3590	7050	5260	15600	7460	8060	3080	5030
16	1120	1830	1840	5910	3480	6240	5140	15200	7180	12000	4040	13400
17	1090	2260	1580	10300	5340	6210	4940	13400	7300	27500	3510	32100
18	948	3280	1580	11800	7910	5650	4880	11500	7380	11900	5070	34200
19	974	3350	1530	8750	7040	5950	4610	10100	8490	8530	8620	19900
20	1070	2100	1630	7200	6220	5460	4330	8550	9370	8430	4990	13100
21	1100	2450	1450	6160	6570	6040	3840	7920	8960	9980	4480	10600
22	1160	2900	1610	5040	9910	6840	3710	e7200	11800	7140	4930	10000
23	1600	4520	1880	4620	9800	7110	3720	e7000	11500	5840	5280	8890
24	1630	4370	2300	4090	9300	14600	3210	e6700	11100	5720	5940	15300
25	1280	3710	2300	3980	9170	21000	3410	e6100	9430	6030	6360	17100
26	1340	3020	3120	3560	7780	20600	4740	e5800	8060	5160	7880	25700
27	1330	2720	4100	3350	7200	17600	13000	5690	7180	8940	8650	27500
28	1240	5920	4930	3170	6670	13900	24900	4700	7220	7090	7610	18400
29	1260	7040	4360	3240	---	11500	21400	4810	6520	5550	5900	14100
30	999	5130	3870	2490	---	9600	23100	4350	5370	4740	5590	11300
31	1140	---	3320	2890	---	8430	---	4400	---	4320	5450	---
TOTAL	38867	89530	76010	134220	141780	336760	227000	729520	256510	254710	156750	325720
MEAN	1254	2984	2452	4330	5064	10860	7567	23530	8550	8216	5056	10860
MAX	1700	7040	4930	11800	9910	33500	24900	87200	20300	27500	8650	34200
MIN	870	1220	1450	2400	2480	5020	3210	4350	3360	3560	2980	2310
CFSM	.20	.48	.39	.69	.81	1.74	1.21	3.76	1.37	1.31	.81	1.74
IN.	.23	.53	.45	.80	.84	2.00	1.35	4.34	1.53	1.51	.93	1.94

CAL YR 1988 TOTAL 1375070 MEAN 3757 MAX 22700 MIN 813 CFSM .60 IN. 8.18
WTR YR 1989 TOTAL 2767377 MEAN 7582 MAX 87200 MIN 870 CFSM 1.21 IN. 16.45

e Estimated.

JAMES RIVER BASIN

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02035000 JAMES RIVER AT CARTERSVILLE, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1930, 1948, 1967 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1968 to January 1976, October 1980 to May 1981.

WATER TEMPERATURE: April 1968 to January 1976, October 1980 to May 1981.

SUSPENDED-SEDIMENT DISCHARGE: October 1980 to May 1981.

COOPERATION.--Chemical data as noted were provided by the Virginia Division of Consolidated Laboratory Services (VDCLS) and reviewed by the U.S. Geological Survey.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	AGENCY ANA- LYZING SAMPLE	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT											
12...	0945	1430	345	7.90	10.0	753	VDCLS	--	9.2	83	--
NOV											
28...	1000	5490	198	6.60	4.0	748	USGS	44	12.0	93	1200
28...	1001	5490	198	6.60	4.0	748	VDCLS	--	12.0	93	--
29...	1015	7470	182	7.40	9.0	757	VDCLS	--	10.3	90	--
DEC											
28...	1330	4220	315	6.70	2.0	744	USGS	12	13.2	98	K25
28...	1331	4860	315	6.70	2.0	744	VDCLS	--	13.2	98	--
JAN											
16...	1030	6380	232	7.50	4.5	752	VDCLS	--	13.4	105	--
17...	1510	12600	196	7.00	7.0	758	VDCLS	--	11.5	95	--
18...	0930	12300	208	7.20	6.0	755	VDCLS	--	11.4	92	--
19...	0925	8920	185	7.20	6.5	753	VDCLS	--	12.2	100	--
25...	1145	3840	137	7.90	5.0	760	VDCLS	--	12.7	100	--
FEB											
22...	1100	9910	200	7.50	8.5	747	USGS	42	11.3	99	320
22...	1101	9910	200	7.50	8.5	747	VDCLS	--	11.3	99	--
23...	0930	9880	125	7.10	8.5	751	VDCLS	--	11.0	95	--
MAR											
07...	1000	39300	170	7.90	4.0	761	VDCLS	--	12.8	98	--
08...	0920	23900	120	7.40	3.0	768	VDCLS	--	12.8	94	--
09...	1000	18800	160	7.10	4.5	768	VDCLS	--	12.9	99	--
10...	0915	15800	160	7.00	5.0	764	VDCLS	--	11.8	92	--
11...	1215	11100	118	7.70	6.0	761	VDCLS	--	11.8	95	--
23...	1000	6440	134	7.70	9.5	770	VDCLS	--	10.7	92	--
24...	1030	13100	114	7.70	8.0	767	VDCLS	--	11.2	94	--
25...	0900	21600	101	7.80	7.5	767	VDCLS	--	11.2	92	--
26...	0800	21000	123	7.80	9.0	770	VDCLS	--	11.1	95	--
27...	0800	18400	120	7.80	10.5	755	VDCLS	--	10.4	94	--
28...	0800	14400	108	7.80	13.0	761	VDCLS	--	9.7	92	--
29...	0800	11800	105	7.80	15.5	755	VDCLS	--	9.3	94	--
APR											
25...	0930	3410	165	7.90	18.5	750	USGS	2.4	9.1	99	K14
25...	0931	3410	165	7.90	18.5	750	VDCLS	--	9.1	99	--
27...	1330	12200	111	7.40	19.5	752	VDCLS	--	8.0	89	--
28...	0900	25900	190	7.50	18.5	753	VDCLS	--	7.9	85	--
29...	0830	21200	102	7.40	17.5	755	VDCLS	--	8.5	89	--
30...	0830	22000	101	7.50	17.0	757	VDCLS	--	8.8	91	--

JAMES RIVER BASIN

02035000 JAMES RIVER AT CARTERSVILLE, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	AGENCY ANA- LYZING SAMPLE	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
MAY											
01...	1330	22400	119	7.50	17.0	754	VDCLS	--	8.9	93	--
02...	1030	50400	95	7.40	16.5	750	VDCLS	--	8.6	89	--
03...	0930	61900	105	7.50	15.5	759	VDCLS	--	8.2	83	--
03...	1530	56100	107	7.60	16.0	758	VDCLS	--	8.6	87	--
04...	1030	39300	98	7.60	15.5	763	VDCLS	--	9.2	92	--
04...	1500	35800	95	7.50	15.5	767	VDCLS	--	9.0	90	--
05...	1330	25900	115	7.60	15.5	749	VDCLS	--	9.7	99	--
06...	0830	60500	173	7.60	15.0	747	VDCLS	--	9.3	94	--
07...	0800	91500	85	7.40	15.0	748	VDCLS	--	9.5	96	--
08...	1030	58200	102	7.80	14.0	751	VDCLS	--	9.6	94	--
09...	1000	34200	106	7.50	13.5	752	VDCLS	--	10.2	99	--
10...	1100	32800	120	7.20	12.5	748	VDCLS	--	10.5	100	--
11...	0930	35700	115	7.10	13.5	746	VDCLS	--	9.9	97	--
12...	1345	33400	100	7.20	13.5	753	VDCLS	--	10.0	97	--
13...	0830	26800	93	7.30	12.0	756	VDCLS	--	10.3	97	--
14...	0830	21600	90	7.40	13.5	757	VDCLS	--	10.0	96	--
15...	0900	15800	85	7.30	12.5	756	VDCLS	--	10.4	98	--
JUN											
08...	1100	20200	130	6.50	22.5	751	VDCLS	--	8.7	102	--
28...	1400	7170	151	7.80	28.5	753	USGS	7.0	7.0	91	19
28...	1401	7170	151	7.80	28.5	753	VDCLS	--	7.0	91	--
JUL											
06...	1030	19800	107	7.10	24.0	757	VDCLS	--	7.2	86	--
07...	1030	15900	100	7.00	23.5	756	VDCLS	--	7.5	89	--
17...	0945	33600	88	7.10	22.5	751	VDCLS	--	9.8	115	--
18...	0830	12500	100	7.40	22.0	755	VDCLS	--	10.0	116	--
26...	1000	5410	109	7.25	27.5	763	VDCLS	--	7.2	91	--
AUG											
29...	1230	5990	178	7.80	25.0	748	USGS	12	7.3	90	48
29...	1231	5990	178	7.80	25.0	748	VDCLS	--	7.3	90	--
SEP											
17...	1600	27500	80	7.00	22.0	756	VDCLS	--	7.3	84	--
18...	1100	36000	180	7.00	22.0	758	VDCLS	--	7.3	84	--
19...	1030	19400	122	7.40	20.5	758	VDCLS	--	8.2	92	--
20...	1300	12900	110	6.80	20.0	759	VDCLS	--	9.0	99	--
26...	1030	25400	87	7.00	17.0	756	VDCLS	--	8.8	91	--
27...	1030	27700	74	7.10	16.0	760	VDCLS	--	8.7	88	--
28...	1100	19200	93	7.00	16.0	768	VDCLS	--	8.7	87	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	STREP- TOCOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3	SULFATE DIS- SOLVED (MG/L AS SO4)
OCT										
12...	--	--	--	--	--	--	--	--	--	--
NOV										
28...	K3400	69	20	4.6	13	2.5	54	49	60	19
28...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
DEC										
28...	46	93	28	5.7	21	2.5	77	64	79	33
28...	--	--	--	--	--	--	--	--	--	--
JAN										
16...	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
FEB										
22...	720	51	15	3.3	12	1.8	38	35	43	20
22...	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--
MAR										
07...	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
APR										
25...	K11	56	16	3.8	8.6	1.6	49	49	60	13
25...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--
MAY										
01...	--	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
JUN										
08...	--	--	--	--	--	--	--	--	--	--
28...	21	53	16	3.2	5.5	1.6	46	46	56	12
28...	--	--	--	--	--	--	--	--	--	--
JUL										
06...	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
AUG										
29...	21	67	20	4.0	10	2.0	52	54	65	18
29...	--	--	--	--	--	--	--	--	--	--
SEP										
17...	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--

JAMES RIVER BASIN

02035000 JAMES RIVER AT CARTERSVILLE, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L)	RESIDUE VOLA- TILE, SUS- PENDED (MG/L)	RESIDUE FIXED NON FILTER- ABLE (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)
OCT										
12...	--	--	5.2	--	--	<1	<1	<1	0.180	<0.010
NOV										
28...	15	0.10	7.7	119	117	58	11	47	0.230	<0.010
28...	--	--	7.3	--	--	75	45	30	0.190	<1.00
29...	--	--	8.1	--	--	45	10	35	0.210	<0.010
DEC										
28...	23	0.10	4.8	176	166	--	--	--	<0.100	<0.010
28...	--	--	5.4	--	--	21	9	12	0.170	<0.010
JAN										
16...	--	--	6.6	--	--	26	2	24	0.250	<0.010
17...	--	--	6.6	--	--	150	30	120	0.230	<0.010
18...	--	--	5.5	--	--	90	20	70	0.220	<0.010
19...	--	--	6.7	--	--	36	10	26	0.270	<0.010
25...	--	--	7.3	--	--	5	2	3	0.320	<0.010
FEB										
22...	14	0.10	7.7	109	99	60	2	58	0.230	<0.010
22...	--	--	7.1	--	--	53	9	44	0.220	0.020
23...	--	--	7.6	--	--	28	2	26	0.270	<0.010
MAR										
07...	--	--	5.5	--	--	308	56	252	0.260	<0.010
08...	--	--	7.1	--	--	274	30	244	0.340	<0.010
09...	--	--	5.9	--	--	95	12	83	0.340	<0.010
10...	--	--	6.6	--	--	62	11	51	0.310	<0.010
11...	--	--	7.4	--	--	30	4	26	0.320	0.010
23...	--	--	6.8	--	--	--	--	--	0.270	<0.010
24...	--	--	6.2	--	--	39	10	29	0.140	<0.010
25...	--	--	5.9	--	--	47	11	36	0.210	0.010
26...	--	--	6.7	--	--	66	14	52	0.280	0.010
27...	--	--	6.3	--	--	62	12	50	0.240	0.010
28...	--	--	7.4	--	--	28	4	24	0.250	0.010
29...	--	--	7.0	--	--	29	4	25	0.250	0.010
APR										
25...	8.8	0.10	2.5	84	84	12	12	0	<0.100	0.010
25...	--	--	2.5	--	--	9	4	5	0.080	<0.010
27...	--	--	4.8	--	--	57	9	48	0.240	<0.010
28...	--	--	4.0	--	--	166	25	141	0.180	0.010
29...	--	--	6.4	--	--	130	19	111	0.280	0.010
30...	--	--	6.7	--	--	91	14	77	0.280	0.010
MAY										
01...	--	--	6.8	--	--	92	14	78	0.270	<0.010
02...	--	--	6.8	--	--	180	25	155	0.240	<0.010
03...	--	--	7.9	--	--	212	28	184	0.270	0.010
03...	--	--	7.0	--	--	264	32	232	0.260	0.010
04...	--	--	7.2	--	--	143	19	124	0.240	0.010
04...	--	--	7.2	--	--	132	16	116	0.240	0.010
05...	--	--	7.3	--	--	69	8	61	0.280	<0.010
06...	--	--	6.1	--	--	488	30	458	0.270	<0.010
07...	--	--	6.1	--	--	292	36	256	0.250	<0.010
08...	--	--	7.1	--	--	139	17	122	0.250	<0.010
09...	--	--	7.3	--	--	68	10	58	0.280	<0.010
10...	--	--	8.0	--	--	57	10	47	0.310	<0.010
11...	--	--	7.8	--	--	59	5	54	0.310	<0.010
12...	--	--	7.3	--	--	57	8	49	0.290	<0.010
13...	--	--	7.6	--	--	52	7	45	0.270	<0.010
14...	--	--	7.6	--	--	30	5	25	0.310	<0.010
15...	--	--	7.4	--	--	27	4	23	0.340	<0.010
JUN										
08...	--	--	5.0	--	--	158	20	138	0.260	0.020
28...	6.2	0.10	8.0	78	82	18	--	--	0.360	<0.010
28...	--	--	8.0	--	--	17	3	14	0.400	<0.010
JUL										
06...	--	--	7.9	--	--	290	44	246	0.300	0.010
07...	--	--	7.6	--	--	218	33	185	0.250	0.010
17...	--	--	7.3	--	--	156	22	134	0.240	<0.010
18...	--	--	8.2	--	--	87	10	77	0.390	<0.010
26...	--	--	9.5	--	--	17	5	12	0.350	<0.010
AUG										
29...	9.5	0.10	9.6	118	107	19	2	17	0.390	<0.010
29...	--	--	8.9	--	--	27	3	24	0.420	0.010
SEP										
17...	--	--	7.0	--	--	268	30	238	0.460	0.010
18...	--	--	7.4	--	--	250	36	214	0.350	0.010
19...	--	--	7.7	--	--	136	20	116	0.300	<0.010
20...	--	--	8.0	--	--	68	10	58	0.320	0.010
26...	--	--	8.4	--	--	116	18	98	0.260	0.010
27...	--	--	7.9	--	--	128	16	112	0.250	0.010
28...	--	--	8.9	--	--	61	8	53	0.320	0.020

02035000 JAMES RIVER AT CARTERSVILLE, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)
OCT										
12...	0.180	<0.040	--	0.30	0.500	--	0.510	--	--	--
NOV										
28...	0.230	<0.010	0.060	0.70	0.420	0.260	0.240	150	<1	31
28...	0.190	0.180	--	0.60	0.400	--	0.240	--	--	--
29...	0.210	0.050	--	0.60	0.400	--	0.200	--	--	--
DEC										
28...	<0.100	0.020	0.030	0.70	0.540	0.440	0.400	--	--	--
28...	0.170	<0.040	--	0.20	0.410	--	0.430	--	--	--
JAN										
16...	0.250	0.050	--	0.40	0.280	--	0.210	--	--	--
17...	0.230	0.230	--	1.4	0.800	--	0.080	--	--	--
18...	0.220	0.080	--	0.30	0.320	--	0.280	--	--	--
19...	0.270	0.050	--	0.30	0.150	--	0.170	--	--	--
25...	0.320	0.040	--	0.20	0.100	--	0.090	--	--	--
FEB										
22...	0.230	0.030	0.050	0.80	0.270	0.150	0.140	190	<1	27
22...	0.240	0.180	--	0.60	0.180	--	0.160	--	--	--
23...	0.270	0.090	--	0.40	0.170	--	0.080	--	--	--
MAR										
07...	0.260	0.120	--	1.8	0.480	--	0.020	--	--	--
08...	0.340	0.160	--	0.80	0.270	--	0.030	--	--	--
09...	0.340	0.090	--	0.50	0.210	--	0.070	--	--	--
10...	0.310	0.110	--	0.40	0.170	--	0.090	--	--	--
11...	0.330	0.120	--	0.40	0.150	--	0.060	--	--	--
23...	0.270	0.040	--	0.40	0.100	--	0.080	--	--	--
24...	0.140	<0.040	--	0.60	0.040	--	0.040	--	--	--
25...	0.220	0.040	--	0.30	0.110	--	0.060	--	--	--
26...	0.290	<0.040	--	0.30	0.140	--	0.100	--	--	--
27...	0.250	<0.040	--	0.20	0.120	--	0.090	--	--	--
28...	0.260	0.030	--	0.40	0.080	--	0.060	--	--	--
29...	0.260	0.050	--	0.40	0.110	--	0.050	--	--	--
APR										
25...	<0.100	0.020	0.030	0.30	0.120	0.120	0.100	40	<1	24
25...	0.080	<0.040	--	0.20	0.140	--	0.110	--	--	--
27...	0.240	0.060	--	0.50	0.140	--	0.050	--	--	--
28...	0.190	0.100	--	1.0	0.380	--	0.130	--	--	--
29...	0.290	0.070	--	0.80	0.280	--	0.070	--	--	--
30...	0.290	0.060	--	0.70	0.170	--	0.060	--	--	--
MAY										
01...	0.270	0.050	--	0.60	0.250	--	0.060	--	--	--
02...	0.240	0.070	--	0.90	0.280	--	0.030	--	--	--
03...	0.280	0.070	--	1.4	0.350	--	0.030	--	--	--
03...	0.270	0.080	--	1.3	0.290	--	0.040	--	--	--
04...	0.250	0.040	--	0.30	0.050	--	0.030	--	--	--
04...	0.250	0.040	--	0.50	0.130	--	0.030	--	--	--
05...	0.280	0.040	--	0.30	0.110	--	0.040	--	--	--
06...	0.270	0.080	--	1.7	0.600	--	0.030	--	--	--
07...	0.250	0.040	--	0.90	0.460	--	0.010	--	--	--
08...	0.250	0.040	--	0.90	0.320	--	0.030	--	--	--
09...	0.280	<0.040	--	0.50	0.170	--	0.020	--	--	--
10...	0.310	<0.040	--	0.40	0.150	--	0.050	--	--	--
11...	0.310	<0.040	--	0.30	0.160	--	0.050	--	--	--
12...	0.290	<0.040	--	0.20	0.080	--	0.040	--	--	--
13...	0.270	<0.040	--	0.30	0.100	--	0.030	--	--	--
14...	0.310	<0.040	--	0.20	0.120	--	0.040	--	--	--
15...	0.340	0.040	--	0.30	0.190	--	0.040	--	--	--
JUN										
08...	0.280	0.070	--	0.70	0.180	--	0.060	--	--	--
28...	0.360	<0.010	0.030	0.20	0.080	0.090	0.070	--	--	--
28...	0.400	<0.040	--	0.20	0.110	--	0.080	--	--	--
JUL										
06...	0.310	<0.040	--	0.90	0.340	--	0.070	--	--	--
07...	0.260	0.040	--	0.50	0.180	--	0.050	--	--	--
17...	0.240	0.060	--	0.40	0.150	--	0.040	--	--	--
18...	0.390	<0.040	--	0.30	0.140	--	0.060	--	--	--
26...	0.350	<0.040	--	0.50	0.110	--	0.070	--	--	--
AUG										
29...	0.390	0.010	0.020	0.50	0.270	0.210	0.200	30	<1	31
29...	0.430	<0.040	--	0.30	0.280	--	0.210	--	--	--
SEP										
17...	0.470	0.050	--	0.80	0.300	--	0.030	--	--	--
18...	0.360	0.050	--	0.40	0.100	--	0.080	--	--	--
19...	0.300	<0.040	--	0.90	0.170	--	0.050	--	--	--
20...	0.330	0.040	--	0.20	0.050	--	0.050	--	--	--
26...	0.270	0.040	--	0.50	0.160	--	0.050	--	--	--
27...	0.260	0.050	--	0.80	0.180	--	0.020	--	--	--
28...	0.340	0.040	--	0.40	0.130	--	0.050	--	--	--

JAMES RIVER BASIN

02035000 JAMES RIVER AT CARTERSVILLE, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)
OCT										
12...	--	--	--	--	--	--	--	--	--	--
NOV										
28...	0.7	<1	1	<3	2	260	<5	<4	46	<0.1
28...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
DEC										
28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
JAN										
16...	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
FEB										
22...	<0.5	<1	<1	<3	3	290	<5	4	33	<0.1
22...	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--
MAR										
07...	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
APR										
25...	<0.5	<1	<1	<3	4	170	<5	<4	10	<0.1
25...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--
MAY										
01...	--	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
JUN										
08...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
JUL										
06...	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
AUG										
29...	<0.5	<1	<1	<3	6	140	<1	<4	5	<0.1
29...	--	--	--	--	--	--	--	--	--	--
SEP										
17...	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--

02035000 JAMES RIVER AT CARTERSVILLE, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	SEDI- MENT, SUS- PENDED (MG/L)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT										
12...	--	--	--	--	--	--	--	4.9	--	--
NOV										
28...	<10	2	<1	2.0	90	<6	<3	11	119	97
28...	--	--	--	--	--	--	--	5.0	--	--
29...	--	--	--	--	--	--	--	6.9	--	--
DEC										
28...	--	--	--	--	--	--	--	--	25	95
28...	--	--	--	--	--	--	--	4.2	--	--
JAN										
16...	--	--	--	--	--	--	--	3.9	--	--
17...	--	--	--	--	--	--	--	2.9	--	--
18...	--	--	--	--	--	--	--	2.8	--	--
19...	--	--	--	--	--	--	--	2.5	--	--
25...	--	--	--	--	--	--	--	2.4	--	--
FEB										
22...	<10	2	<1	<1.0	72	<6	5	6.4	84	90
22...	--	--	--	--	--	--	--	5.6	--	--
23...	--	--	--	--	--	--	--	4.3	--	--
MAR										
07...	--	--	--	--	--	--	--	6.1	--	--
08...	--	--	--	--	--	--	--	7.2	--	--
09...	--	--	--	--	--	--	--	3.6	--	--
10...	--	--	--	--	--	--	--	3.5	--	--
11...	--	--	--	--	--	--	--	3.1	--	--
23...	--	--	--	--	--	--	--	3.0	--	--
24...	--	--	--	--	--	--	--	3.9	--	--
25...	--	--	--	--	--	--	--	4.2	--	--
26...	--	--	--	--	--	--	--	4.1	--	--
27...	--	--	--	--	--	--	--	3.1	--	--
28...	--	--	--	--	--	--	--	2.8	--	--
29...	--	--	--	--	--	--	--	2.4	--	--
APR										
25...	<10	5	<1	1.0	75	<6	4	3.2	5	91
25...	--	--	--	--	--	--	--	1.7	--	--
27...	--	--	--	--	--	--	--	3.9	--	--
28...	--	--	--	--	--	--	--	3.6	--	--
29...	--	--	--	--	--	--	--	4.9	--	--
30...	--	--	--	--	--	--	--	3.7	--	--
MAY										
01...	--	--	--	--	--	--	--	2.7	--	--
02...	--	--	--	--	--	--	--	4.9	--	--
03...	--	--	--	--	--	--	--	4.7	--	--
03...	--	--	--	--	--	--	--	4.9	--	--
04...	--	--	--	--	--	--	--	3.4	--	--
04...	--	--	--	--	--	--	--	3.3	--	--
05...	--	--	--	--	--	--	--	2.8	--	--
06...	--	--	--	--	--	--	--	5.1	--	--
07...	--	--	--	--	--	--	--	4.8	--	--
08...	--	--	--	--	--	--	--	3.5	--	--
09...	--	--	--	--	--	--	--	3.2	--	--
10...	--	--	--	--	--	--	--	3.1	--	--
11...	--	--	--	--	--	--	--	2.6	--	--
12...	--	--	--	--	--	--	--	2.3	--	--
13...	--	--	--	--	--	--	--	2.2	--	--
14...	--	--	--	--	--	--	--	2.0	--	--
15...	--	--	--	--	--	--	--	1.5	--	--
JUN										
08...	--	--	--	--	--	--	--	6.2	--	--
28...	--	--	--	--	--	--	--	4.1	19	96
28...	--	--	--	--	--	--	--	3.1	--	--
JUL										
06...	--	--	--	--	--	--	--	6.4	--	--
07...	--	--	--	--	--	--	--	7.5	--	--
17...	--	--	--	--	--	--	--	6.2	--	--
18...	--	--	--	--	--	--	--	4.6	--	--
26...	--	--	--	--	--	--	--	4.3	--	--
AUG										
29...	<10	<1	<1	<1.0	93	<6	5	4.6	28	96
29...	--	--	--	--	--	--	--	3.5	--	--
SEP										
17...	--	--	--	--	--	--	--	8.1	--	--
18...	--	--	--	--	--	--	--	5.8	--	--
19...	--	--	--	--	--	--	--	5.9	--	--
20...	--	--	--	--	--	--	--	4.4	--	--
26...	--	--	--	--	--	--	--	8.3	--	--
27...	--	--	--	--	--	--	--	6.2	--	--
28...	--	--	--	--	--	--	--	5.5	--	--

JAMES RIVER BASIN

02036500 FINE CREEK AT FINE CREEK MILLS, VA

LOCATION.--Lat 37°35'52", long 77°49'12", Powhatan County, Hydrologic Unit 02080205, on right bank 75 ft downstream from bridge on State Highway 711 at Fine Creek Mills, 0.8 mi upstream from mouth, and 6.7 mi northeast of Powhatan.

DRAINAGE AREA.--22.1 mi².

PERIOD OF RECORD.--July 1944 to current year.

REVISED RECORDS.--WSP 1203: 1948. WSP 1303: 1945(M). WSP 1383: 1954. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 156.59 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 28, 1953, nonrecording gage and crest-stage gage at site 75 ft upstream at same datum.

REMARKS.--Records good except for period of no gage-height record, July 10 to Sept. 30, which is fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--45 years, 20.1 ft³/s, 12.35 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,180 ft³/s, Oct. 6, 1972, gage height, 9.02 ft, from rating curve extended above 2,600 ft³/s; minimum daily, 0.08 ft³/s, Oct. 1, 1968; minimum gage height, 1.53 ft, Sept. 30, Oct. 1, 1970.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	1815	*273	*3.10	No other peak equal to or greater than base discharge.			

Minimum discharge, 0.95 ft³/s, Oct. 1, 2, gage height, 1.61 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.95	15	15	11	5.0	18	19	16	2.4	5.5	e8.6	e5.5
2	1.2	24	10	8.9	5.0	16	16	62	2.7	4.8	e12	e5.2
3	1.5	20	8.0	7.7	6.3	14	14	58	2.9	4.2	e16	e4.7
4	3.5	11	6.5	5.9	11	18	14	27	2.8	4.2	e12	e4.3
5	2.1	8.7	5.6	4.4	13	21	16	27	3.1	12	e8.8	e3.9
6	2.4	7.2	5.1	5.4	13	43	33	190	4.6	42	e6.2	e2.4
7	2.9	6.3	4.8	6.4	17	147	46	116	7.1	26	e5.2	e2.1
8	2.4	5.7	4.7	8.0	16	80	93	42	9.0	13	e1.6	e2.0
9	2.2	4.9	5.8	7.1	12	39	54	28	23	8.2	e1.4	e2.0
10	2.0	4.5	6.7	6.3	9.4	29	33	66	23	e5.4	e1.4	e1.9
11	1.9	4.4	7.1	5.7	8.3	23	25	54	10	e4.5	e8.0	e1.9
12	1.7	4.0	5.5	9.3	7.9	19	20	29	9.1	e3.5	e8.5	e1.8
13	1.6	4.2	4.0	13	7.9	18	18	22	14	e5.9	e7.8	e1.7
14	1.6	4.1	3.6	12	8.7	19	16	17	20	e9.4	e7.4	e2.4
15	1.7	4.0	4.8	13	9.2	20	42	16	12	e17	e5.8	e3.2
16	1.6	4.0	5.5	14	10	18	85	24	20	e14	e5.0	e17
17	1.6	8.6	4.9	11	11	16	41	22	68	e65	e4.2	e75
18	1.8	8.5	3.8	9.2	11	15	28	16	31	e45	e20	e40
19	2.2	9.7	3.5	7.8	12	16	22	12	15	e20	e40	e20
20	2.8	10	4.0	7.2	14	16	19	10	10	e12	e26	e15
21	7.5	8.2	4.9	6.2	33	24	16	9.7	9.0	e9.5	e16	e19
22	10	7.0	5.6	6.1	77	25	15	9.2	14	e7.4	e20	e13
23	13	6.3	5.5	6.8	63	22	14	8.3	32	e6.5	e15	e11
24	7.8	6.0	5.4	6.7	36	98	12	7.2	44	e6.0	e13	e14
25	4.2	5.5	5.3	6.5	25	111	12	6.2	39	e7.2	e15	e11
26	2.6	5.2	4.6	5.9	22	48	17	5.6	17	e6.6	e10	e40
27	2.2	11	4.3	5.9	19	32	22	5.2	13	e24	e8.0	e100
28	2.2	39	7.1	5.6	19	26	20	4.1	10	e16	e7.4	e35
29	2.2	49	9.2	5.4	---	22	18	3.3	8.3	e12	e6.6	e20
30	2.0	25	9.1	5.4	---	20	16	2.6	6.4	e14	e6.2	e9.0
31	2.0	---	9.6	5.2	---	20	---	2.3	---	e11	e5.9	---
TOTAL	95.35	331.0	189.5	239.0	501.7	1053	816	917.7	482.4	441.8	329.0	484.0
MEAN	3.08	11.0	6.11	7.71	17.9	34.0	27.2	29.6	16.1	14.3	10.6	16.1
MAX	13	49	15	14	77	147	93	190	68	65	40	100
MIN	.95	4.0	3.5	4.4	5.0	14	12	2.3	2.4	3.5	1.4	1.7
CFSM	.14	.50	.28	.35	.81	1.54	1.23	1.34	.73	.64	.48	.73
IN.	.16	.56	.32	.40	.84	1.77	1.37	1.54	.81	.74	.55	.81

CAL YR 1988 TOTAL 4203.19 MEAN 11.5 MAX 123 MIN .52 CFSM .52 IN. 7.08
WTR YR 1989 TOTAL 5880.45 MEAN 16.1 MAX 190 MIN .95 CFSM .73 IN. 9.90

e Estimated.

JAMES RIVER BASIN

205

02037000 JAMES RIVER AND KANAWHA CANAL NEAR RICHMOND, VA

LOCATION.--Lat 37°33'52", long 77°34'28", Henrico County, Hydrologic Unit 02080205, on left bank 75 ft downstream from Canal bridge, 400 ft downstream from head gates, 1,200 ft north of north end of Boshier Dam on James River, 1.6 mi upstream from Huguenot Memorial Bridge, and 2.0 mi west of Richmond city limits.

PERIOD OF RECORD.--September 1936 to current year.

GAGE.--Water-stage recorder. Datum of gage is 106.07 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1938, at datum 3.06 ft higher.

REMARKS.--No estimated daily discharges. Records good. Canal diverts from James River 1,200 ft upstream from Boshier Dam and discharges into river at several points downstream from gaging station near Richmond. Above 2,540 ft³/s, gage height, 14.5 ft, there is interchange of flow with James River; discharge above 2,540 ft³/s included in discharge for James River near Richmond (station 02037500). Figures given show flow in canal only. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--53 years, 723 ft³/s.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 29.1 ft, June 23, 1972, from floodmarks, interchange of flow with James River makes maximum discharge indeterminate; no flow at times when head gates were closed.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,340 ft³/s, May 7, gage height, 10.32 ft; minimum, 12 ft³/s, Oct. 17, gage height, 1.15 ft, result of head gates being closed.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	402	356	317	307	109	271	270	47	343	270	250	268
2	393	347	302	295	109	283	267	48	388	266	253	262
3	393	386	304	240	110	259	267	45	383	268	252	261
4	371	429	304	105	111	269	274	42	379	268	249	274
5	390	408	302	111	111	283	273	42	379	269	243	271
6	413	405	308	111	111	290	257	71	381	282	239	270
7	412	416	311	111	112	267	244	496	349	278	243	270
8	398	426	306	112	111	270	233	826	385	283	259	269
9	385	422	308	111	246	273	262	459	321	279	274	266
10	415	404	294	110	294	264	270	435	335	272	273	269
11	438	395	306	111	277	263	273	148	319	272	274	273
12	445	391	304	113	269	261	275	43	362	264	273	114
13	173	390	301	114	269	271	272	42	354	269	277	31
14	18	386	302	113	301	263	270	39	304	268	277	31
15	16	408	302	114	297	276	267	38	281	275	275	32
16	14	422	307	113	296	268	272	77	256	261	273	77
17	13	411	302	115	296	269	266	45	258	268	279	46
18	15	408	300	120	294	270	272	42	274	270	251	37
19	106	419	305	117	297	270	275	40	276	263	273	35
20	418	405	303	115	291	290	281	39	284	256	263	40
21	402	413	304	113	266	271	279	38	283	262	265	33
22	375	419	300	113	258	267	279	38	286	259	267	30
23	389	430	297	111	269	266	283	39	285	253	269	29
24	390	420	301	111	269	217	277	38	283	258	270	28
25	389	413	301	111	267	244	215	48	276	261	272	32
26	384	405	297	110	275	268	34	63	270	258	277	47
27	384	408	301	109	281	264	116	60	274	129	281	33
28	384	357	303	109	273	278	267	59	282	152	281	83
29	368	414	303	109	---	270	257	58	281	265	274	241
30	375	416	305	109	---	260	264	56	275	255	274	242
31	364	---	303	108	---	257	---	116	---	242	271	---
TOTAL	9832	12129	9403	3971	6469	8292	7611	3677	9406	7995	8251	4194
MEAN	317	404	303	128	231	267	254	119	314	258	266	140
MAX	445	430	317	307	301	290	283	826	388	283	281	274
MIN	13	347	294	105	109	217	34	38	256	129	239	28

CAL YR 1988 TOTAL 105373.5 MEAN 288 MAX 500 MIN 1.1
WTR YR 1989 TOTAL 91230 MEAN 250 MAX 826 MIN 13

JAMES RIVER BASIN

02037500 JAMES RIVER NEAR RICHMOND, VA

LOCATION.--Lat 37°33'47", long 77°32'50", Henrico County, Hydrologic Unit 02080205, on left bank 0.2 mi upstream from Huguenot Memorial Bridge, 0.5 mi southwest of Richmond city limits, 1.7 mi downstream from Boshier Dam, 3.3 mi upstream from Powhite Creek, and at mile 116.6.

DRAINAGE AREA.--6,758 mi².

PERIOD OF RECORD.--October 1934 to current year. Gage-height records collected in vicinity of Mayo's Bridge, at mile 109.5, 1876-1956, and at mile 108.7 since 1957, are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 972: 1936(M). WSP 1433: 1951(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Control is Williams Island dams which divert flow for city of Richmond water supply. Datum of gage is 98.82 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. City of Richmond takes from 40 ft³/s to 90 ft³/s for water supply from river downstream from gage except during periods of low flow when supply is obtained from James River and Kanawha Canal. Flow regulated by powerplants upstream from station. Above 18.2 ft stage, there is interchange of flow with James River and Kanawha Canal. Records of daily discharge include diversion by city of Richmond but do not include flow in James River and Kanawha Canal (station 02037000) which diverts around station. National Weather Service gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--55 years, 7,518 ft³/s, 15.11 in/yr, includes flow in James River and Kanawha Canal.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 313,000 ft³/s, includes canal flow, June 23, 1972, gage height, 28.62 ft; minimum daily, about 10 ft³/s, Sept. 8-15, 1966, Sept. 30, Oct. 5, 6, 1968, Oct. 8-10, 1970; minimum daily discharge of James River and James River and Kanawha Canal combined, 214 ft³/s, Oct. 5, 1941, caused by recharging of the pool above Boshier Dam after the canal gates were closed.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 50,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 3	1500	67,200	15.06	May 7	2030	*96,900	*17.70

Minimum discharge, 799 ft³/s, Oct. 12, gage height, 3.43 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP			
1	1690	1400	4420	3500	3020	6370	7670	22500	4010	4920	4150	4850			
2	1280	1530	3530	2930	2800	5950	7180	38000	3490	4250	4460	4370			
3	1450	1820	3020	2820	2630	5660	5750	64700	3230	3890	5800	3810			
4	1340	1940	2940	3050	2900	5180	5990	48400	3230	3670	5860	3510			
5	1110	1740	2700	3120	2940	4960	5720	29000	3160	3620	5200	3080			
6	1330	1550	2400	2910	3190	5590	6260	44800	3090	6190	4410	2840			
7	1320	1660	2540	2870	3080	24200	7680	87500	3320	19500	3720	2710			
8	1090	2670	2210	3260	3730	30000	9040	84300	18700	12400	3250	2620			
9	1220	3850	2430	3070	3950	21000	9300	41300	11900	8880	3370	2420			
10	1060	3460	2300	3230	3460	17000	7810	31300	12400	7620	3510	2400			
11	1030	3060	2220	3700	3220	12500	7210	36300	14000	7730	3290	2580			
12	902	2260	2500	3820	2940	10200	6640	34200	10900	6520	3070	2460			
13	1300	2160	2290	4280	2770	8940	5890	27500	8800	5630	3020	3030			
14	1390	1960	2070	4330	2660	7440	5570	21700	8270	5390	3470	5130			
15	1160	1570	2010	4460	2950	7360	6190	16300	7460	5660	3310	5390			
16	1140	1810	2090	4680	3420	6600	6940	14900	6640	8470	3140	5230			
17	1310	1890	2110	6700	3550	6200	6020	14400	6620	29800	3350	26800			
18	1290	2560	1830	11900	6120	5920	5630	12000	7070	17500	3480	33300			
19	1170	3060	1940	9220	6950	5880	5460	10300	6290	10200	7100	24100			
20	848	2920	1860	7360	6090	5620	5080	9060	8430	8200	5900	15000			
21	1070	2160	1910	5950	5880	5650	4720	7850	7970	9020	4400	11300			
22	1310	2500	1850	5510	9660	6510	4060	6970	9600	8330	4290	9960			
23	1210	3210	1950	4390	10600	7010	4150	6740	11200	6760	4750	9250			
24	1520	4130	2250	4100	9460	11200	3420	6770	11000	5770	4890	9280			
25	1450	3740	2560	4070	9190	22200	3590	6350	9500	5570	5260	18200			
26	1240	3160	2690	3710	8130	20700	3960	6250	8190	5550	5920	18900			
27	1250	3000	3340	3440	7150	19400	6510	5620	7000	5880	7040	31300			
28	1230	4390	4430	3260	6600	15400	21400	5250	6520	8090	7340	20200			
29	1200	7460	4620	3170	---	12200	21900	4240	6420	6390	6360	15500			
30	1190	6130	4100	3060	---	10200	21100	4270	5730	5250	5460	11900			
31	997	---	3560	2660	---	8910	---	4040	---	4530	5150	---			
TOTAL	38097	84750	82670	134530	139040	341950	227840	752810	234140	251180	143720	311420			
MEAN	1229	2825	2667	4340	4966	11030	7595	24280	7805	8103	4636	10380			
MAX	1690	7460	4620	11900	10600	30000	21900	87500	18700	29800	7340	33300			
MIN	848	1400	1830	2660	2630	4960	3420	4040	3090	3620	3020	2400			
(*)	317	404	303	128	231	267	254	119	314	258	266	140			
MEAN†	1546	3229	2970	4468	5197	11300	7849	24400	8119	8361	4902	10520			
CFSM†	.23	.48	.44	.66	.77	1.67	1.16	3.61	1.20	1.24	.73	1.56			
IN.†	.26	.53	.51	.76	.80	1.93	1.30	4.16	1.34	1.43	.84	1.74			
CAL YR	1988	TOTAL	1417145	MEAN	3872	MAX	20600	MIN	580	MEAN†	4160	CFSM†	.62	IN.†	8.38
WTR YR	1989	TOTAL	2742147	MEAN	7513	MAX	87500	MIN	848	MEAN†	7763	CFSM†	1.15	IN.†	15.60

* Average diversion, in cubic feet per second, by James River & Kanawha Canal.

† Adjusted for diversion.

02038000 FALLING CREEK NEAR CHESTERFIELD, VA

LOCATION.--Lat 37°26'37", long 77°31'21", Chesterfield County, Hydrologic Unit 02080206, on left bank 50 ft upstream from bridge on State Highway 651, 0.8 mi downstream from Licking Creek, 2.8 mi upstream from Pocoshock Creek, and 4.7 mi northwest of Chesterfield.

DRAINAGE AREA.--32.8 mi².

PERIOD OF RECORD.--October 1955 to current year.

REVISED RECORDS.--WSP 1904: 1957(M), 1958-60.

GAGE.--Water-stage recorder. Datum of gage is 126.39 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for period of backwater from beaver dam, Oct. 26 to Nov. 23, and period with ice effect, Dec. 13-18, which are fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--34 years, 33.2 ft³/s, 13.75 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,930 ft³/s, Oct. 1, 1979, gage height, 15.32 ft, from flood-marks, from rating curve extended above 3,200 ft³/s on basis of slope-conveyance study; minimum, 0.01 ft³/s, Sept. 20, Oct. 3, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 220 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 21	2030	377	7.40	Apr. 15	2015	307	6.90
Mar. 7	0445	375	7.36	May 6	0900	339	7.13
Mar. 24	1400	264	6.56	June 8	0130	644	8.76
Apr. 8	0230	258	6.50	Aug. 18	1345	*726	*9.09

Minimum discharge, 1.2 ft³/s, Oct. 12; minimum gage height, 2.82 ft, Oct. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	61	17	13	7.9	55	75	32	8.8	7.4	6.8	5.4
2	1.6	46	12	12	7.6	38	45	138	8.7	7.3	14	4.9
3	3.7	12	9.7	11	7.5	35	42	63	11	7.3	25	4.3
4	11	8.0	8.4	9.4	20	47	39	37	9.6	8.3	12	3.9
5	12	9.9	7.3	7.2	22	44	37	38	9.3	8.0	7.9	3.9
6	7.5	21	6.8	8.8	27	89	106	260	16	24	6.1	3.9
7	3.9	17	6.5	11	49	288	123	136	98	19	5.2	4.0
8	2.3	11	6.9	12	38	97	204	62	371	11	4.2	3.7
9	1.8	8.5	8.6	12	23	67	91	49	65	8.9	3.5	3.4
10	1.5	7.2	11	10	17	57	63	108	43	7.4	9.6	3.3
11	1.5	6.9	11	8.6	15	46	51	70	23	6.3	27	3.2
12	1.5	9.2	8.5	19	14	42	45	50	16	5.6	18	3.3
13	1.7	13	e6.7	40	13	41	41	42	27	8.5	11	3.3
14	2.1	16	e6.3	27	14	73	38	36	31	17	11	3.3
15	2.3	20	e6.1	22	15	52	163	34	19	15	8.8	3.9
16	2.6	13	e6.0	21	16	53	195	62	17	81	7.3	7.1
17	3.0	27	e5.8	15	18	38	75	50	33	130	19	103
18	4.4	29	e5.6	12	19	37	58	36	24	32	353	36
19	6.0	17	5.4	11	23	57	49	29	15	20	104	14
20	7.1	13	5.5	9.6	28	40	43	26	15	15	32	15
21	18	12	6.1	8.3	169	59	39	24	15	11	21	21
22	38	9.6	7.3	7.2	209	52	36	21	17	8.5	16	14
23	15	7.9	6.9	7.1	88	43	34	18	15	8.8	14	15
24	7.9	10	6.7	7.1	57	204	31	17	13	7.4	11	15
25	6.0	19	8.6	6.0	45	120	30	16	13	6.0	9.6	11
26	e5.4	29	7.1	6.5	44	66	37	15	11	27	9.4	105
27	e5.0	40	6.5	6.6	40	52	35	13	9.6	82	8.8	50
28	e5.2	120	8.0	5.3	51	45	35	11	9.2	26	8.2	16
29	e5.6	73	8.4	5.3	---	41	30	10	7.9	13	7.3	11
30	e6.5	27	7.9	5.9	---	43	42	9.7	7.4	9.5	7.2	8.8
31	24	---	8.5	6.9	---	102	---	9.4	---	7.9	6.2	---
TOTAL	215.7	713.2	243.1	363.8	1097.0	2123	1932	1522.1	978.5	646.1	804.1	499.6
MEAN	6.96	23.8	7.84	11.7	39.2	68.5	64.4	49.1	32.6	20.8	25.9	16.7
MAX	38	120	17	40	209	288	204	260	371	130	353	105
MIN	1.5	6.9	5.4	5.3	7.5	35	30	9.4	7.4	5.6	3.5	3.2
CFSM	.21	.72	.24	.36	1.19	2.09	1.96	1.50	.99	.64	.79	.51
IN.	.24	.81	.28	.41	1.24	2.41	2.19	1.73	1.11	.73	.91	.57

CAL YR 1988 TOTAL 5688.4 MEAN 15.5 MAX 201 MIN 1.5 CFSM .47 IN. 6.45
WTR YR 1989 TOTAL 11138.2 MEAN 30.5 MAX 371 MIN 1.5 CFSM .93 IN. 12.63

e Estimated.

JAMES RIVER BASIN

02038850 HOLIDAY CREEK NEAR ANDERSONVILLE, VA
(Hydrologic bench-mark station)

LOCATION.--Lat 37°24'55", long 78°38'10", Appomattox County, Hydrologic Unit 02080207, on right bank 350 ft downstream from culvert on State Highway 614, 1.0 mi upstream from Holiday Lake, and 5.2 mi southwest of Andersonville.

DRAINAGE AREA.--8.53 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1966 to current year.

REVISED RECORDS.--WDR VA-72-1: 1971(P).

GAGE.--Water-stage recorder. Datum of gage is 472.97 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Recording rain gage at station.

AVERAGE DISCHARGE.--23 years, 8.52 ft³/s, 13.56 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,640 ft³/s, June 21, 1972, gage height, 14.64 ft, from high-water mark in gage house, from rating curve extended above 4,200 ft³/s on basis of slope-area measurement of peak flow; minimum, 0.10 ft³/s, Sept. 11, 12, 1966; minimum gage height, 0.73 ft, Aug. 12, 14, 15, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 150 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	1930	229	2.93	Sept. 16	1915	227	2.92
May 2	0215	199	2.76	Sept. 26	0300	538	4.50
May 6	0115	*550	*4.55				

Minimum discharge, 1.2 ft³/s, Oct. 13-14, gage height, 0.88 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	8.9	3.0	2.5	1.9	4.9	5.1	12	4.5	3.1	4.2	2.8
2	1.6	4.4	2.5	2.5	1.9	4.1	4.8	74	4.2	3.0	3.8	2.7
3	2.2	3.0	2.3	2.2	2.1	3.8	4.9	16	4.5	3.2	3.5	2.7
4	3.7	2.7	2.1	2.0	3.1	5.8	5.0	9.7	4.4	3.8	3.2	2.6
5	2.2	4.8	2.1	1.9	3.0	4.9	6.9	30	4.3	6.4	3.1	2.6
6	1.8	3.8	2.0	2.6	3.5	54	8.2	156	5.6	16	2.9	2.9
7	1.6	2.9	2.0	2.7	4.6	39	13	39	16	7.7	2.9	3.0
8	1.6	2.6	1.9	2.5	3.9	13	16	21	8.2	5.4	3.0	3.0
9	1.6	2.4	2.5	2.3	3.0	8.7	12	16	12	7.1	2.7	2.8
10	1.6	2.4	2.7	2.1	3.5	7.1	8.6	44	8.0	9.1	2.8	2.7
11	1.5	2.4	2.3	2.1	3.6	6.1	7.3	17	5.6	5.5	4.7	2.6
12	1.4	2.3	e2.3	3.5	2.3	5.5	6.4	13	5.4	4.6	4.2	13
13	1.4	2.4	e2.4	3.5	2.3	5.5	6.0	11	11	4.4	3.7	6.0
14	1.4	2.4	2.3	2.9	2.7	6.3	5.6	9.4	9.4	6.5	3.4	3.9
15	1.5	2.3	2.3	3.6	2.5	6.3	7.0	9.9	7.5	4.8	3.4	8.3
16	1.5	2.3	2.2	3.3	3.9	7.8	6.8	12	8.1	9.1	3.3	93
17	1.5	17	e1.9	2.8	4.5	6.3	5.8	9.2	10	8.6	3.1	34
18	1.5	5.7	e2.1	2.6	3.8	6.1	5.4	8.2	6.8	6.4	3.8	12
19	1.5	3.9	2.0	2.4	3.7	6.1	5.2	7.4	5.4	5.4	3.9	7.9
20	1.5	3.8	1.9	2.3	4.1	6.4	5.0	7.0	5.7	6.3	3.4	6.1
21	3.0	3.5	2.0	2.1	26	13	4.8	6.9	6.1	5.0	4.9	5.8
22	3.7	3.1	2.2	2.3	16	8.9	4.7	6.3	6.2	4.2	5.5	5.8
23	2.4	3.0	2.1	2.0	13	9.1	4.4	8.3	5.1	4.2	4.3	5.2
24	2.1	2.9	2.1	2.1	8.5	46	4.3	8.8	4.6	4.1	4.1	4.7
25	2.0	2.8	2.1	2.0	5.7	16	4.8	6.8	4.2	3.7	5.5	5.5
26	2.0	2.7	1.9	1.9	5.7	9.8	16	6.1	4.0	3.6	4.7	142
27	2.0	9.6	1.9	2.0	6.2	7.8	11	5.7	3.7	4.4	4.1	22
28	2.1	28	2.0	1.9	5.7	6.9	13	5.1	3.5	4.1	3.7	12
29	2.1	6.2	2.0	1.9	---	6.3	11	5.0	3.4	3.6	3.4	7.7
30	2.1	3.7	1.9	2.0	---	6.2	11	4.9	3.2	3.4	3.3	6.2
31	2.2	---	2.0	2.0	---	5.8	---	4.7	---	4.2	3.0	---
TOTAL	59.7	147.9	67.0	74.5	150.7	343.5	230.0	590.4	190.6	170.9	115.5	431.5
MEAN	1.93	4.93	2.16	2.40	5.38	11.1	7.67	19.0	6.35	5.51	3.73	14.4
MAX	3.7	28	3.0	3.6	26	54	16	156	16	16	5.5	142
MIN	1.4	2.3	1.9	1.9	1.9	3.8	4.3	4.7	3.2	3.0	2.7	2.6
CFSM	.23	.58	.25	.28	.63	1.30	.90	2.23	.74	.65	.44	1.69
IN.	.26	.65	.29	.32	.66	1.50	1.00	2.57	.83	.75	.50	1.88

CAL YR 1988 TOTAL 1624.57 MEAN 4.44 MAX 50 MIN .65 CFSM .52 IN. 7.08
WTR YR 1989 TOTAL 2572.2 MEAN 7.05 MAX 156 MIN 1.4 CFSM .83 IN. 11.22

e Estimated.

JAMES RIVER BASIN

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02038850 HOLIDAY CREEK NEAR ANDERSONVILLE, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1968 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
DEC 20...	0915	1.9	33	7.00	1.0	2.5	758	14.1	100	150	120
MAR 28...	0915	6.9	36	6.50	13.5	2.4	755	10.6	103	K9	K18
JUN 13...	1230	8.0	23	6.60	19.0	5.5	745	9.2	101	K170	1100
AUG 29...	1300	3.5	39	5.40	23.0	3.1	750	8.8	104	110	40

DATE	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3	ALKA- LITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
DEC 20...	12	2.8	1.2	3.0	0.50	0	17	14	14	4.7	1.6
MAR 28...	10	2.2	1.1	2.5	0.70	0	9	7	10	6.3	1.9
JUN 13...	10	2.3	1.0	2.2	0.60	0	13	11	10	2.0	1.6
AUG 29...	13	3.0	1.3	2.9	0.70	0	8	6	16	1.0	1.7

DATE	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)
DEC 20...	0.10	15	31	38	0.010	<1.00	0.010	0.010	<0.20	0.020	<0.010
MAR 28...	0.10	11	30	32	<0.010	<0.100	0.020	<0.010	0.50	0.020	0.010
JUN 13...	0.10	11	26	28	<0.010	<0.100	0.020	0.020	0.80	0.020	<0.010
AUG 29...	<0.10	14	41	35	<0.010	<0.100	0.020	0.020	<0.20	0.030	<0.010

JAMES RIVER BASIN

02038850 HOLIDAY CREEK NEAR ANDERSONVILLE, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)
DEC 20...	<0.010	50	<1	16	<0.5	<1	<1	<3	2	420
MAR 28...	<0.010	70	<1	19	<0.5	<1	<1	<3	1	300
JUN 13...	0.020	50	<1	17	<0.5	<1	<1	<3	1	820
AUG 29...	0.020	30	<1	15	<0.5	<1	<1	<3	<1	720

DATE	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)
DEC 20...	<5	<4	12	0.2	<10	<1	<1	1.0	23	<6
MAR 28...	<5	<4	12	0.2	<10	2	<1	<1.0	19	<6
JUN 13...	1	<4	19	0.1	<10	1	<1	<1.0	20	<6
AUG 29...	<1	<4	19	0.1	<10	<1	<1	<1.0	27	<6

[illegible]

02039000 BUFFALO CREEK NEAR HAMPDEN SYDNEY, VA

LOCATION.--Lat 37°15'25", long 78°29'12", Prince Edward County, Hydrologic Unit 02080207, on left bank 100 ft upstream from bridge on State Highway 658, 0.8 mi upstream from Locket Creek, 2.0 mi northwest of Hampden Sydney, and 6.0 mi southwest of Farmville.

DRAINAGE AREA.--69.7 mi².

PERIOD OF RECORD.--August 1946 to current year.

REVISED RECORDS.--WSP 1303: 1948-50(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 339.19 ft above National Geodetic Vertical Datum of 1929 (levels by Virginia Department of Transportation). Prior to Aug. 19, 1953, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods of doubtful gage-height record, Oct. 1, 2, 7-10, 12, 13, 15-20, 23-31, Nov. 4, 7-16, 20-26, and Feb. 26, 27, and period with ice effect, Dec. 13, 14, which are fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--43 years, 67.2 ft³/s, 13.09 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,160 ft³/s, June 21, 1972, gage height, 12.38 ft, from rating curve extended above 1,600 ft³/s on basis of slope-area measurement at gage height 11.96 ft; minimum daily, 2.7 ft³/s, Oct. 7, 8, 1970.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of about 15 ft, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Nov. 28	1700	505	5.54	May 2	0730	2,220	7.94
Feb. 22	0100	770	6.14	May 6	0930	1,220	6.96
Apr. 28	0700	558	5.68	July 16	2230	*3,230	*8.73

Minimum daily discharge, 17 ft³/s, Oct. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e17	92	77	42	28	119	63	147	39	37	51	35
2	e18	70	57	50	28	95	56	1160	39	36	47	34
3	24	50	50	44	28	78	54	399	42	36	44	33
4	36	e37	45	41	30	81	52	251	40	44	41	31
5	35	41	41	37	31	76	59	181	42	54	38	31
6	27	44	40	39	36	144	99	724	63	127	37	35
7	e23	e37	38	40	43	370	136	361	88	73	36	34
8	e21	e33	37	39	43	181	272	225	143	54	36	33
9	e20	e30	39	39	39	117	190	150	124	46	34	33
10	e22	e29	42	37	35	93	122	235	94	41	34	32
11	23	e28	40	36	33	77	93	159	63	36	44	31
12	e21	e28	36	44	32	67	78	118	99	34	43	31
13	e20	e27	e34	51	31	63	69	96	252	36	41	32
14	24	e27	e32	49	31	75	63	82	105	45	40	32
15	e21	e26	36	51	31	67	77	83	108	40	41	39
16	e20	e26	35	50	32	60	85	112	153	808	39	237
17	e20	52	34	45	35	54	70	88	268	1070	37	300
18	e19	53	33	42	36	52	63	72	231	383	37	211
19	e20	45	31	39	39	49	59	62	116	233	39	141
20	e19	e40	31	37	41	49	56	56	82	152	38	105
21	33	e37	32	35	241	70	53	54	71	109	45	79
22	43	e34	33	34	496	68	51	51	73	80	67	62
23	e34	e32	32	33	273	65	50	53	116	61	84	53
24	e27	e30	33	32	185	310	48	66	134	51	60	46
25	e23	e29	40	31	124	245	49	55	69	46	51	46
26	e22	e28	36	31	e98	140	111	50	56	43	47	258
27	e22	47	34	30	e100	100	121	48	49	45	44	190
28	e22	387	34	29	112	81	405	44	45	47	41	105
29	e23	247	35	29	---	68	234	42	43	46	39	71
30	e23	124	34	29	---	64	176	41	39	44	39	59
31	e25	---	34	29	---	81	---	41	---	54	37	---
TOTAL	747	1810	1185	1194	2311	3259	3114	5306	2886	4011	1351	2459
MEAN	24.1	60.3	38.2	38.5	82.5	105	104	171	96.2	129	43.6	82.0
MAX	43	387	77	51	496	370	405	1160	268	1070	84	300
MIN	17	26	31	29	28	49	48	41	39	34	34	31
CFSM	.35	.87	.55	.55	1.18	1.51	1.49	2.46	1.38	1.86	.63	1.18
IN.	.40	.97	.63	.64	1.23	1.74	1.66	2.83	1.54	2.14	.72	1.31

CAL YR 1988 TOTAL 17005.5 MEAN 46.5 MAX 387 MIN 9.5 CFSM .67 IN. 9.08
WTR YR 1989 TOTAL 29633 MEAN 81.2 MAX 1160 MIN 17 CFSM 1.16 IN. 15.82

e Estimated.

JAMES RIVER BASIN

02039500 APPOMATTOX RIVER AT FARMVILLE, VA

LOCATION.--Lat 37°18'25", long 78°23'20", Cumberland County, Hydrologic Unit 02080207, on left bank at downstream side of bridge on State Highway 45 at north town limits of Farmville and 1.1 mi downstream from Buffalo Creek.

DRAINAGE AREA.--303 mi².

PERIOD OF RECORD.--March 1926 to current year.

REVISED RECORDS.--WSP 972: 1927-37, 1938(M). WSP 1303: 1927(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 281.93 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 29, 1928, nonrecording gage at same site and datum.

REMARKS.--Records good except for period with ice effect, Dec. 13-19, which is fair. Diurnal fluctuation at low flow caused by Prince Edward Mill 0.2 mi upstream. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--63 years, 286 ft³/s, 12.82 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,100 ft³/s, June 22, 1972, gage height, 29.70 ft, from flood-marks, from rating curve extended above 12,000 ft³/s on basis of contracted-opening measurement of peak flow; minimum, 3.8 ft³/s, Sept. 25, 1941.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,900 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 22	1300	2,520	13.23	May 7	0330	*5,820	*16.82
Mar. 7	2300	2,760	13.66	July 17	0200	4,110	15.29
Mar. 25	0500	2,260	12.69	Sept. 17	2000	2,120	12.39
May 3	0200	4,920	16.08	Sept. 27	0900	4,100	15.28

Minimum discharge, 46 ft³/s, Oct. 1, 13, gage height, 3.37 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	157	276	112	97	467	273	551	93	82	142	81
2	49	269	204	143	97	381	227	2820	87	77	136	75
3	56	172	169	140	102	316	208	3360	91	76	121	73
4	89	116	144	125	139	323	208	848	93	85	106	68
5	98	102	127	115	150	358	236	578	94	114	97	65
6	80	140	118	111	174	648	381	3070	178	283	90	67
7	64	125	112	125	222	2170	517	4490	215	291	85	73
8	57	101	108	131	244	1480	1020	1240	395	173	85	74
9	55	89	116	130	201	593	856	637	371	116	82	74
10	55	84	137	125	158	445	562	1140	401	113	80	70
11	53	87	134	118	141	356	389	965	222	96	103	67
12	52	83	111	150	137	307	316	547	152	77	124	70
13	51	79	e105	198	127	280	274	402	265	72	117	286
14	51	79	e102	196	127	316	245	328	593	95	105	149
15	54	79	e100	197	128	302	262	308	348	124	103	139
16	52	77	e99	210	130	294	327	618	495	989	107	716
17	53	119	e97	190	156	283	275	408	870	3600	96	1870
18	53	260	e98	162	185	244	234	294	764	1190	96	983
19	53	170	e99	148	192	230	213	241	418	635	105	429
20	52	138	101	136	209	217	198	209	251	421	101	310
21	69	130	100	126	847	371	183	191	223	322	120	267
22	115	115	103	116	2300	498	172	174	310	236	204	238
23	116	102	103	115	1240	361	165	171	268	181	217	206
24	84	98	103	113	800	1420	155	270	294	167	173	174
25	71	96	115	111	554	1710	154	203	227	141	153	165
26	65	91	114	110	441	714	475	154	162	135	152	1410
27	62	127	104	107	448	454	585	136	164	148	132	3120
28	62	1040	101	104	459	359	724	120	117	190	114	631
29	63	986	104	102	---	308	831	106	103	237	104	322
30	63	481	101	97	---	279	653	101	92	134	97	249
31	65	---	99	99	---	299	---	97	---	137	90	---
TOTAL	2011	5792	3704	4162	10205	16783	11318	24777	8356	10737	3637	12521
MEAN	64.9	193	119	134	364	541	377	799	279	346	117	417
MAX	116	1040	276	210	2300	2170	1020	4490	870	3600	217	3120
MIN	49	77	97	97	97	217	154	97	87	72	80	65
CFSM	.21	.64	.39	.44	1.20	1.79	1.25	2.64	.92	1.14	.39	1.38
IN.	.25	.71	.45	.51	1.25	2.06	1.39	3.04	1.03	1.32	.45	1.54

CAL YR 1988 TOTAL 62608 MEAN 171 MAX 1870 MIN 34 CFSM .56 IN. 7.69
WTR YR 1989 TOTAL 114003 MEAN 312 MAX 4490 MIN 49 CFSM 1.03 IN. 14.00

e Estimated.

02040000 APPOMATTOX RIVER AT MATTOAX, VA

LOCATION.--Lat 37°25'17", long 77°51'33", Amelia County, Hydrologic Unit 02080207, on right bank 75 ft upstream from Norfolk Southern Railway bridge at Mattoax, 0.3 mi upstream from Skinquarter Creek, and 3.7 mi upstream from Flat Creek.

DRAINAGE AREA.--726 mi².

PERIOD OF RECORD.--August 1900 to December 1905, March 1926 to current year.

REVISED RECORDS.--WSP 892: 1938. WSP 972: 1928, 1932, 1934-38. WSP 1303: 1901(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 174.51 ft above National Geodetic Vertical Datum of 1929.

August 1900 to December 1905, nonrecording gage at same site, different datum. March 1926 to October 1936, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods of doubtful gage-height record, Dec. 3-9, 19-21, Dec. 29 to Jan. 3, Jan. 5, and Aug. 5-10, which are fair. National Weather Service gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--68 years, 721 ft³/s, 13.49 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,000 ft³/s, Aug. 18, 1940, gage height, 35.3 ft, from flood-mark in gage house, from rating curve extended above 20,000 ft³/s on basis of records for stations at Farmville and near Petersburg; minimum, 11 ft³/s, Oct. 2, 1930, gage height, 3.52 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	1430	*5,170	*20.93	July 20	0930	4,150	18.80
May 10	1600	4,540	19.78				

Minimum discharge, 74 ft³/s, Oct. 2, gage height, 6.06 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	76	190	1350	e240	232	1180	832	1290	294	308	354	207
2	75	403	742	e255	231	1180	742	2530	281	279	383	189
3	79	571	e580	e300	230	941	643	3460	274	259	353	172
4	95	385	e460	357	283	854	586	3810	263	256	312	161
5	116	288	e390	e299	342	952	576	4130	272	293	e265	151
6	158	269	e340	286	381	1320	733	4950	286	473	e235	144
7	150	267	e320	285	480	3250	1160	4480	388	766	e218	141
8	122	276	e300	299	595	3340	2320	4010	515	728	e200	145
9	105	237	e315	309	578	3360	2620	4090	1220	516	e180	149
10	97	206	337	305	476	2340	2380	4460	1220	396	e195	148
11	93	193	355	295	390	1190	1370	3700	826	336	216	144
12	89	184	348	308	346	966	1010	2420	591	311	241	137
13	86	181	313	397	329	831	837	1430	636	268	277	135
14	83	177	272	505	317	822	742	1130	924	355	267	222
15	86	171	303	534	310	933	947	979	990	384	249	278
16	81	169	322	535	312	868	1230	1170	881	711	243	2140
17	85	185	296	525	326	783	1080	1540	1240	2810	232	3380
18	83	239	272	463	348	736	835	1100	1710	3600	929	2500
19	84	361	e265	403	387	685	718	857	1470	4050	677	1480
20	83	354	e250	361	433	645	638	739	871	4100	340	786
21	97	296	e260	332	837	722	577	658	934	1570	280	944
22	147	284	260	306	2550	1010	528	600	1120	819	273	659
23	219	271	261	287	3070	1060	490	548	1030	659	499	548
24	228	232	261	276	3210	2120	458	533	970	646	497	462
25	178	214	260	269	2530	3100	434	619	1270	560	402	408
26	140	208	269	261	1260	3210	691	539	877	478	331	1320
27	120	265	279	254	1080	2790	1500	451	572	580	320	2440
28	113	1190	262	249	1090	1240	1790	399	504	555	298	2590
29	109	2270	e250	243	---	992	1890	357	403	435	266	1840
30	106	2460	e230	241	---	857	1920	327	345	530	244	763
31	108	---	e225	238	---	827	---	309	---	391	225	---
TOTAL	3491	12996	10947	10217	22953	45104	32277	57615	23177	28422	10001	24783
MEAN	113	433	353	330	820	1455	1076	1859	773	917	323	826
MAX	228	2460	1350	535	3210	3360	2620	4950	1710	4100	929	3380
MIN	75	169	225	238	230	645	434	309	263	256	180	135
CFSM	.16	.60	.49	.45	1.13	2.00	1.48	2.56	1.06	1.26	.44	1.14
IN.	.18	.67	.56	.52	1.18	2.31	1.65	2.95	1.19	1.46	.51	1.27

CAL YR 1988 TOTAL 166870 MEAN 456 MAX 3220 MIN 63 CFSM .63 IN. 8.55
WTR YR 1989 TOTAL 281983 MEAN 773 MAX 4950 MIN 75 CFSM 1.06 IN. 14.45

e Estimated.

JAMES RIVER BASIN

02041000 DEEP CREEK NEAR MANNBORO, VA

LOCATION.--Lat 37°16'59", long 77°52'12", Amelia County, Hydrologic Unit 02080207, on left bank 300 ft upstream from bridge on State Highway 153, 0.9 mi upstream from Sweathouse Creek, 3.4 mi northwest of Mannboro, and 7.5 mi southeast of Amelia.

DRAINAGE AREA.--158 mi².

PERIOD OF RECORD.--September 1946 to current year.

REVISED RECORDS.--WSP 1203: 1948 (calendar year figures only). WSP 2104: Drainage area. WDR VA-79-1: 1973-76(P), 1978.

GAGE.--Water-stage recorder. Datum of gage is 177.20 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 2, 1949, nonrecording gage at same site and datum.

REMARKS.--Records good except for period of no gage-height record, June 28 to July 20, which is fair. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--43 years, 150 ft³/s, 12.89 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,000 ft³/s, Oct. 6, 1972, gage height, 24.04 ft, from high-water mark, from rating curve extended above 3,900 ft³/s; minimum, 0.03 ft³/s, Oct. 4, 5, 1968; minimum gage height, 0.29 ft, Aug. 9-12, 1957.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of 14.8 ft, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 22	2300	1,440	7.70	Mar. 25	1100	1,590	7.92
Mar. 8	0500	1,400	7.63	May 7	0500	*2,320	*8.84

Minimum discharge, 16 ft³/s, Oct. 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	89	177	63	50	299	227	210	43	e48	82	32
2	27	246	123	94	48	293	188	391	41	e43	93	31
3	33	267	97	100	47	200	149	953	39	e40	74	29
4	67	139	83	89	48	190	136	550	39	e37	59	28
5	87	90	73	74	51	209	132	236	39	e38	52	27
6	88	93	67	88	67	237	221	926	52	e46	47	26
7	67	89	62	97	105	700	381	1880	123	e62	43	26
8	52	76	59	99	135	1170	810	855	568	e94	40	26
9	45	59	61	101	121	448	940	341	688	e76	37	25
10	41	51	73	96	89	289	402	357	373	e60	38	25
11	39	47	76	89	73	255	237	482	192	e49	50	25
12	37	44	69	102	68	203	186	331	128	e45	55	24
13	28	42	e65	143	63	173	158	221	249	e42	63	24
14	21	42	58	159	63	229	139	184	222	e53	58	25
15	19	41	55	139	61	283	276	160	172	e73	52	25
16	18	41	61	130	58	228	670	222	166	e135	48	26
17	18	57	61	114	60	184	607	239	313	e300	45	32
18	17	131	61	95	64	155	256	183	408	e550	50	36
19	18	159	54	82	77	157	191	143	210	e470	64	32
20	18	113	51	74	90	163	159	120	121	e220	61	35
21	25	94	53	69	243	202	138	105	98	78	61	62
22	113	79	57	61	941	261	124	95	125	63	94	79
23	155	67	56	60	1090	223	113	86	164	55	111	77
24	115	58	56	60	413	543	104	79	666	50	86	53
25	63	52	66	57	229	1390	98	72	412	65	59	41
26	43	49	66	54	189	747	191	66	158	58	49	113
27	33	55	60	52	176	302	275	62	105	176	45	183
28	29	337	57	50	205	216	591	57	e85	211	42	162
29	27	713	55	49	---	181	900	52	e70	161	39	81
30	26	491	52	49	---	157	319	48	e66	167	37	53
31	25	---	53	50	---	184	---	45	---	113	35	---
TOTAL	1421	3911	2117	2639	4924	10471	9318	9751	6135	3678	1769	1463
MEAN	45.8	130	68.3	85.1	176	338	311	315	204	119	57.1	48.8
MAX	155	713	177	159	1090	1390	940	1880	688	550	111	183
MIN	17	41	51	49	47	155	98	45	39	37	35	24
CFSM	.29	.83	.43	.54	1.11	2.14	1.97	1.99	1.29	.75	.36	.31
IN.	.33	.92	.50	.62	1.16	2.47	2.19	2.30	1.44	.87	.42	.34

CAL YR 1988 TOTAL 31258.0 MEAN 85.4 MAX 882 MIN 7.8 CFSM .54 IN. 7.36
WTR YR 1989 TOTAL 57597 MEAN 158 MAX 1880 MIN 17 CFSM 1.00 IN. 13.56

e Estimated.

JAMES RIVER BASIN

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02041650 APPOMATTOX RIVER AT MATOACA, VA
(National stream-quality accounting network station)

LOCATION.--Lat 37°13'28", long 77°28'32", Chesterfield County, Hydrologic Unit 02080207, on left bank at upstream side of bridge on State Highway 600, 0.2 mi south of Matoaca, 2.0 mi upstream from Rohoic Creek, 2.8 mi downstream from Lake Chesdin, 3.5 mi west of Petersburg, and at mile 15.9.

DRAINAGE AREA.--1,344 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1969 to current year.

GAGE.--Water-stage recorder. Datum of gage is 68.30 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Appomattox Water Authority at Lake Chesdin, capacity, 36,000 acre-ft, 2.8 mi upstream from which an average of 12.4 ft³/s is diverted for industrial and municipal use. Records do not include flow of Upper Appomattox Canal of city of Petersburg which diverts around station. National Weather Service gage-height telemeter at station.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--20 years, 1,438 ft³/s, 14.53 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,800 ft³/s, Oct. 7, 1972, gage height, 18.39 ft; minimum, 41 ft³/s, Oct. 4, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,940 ft³/s, May 7, 8, gage height, 9.20 ft; minimum, 95 ft³/s, Oct. 2, gage height, 1.55 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	98	395	3400	439	409	2120	1870	2810	414	421	568	274
2	105	704	1740	468	407	2170	1540	3750	404	378	524	260
3	185	931	1110	508	411	1930	1330	5590	378	337	602	240
4	243	924	864	637	424	1670	1170	5830	373	327	513	214
5	217	698	696	498	489	1660	1100	5610	355	338	438	220
6	221	594	614	524	591	2010	1470	7880	421	395	374	226
7	246	500	545	533	841	5360	2280	8780	459	590	337	202
8	239	449	517	551	1110	6780	4760	8770	1440	878	282	181
9	196	423	536	574	1140	6400	5630	7930	1780	795	242	177
10	177	377	515	569	979	5400	4990	6970	2290	613	309	177
11	165	384	529	544	804	3310	3530	6520	1740	470	392	176
12	159	307	516	642	696	2000	2110	5910	1260	389	386	175
13	146	299	463	848	606	1580	1620	3570	1630	378	390	171
14	132	281	403	998	585	1680	1330	2060	1640	491	404	170
15	122	272	404	1060	545	1810	2100	1610	1510	413	396	182
16	117	267	446	1050	546	1830	4650	1640	1370	710	367	395
17	112	513	467	978	532	1570	3790	1990	1700	2030	355	2260
18	109	662	420	889	631	1390	2510	2070	2230	3740	544	3580
19	111	656	374	790	656	1320	1680	1560	2440	4530	1120	2550
20	113	726	386	740	718	1220	1340	1240	1730	4750	904	1430
21	138	660	405	590	1580	1350	1160	1080	1220	4340	606	1000
22	257	518	411	526	5010	1600	1060	921	1280	1720	506	1010
23	314	480	406	509	6050	1850	927	839	1550	983	521	890
24	399	445	408	481	5800	3420	857	775	2300	962	639	632
25	386	394	445	459	4820	5900	814	701	2210	870	630	513
26	307	371	427	459	3190	6390	1040	770	1760	735	519	868
27	234	357	424	464	1970	5570	1870	719	1150	1050	448	1890
28	202	1070	465	416	1870	3720	3140	588	820	1110	420	2760
29	187	2860	403	419	---	2000	4120	504	646	893	391	2780
30	168	3840	388	422	---	1650	3790	463	489	689	360	1770
31	160	---	395	412	---	1950	---	441	---	726	314	---
TOTAL	5965	21357	19522	18997	43410	88610	69578	99891	38989	37051	14801	27373
MEAN	192	712	630	613	1550	2858	2319	3222	1300	1195	477	912
MAX	399	3840	3400	1060	6050	6780	5630	8780	2440	4750	1120	3580
MIN	98	267	374	412	407	1220	814	441	355	327	242	170
CFSM	.14	.53	.47	.46	1.15	2.13	1.73	2.40	.97	.89	.36	.68
IN.	.17	.59	.54	.53	1.20	2.45	1.93	2.76	1.08	1.03	.41	.76

CAL YR 1988 TOTAL 268049 MEAN 732 MAX 5680 MIN 96 CFSM .54 IN. 7.42
WTR YR 1989 TOTAL 485544 MEAN 1330 MAX 8780 MIN 98 CFSM .99 IN. 13.44

JAMES RIVER BASIN

02041650 APPOMATTOX RIVER AT MATOACA, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1978 to current year.

COOPERATION.--Chemical data as noted were provided by the Virginia Division of Consolidated Laboratory Services (VDCLS) and reviewed by the U.S. Geological Survey.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	AGENCY ANA- LYZING SAMPLE	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, CHEM- ICAL (LOW LEVEL) (MG/L)
NOV 10...	0900	362	89	7.50	11.5	752	USGS	3.8	10.2	95	--
JAN 25...	1230	448	90	7.70	6.0	760	USGS	6.5	12.7	102	--
FEB 14...	0900	572	91	7.50	6.0	760	USGS	4.8	12.4	100	--
APR 19...	1200	1700	67	7.10	15.0	751	USGS	9.1	10.0	101	--
JUN 29...	1330	632	72	7.20	28.0	753	USGS	13	7.6	98	--
JUL 06...	1030	382	70	7.09	26.0	764	VDCLS	--	7.6	93	--
19...	1430	4560	95	7.10	25.5	758	VDCLS	13	8.3	102	35
20...	0730	4750	58	7.20	24.0	753	VDCLS	34	7.8	94	12
21...	1400	4580	38	6.95	25.5	763	VDCLS	--	8.2	100	20
26...	1000	698	100	7.10	24.0	765	VDCLS	18	7.3	86	--
AUG 11...	1000	390	72	7.10	23.5	762	VDCLS	9.0	7.6	90	21
22...	0930	510	74	7.20	25.0	752	USGS	3.6	7.1	87	--
22...	0931	510	74	7.20	25.0	752	VDCLS	6.9	7.1	87	31
SEP 06...	1030	227	100	7.00	21.0	755	VDCLS	4.4	9.8	111	--
18...	1000	3820	97	7.20	25.0	763	VDCLS	--	8.3	101	--
19...	0900	2760	103	7.40	24.5	760	VDCLS	--	8.1	97	7
26...	1300	801	88	7.04	22.0	756	VDCLS	--	8.5	98	19
28...	1200	2780	78	6.80	22.0	769	VDCLS	20	8.3	94	15
29...	1000	2840	75	6.80	--	765	VDCLS	--	8.8	--	--

[illegible]

JAMES RIVER BASIN

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02041650 APPOMATTOX RIVER AT MATOACA, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L)	RESIDUE VOLA- TILE, SUS- PENDED (MG/L)	RESIDUE FIXED NON FILTER- ABLE (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
NOV											
10...	7.2	4.3	0.10	13	58	62	--	--	--	--	0.010
JAN											
25...	9.7	5.4	0.10	16	63	67	--	--	--	--	<0.010
FEB											
14...	10	5.4	0.10	16	63	68	--	--	--	--	<0.010
APR											
19...	7.0	3.8	0.10	12	58	48	--	--	--	--	<0.010
JUN											
29...	4.0	3.3	0.10	14	73	51	--	--	--	--	<0.010
JUL											
06...	--	--	--	14	--	--	4	1	3	0.180	0.030
19...	--	--	--	17	--	--	7	2	5	0.100	<0.010
20...	--	--	--	15	--	--	13	4	9	0.150	<0.010
21...	--	--	--	8.4	--	--	15	3	12	0.530	0.010
26...	--	--	--	12	--	--	7	3	4	0.110	<0.010
AUG											
11...	--	--	--	13	--	--	6	3	3	<0.00	0.180
22...	4.0	3.3	0.10	15	58	55	4	4	--	0.100	<0.010
22...	--	--	--	14	--	--	10	4	6	0.100	<0.010
SEP											
06...	--	--	--	16	--	--	6	4	2	0.300	0.010
18...	--	--	--	17	--	--	11	1	10	<0.040	<0.010
19...	--	--	--	17	--	--	15	6	9	<0.040	<0.010
26...	--	--	--	14	--	--	8	3	5	0.330	0.020
28...	--	--	--	14	--	--	10	2	8	0.190	0.020
29...	--	--	--	14	--	--	9	4	5	0.170	0.020

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)
NOV										
10...	<0.100	<0.010	<0.010	0.30	0.020	0.010	<0.010	10	<1	19
JAN										
25...	0.190	<0.010	0.040	0.30	0.020	0.010	0.010	--	--	--
FEB										
14...	0.150	0.040	0.010	0.30	0.020	<0.010	<0.010	50	<1	17
APR										
19...	<0.100	0.020	0.020	0.50	0.030	0.020	<0.010	60	<1	22
JUN										
29...	0.250	0.030	0.080	0.50	0.050	0.040	0.030	--	--	--
JUL										
06...	0.210	0.040	--	0.40	0.040	0.020	0.020	--	--	--
19...	0.100	0.050	--	0.50	0.040	<0.010	0.010	--	--	--
20...	0.150	0.100	--	0.50	0.050	<0.010	<0.010	--	--	--
21...	0.540	0.060	--	0.50	0.100	0.020	0.020	--	--	--
26...	0.120	0.060	--	0.50	0.050	0.020	0.020	--	--	--
AUG										
11...	0.180	0.110	--	0.60	0.030	0.010	0.010	--	--	--
22...	<0.100	0.050	0.040	0.40	0.040	0.010	<0.010	<10	<1	18
22...	0.100	<0.040	--	0.50	0.004	0.010	<0.010	--	--	--
SEP										
06...	0.310	0.060	--	0.40	0.040	0.030	0.020	--	--	--
18...	<0.040	<0.040	--	0.40	0.030	<0.010	<0.010	--	--	--
19...	<0.040	0.050	--	0.50	0.040	0.010	<0.010	--	--	--
26...	0.350	0.120	--	0.50	0.040	0.020	0.010	--	--	--
28...	0.210	0.130	--	0.50	0.050	0.020	0.010	--	--	--
29...	0.190	0.120	--	0.40	0.060	0.020	0.020	--	--	--

JAMES RIVER BASIN

02042500 CHICKAHOMINY RIVER NEAR PROVIDENCE FORGE, VA

LOCATION.--Lat 37°26'10", long 77°03'40", New Kent County, Hydrologic Unit 02080206, on left bank 100 ft downstream from bridge on State Highway 618, 1.1 mi southwest of Providence Forge, and 1.7 mi downstream from Schminoe Creek.

DRAINAGE AREA.--248 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1942 to current year.

REVISED RECORDS.--WSP 1553: 1956. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 6.07 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for period with ice effect, Dec. 13-18, which is fair.

AVERAGE DISCHARGE.--47 years, 263 ft³/s, 14.40 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,710 ft³/s, Aug. 15, 1955, gage height, 11.67 ft; minimum, 0.70 ft³/s, July 7, 1977; minimum gage height, 1.53 ft, Sept. 13, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,230 ft³/s, May 8, gage height, 8.56 ft; minimum, 5.9 ft³/s, Oct. 2, gage height, 1.83 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.3	76	146	69	71	740	1090	207	52	100	78	113
2	6.1	127	173	81	68	598	1020	300	45	70	94	87
3	8.4	119	283	86	66	501	716	624	74	48	119	70
4	24	153	414	91	76	442	577	931	58	35	99	61
5	27	155	443	90	83	419	504	642	47	26	107	53
6	30	134	378	90	104	416	526	572	60	35	118	46
7	40	127	283	97	152	546	626	929	63	60	130	41
8	41	138	207	100	191	798	975	1150	146	43	173	36
9	43	150	165	107	232	957	1140	877	168	33	228	32
10	44	144	149	112	252	956	1110	883	330	31	268	27
11	40	132	131	111	238	1090	1040	986	403	36	332	24
12	38	113	115	118	224	999	966	970	393	49	288	20
13	27	99	e102	153	209	755	825	778	347	67	235	18
14	21	88	e94	196	188	583	645	592	303	207	203	17
15	16	76	e88	237	164	481	552	514	270	130	171	26
16	13	65	e84	255	145	445	645	505	262	144	152	127
17	10	65	e79	253	133	413	867	498	271	438	154	131
18	9.0	92	e76	259	127	389	858	501	265	439	426	96
19	8.9	174	74	253	149	387	786	487	282	426	707	100
20	8.5	246	72	235	167	380	821	398	303	400	721	143
21	9.0	202	73	213	215	380	758	347	309	358	573	239
22	29	142	75	194	369	362	604	371	312	474	421	229
23	31	115	73	199	614	341	469	369	437	721	328	290
24	43	101	72	186	901	434	379	323	364	647	385	401
25	54	91	74	149	888	653	320	261	323	494	476	410
26	52	82	74	117	946	951	280	207	275	359	459	430
27	50	73	71	104	939	943	250	163	244	243	393	412
28	57	101	69	94	861	1010	228	129	210	161	318	376
29	61	140	68	89	---	979	209	104	175	106	245	410
30	57	131	64	81	---	831	213	83	135	76	189	389
31	47	---	64	75	---	881	---	65	---	70	146	---
TOTAL	951.2	3651	4333	4494	8772	20060	19999	15766	6926	6526	8736	4854
MEAN	30.7	122	140	145	313	647	667	509	231	211	282	162
MAX	61	246	443	259	946	1090	1140	1150	437	721	721	430
MIN	6.1	65	64	69	66	341	209	65	45	26	78	17
CFSM	.12	.49	.56	.58	1.26	2.61	2.69	2.05	.93	.85	1.14	.65
IN.	.14	.55	.65	.67	1.32	3.01	3.00	2.36	1.04	.98	1.31	.73

CAL YR 1988 TOTAL 59321.6 MEAN 162 MAX 998 MIN 6.1 CFSM .65 IN. 8.90
WTR YR 1989 TOTAL 105068.2 MEAN 288 MAX 1150 MIN 6.1 CFSM 1.16 IN. 15.76

e Estimated.

JAMES RIVER BASIN

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02042500 CHICKAHOMINY RIVER NEAR PROVIDENCE FORGE, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969-70, 1972 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CACO3)
OCT 26...	0945	52	121	7.10	10.0	22	759	7.6	68	28
DEC 21...	0930	72	116	6.90	20.0	50	766	11.8	129	26
FEB 14...	0945	191	140	8.00	4.5	32	769	11.8	90	26
APR 05...	1400	498	95	7.20	19.0	--	755	5.7	62	22
MAY 10...	0830	855	72	6.80	15.0	110	753	6.8	68	18
JUN 14...	0900	304	80	6.50	22.0	100	760	6.8	78	23
JUL 12...	1000	48	101	7.00	27.0	60	761	5.6	70	33
SEP 13...	0900	18	118	6.70	24.0	55	763	6.4	76	34

DATE	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)
OCT 26...	7.9	1.9	8.8	2.6	10	21	12	0.10	8.6	69
DEC 21...	7.2	1.9	11	3.1	15	19	15	0.10	9.5	77
FEB 14...	7.2	2.0	16	3.1	9.0	18	25	0.10	5.9	83
APR 05...	6.2	1.5	11	2.0	15	7.0	15	0.10	1.3	54
MAY 10...	4.9	1.3	7.2	1.6	13	5.0	9.6	0.10	5.0	44
JUN 14...	6.7	1.5	7.4	1.2	14	10	9.4	0.10	8.4	54
JUL 12...	9.4	2.2	9.7	1.0	30	3.0	11	0.10	8.7	65
SEP 13...	9.8	2.2	9.2	1.8	31	3.0	11	0.20	10	68

JAMES RIVER BASIN

02042500 CHICKAHOMINY RIVER NEAR PROVIDENCE FORGE, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	CADMIUM DIS- SOLVED (UG/L AS CD)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)
OCT 26...	<0.010	<0.010	0.40	0.026	0.020	0.010	<1	2	240
DEC 21...	0.053	0.010	0.30	0.045	0.020	0.011	<1	3	1000
FEB 14...	0.021	<0.010	0.40	0.029	0.017	0.021	<1	2	870
APR 05...	0.014	0.010	0.60	0.059	0.026	0.015	<1	1	1400
MAY 10...	0.052	<0.010	0.60	0.080	0.038	0.024	<1	3	1900
JUN 14...	0.093	0.030	0.80	0.102	0.036	0.009	<1	2	1900
JUL 12...	0.169	0.040	0.50	0.070	0.057	0.022	<1	1	1300
SEP 13...	0.191	0.030	0.40	0.063	0.071	0.056	<1	2	1300

DATE	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L)	PHEOPHY- -TIN A FLUORO- METRIC METHOD (UG/L)
OCT 26...	170	<5	30	30	<0.1	10	6.9	0.100	0.700
DEC 21...	640	<5	130	100	<0.1	19	7.3	0.300	0.500
FEB 14...	410	<5	70	50	<0.1	18	5.8	0.800	0.700
APR 05...	470	<5	90	68	<0.1	26	13	1.60	1.30
MAY 10...	1100	<1	60	45	<0.1	9	10	10.7	5.40
JUN 14...	550	1	140	120	<0.1	3	12	0.300	1.70
JUL 12...	730	<1	150	100	<0.1	6	8.2	0.700	0.800
SEP 13...	570	<1	120	110	<0.1	7	8.3	0.300	0.100

JAMES RIVER BASIN

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02042720 CHICKAHOMINY RIVER ABOVE WALKERS DAM, AT WALKERS, VA

LOCATION.--Lat 37°24'31", long 76°56'18", New Kent County, Hydrologic Unit 02080206, on left bank 600 ft upstream from Walkers Dam at city of Newport News pumping station, 0.7 mi south of Walkers, and 8.0 mi upstream from Diascund Creek.

DRAINAGE AREA.--301 mi².

PERIOD OF RECORD.--Water years 1983 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)
OCT 26...	1030	110	7.10	14.0	20	759	8.5	83	26	7.3
DEC 21...	1030	107	6.60	4.0	70	766	10.9	82	22	6.3
FEB 14...	1030	103	7.90	5.5	31	769	12.4	98	24	6.8
APR 05...	1600	93	7.10	17.5	110	755	7.3	77	19	5.5
MAY 10...	0930	74	6.70	16.5	110	753	6.4	66	19	5.5
JUN 14...	1000	86	6.80	26.5	70	760	8.0	100	27	8.2
JUL 12...	0930	77	6.90	30.5	70	761	6.9	92	27	8.2
SEP 13...	0945	140	6.10	25.5	60	763	4.5	55	27	8.1

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)
OCT 26...	1.9	10	1.3	20	14	12	0.10	12	71
DEC 21...	1.6	9.5	3.1	9.0	23	13	0.10	9.8	73
FEB 14...	1.6	9.3	2.8	14	15	13	0.10	4.6	62
APR 05...	1.3	9.6	1.8	11	8.2	13	0.10	1.5	48
MAY 10...	1.3	6.6	1.7	15	5.0	9.0	0.10	4.6	44
JUN 14...	1.7	7.6	1.4	22	5.0	10	0.10	5.9	54
JUL 12...	1.7	7.6	0.90	25	2.0	9.7	0.10	7.8	55
SEP 13...	1.7	7.4	1.0	23	4.0	9.7	0.10	9.6	56

JAMES RIVER BASIN

02042720 CHICKAHOMINY RIVER ABOVE WALKERS DAM, AT WALKERS, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	CADMIUM DIS- SOLVED (UG/L AS CD)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)
OCT 26...	<0.010	<0.010	0.70	0.019	0.015	<0.001	2	1	400
DEC 21...	0.029	0.020	0.60	0.050	0.029	0.013	<1	3	900
FEB 14...	0.018	<0.010	0.60	0.054	0.022	0.016	<1	1	790
APR 05...	0.026	0.010	0.80	0.056	0.018	0.010	<1	<1	1300
MAY 10...	0.043	0.030	0.70	0.088	0.044	0.023	<1	3	2000
JUN 14...	0.012	0.010	0.50	0.062	0.027	0.003	<1	1	1600
JUL 12...	0.010	0.050	0.70	0.036	0.025	0.006	<1	4	1900
SEP 13...	0.024	0.020	0.70	0.039	0.032	0.013	<1	1	1500

DATE	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L)	PHEOPHY- -TIN A FLUORO- METRIC METHOD (UG/L)
OCT 26...	440	<5	70	67	<0.1	13	10	14.8	4.00
DEC 21...	530	<5	70	62	0.1	12	11	4.30	2.40
FEB 14...	430	<5	50	38	<0.1	8	6.9	5.80	2.80
APR 05...	450	<5	60	49	<0.1	9	11	4.80	3.40
MAY 10...	1000	1	90	64	<0.1	7	12	7.70	3.20
JUN 14...	730	1	220	70	<0.1	4	13	18.7	8.00
JUL 12...	1100	1	570	560	<0.1	6	13	53.3	12.6
SEP 13...	510	<1	280	200	<0.1	5	10	10.7	9.10

JAMES RIVER BASIN

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02042726 DIASCUND CREEK AT RT. 628, NEAR NEW KENT, VA

LOCATION.--Lat 37°28'52", long 76°58'21", New Kent County, Hydrologic Unit 02080206, at bridge on State Highway 628, 2.4 mi south of New Kent, and 6.0 mi upstream from Timber Swamp.

DRAINAGE AREA.--9.25 mi².

PERIOD OF RECORD.--October 1985 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	ALKA- LITY LAB (MG/L AS CACO3)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SILICA, DIS- SOLVED (MG/L AS SiO2)
OCT 26...	1400	5.1	75	6.80	10.5	759	7.8	70	20	8.5	8.0
DEC 21...	1345	4.1	65	6.70	5.0	758	11.2	88	20	5.2	7.4
FEB 14...	1230	5.5	69	7.90	7.0	769	12.2	100	21	4.9	5.9
APR 06...	1130	34	56	6.60	13.5	767	7.9	75	17	5.6	3.6
MAY 10...	1200	19	57	6.60	16.0	752	7.6	78	18	3.9	4.0
JUN 14...	1200	8.0	72	6.74	25.5	760	7.1	87	31	4.2	7.2
JUL 12...	1045	5.3	77	6.70	28.0	761	6.6	84	33	6.0	7.1
SEP 13...	1130	4.1	82	6.50	25.0	763	5.5	66	30	5.4	7.7

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC TOTAL (MG/L AS C)
OCT 26...	<0.010	<0.010	0.40	0.051	0.014	1300	750	90	95	7.8
DEC 21...	<0.010	0.020	0.30	0.053	0.005	1500	440	100	97	4.6
FEB 14...	0.013	<0.010	0.30	0.036	0.046	910	550	50	46	4.4
APR 06...	0.011	<0.010	0.20	0.049	0.022	2100	1200	60	52	9.1
MAY 10...	<0.010	<0.010	0.30	0.116	0.032	2700	1200	70	46	6.9
JUN 14...	0.017	<0.010	0.50	0.187	0.003	4200	1300	90	80	9.3
JUL 12...	0.048	0.020	0.40	0.127	0.023	3500	760	180	160	9.6
SEP 13...	<0.010	0.020	0.40	0.105	0.026	2300	900	140	150	6.5

JAMES RIVER BASIN

02042734 DIASCUND CREEK RESERVOIR OFF TIMBER SWAMP, NEAR WALKERS, VA

LOCATION.--Lat 37°25'48", long 76°54'19", New Kent County, Hydrologic Unit 02080206, in Diascund Creek Reservoir at mouth of Timber Swamp, 0.3 mi west of bridge on State Highway 603, and 2.1 mi east of Walkers.

PERIOD OF RECORD.--Water years 1983 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
OCT								
26...	1130	3.00	82	6.70	14.0	759	8.4	82
26...	1145	10.0	82	6.90	14.0	759	4.9	48
DEC								
21...	1100	3.00	75	7.90	4.5	766	13.8	106
21...	1115	10.0	75	8.00	4.0	766	13.6	103
FEB								
15...	0930	3.00	71	8.30	8.0	770	12.7	106
15...	0945	10.0	71	8.00	7.0	770	12.5	102
APR								
05...	0900	3.00	71	7.30	16.0	767	9.9	99
05...	0915	10.0	72	7.20	15.5	767	9.5	95
05...	0930	18.0	83	6.80	11.5	767	4.9	45
MAY								
09...	0900	3.00	69	7.10	18.0	763	8.4	88
09...	0915	10.0	72	7.00	17.0	763	6.1	63
09...	0930	18.0	87	6.60	14.0	763	0.1	1
JUN								
13...	1045	3.00	72	7.50	25.5	757	8.5	105
13...	1100	10.0	72	7.30	25.5	757	6.3	77
13...	1115	18.0	110	6.80	16.0	757	0.1	1
JUL								
11...	0900	3.00	69	7.67	29.0	761	8.0	105
11...	0915	10.0	90	6.51	26.0	761	0.1	2
11...	0930	18.0	121	6.62	18.0	761	0.1	1
SEP								
12...	0930	3.00	70	8.40	28.0	764	9.0	114
12...	0945	10.0	69	6.80	25.0	764	1.4	17
12...	1000	18.0	198	6.60	19.5	764	0	0

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L)	PHEOPHY- TIN A FLUORO- METRIC METHOD (UG/L)
OCT							
26...	<0.010	0.020	0.60	0.019	<0.001	30.8	7.10
26...	<0.010	0.010	0.50	0.017	<0.001	28.3	9.00
DEC							
21...	0.024	0.020	1.0	0.025	<0.001	88.0	1.80
21...	0.014	0.010	1.1	0.026	<0.001	72.6	0.00
FEB							
15...	<0.010	<0.010	1.5	0.022	0.008	33.0	5.90
15...	<0.010	<0.010	2.1	0.023	0.006	42.1	8.10
APR							
05...	0.014	0.030	0.50	0.029	0.010	2.00	3.30
05...	<0.010	<0.010	0.70	0.050	0.007	2.50	3.50
05...	<0.010	0.040	0.80	0.036	0.007	3.80	6.50
MAY							
09...	0.026	0.020	0.50	0.035	0.003	3.30	3.00
09...	<0.010	0.030	0.50	0.038	0.002	10.0	5.00
09...	<0.010	0.350	0.90	0.035	0.003	4.40	6.50
JUN							
13...	0.013	0.040	0.60	0.030	0.005	19.5	2.90
13...	<0.010	0.020	0.50	0.033	0.002	15.7	7.80
13...	0.028	0.670	1.1	0.072	0.049	2.50	8.10
JUL							
11...	0.011	0.020	0.40	0.020	0.004	9.10	14.0
11...	0.014	0.030	0.50	0.027	0.003	10.2	10.6
11...	<0.010	1.20	1.4	0.024	0.013	8.30	14.2
SEP							
12...	0.014	0.030	0.90	0.016	0.001	15.4	1.80
12...	<0.010	0.010	0.70	0.024	<0.001	23.9	18.3
12...	<0.010	3.20	3.8	0.020	0.013	31.9	23.2

JAMES RIVER BASIN

225

02042736 BEAVERDAM CREEK AT RT. 632, NEAR BARHAMSVILLE, VA

LOCATION.--Lat 37°28'58", long 76°54'23", New Kent County, Hydrologic Unit 02080206, on State Highway 632, 4.0 mi northwest of Barhamsville, and 4.1 mi upstream from mouth.

DRAINAGE AREA.--4.82 mi².

PERIOD OF RECORD.--October 1985 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	ALKA- LITY LAB (MG/L AS CACO3)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SILICA, DIS- SOLVED (MG/L AS SiO2)
OCT 26...	1315	0.67	150	6.60	10.5	759	5.1	46	27	12	9.3
DEC 21...	1145	0.96	140	6.60	3.0	758	9.1	68	45	11	8.5
FEB 14...	1145	1.1	178	7.60	6.0	769	10.1	80	48	11	7.6
APR 06...	1030	42	85	6.80	13.0	767	6.6	62	24	11	4.0
MAY 10...	1100	14	105	7.20	15.5	752	8.1	82	35	8.4	4.9
JUN 14...	1130	4.5	137	6.70	26.0	760	7.0	86	59	9.7	8.9
JUL 12...	1030	4.2	135	6.48	26.0	761	2.3	29	55	11	8.5

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC TOTAL (MG/L AS C)
OCT 26...	<0.010	<0.010	0.50	0.040	0.001	1600	600	50	38	10
DEC 21...	<0.010	0.020	0.20	0.032	0.004	740	190	30	24	5.4
FEB 14...	0.012	<0.010	0.30	0.025	0.007	650	290	20	15	5.2
APR 06...	<0.010	0.020	0.40	0.035	0.017	1500	850	40	37	10
MAY 10...	<0.010	<0.010	0.30	0.054	0.025	1500	760	20	15	7.3
JUN 14...	0.012	<0.010	0.60	0.123	0.001	3400	910	130	130	10
JUL 12...	0.068	0.040	0.70	0.186	0.008	7300	910	720	660	15

JAMES RIVER BASIN

02042742 WAHRANI SWAMP AT RT. 632, NEAR BARHAMSVILLE, VA

LOCATION.--Lat 37°27'30", long 76°51'57", New Kent County, Hydrologic Unit 02080206, on State Highway 632, 1.3 mi west of Barhamsville, and 1.8 mi upstream from Barnes Swamp.

DRAINAGE AREA.--4.02 mi².

PERIOD OF RECORD.--October 1985 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	ALKA- LITY LAB (MG/L AS CACO3)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SILICA, DIS- SOLVED (MG/L AS SiO2)
OCT 26...	1245	0.61	108	6.30	9.0	759	4.3	37	18	10	11
DEC 21...	1015	1.5	99	6.60	3.0	760	9.6	72	23	9.6	9.6
FEB 14...	1100	2.2	101	7.70	6.0	769	10.9	87	25	9.0	8.0
APR 06...	1000	27	68	7.30	16.5	767	7.0	71	16	6.1	4.7
MAY 10...	1000	9.3	76	7.10	15.0	753	8.1	81	21	6.1	5.2
JUN 14...	1100	7.9	87	6.40	24.5	760	3.7	44	32	6.7	8.4
JUL 12...	1015	2.0	331	7.35	25.5	761	0.3	4	53	12	9.7
SEP 13...	1100	(a)	170	6.00	23.0	763	1.3	15	51	10	9.3

a No apparent flow.

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC TOTAL (MG/L AS C)
OCT 26...	<0.010	<0.010	0.60	0.049	0.036	1600	1700	130	130	9.9
DEC 21...	0.030	0.040	0.50	0.089	0.013	2300	1000	100	100	7.1
FEB 14...	0.062	<0.010	0.50	0.087	0.019	1600	950	60	51	7.9
APR 06...	0.043	<0.010	1.0	0.035	0.020	2700	1600	60	58	15
MAY 10...	0.084	<0.010	0.30	0.105	0.021	2900	1500	70	56	13
JUN 14...	0.030	0.010	1.0	0.180	0.004	5100	880	230	220	15
JUL 12...	0.016	0.080	0.90	0.228	0.009	17000	15000	1400	1300	25
SEP 13...	0.018	0.090	1.1	0.158	0.035	18000	8700	880	940	18

02042746 DIASCUND CREEK RESERVOIR OFF PUMP STATION, NEAR WALKERS, VA

LOCATION.--Lat 37°25'51", long 76°53'38", New Kent County, Hydrologic Unit 02080206, in Diascund Creek Reservoir 0.1 mi northwest of city of Newport News pumping station, 0.4 mi east of bridge on State Highway 603, and 2.8 mi east of Walkers.

PERIOD OF RECORD.--Water years 1983 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	ALKA- LINITY LAB (MG/L AS CAC03)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SILICA, DIS- SOLVED (MG/L AS SiO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)
OCT												
26...	1200	3.00	88	6.90	14.0	759	8.5	83	26	8.0	2.1	<0.010
26...	1215	10.0	88	7.00	14.0	759	6.5	63	26	8.0	2.2	<0.010
DEC												
21...	1130	3.00	86	7.90	4.5	766	13.6	105	24	7.6	3.1	0.010
21...	1145	10.0	86	8.00	4.5	766	13.6	104	24	7.7	3.0	<0.010
21...	1200	16.0	86	8.00	4.5	766	13.5	104	23	7.4	3.0	<0.010
FEB												
15...	1000	3.00	85	8.20	7.5	770	12.9	106	23	8.0	4.1	<0.010
15...	1015	10.0	86	8.10	7.0	770	12.9	105	23	7.9	4.1	<0.010
APR												
05...	0945	3.00	91	7.20	16.0	767	9.7	97	19	12	4.1	<0.010
05...	1000	10.0	92	7.10	15.5	767	9.1	90	20	12	4.0	<0.010
05...	1015	18.0	92	7.00	14.5	767	7.8	76	20	11	4.1	<0.010
MAY												
09...	0945	3.00	80	7.00	18.0	763	7.9	83	18	9.1	2.3	<0.010
09...	1000	10.0	79	6.90	17.5	763	6.8	71	19	9.3	2.5	<0.010
09...	1015	18.0	88	6.50	14.5	763	0.2	2	22	10	4.1	<0.010
JUN												
13...	1130	3.00	77	7.30	25.5	757	8.1	100	20	7.9	2.1	<0.010
13...	1145	10.0	76	7.30	25.5	757	7.5	92	19	7.9	2.0	<0.010
13...	1200	18.0	108	6.70	15.5	757	0.1	1	27	9.0	4.8	0.037
JUL												
11...	0945	3.00	78	7.28	29.0	761	7.7	101	23	7.5	2.3	0.015
11...	1000	10.0	81	6.41	27.0	761	0.2	3	29	7.3	3.3	<0.010
11...	1015	18.0	122	6.72	18.0	761	0.1	1	44	9.0	7.4	<0.010
SEP												
12...	1015	3.00	75	8.00	27.5	764	8.9	112	24	6.4	3.1	<0.010
12...	1030	10.0	72	6.50	24.5	764	0.3	4	21	6.3	3.2	<0.010
12...	1045	18.0	179	6.70	20.5	764	0	0	48	10	7.1	0.015

DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L)	PHEOPHY- -TIN A FLUORO- METRIC METHOD (UG/L)
OCT												
26...	0.020	0.50	0.018	0.008	<0.001	710	55	100	2	8.2	37.7	5.60
26...	0.040	0.50	0.016	0.004	<0.001	700	39	110	7	7.4	38.2	5.00
DEC												
21...	0.010	0.80	0.028	0.011	<0.001	370	69	50	5	8.9	84.1	9.60
21...	0.010	1.0	0.022	0.004	<0.001	370	68	60	3	10	88.0	7.70
21...	<0.010	0.90	0.021	0.014	<0.001	370	66	50	3	8.6	78.1	13.6
FEB												
15...	<0.010	1.3	0.020	0.010	0.005	410	100	70	11	6.9	26.7	4.00
15...	<0.010	1.1	0.021	0.010	0.005	460	96	70	10	8.5	42.3	7.10
APR												
05...	<0.010	0.60	0.032	0.005	0.007	340	91	90	56	9.0	2.40	5.30
05...	<0.010	0.70	0.025	0.025	0.007	360	88	90	4	8.0	11.0	5.20
05...	<0.010	0.70	0.035	0.008	0.007	410	48	160	54	8.3	1.30	5.30
MAY												
09...	0.040	0.60	0.036	0.021	0.001	820	410	130	14	9.1	1.00	2.50
09...	0.080	0.80	0.024	0.012	0.002	880	510	160	15	7.7	5.20	5.00
09...	0.280	0.80	0.039	0.023	0.002	2400	1500	610	610	10	1.80	5.60
JUN												
13...	0.010	0.50	0.042	0.008	0.001	700	580	80	60	11	2.50	5.10
13...	0.010	0.50	0.026	0.016	0.003	660	490	70	22	11	11.0	3.50
13...	0.650	1.2	0.075	0.029	0.008	6700	6900	970	1000	11	0.800	2.50
JUL												
11...	0.020	0.70	0.017	0.005	0.001	680	310	110	14	9.4	7.70	7.80
11...	0.020	0.70	0.026	0.004	<0.001	1700	1300	780	780	11	13.8	10.3
11...	2.20	2.5	0.056	0.026	0.019	23000	20000	1800	1800	15	8.80	8.70
SEP												
12...	0.020	0.80	0.160	0.010	<0.001	880	390	150	70	8.5	19.3	9.80
12...	0.020	1.0	0.037	0.013	0.001	660	200	290	320	9.1	17.6	14.7
12...	2.70	2.6	0.018	0.015	0.011	21000	23000	2000	2000	15	22.3	23.6

JAMES RIVER BASIN

0204275430 LITTLE CREEK RESERVOIR (NORTH CENTRAL) NEAR NORGE, VA

LOCATION.--Lat 37°21'43", long 76°49'42", James City County, Hydrologic Unit 02080206, near city of Newport News
pumping station in north-central arm of Little Creek Reservoir, 1.8 mi south of Toano, and 3.3 mi west of Norge.

PERIOD OF RECORD.--Water years 1983 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	ALKA- LITY LAB (MG/L AS CAO3)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SILICA, DIS- SOLVED (MG/L AS SiO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)
OCT												
25...	1115	3.00	121	7.10	15.0	758	10.3	103	--	--	2.4	<0.010
25...	1130	10.0	120	7.00	15.0	758	9.8	98	24	12	2.5	<0.010
25...	1145	20.0	117	7.00	15.0	758	7.7	77	--	--	2.4	<0.010
25...	1200	30.0	170	6.80	12.0	758	0.6	6	--	--	5.1	<0.010
25...	1215	40.0	176	6.70	11.0	758	0.2	2	32	15	5.6	<0.010
DEC												
20...	1030	3.00	110	7.40	6.0	768	11.3	90	--	--	4.5	0.039
20...	1045	10.0	110	7.30	6.0	768	11.2	89	19	12	4.5	0.036
20...	1100	20.0	110	7.30	5.5	768	11.3	90	--	--	4.7	0.037
20...	1115	30.0	110	7.30	5.5	768	11.4	89	--	--	4.8	0.039
20...	1130	40.0	109	7.20	5.0	768	11.5	90	18	12	5.1	0.036
FEB												
15...	1230	3.00	103	7.60	7.5	770	11.9	98	--	--	5.0	0.058
15...	1245	10.0	103	7.40	7.5	770	11.8	97	17	13	4.9	0.055
15...	1300	20.0	103	7.40	7.0	770	11.8	97	--	--	4.9	0.045
15...	1315	30.0	103	7.40	7.0	770	11.7	95	--	--	5.0	0.046
15...	1330	40.0	103	7.30	6.5	770	11.5	93	16	13	5.1	0.055
APR												
05...	1145	3.00	103	7.50	14.5	767	11.0	107	--	--	4.1	<0.010
05...	1200	10.0	102	7.50	14.5	767	10.8	105	15	15	4.0	<0.010
05...	1215	20.0	102	7.20	10.0	767	9.7	85	--	--	4.3	0.033
05...	1230	30.0	102	6.90	8.5	767	10.1	86	--	--	4.4	0.042
05...	1245	40.0	101	6.90	8.5	767	10.0	85	15	15	4.4	0.043
MAY												
09...	1145	3.00	102	7.30	18.5	762	9.3	99	--	--	3.0	<0.010
09...	1200	10.0	101	7.30	18.0	762	9.2	97	15	14	3.0	<0.010
09...	1215	20.0	102	6.70	12.5	762	5.6	53	--	--	3.9	0.025
09...	1230	30.0	104	6.50	10.0	762	4.8	43	--	--	4.4	0.037
09...	1245	40.0	104	6.50	9.5	762	4.5	40	16	14	4.5	0.041
JUN												
13...	1330	3.00	100	7.40	27.0	756	8.6	109	--	--	2.6	<0.010
13...	1345	10.0	98	7.20	27.0	756	7.8	98	19	14	2.9	0.030
13...	1400	20.0	104	6.40	14.5	756	1.4	14	--	--	3.8	0.080
13...	1415	30.0	105	6.30	11.0	756	1.0	9	--	--	4.6	0.075
13...	1430	40.0	106	6.40	10.5	756	0.6	5	16	31	4.8	0.046
JUL												
11...	1135	3.00	98	7.56	29.5	761	8.3	109	--	--	2.7	<0.010
11...	1145	10.0	97	7.54	29.5	761	8.0	105	18	11	3.5	<0.010
11...	1200	20.0	108	6.27	16.5	761	0.2	2	--	--	4.0	<0.010
11...	1215	30.0	113	6.43	11.5	761	0.1	1	--	--	4.7	<0.010
11...	1230	40.0	116	6.53	10.5	761	0.1	1	20	14	5.1	<0.010
SEP												
12...	1215	3.00	--	--	--	764	--	--	--	--	4.0	<0.010
12...	1230	10.0	--	--	--	764	--	--	20	11	4.0	<0.010
12...	1245	20.0	--	--	--	764	--	--	--	--	5.0	<0.010
12...	1300	30.0	--	--	--	764	--	--	--	--	5.0	<0.010
12...	1315	40.0	--	--	--	764	--	--	26	15	6.0	0.010

JAMES RIVER BASIN

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0204275430 LITTLE CREEK RESERVOIR (NORTH CENTRAL) NEAR NORGE, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L)	PHEOPHY -TIN A FLUORO- METRIC METHOD (UG/L)
OCT												
25...	0.040	0.40	0.003	0.003	<0.001	--	210	--	120	--	7.10	2.80
25...	0.040	0.30	0.002	0.003	<0.001	450	89	140	84	6.4	6.40	2.70
25...	0.030	0.40	0.004	<0.002	<0.001	--	66	--	80	--	7.20	2.70
25...	0.610	1.1	0.004	<0.002	0.004	--	11000	--	1400	--	17.6	9.90
25...	0.900	1.3	0.005	<0.002	0.005	11000	13000	1100	1300	8.6	18.0	11.2
DEC												
20...	0.060	0.40	0.014	0.005	0.002	--	180	--	15	--	11.5	1.60
20...	0.060	0.50	0.014	0.006	<0.001	340	160	50	7	6.7	10.7	2.50
20...	0.050	0.50	0.017	<0.002	0.004	--	190	--	8	--	11.4	4.30
20...	0.050	0.60	0.017	0.006	0.004	--	150	--	10	--	10.9	3.20
20...	0.050	0.60	0.019	0.010	0.003	460	240	50	13	7.2	10.0	5.10
FEB												
15...	<0.010	0.90	0.014	0.008	0.003	--	230	--	5	--	14.3	0.00
15...	<0.010	0.60	0.014	0.008	0.004	380	240	20	5	6.1	10.7	2.80
15...	<0.010	0.50	0.022	0.006	0.003	--	260	--	6	--	11.5	3.30
15...	<0.010	0.70	0.021	0.007	0.005	--	260	--	6	--	11.8	2.00
15...	<0.010	0.80	0.015	0.008	0.004	480	300	30	8	6.2	10.4	1.80
APR												
05...	<0.010	0.20	0.031	0.006	0.005	--	180	--	8	--	9.60	1.60
05...	<0.010	0.70	0.011	0.002	0.005	300	140	20	3	7.4	7.70	4.50
05...	0.020	0.40	0.010	0.010	0.005	--	160	--	13	--	6.20	2.40
05...	0.040	0.40	0.011	0.007	0.005	--	200	--	21	--	4.90	2.00
05...	0.040	0.40	0.009	0.004	0.005	340	170	40	22	6.3	4.50	2.70
MAY												
09...	0.010	0.70	0.010	0.004	<0.001	--	82	--	9	--	3.30	2.00
09...	0.010	0.80	0.013	0.004	0.001	190	81	20	8	6.0	6.00	3.80
09...	0.060	0.80	0.009	0.003	<0.001	--	110	--	44	--	2.30	2.00
09...	0.150	0.70	0.011	0.005	<0.001	--	160	--	180	--	1.20	1.90
09...	0.170	0.70	0.012	0.002	<0.001	490	150	270	240	5.5	1.40	1.60
JUN												
13...	<0.010	0.30	0.017	0.004	<0.001	--	190	--	7	--	6.00	2.90
13...	0.010	0.40	0.023	0.011	<0.001	520	290	50	2	8.2	7.70	4.20
13...	0.020	0.50	0.015	0.003	<0.001	--	110	--	250	--	1.70	4.30
13...	0.210	0.50	0.006	0.002	<0.001	--	420	--	540	--	1.40	1.90
13...	0.260	0.50	0.023	0.003	<0.001	1300	190	570	570	6.5	1.40	1.30
JUL												
11...	0.020	0.50	0.008	0.002	<0.001	--	190	--	74	--	4.70	1.60
11...	0.010	0.60	0.018	0.007	0.001	500	230	80	4	8.8	21.4	3.30
11...	0.020	0.30	0.014	0.004	<0.001	--	900	--	710	--	6.90	3.00
11...	0.320	0.70	0.014	0.008	<0.001	--	2300	--	870	--	2.80	1.50
11...	0.430	0.70	0.010	0.005	0.001	3900	3600	790	800	6.6	1.90	0.100
SEP												
12...	0.020	0.50	0.012	--	<0.001	--	170	--	20	--	9.60	4.90
12...	0.020	0.80	0.013	0.007	0.001	260	130	30	<10	7.6	14.3	4.50
12...	0.030	0.40	0.016	0.007	<0.001	--	260	--	1300	--	33.8	15.0
12...	0.470	0.70	0.011	0.006	<0.001	--	6400	--	1100	--	12.6	7.10
12...	0.830	0.90	0.027	0.021	0.015	9500	9000	990	1100	8.2	3.80	1.10

JAMES RIVER BASIN

0204275470 LITTLE CREEK RESERVOIR (SOUTH CENTRAL) NEAR NORGE, VA

LOCATION.--Lat 37°21'17", long 76°50'27", James City County, Hydrologic Unit 02080206, 0.3 mi north of Little Creek Reservoir dam, 0.9 mi southwest of city of Newport News pumping station, 2.7 mi southwest of Toano, and 4.0 mi west of Norge.

PERIOD OF RECORD.--Water years 1983 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
OCT								
25...	1000	3.00	122	7.00	15.0	758	9.0	90
25...	1015	10.0	127	6.80	15.0	758	5.0	50
25...	1030	20.0	117	6.70	15.0	758	3.4	34
25...	1045	35.0	160	6.60	11.5	758	1.2	11
25...	1100	50.0	170	6.60	11.0	758	0.4	4
DEC								
20...	1145	3.00	109	7.10	6.0	768	11.0	88
20...	1200	10.0	110	7.10	6.0	768	11.0	88
20...	1215	20.0	110	7.10	6.0	768	11.0	88
20...	1230	35.0	110	7.10	6.0	768	11.2	89
20...	1245	50.0	111	7.10	6.0	768	12.0	95
FEB								
15...	1130	3.00	104	7.80	7.5	770	11.6	95
15...	1145	10.0	104	7.70	7.5	770	11.6	95
15...	1200	20.0	104	7.70	7.0	770	11.6	95
15...	1215	35.0	104	7.60	6.5	770	11.3	91
APR								
05...	1030	3.00	102	7.50	13.5	767	11.2	107
05...	1045	10.0	101	7.50	13.5	767	10.9	104
05...	1100	20.0	101	7.30	11.0	767	10.4	94
05...	1115	35.0	101	7.10	8.5	767	9.8	84
05...	1130	50.0	102	7.00	8.5	767	10.1	85
MAY								
09...	1030	3.00	102	7.40	18.0	762	9.4	99
09...	1045	10.0	101	7.40	17.5	762	9.3	97
09...	1100	20.0	102	6.80	12.5	762	6.2	58
09...	1115	35.0	104	6.60	10.0	762	4.8	42
09...	1130	50.0	104	6.60	9.5	762	5.2	45
JUN								
13...	1215	3.00	100	7.50	26.5	756	8.6	108
13...	1230	10.0	101	7.50	25.5	756	8.2	101
13...	1245	20.0	102	6.80	15.0	756	3.5	35
13...	1300	35.0	104	6.40	10.5	756	1.8	16
13...	1315	50.0	105	6.40	10.0	756	1.7	15
JUL								
11...	1030	3.00	98	7.79	29.5	761	8.3	109
11...	1045	10.0	96	7.19	28.5	761	7.0	91
11...	1100	20.0	104	6.29	17.5	761	0.2	2
11...	1115	35.0	104	6.33	11.0	761	0.1	1
11...	1130	50.0	110	6.45	10.5	761	0.0	0
SEP								
12...	1100	3.00	94	7.90	27.0	764	8.6	108
12...	1115	10.0	94	7.90	26.5	764	8.1	101
12...	1130	20.0	97	6.30	22.0	764	0	0
12...	1145	35.0	115	6.70	11.0	764	0	0
12...	1200	50.0	127	6.40	10.5	764	0	0

JAMES RIVER BASIN

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0204275470 LITTLE CREEK RESERVOIR (SOUTH CENTRAL) NEAR NORGE, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L)	PHEOPHY -TIN A FLUORO- METRIC METHOD (UG/L)
OCT								
25...	<0.010	0.040	0.40	0.004	--	0.001	3.30	1.20
25...	<0.010	0.050	0.70	0.003	--	<0.001	6.40	1.60
25...	<0.010	0.030	0.70	0.002	--	<0.001	5.60	1.60
25...	<0.010	0.640	1.0	0.007	--	0.002	8.80	9.50
25...	<0.010	0.880	1.2	0.009	--	0.013	5.60	6.20
DEC								
20...	0.036	0.060	0.40	0.012	--	<0.001	9.80	1.60
20...	0.037	0.070	0.50	0.008	--	<0.002	13.6	1.10
20...	0.040	0.060	0.50	0.015	--	0.001	12.0	3.40
20...	0.037	0.070	0.50	0.021	--	<0.001	12.1	2.30
20...	0.037	0.070	0.60	0.010	--	0.002	18.7	1.40
FEB								
15...	0.042	<0.010	0.70	0.033	--	0.002	7.10	2.10
15...	0.049	<0.010	0.40	0.009	--	0.001	11.3	2.30
15...	0.060	0.020	0.90	0.007	--	0.002	11.0	1.90
15...	0.048	0.020	0.80	0.010	--	0.002	7.10	1.10
APR								
05...	0.036	0.030	0.50	0.014	--	0.008	1.90	1.20
05...	<0.010	<0.010	0.60	0.013	--	0.006	5.90	1.50
05...	0.027	0.020	0.50	0.011	--	0.005	4.10	2.10
05...	0.040	0.030	0.50	0.010	--	0.005	1.70	1.20
05...	0.042	0.050	0.50	0.012	--	0.007	1.10	1.40
MAY								
09...	<0.010	0.010	0.50	0.012	--	<0.001	0.800	1.60
09...	<0.010	0.010	0.40	0.013	--	0.001	4.10	1.20
09...	0.019	0.040	0.60	0.011	--	0.001	1.60	1.80
09...	0.036	0.140	0.50	0.012	--	0.001	1.00	1.50
09...	0.038	0.150	0.80	0.011	--	<0.001	0.400	1.40
JUN								
13...	<0.010	0.010	0.60	0.010	--	<0.001	1.70	4.00
13...	<0.010	<0.010	0.60	0.009	--	<0.001	1.10	2.90
13...	<0.010	<0.010	0.50	0.010	--	<0.001	1.60	4.60
13...	0.043	0.150	0.70	0.010	--	<0.001	0.400	2.10
13...	0.050	0.210	0.80	0.010	--	<0.001	0.300	1.70
JUL								
11...	0.018	0.070	0.40	0.007	--	0.002	3.80	3.40
11...	<0.010	0.010	0.40	0.010	--	<0.001	16.5	3.30
11...	<0.010	<0.010	0.30	0.011	--	<0.001	3.60	3.40
11...	0.037	0.160	0.60	0.005	--	<0.001	1.00	1.00
11...	<0.010	0.400	0.80	0.006	--	0.001	0.500	0.900
SEP								
12...	<0.010	0.110	0.40	0.014	0.005	<0.001	7.70	2.20
12...	<0.010	0.020	0.30	0.016	--	<0.001	12.1	4.70
12...	<0.010	0.030	0.40	0.009	--	<0.001	27.8	14.5
12...	<0.010	0.340	0.50	0.010	--	<0.001	3.60	3.40
12...	<0.010	0.630	0.70	0.014	--	0.001	1.60	1.30

GREAT DISMAL SWAMP BASIN

02043500 CYPRESS SWAMP AT CYPRESS CHAPEL, VA

LOCATION.--Lat 36°37'24", long 76°36'07", Suffolk City, Hydrologic Unit 03010205, near center of span on downstream side of bridge on State Highway 32, 0.5 mi downstream from Dragon Swamp, 0.8 mi northwest of Cypress Chapel, and 6.5 mi south of downtown Suffolk.

DRAINAGE AREA.--23.8 mi².

PERIOD OF RECORD.--October 1953 to September 1971, March 1978 to current year.

GAGE.--Water-stage recorder. Datum of gage is 28.65 ft above National Geodetic Vertical Datum of 1929. October 1953 to September 1971, recording gage on right bank 30 ft upstream at same datum.

REMARKS.--Records good except for period with ice effect, Dec. 12-18, which is fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--29 years, 26.6 ft³/s, 15.18 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,330 ft³/s, Aug. 11, 1967, gage height, 6.85 ft; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 22	1600	217	4.33	Apr. 8	1330	300	4.65
Mar. 1	0230	329	4.74	Apr. 16	1030	212	4.32
Mar. 4	2000	208	4.29	Aug. 14	0730	473	5.16
Mar. 7	1630	369	4.86	Aug. 18	2200	350	4.80
Mar. 24	2200	*547	*5.35				

No flow part or all of October, November, June to September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	11	3.0	3.0	290	92	54	.00	1.2	.00	.04
2	.00	.00	7.5	8.2	3.0	158	78	92	.00	.15	.00	.03
3	.00	.01	5.0	8.8	3.0	94	44	89	.0	.03	.00	.0
4	.00	.60	3.6	7.9	2.6	162	33	46	.02	.01	.00	.00
5	.00	1.9	2.8	5.9	2.9	182	27	30	.01	.52	.00	.00
6	.00	6.6	2.2	5.2	10	132	77	72	.01	.18	.24	.00
7	.00	13	1.8	5.7	16	308	169	79	.31	.10	25	.00
8	.00	13	1.6	5.8	14	240	269	48	1.3	2.3	13	.00
9	.00	11	1.8	7.4	9.8	138	188	30	1.3	1.2	2.2	.00
10	.00	7.5	2.8	15	6.3	99	93	37	3.3	.15	.59	.00
11	.00	4.8	3.5	20	4.1	74	63	59	1.2	.03	.55	.00
12	.00	2.8	e3.0	24	3.8	58	59	42	.15	1.1	6.8	.00
13	.00	1.6	e2.4	43	3.2	50	47	26	.19	15	94	.00
14	.00	1.0	e2.1	54	2.9	139	35	17	4.1	106	414	.00
15	.00	.70	e1.9	39	2.9	165	61	11	2.8	107	267	.00
16	.00	.66	e1.8	26	2.8	129	196	12	.35	17	208	2.6
17	.00	.93	e1.6	20	2.3	116	123	11	.83	21	94	5.8
18	.00	1.1	e1.4	15	1.7	73	60	7.0	.79	33	219	3.4
19	.00	1.6	1.1	12	7.7	67	41	4.1	.47	17	256	10
20	.00	3.7	1.1	10	26	62	28	2.3	.16	7.2	107	45
21	.00	3.0	1.0	7.9	63	55	21	1.3	1.6	2.5	49	126
22	.00	1.5	1.4	6.5	197	69	16	.79	12	.79	25	96
23	.00	.98	1.6	5.1	157	64	12	.54	18	.26	14	39
24	.00	1.0	1.6	5.0	86	356	9.9	2.9	33	.08	8.8	19
25	.00	3.6	1.6	4.8	68	404	7.5	3.6	14	.03	5.7	12
26	.00	2.3	1.4	4.2	63	182	6.7	1.8	1.5	.01	3.8	22
27	.00	1.4	1.1	4.2	86	98	6.2	.72	.25	.00	2.8	44
28	.00	5.2	.95	3.9	213	62	19	.19	.23	.00	1.8	39
29	.00	17	.89	3.3	---	45	17	.05	12	.00	.75	20
30	.00	17	.82	3.0	---	39	23	.02	8.6	.00	.30	13
31	.00	---	1.1	3.0	---	43	---	.01	---	.00	.11	---
TOTAL	0.00	125.48	73.46	386.8	1061.0	4153	1921.3	780.32	118.47	333.84	1819.44	496.87
MEAN	.00	4.18	2.37	12.5	37.9	134	64.0	25.2	3.95	10.8	58.7	16.6
MAX	.00	17	11	54	213	404	269	92	33	107	414	126
MIN	.00	.00	.82	3.0	1.7	39	6.2	.01	.00	.00	.00	.00
CFSM	.00	.18	.10	.52	1.59	5.63	2.69	1.06	.17	.45	2.47	.70
IN.	.00	.20	.11	.60	1.66	6.49	3.00	1.22	.19	.52	2.84	.78

CAL YR 1988 TOTAL 5793.96 MEAN 15.8 MAX 186 MIN .00 CFSM .67 IN. 9.06
WTR YR 1989 TOTAL 11269.98 MEAN 30.9 MAX 414 MIN .00 CFSM 1.30 IN. 17.62

e Estimated.

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LOCATION.--Lat 36°35'42", long 76°26'23", Chesapeake City, Hydrologic Unit 03010205, on right bank in outlet canal, 200 ft upstream from dam and gates, 0.5 mi downstream from Lake Drummond, 3.1 mi north of North Carolina State line, and 20 mi southwest of Norfolk.

REVISED RECORDS.--WSP 1032: 1934-43.

REMARKS.--Mean daily gage heights are shown in table below.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 5.34 ft, June 3; minimum, 3.51 ft, Oct. 19.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.59	3.82	3.80	3.86	4.66	5.19	5.14	5.20	5.22	5.22	5.20	5.14
2	3.56	3.76	3.80	3.90	4.66	5.11	5.05	5.30	5.30	5.22	5.20	5.20
3	3.56	3.78	3.80	3.90	4.68	5.15	5.06	5.10	5.34	5.24	5.20	5.21
4	3.70	3.72	3.80	3.94	4.68	5.22	5.18	5.15	5.13	5.24	5.20	5.24
5	3.70	3.72	3.78	3.94	4.68	5.25	5.17	5.22	5.14	5.25	5.20	5.24
6	3.70	3.76	3.78	3.96	4.73	5.13	5.21	5.27	5.10	5.20	5.20	5.22
7	3.69	3.78	3.78	3.96	4.74	5.22	5.11	5.20	5.24	5.15	5.25	5.22
8	3.68	3.76	3.78	3.98	4.80	5.20	5.10	5.15	5.21	5.15	5.25	5.20
9	3.68	3.76	3.78	4.02	4.82	5.20	5.09	5.10	5.18	5.19	5.14	5.20
10	3.64	3.76	3.78	4.04	4.82	5.21	5.09	5.20	5.20	5.18	5.16	5.20
11	3.64	3.76	3.86	4.10	4.84	5.21	5.10	5.10	5.18	5.20	5.19	5.16
12	3.64	3.76	3.83	4.14	4.86	5.18	5.12	5.13	5.12	5.17	5.29	5.18
13	3.66	3.74	3.84	4.24	4.86	5.08	5.09	5.10	5.15	5.20	5.20	5.16
14	3.60	3.73	3.85	4.24	4.88	5.05	5.02	5.08	5.21	5.30	5.16	5.16
15	3.58	3.72	3.80	4.33	4.90	5.07	5.14	5.09	5.22	5.15	5.18	5.15
16	3.56	3.72	3.80	4.36	4.94	5.02	5.20	5.11	5.24	5.19	5.16	5.31
17	3.55	3.72	3.80	4.44	4.96	5.10	5.20	5.25	5.22	5.19	5.16	5.19
18	3.54	3.72	3.80	4.42	4.96	5.08	5.19	5.20	5.24	5.23	5.17	5.09
19	3.51	3.76	3.80	4.45	5.03	5.16	5.10	5.20	5.21	5.18	5.06	5.17
20	3.64	3.78	3.82	4.47	5.07	5.10	5.12	5.26	5.19	5.18	5.14	5.13
21	3.61	3.76	3.80	4.51	5.15	5.04	5.07	5.20	5.24	5.20	5.16	4.89
22	3.68	3.76	3.82	4.48	5.15	4.99	5.09	5.10	5.22	5.20	5.18	4.95
23	3.66	3.76	3.82	4.48	5.12	5.03	5.13	5.20	5.29	5.19	5.12	5.15
24	3.66	3.76	3.82	4.48	5.15	5.21	5.18	5.24	5.25	5.16	5.22	5.18
25	3.66	3.74	3.82	4.56	5.14	5.05	5.19	5.12	5.20	5.20	5.15	5.19
26	3.66	3.74	3.82	4.60	5.13	5.10	5.20	5.20	5.18	5.20	5.16	5.21
27	3.64	3.75	3.82	4.59	5.12	5.20	5.20	5.19	5.12	5.20	5.18	5.10
28	3.64	3.80	3.85	4.60	5.20	5.15	5.22	5.15	5.17	5.20	5.16	5.08
29	3.64	3.78	3.85	4.64	---	5.13	5.17	5.19	5.20	5.20	5.13	5.16
30	3.62	3.78	3.84	4.66	---	5.14	5.21	5.20	5.22	5.20	5.18	5.20
31	3.60	---	3.88	4.69	---	5.02	---	5.22	---	5.20	5.16	---
MEAN	3.63	3.76	3.81	4.29	4.92	5.13	5.14	5.17	5.20	5.20	5.18	5.16
MAX	3.70	3.82	3.88	4.69	5.20	5.25	5.22	5.30	5.34	5.30	5.29	5.31
MIN	3.51	3.72	3.78	3.86	4.66	4.99	5.02	5.08	5.10	5.15	5.06	4.89

CHOWAN RIVER BASIN

02044500 NOTTOWAY RIVER NEAR RAWLINGS, VA

LOCATION.--Lat 36°59'00", long 77°48'00", Brunswick County, Hydrologic Unit 03010201, on right bank at downstream side of bridge on State Highway 612 at Harpers Bridge, 0.1 mi upstream from Beaver Pond Creek, and 2.6 mi northwest of Rawlings.

DRAINAGE AREA.--309 mi².

PERIOD OF RECORD.--October 1950 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 184.88 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--39 years, 311 ft³/s, 13.67 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,900 ft³/s, Oct. 6, 1972, gage height, 23.25 ft, from rating curve extended above 16,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 0.40 ft³/s, Oct. 14, 15, 1954; minimum gage height, 1.83 ft, Oct. 15, 1954.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of 20.8 ft, discharge, about 19,000 ft³/s, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 7	1630	*3,000	*8.09	No other peak equal to or greater than base discharge.			

Minimum discharge, 18 ft³/s, Oct. 1-2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	175	273	110	110	939	738	440	148	102	179	91
2	18	715	211	134	108	721	519	1020	138	93	163	83
3	36	483	175	175	106	505	395	1800	134	89	148	79
4	112	255	155	158	118	432	358	1060	156	86	134	74
5	150	195	138	130	134	476	332	537	167	105	119	68
6	132	184	126	124	162	477	568	1310	453	141	102	68
7	143	167	121	132	217	1510	1000	2770	620	142	94	70
8	67	150	118	146	279	1900	1600	1530	461	143	83	70
9	47	131	117	153	273	749	1610	625	516	111	74	67
10	40	121	133	151	210	613	801	608	506	89	85	65
11	35	119	139	145	175	548	564	774	332	77	194	63
12	32	113	132	178	161	435	451	550	237	85	215	59
13	28	108	112	261	148	379	388	431	224	169	184	56
14	27	105	104	316	142	586	343	365	333	293	148	56
15	24	102	115	294	137	693	531	334	267	373	128	57
16	25	99	119	254	132	642	1180	363	235	319	128	71
17	26	132	118	229	128	504	906	415	438	899	212	115
18	30	316	111	197	147	402	545	346	574	1100	658	128
19	38	303	102	175	e160	459	434	290	292	410	467	107
20	37	224	106	161	189	471	371	263	216	265	266	108
21	52	195	107	147	586	499	328	246	199	209	191	197
22	199	172	109	134	1960	712	300	230	193	173	309	198
23	286	154	112	130	2150	573	279	219	183	145	425	153
24	165	139	110	127	787	1270	261	210	246	125	265	140
25	109	130	113	124	503	2230	253	201	247	111	194	114
26	79	124	109	123	403	1420	337	195	191	104	158	327
27	62	125	104	121	391	639	617	186	179	512	143	470
28	56	276	102	115	608	488	839	171	160	404	132	277
29	55	923	103	110	---	406	1040	156	134	332	121	185
30	51	508	99	110	---	397	571	151	115	245	113	148
31	50	---	102	110	---	648	---	148	---	196	103	---
TOTAL	2229	6943	3895	4974	10624	22723	18459	17944	8294	7647	5935	3764
MEAN	71.9	231	126	160	379	733	615	579	276	247	191	125
MAX	286	923	273	316	2150	2230	1610	2770	620	1100	658	470
MIN	18	99	99	110	106	379	253	148	115	77	74	56
CFSM	.23	.75	.41	.52	1.23	2.37	1.99	1.87	.89	.80	.62	.41
IN.	.27	.84	.47	.60	1.28	2.74	2.22	2.16	1.00	.92	.71	.45

CAL YR 1988 TOTAL 59503 MEAN 163 MAX 1090 MIN 15 CFSM .53 IN. 7.16
WTR YR 1989 TOTAL 113431 MEAN 311 MAX 2770 MIN 18 CFSM 1.01 IN. 13.66

e Estimated.

02045500 NOTTOWAY RIVER NEAR STONY CREEK, VA

LOCATION.--Lat 36°54'00", long 77°24'00", Sussex County, Hydrologic Unit 03010201, on left bank 15 ft downstream from bridge on U.S. Highway 301, 1.8 mi upstream from Island Swamp, 3.3 mi south of town of Stony Creek, and 4.4 mi upstream from Stony Creek.

DRAINAGE AREA.--579 mi².

PERIOD OF RECORD.--October 1929 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 802: 1935(M). WSP 972: 1931(M), 1932, 1934-35, 1939. WSP 2104: Drainage area. WDR VA-74-1: 1972.

GAGE.--Water-stage recorder. Datum of gage is 58.42 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 11, 1934, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods of doubtful gage-height record, July 21, 23, 26, and Aug. 8-11, 25-30, which are fair. Diurnal fluctuation at low flow caused by Baskerville Mill, 33 mi upstream. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--60 years, 563 ft³/s, 13.20 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 25,200 ft³/s, Aug. 17, 1940, gage height, 23.66 ft, from rating curve extended above 13,000 ft³/s; minimum, 3.4 ft³/s, Aug. 15, 16, 1977; minimum gage height, 0.62 ft, Sept. 2, 5, 1932.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 23	0230	4,230	14.15	Apr. 8	1930	4,350	14.31
Mar. 25	1030	4,120	14.00	Apr. 16	0830	4,080	13.94
Mar. 31	2030	4,030	13.88	May 3	0600	*4,650	*14.70

Minimum discharge, 23 ft³/s, Oct. 1-2, gage height, 2.49 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	120	578	136	151	2230	3130	1080	178	169	253	135
2	24	736	361	153	149	1670	1630	2640	173	157	232	123
3	28	998	274	181	146	1090	1050	4360	182	145	266	114
4	37	577	227	216	155	1100	906	3200	175	130	203	107
5	137	330	197	196	180	1040	815	1440	206	127	175	107
6	195	262	176	168	237	948	1540	1620	378	133	154	103
7	165	232	162	170	351	2610	2420	2740	738	188	133	101
8	164	195	155	184	548	3420	3970	3320	799	186	e118	102
9	100	172	154	202	508	2590	3900	1970	875	186	e105	102
10	71	151	160	227	408	1320	2560	1070	775	145	e119	102
11	58	135	179	230	311	1080	1350	1150	634	125	e170	101
12	51	128	182	236	265	884	1060	1090	422	112	286	98
13	46	123	168	404	239	754	889	809	301	107	282	96
14	42	120	146	558	221	1450	782	665	424	364	248	95
15	39	115	151	534	212	1480	1590	578	492	525	341	95
16	37	109	150	460	201	1610	3830	550	448	504	215	113
17	35	111	156	382	192	1310	2840	596	701	934	198	189
18	35	151	158	330	211	966	1490	600	822	1350	525	223
19	38	408	144	283	248	999	1020	504	662	1100	945	203
20	39	373	135	252	306	933	853	427	443	511	587	193
21	44	275	133	229	724	916	745	380	498	e353	370	335
22	65	226	137	206	3600	1150	668	345	496	285	301	420
23	198	195	138	190	4140	1130	617	318	363	e236	418	329
24	324	176	139	183	3210	2380	571	345	566	198	527	263
25	201	159	141	178	1210	4040	538	291	565	183	e358	256
26	140	147	142	173	853	3690	581	266	406	e168	e250	500
27	103	138	136	172	828	1910	820	251	296	439	e210	870
28	80	155	129	167	1470	1070	1520	230	264	804	e180	700
29	70	596	129	156	---	879	1690	212	236	503	e165	456
30	65	1110	132	151	---	838	1670	190	198	436	e155	322
31	63	---	127	152	---	3250	---	184	---	319	147	---
TOTAL	2717	8723	5496	7459	21274	50737	47045	33421	13716	11122	8636	6953
MEAN	87.6	291	177	241	760	1637	1568	1078	457	359	279	232
MAX	324	1110	578	558	4140	4040	3970	4360	875	1350	945	870
MIN	23	109	127	136	146	754	538	184	173	107	105	95
CFSM	.15	.50	.31	.42	1.31	2.83	2.71	1.86	.79	.62	.48	.40
IN.	.17	.56	.35	.48	1.37	3.26	3.02	2.15	.88	.71	.55	.45

CAL YR 1988 TOTAL 96233 MEAN 263 MAX 1680 MIN 20 CFSM .45 IN. 6.18
WTR YR 1989 TOTAL 217299 MEAN 595 MAX 4360 MIN 23 CFSM 1.03 IN. 13.96

e Estimated.

CHOWAN RIVER BASIN

02046000 STONY CREEK NEAR DINWIDDIE, VA

LOCATION.--Lat 37°04'01", long 77°36'10", Dinwiddie County, Hydrologic Unit 03010201, on right bank at upstream side of upstream bridge on U.S. Highway 1, 1.2 mi southwest of Dinwiddie, 1.7 mi downstream from Chamberlains Bed Creek, and 5.7 mi downstream from confluence of White Oak and Butterwood Creeks.

DRAINAGE AREA.--112 mi².

PERIOD OF RECORD.--September 1946 to current year. Published as "at Dinwiddie" September 1946 to September 1947 and October 1949 to September 1950.

REVISED RECORDS.--WSP 1303: 1947(M). WSP 1433: 1951(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 129.94 ft above National Geodetic Vertical Datum of 1929. Prior to June 12, 1957, nonrecording gage and crest-stage gage at same site and datum.

REMARKS.--Records good. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--43 years, 112 ft³/s, 13.58 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,400 ft³/s, Oct. 6, 1972, gage height, 20.84 ft, from rating curve extended above 5,800 ft³/s on basis of contracted-opening measurement of peak flow; no flow for part of Oct. 13, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 22	0330	1,270	8.43	Apr. 16	0330	1,240	8.35
Mar. 31	2330	1,470	8.92	May 2	1930	*1,640	*9.26

Minimum discharge, 1.1 ft³/s, Oct. 2, gage height, 0.91 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	141	53	24	27	405	1040	167	22	17	33	39
2	1.3	171	42	34	24	244	379	1020	20	15	82	33
3	3.6	100	36	37	23	167	239	994	26	14	119	42
4	8.5	67	31	34	34	184	195	348	32	13	72	71
5	18	50	27	29	42	193	163	214	34	13	47	51
6	19	46	25	29	55	191	424	592	53	12	32	39
7	14	37	24	34	106	873	535	813	71	12	23	32
8	9.8	32	22	35	139	673	958	454	86	12	17	28
9	7.4	27	e20	39	91	316	638	228	144	11	14	25
10	5.9	22	29	42	66	276	323	242	120	10	20	24
11	4.8	18	31	41	55	211	223	235	83	9.2	135	22
12	3.8	16	30	72	50	162	177	181	59	8.5	206	20
13	3.3	15	26	180	45	140	152	140	52	13	108	20
14	3.5	14	22	142	42	362	133	113	70	191	70	20
15	4.4	13	22	96	41	283	566	100	62	139	56	20
16	7.7	12	23	81	39	302	1100	105	67	123	50	38
17	9.5	17	24	67	36	247	497	108	88	219	206	86
18	10	52	23	56	41	189	260	96	61	152	687	46
19	12	63	21	50	e46	437	191	82	47	99	565	40
20	13	53	20	44	60	303	157	71	39	67	219	61
21	20	44	21	39	413	282	134	63	58	49	231	97
22	32	36	21	35	1240	308	118	57	105	36	827	93
23	41	31	22	33	716	227	107	52	108	27	601	87
24	38	27	22	32	301	734	99	49	253	23	233	111
25	28	23	22	31	193	939	94	44	91	21	127	77
26	20	20	22	30	160	461	153	40	65	22	94	502
27	14	19	20	29	162	255	195	37	51	120	80	326
28	11	83	20	28	328	192	473	33	39	211	69	170
29	10	122	20	26	---	158	295	29	30	103	61	98
30	16	69	20	26	---	179	206	25	22	53	54	77
31	31	---	21	27	---	1060	---	23	---	38	46	---
TOTAL	421.8	1440	782	1502	4575	10953	10224	6755	2058	1852.7	5184	2395
MEAN	13.6	48.0	25.2	48.5	163	353	341	218	68.6	59.8	167	79.8
MAX	41	171	53	180	1240	1060	1100	1020	253	219	827	502
MIN	1.3	12	20	24	23	140	94	23	20	8.5	14	20
CFSM	.12	.43	.23	.43	1.46	3.15	3.04	1.95	.61	.53	1.49	.71
IN.	.14	.48	.26	.50	1.52	3.64	3.40	2.24	.68	.62	1.72	.80

CAL YR 1988 TOTAL 16776.32 MEAN 45.8 MAX 461 MIN .85 CFSM .41 IN. 5.57
WTR YR 1989 TOTAL 48142.5 MEAN 132 MAX 1240 MIN 1.3 CFSM 1.18 IN. 15.99

e Estimated.

CHOWAN RIVER BASIN

237

02047000 NOTTOWAY RIVER NEAR SEBRELL, VA
(National stream-quality accounting network station)

LOCATION.--Lat 36°46'13", long 77°09'59", Southampton County, Hydrologic Unit 03010201, on right bank 1,000 ft upstream from bridge on State Highway 653, 1 mi downstream from Three Creek, 2.5 mi southwest of Sebrell, and 5.5 mi upstream from Assamoosick Swamp.

DRAINAGE AREA.--1,421 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1941 to current year.

REVISED RECORDS.--WSP 1333: 1942, 1944, 1948-49. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 5.94 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 23, 1950, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good.

AVERAGE DISCHARGE.--48 years, 1,371 ft³/s, 13.10 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,000 ft³/s, July 19, 1975, gage height, 24.43 ft; minimum, 4.0 ft³/s, Oct. 25, 1981; minimum gage height, 2.82 ft, Oct. 24-25, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,580 ft³/s, May 6, gage height, 17.71 ft; minimum, 39 ft³/s, Oct. 3, gage height, 2.90 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	132	1360	283	362	4840	4380	4640	437	793	649	360
2	40	234	1170	300	380	4760	4890	5840	405	592	519	324
3	44	814	817	328	372	5020	6120	6810	380	456	454	289
4	61	1380	634	371	363	5320	6800	7030	378	394	541	259
5	70	1290	533	414	373	5140	6470	7450	430	343	538	236
6	76	939	468	427	439	4660	5700	8350	573	335	427	239
7	188	769	417	402	588	4550	5130	8260	751	365	360	240
8	237	722	376	390	839	4860	5700	7100	1150	508	308	217
9	214	621	352	415	1170	5260	6650	6070	1410	408	261	202
10	186	516	356	459	1300	5780	7550	5780	1560	363	239	192
11	128	442	361	508	1190	6410	8160	5770	1620	314	226	184
12	100	381	379	560	1030	6270	8070	5230	1410	268	271	178
13	84	337	400	624	908	5280	7090	4320	1070	245	482	170
14	74	311	393	820	807	4230	5550	3570	817	426	661	163
15	68	290	359	1140	729	3760	4300	2890	811	701	639	161
16	62	274	349	1220	683	4040	4620	2310	971	1220	671	173
17	57	267	347	1120	638	4690	5720	1950	993	1660	634	198
18	54	270	344	990	630	5100	6560	1790	1380	2240	652	240
19	54	286	333	870	666	5200	7290	1660	1610	2710	1030	418
20	52	484	324	757	763	4780	7060	1450	1500	2820	1830	397
21	53	660	319	665	1050	4160	5850	1250	1390	2410	2260	382
22	65	569	309	591	1980	3740	4240	1090	1530	1740	1990	471
23	76	494	305	536	3100	3540	3050	954	1710	1170	1570	670
24	98	445	312	490	4040	3720	2330	920	2120	798	1640	587
25	318	412	309	456	5170	4540	1920	916	2600	600	1740	492
26	333	379	307	431	6200	5630	1710	854	2750	497	1270	596
27	242	357	310	414	6350	6530	1700	772	2610	469	806	798
28	185	373	303	400	5570	7340	2050	707	2220	663	617	1500
29	148	432	287	388	---	7330	2580	608	1640	1270	522	1570
30	122	730	274	374	---	6300	3510	536	1130	1120	458	1170
31	106	---	274	358	---	5000	---	482	---	864	403	---
TOTAL	3636	15610	13381	17501	47690	157780	152750	107359	39356	28762	24668	13076
MEAN	117	520	432	565	1703	5090	5092	3463	1312	928	796	436
MAX	333	1380	1360	1220	6350	7340	8160	8350	2750	2820	2260	1570
MIN	40	132	274	283	362	3540	1700	482	378	245	226	161
CFSM	.08	.37	.30	.40	1.20	3.58	3.58	2.44	.92	.65	.56	.31
IN.	.10	.41	.35	.46	1.25	4.13	4.00	2.81	1.03	.75	.65	.34

CAL YR 1988 TOTAL 262487 MEAN 717 MAX 4750 MIN 40 CFSM .50 IN. 6.87
WTR YR 1989 TOTAL 621569 MEAN 1703 MAX 8350 MIN 40 CFSM 1.20 IN. 16.27

CHOWAN RIVER BASIN

02047000 NOTTOWAY RIVER NEAR SEBRELL, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1947, 1978 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1946 to September 1947.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)
NOV 08...	1000	732	83	6.70	10.0	756	3.2	8.4	75	86	260
FEB 16...	1100	688	75	7.00	10.0	769	5.5	10.5	92	46	48
MAY 19...	0900	1690	61	6.70	16.5	760	6.4	8.4	86	30	44
AUG 17...	1100	638	73	7.00	23.0	753	6.2	6.5	77	100	150

DATE	HARD-NESS TOTAL (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CAC03)	ALKA-LINITY WAT DIS TOT IT FIELD (MG/L AS CAC03)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
NOV 08...	24	6.1	2.2	5.7	3.4	16	13	16	22	7.6	0.10
FEB 16...	21	5.4	1.8	6.0	1.9	17	14	18	14	7.4	0.10
MAY 19...	20	5.0	1.8	4.1	1.6	16	15	19	5.0	4.7	0.10
AUG 17...	23	5.8	2.1	5.5	1.9	21	21	25	5.0	6.3	0.10

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHOUS TOTAL (MG/L AS P)	PHOS-PHOUS DIS-SOLVED (MG/L AS P)	PHOS-PHOUS ORTHO, DIS-SOLVED (MG/L AS P)
NOV 08...	13	59	71	0.010	<0.100	0.020	<0.010	0.60	0.050	0.030	<0.010
FEB 16...	13	62	61	<0.010	<0.100	0.010	0.010	0.40	0.040	0.020	0.010
MAY 19...	12	41	46	<0.010	0.190	0.060	0.040	1.1	0.050	0.030	<0.010
AUG 17...	15	65	56	<0.010	0.170	0.020	0.030	0.50	0.070	0.020	0.020

CHOWAN RIVER BASIN

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02047000 NOTTOWAY RIVER NEAR SEBRELL, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
NOV 08...	80	<1	36	<0.5	<1	<1	<3	2	630	<5	<4
FEB 16...	80	<1	26	<0.5	<1	<1	<3	1	500	<5	<4
MAY 19...	80	<1	31	<0.5	<1	<1	<3	2	1000	1	<4
AUG 17...	30	<1	26	<0.5	<1	<1	<3	1	650	<1	<4

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 08...	62	<0.1	<10	<1	<1	1.0	50	<6	19	8	87
FEB 16...	25	<0.1	<10	3	<1	2.0	41	<6	<3	6	97
MAY 19...	67	<0.1	<10	4	<1	<1.0	40	<6	6	14	93
AUG 17...	34	<0.1	<10	<1	<1	<1.0	50	<6	22	12	91

CHOWAN RIVER BASIN

02047500 BLACKWATER RIVER NEAR DENDRON, VA

LOCATION.--Lat 37°01'30", long 76°52'30", Surry County, Hydrologic Unit 03010202, on left bank 10 ft upstream from Walls Bridge on State Highway 617, 1.2 mi downstream from Cypress Swamp, and 3.5 mi southeast of Dendron.

DRAINAGE AREA.--294 mi/.

PERIOD OF RECORD.--October 1941 to December 1986, July 1988 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 30.99 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). Prior to Aug. 13, 1980, at site 25 ft upstream at same datum.

REMARKS.--Records good for period July to September 1988. Records good for period October 1988 to September 1989 except those for period of no gage-height record, Nov. 1-15, and period with ice effect, Feb. 19, which are fair. Several measurements of water temperature were made during the year. Water-quality records for some periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--46 years, 313 ft³/s, 14.46 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,850 ft³/s, Sept. 28, 1985, gage height, 9.11 ft, from rating curve extended above 4,900 ft³/s; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of 13.1 ft, from U.S. Army Corps of Engineers floodmarks, discharge, 10,000 ft³/s, from rating curve extended above 4,900 ft³/s.

EXTREMES FOR CURRENT PERIOD.--July to September 1988: Maximum discharge during period, 202 ft³/s, Sept. 6, gage height, 3.39 ft; minimum, 0.06 ft³/s, Aug. 19.

Water year 1989: Maximum discharge, 2,440 ft³/s, May 4, gage height, 6.51 ft; minimum, 0.28 ft³/s, Oct. 17.

DISCHARGE, CUBIC FEET PER SECOND, JULY TO SEPTEMBER 1988
MEAN VALUES

[illegible]

CHOWAN RIVER BASIN

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02047500 BLACKWATER RIVER NEAR DENDRON, VA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.1	e35	146	63	109	1410	1360	1200	45	458	7.0	51
2	4.9	e70	149	68	106	1480	1910	1250	41	357	4.5	43
3	8.0	e130	155	70	103	1310	1930	2060	44	229	16	35
4	18	e150	134	70	107	1190	1630	2310	50	159	63	27
5	19	e140	120	68	114	1130	1400	1850	56	128	42	20
6	18	e130	117	71	132	1160	1460	1800	115	110	33	16
7	17	e120	107	77	169	1400	1660	1650	121	100	32	13
8	12	e100	105	79	224	1790	2150	1370	117	83	16	11
9	7.8	e92	103	82	270	1720	2350	1100	121	74	4.6	8.9
10	5.6	e76	115	100	213	1390	2140	980	115	73	5.6	8.2
11	4.7	e67	119	129	220	1310	2040	931	101	63	16	7.5
12	3.9	e62	120	152	234	1240	1810	894	88	51	27	6.8
13	2.4	e56	110	202	226	1090	1480	821	81	45	36	7.3
14	1.6	e53	99	256	215	1060	1160	699	175	109	34	18
15	1.3	e50	94	237	229	1050	1040	587	173	195	39	53
16	1.2	53	95	326	181	1210	1360	509	158	463	44	83
17	.96	54	86	284	156	1270	1610	446	236	610	76	61
18	2.8	65	82	257	153	1210	1440	383	270	628	408	50
19	4.2	94	75	290	e170	1090	1250	313	218	697	599	66
20	5.3	91	76	298	194	1000	1150	259	233	722	398	97
21	5.5	85	77	215	309	959	1020	211	349	893	229	145
22	7.8	110	77	177	806	918	862	156	429	860	284	120
23	8.4	114	74	165	1350	860	703	128	388	646	253	134
24	9.1	101	73	156	1430	1100	558	127	451	419	303	172
25	9.5	98	73	146	1280	1590	432	126	605	209	277	138
26	7.7	99	71	135	1160	1860	368	128	506	115	173	291
27	6.9	113	67	129	1100	1570	320	114	350	80	146	361
28	7.0	136	66	124	1240	1470	284	86	320	54	102	402
29	7.4	189	64	120	---	1400	311	66	507	34	77	356
30	7.6	162	63	116	---	1230	944	55	516	16	67	236
31	9.7	---	62	113	---	1140	---	49	---	9.5	60	---
TOTAL	230.36	2895	2974	4775	12200	39607	38132	22658	6979	8689.5	3871.7	3037.7
MEAN	7.43	96.5	95.9	154	436	1278	1271	731	233	280	125	101
MAX	19	189	155	326	1430	1860	2350	2310	605	893	599	402
MIN	.96	35	62	63	103	860	284	49	41	9.5	4.5	6.8
CFSM	.03	.33	.33	.52	1.48	4.35	4.32	2.49	.79	.95	.42	.34
IN.	.03	.37	.38	.60	1.54	5.01	4.82	2.87	.88	1.10	.49	.38

WTR YR 1989 TOTAL 146049.26 MEAN 400 MAX 2350 MIN .96 CFSM 1.36 IN. 18.48

e Estimated.

CHOWAN RIVER BASIN

02049500 BLACKWATER RIVER NEAR FRANKLIN, VA
(National stream-quality accounting network station)

LOCATION.--Lat 36°45'45", long 76°53'55", Southampton County, Hydrologic Unit 03010202, on right bank 0.4 mi south of Burdette, 0.5 mi upstream from Black Creek, 3.3 mi downstream from Corrowaugh Swamp, and 6.0 mi north of Franklin.

DRAINAGE AREA.--617 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1944 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1.56 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good except those for periods of tidal effect below 40 ft³/s during October, August, and September, which are poor. Low flow reversed by tide some years. Diversion upstream from station by city of Norfolk for municipal water supply most years.

AVERAGE DISCHARGE.--45 years, 642 ft³/s, 14.13 in/yr, adjusted for diversion.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,420 ft³/s, Sept. 14, 1960, gage height, 17.14 ft, from flood-marks; minimum daily, 0.07 ft³/s, Oct. 16, 1981.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of about 22 ft, discharge, 21,000 ft³/s, from rating curve extended above 9,400 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,610 ft³/s, Apr. 9, gage height, 13.68 ft; minimum daily, 1.1 ft³/s, Oct. 17, 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	2.4	41	432	122	223	3170	2530	1410	147	561	82	196		
2	4.8	184	398	143	213	3450	2460	1860	106	576	58	140		
3	6.7	321	359	162	199	3420	2310	2500	105	591	38	106		
4	6.2	383	319	176	220	3230	2320	2650	96	541	22	84		
5	10	412	279	178	253	3010	2430	2770	93	475	14	69		
6	41	393	249	179	306	2780	3230	3030	152	390	8.5	40		
7	65	376	232	185	389	3050	4310	3060	232	326	13	19		
8	67	352	224	191	463	3470	5230	2930	250	257	35	10		
9	63	320	221	194	504	3590	5580	2750	280	181	44	8.5		
10	49	294	230	205	525	3490	5360	2530	323	127	42	12		
11	34	265	243	225	529	3190	4800	2280	338	95	40	13		
12	22	225	248	253	519	2820	4150	2010	291	91	48	12		
13	9.4	191	238	322	486	2490	3560	1780	229	130	78	10		
14	4.8	173	220	438	443	2420	3050	1600	188	245	75	14		
15	2.0	165	207	522	414	2520	2750	1440	124	347	224	20		
16	1.6	162	197	585	393	2640	3020	1280	106	397	316	22		
17	1.1	160	186	622	372	2720	3310	1120	239	400	242	38		
18	1.1	188	173	625	372	2700	3310	962	384	538	433	112		
19	2.0	210	164	603	388	2650	3040	834	488	872	919	227		
20	2.3	214	156	568	431	2500	2700	727	536	1040	1240	334		
21	3.1	223	152	510	572	2330	2360	641	565	962	1770	397		
22	4.1	205	154	462	1160	2220	2040	566	745	828	1770	437		
23	12	201	177	433	1860	2090	1790	502	921	755	1450	468		
24	29	198	186	405	2410	2220	1580	541	965	747	1150	458		
25	38	192	189	361	2670	3070	1370	577	1140	738	1060	403		
26	38	189	187	316	2690	3560	1180	523	1310	688	963	408		
27	34	190	174	288	2600	3700	1010	455	1280	586	753	517		
28	30	240	145	267	2700	3490	896	373	1080	440	605	653		
29	30	377	132	247	---	3080	794	295	874	299	482	768		
30	29	446	124	230	---	2700	1030	238	659	195	365	783		
31	25	---	118	224	---	2590	---	190	---	116	268	---		
TOTAL	667.6	7490	6713	10241	24304	90360	83500	44424	14246	14534	14607.5	6778.5		
MEAN	21.5	250	217	330	868	2915	2783	1433	475	469	471	226		
MAX	67	446	432	625	2700	3700	5580	3060	1310	1040	1770	783		
MIN	1.1	41	118	122	199	2090	794	190	93	91	8.5	8.5		
(*)	29.2	36.2	31.6	37.0	35.1	.65	0	11.3	30.0	33.4	18.6	18.4		
MEAN†	50.7	286	249	367	903	2916	2783	1444	505	502	490	244		
CFSM†	.08	.46	.40	.59	1.46	4.73	4.51	2.34	.82	.81	.79	.40		
IN.†	.09	.52	.47	.69	1.52	5.45	5.03	2.70	.91	.94	.92	.44		
CAL YR 1988	TOTAL	155709.3	MEAN	425	MAX	2440	MIN	1.1	MEAN†	456	CFSM†	.74	IN.†	10.06
WTR YR 1989	TOTAL	317865.6	MEAN	871	MAX	5580	MIN	1.1	MEAN†	871	CFSM†	1.41	IN.†	19.17

* Average diversion, in cubic feet per second, by city of Norfolk.

† Adjusted for diversion.

CHOWAN RIVER BASIN

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02049500 BLACKWATER RIVER NEAR FRANKLIN, VA--Continued

WATER-QUALITY RECORDS

LOCATION.--Samples taken at bridge 2.0 mi upstream from discharge station.

PERIOD OF RECORD.--Water years 1947, 1952, 1975 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
NOV 09...	0830	325	113	6.60	10.5	761	4.0	6.3	57	38	62
FEB 15...	1200	410	105	6.90	7.0	762	5.0	11.2	92	120	50
MAY 18...	1300	955	79	6.70	16.0	758	5.4	7.2	73	47	40
AUG 16...	1200	318	106	6.70	22.5	752	5.0	4.7	55	210	550

DATE	HARD-NESS TOTAL (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CAC03)	ALKA-LINITY WAT DIS TOT IT FIELD (MG/L AS CAC03)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
NOV 09...	41	12	2.7	4.6	4.1	22	20	25	25	11	0.10
FEB 15...	35	11	1.9	4.5	2.0	19	17	21	17	11	0.10
MAY 18...	30	9.1	1.7	3.1	2.0	16	16	19	9.0	7.5	0.10
AUG 16...	41	13	2.0	3.5	1.0	21	20	24	15	7.7	0.10

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHOROUS TOTAL (MG/L AS P)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS ORTHO, DIS-SOLVED (MG/L AS P)
NOV 09...	8.6	95	82	0.010	<0.100	<0.010	0.010	0.70	0.040	0.020	<0.010
FEB 15...	6.2	69	67	<0.010	0.220	0.020	0.010	0.50	0.030	0.010	<0.010
MAY 18...	5.5	57	51	0.010	0.380	0.060	0.040	0.60	0.060	0.030	<0.010
AUG 16...	7.8	80	65	<0.010	0.240	0.030	0.040	0.60	0.070	0.030	0.010

CHOWAN RIVER BASIN

02049500 BLACKWATER RIVER NEAR FRANKLIN, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
NOV 09...	120	<1	50	<0.5	<1	<1	<3	1	830	<5	<4
FEB 15...	110	<1	37	<0.5	<1	1	<3	2	570	<5	<4
MAY 18...	120	<1	39	<0.5	<1	<1	<3	1	1200	1	<4
AUG 16...	70	<1	53	<0.5	<1	<1	<3	2	730	1	<4

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 09...	46	<0.1	<10	2	<1	1.0	62	<6	8	7	96
FEB 15...	23	<0.1	<10	<1	<1	<1.0	58	<6	4	4	94
MAY 18...	62	<0.1	<10	<1	<1	<1.0	50	<6	5	8	95
AUG 16...	71	<0.1	<10	2	<1	<1.0	70	<6	35	9	91

CHOWAN RIVER BASIN

245

02051000 NORTH MEHERRIN RIVER NEAR LUNENBURG, VA

LOCATION.--Lat 36°59'53", long 78°21'03", Lunenburg County, Hydrologic Unit 03010204, on right bank at upstream side of bridge on State Highway 40, 0.5 mi downstream from Tusekiah Creek, 4.6 mi upstream from Juniper Creek, and 5.2 mi northwest of Lunenburg.

DRAINAGE AREA.--55.6 mi².

PERIOD OF RECORD.--August 1946 to September 1980, October 1981 to current year.

REVISED RECORDS.--WSP 1303: 1947(M), 1949(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 333.7 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to July 5, 1951, nonrecording gage at same site and datum. July 5, 1951, to July 11, 1980, water-stage recorder at site 20 ft downstream at same datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 13, 18, and period of no gage-height record, Aug. 7-16, which are fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--42 years, 52.6 ft³/s, 12.85 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,400 ft³/s, Oct. 23, 1971, gage height, 28.30 ft, from rating curve extended above 1,700 ft³/s on basis of slope-area measurement of peak flow; no flow Sept. 5-21, Oct. 8-14, 1954.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of 48 ft, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
June 6	0030	*2,900	*16.15	No other peak equal to or greater than base discharge.			

Minimum discharge, 3.8 ft³/s, Oct. 13-14, gage height, 0.68 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	288	37	29	17	150	51	56	16	9.8	29	10
2	4.1	74	30	46	16	86	42	445	16	9.2	23	9.8
3	7.9	32	25	29	17	64	42	112	28	9.2	20	9.2
4	31	24	22	25	21	96	43	69	19	71	18	8.0
5	15	45	20	21	20	77	44	85	381	28	15	7.8
6	8.1	45	19	24	30	129	175	344	608	70	14	8.0
7	6.7	27	18	35	71	252	245	126	69	30	e13	8.6
8	5.6	20	18	29	59	95	267	76	82	20	e13	8.6
9	5.6	17	20	30	34	79	133	64	55	15	e12	8.6
10	5.6	16	24	28	27	84	81	194	46	13	e12	8.0
11	5.4	16	22	24	24	61	65	95	29	11	e20	7.6
12	4.9	14	18	54	24	54	54	77	24	12	e18	7.2
13	4.3	14	e16	89	21	68	49	61	24	59	e17	7.6
14	3.9	14	17	61	21	154	44	52	24	265	e16	10
15	4.5	14	19	52	21	78	168	55	44	54	e17	9.5
16	4.7	13	20	50	21	64	131	101	65	341	e16	23
17	4.7	93	18	37	22	52	69	61	90	151	15	18
18	4.5	55	e17	32	27	47	56	48	38	64	14	12
19	4.5	30	16	29	30	64	47	40	26	43	15	9.8
20	4.9	30	16	26	42	48	42	34	21	34	15	21
21	58	29	16	23	300	170	37	32	24	29	52	58
22	61	22	17	21	289	92	35	30	24	23	126	20
23	19	19	16	21	132	110	33	28	25	19	85	15
24	12	18	17	20	91	354	32	28	31	17	28	13
25	9.8	16	19	19	67	139	31	24	19	16	22	12
26	8.9	16	17	19	70	85	205	23	17	26	20	177
27	8.1	91	16	19	107	64	128	22	32	57	17	42
28	7.9	369	16	17	221	57	209	19	16	32	17	22
29	7.6	93	16	17	---	51	84	18	13	39	15	17
30	7.6	50	16	17	---	50	67	18	11	21	14	16
31	7.9	---	17	17	---	77	---	17	---	30	12	---
TOTAL	347.8	1604	595	960	1842	3051	2709	2454	1917	1618.2	740	604.3
MEAN	11.2	53.5	19.2	31.0	65.8	98.4	90.3	79.2	63.9	52.2	23.9	20.1
MAX	61	369	37	89	300	354	267	445	608	341	126	177
MIN	3.9	13	16	17	16	47	31	17	11	9.2	12	7.2
CFSM	.20	.96	.35	.56	1.18	1.77	1.62	1.42	1.15	.94	.43	.36
IN.	.23	1.07	.40	.64	1.23	2.04	1.81	1.64	1.28	1.08	.50	.40

CAL YR 1988 TOTAL 12156.2 MEAN 33.2 MAX 369 MIN 2.1 CFSM .60 IN. 8.13
WTR YR 1989 TOTAL 1842.3 MEAN 50.5 MAX 608 MIN 3.9 CFSM .91 IN. 12.34

e Estimated.

CHOWAN RIVER BASIN

02051500 MEHERRIN RIVER NEAR LAWRENCEVILLE, VA

LOCATION.--Lat 36°43'00", long 77°49'55", Brunswick County, Hydrologic Unit 03010204, on right bank 50 ft upstream from Gholson Bridge on State Highway 715, 0.6 mi upstream from Allen Creek, and 3.0 mi southeast of Lawrenceville.

DRAINAGE AREA.--552 mi².

PERIOD OF RECORD.--October 1928 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 972: 1932(M), 1935. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 136.56 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 17, 1931, nonrecording gage at same site and datum.

REMARKS.--Records good except for period with ice effect, Dec. 13-19, which is fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--61 years, 502 ft³/s, 12.35 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 38,000 ft³/s, Aug. 17, 1940, gage height, 42.0 ft, from flood-mark, from rating curve extended above 13,000 ft³/s on basis of velocity-area studies and records for Nottoway River near Stony Creek; minimum, 4.2 ft³/s, Oct. 7, 8, 1954; minimum gage height, 0.72 ft, Sept. 23, 24, 1932.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 23	1100	*6,610	*19.51	Apr. 9	0030	4,680	15.82
Mar. 8	0530	5,050	16.59	May 3	1600	5,420	17.32
Mar. 25	1230	5,350	17.18	May 7	1530	5,070	16.64

Minimum discharge, 47 ft³/s, Oct. 2, gage height, 1.63 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	767	470	191	184	3460	1680	728	210	235	300	151
2	47	2280	363	231	180	1440	939	3000	204	215	348	141
3	83	684	298	334	175	870	697	5230	201	204	700	132
4	301	368	258	282	187	909	654	2100	198	202	471	124
5	381	270	240	232	219	949	597	873	240	344	264	122
6	244	294	219	211	313	786	1280	2240	1740	343	206	113
7	136	335	208	218	431	3570	2180	4790	2240	314	172	120
8	98	267	204	249	730	3910	3950	1870	1080	313	153	120
9	80	206	196	269	591	1140	3210	915	1280	232	143	118
10	74	178	217	285	399	988	1340	847	948	202	148	115
11	72	163	229	279	315	870	949	1220	617	185	296	111
12	66	156	219	307	279	688	783	873	427	173	547	105
13	61	153	e195	668	268	613	669	734	371	229	364	103
14	59	147	e178	785	248	1230	595	610	1040	435	257	102
15	60	141	e169	596	235	1340	1040	543	685	1110	215	101
16	59	138	e164	465	230	1560	2730	520	711	884	197	125
17	59	176	e164	421	223	1020	1410	574	1600	2000	286	182
18	61	777	e170	348	244	753	879	519	1130	1150	1150	237
19	61	520	e180	301	302	1100	714	444	574	541	700	166
20	61	315	197	275	332	851	618	398	423	377	321	153
21	69	266	183	253	1320	783	554	378	405	300	242	192
22	347	249	181	231	5350	1370	507	353	370	252	643	518
23	551	217	179	222	6300	960	471	330	349	218	803	262
24	230	198	180	213	2140	3160	447	315	581	192	487	178
25	143	180	180	209	938	5080	426	297	675	172	302	154
26	110	169	195	202	751	1840	595	281	397	162	233	369
27	94	162	193	198	766	974	1470	270	512	436	212	1110
28	89	712	178	195	1890	769	1630	250	801	493	202	457
29	86	2330	178	193	---	656	1430	232	362	947	190	266
30	83	751	182	187	---	717	878	223	274	710	182	204
31	84	---	182	188	---	2900	---	215	---	327	167	---
TOTAL	3998	13569	6549	9238	25540	47256	35322	32172	20645	13897	10901	6351
MEAN	129	452	211	298	912	1524	1177	1038	688	448	352	212
MAX	551	2330	470	785	6300	5080	3950	5230	2240	2000	1150	1110
MIN	47	138	164	187	175	613	426	215	198	162	143	101
CFSM	.23	.82	.38	.54	1.65	2.76	2.13	1.88	1.25	.81	.64	.38
IN.	.27	.91	.44	.62	1.72	3.18	2.38	2.17	1.39	.94	.73	.43

CAL YR 1988 TOTAL 110872 MEAN 303 MAX 2550 MIN 44 CFSM .55 IN. 7.47
WTR YR 1989 TOTAL 225438 MEAN 618 MAX 6300 MIN 47 CFSM 1.12 IN. 15.19

e Estimated.

CHOWAN RIVER BASIN

247

02052000 MEHERRIN RIVER AT EMPORIA, VA
(National stream-quality accounting network station)

LOCATION.--Lat 36°41'24", long 77°32'27", Emporia City, Hydrologic Unit 03010204, on left bank at downstream side of bridge on U.S. Highway 301 and 1.2 mi upstream from Falling Run.

DRAINAGE AREA.--747 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1951 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 67.17 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--No estimated daily discharges. Records good. Prior to November 1965 and since April 1986, low and medium flow regulated by powerplant 0.8 mi upstream from station.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--38 years, 704 ft³/s, 12.80 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,100 ft³/s, Oct. 8, 1972, gage height, 27.38 ft; minimum, 5.0 ft³/s, Nov. 11, 1954, gage height, 1.00 ft; minimum daily, 7.1 ft³/s, July 20, 1986.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of 31.5 ft, from floodmarks, discharge, about 40,000 ft³/s, from rating curve extended above 18,000 ft³/s on basis of record for station near Lawrenceville.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,390 ft³/s, Feb. 24, gage height, 19.69 ft; minimum, 30 ft³/s, Sept. 7; minimum daily, 43 ft³/s, Sept. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55	630	859	212	260	4510	4060	1360	208	128	321	192
2	64	2840	444	230	250	3700	2280	2990	204	118	303	129
3	68	2000	308	304	212	1790	1310	6250	112	198	488	50
4	217	808	233	356	169	1780	1070	5420	134	103	791	106
5	558	376	351	291	240	1640	920	2170	362	245	218	248
6	368	244	314	231	438	1320	1490	2160	807	331	151	43
7	240	405	278	231	483	3270	3300	4820	3440	373	228	68
8	81	396	164	250	928	5620	4650	4740	1560	145	76	212
9	112	346	315	304	1010	3670	5540	1980	1660	185	197	102
10	111	319	160	323	773	1900	3360	1390	1440	249	179	94
11	101	143	252	338	276	1530	1930	1590	984	71	293	90
12	79	189	196	360	435	1140	1450	1440	371	158	428	86
13	71	136	190	661	517	1040	1140	1140	391	218	480	92
14	90	186	166	1090	290	1410	1030	946	535	637	287	107
15	74	106	225	1010	316	2340	1570	418	1230	1200	334	83
16	59	202	263	687	273	2760	3890	602	806	1180	206	114
17	73	213	253	559	263	2260	3460	647	1280	2330	318	115
18	81	542	156	472	307	1370	1850	656	2150	2600	2150	290
19	84	1080	174	390	372	1420	1270	539	923	1100	1830	229
20	83	508	261	341	440	1600	1010	458	412	416	544	155
21	92	172	219	398	1110	1140	838	414	437	306	344	281
22	239	381	153	301	5000	1640	561	376	547	293	336	427
23	637	394	198	269	7050	1750	729	348	421	184	1160	391
24	376	105	187	236	6130	3060	438	333	655	277	665	222
25	211	283	183	308	2460	6050	542	406	917	300	397	173
26	164	230	207	266	1390	5210	736	282	647	133	150	337
27	88	110	217	245	1180	2350	1390	308	283	678	191	886
28	87	449	201	180	2210	1440	2290	321	952	933	231	973
29	88	2460	193	174	---	1040	2710	176	526	679	231	377
30	88	1970	195	281	---	1010	2050	169	332	1250	129	151
31	87	---	187	170	---	3300	---	250	---	403	112	---
TOTAL	4826	18223	7702	11468	34782	74060	58864	45099	24726	17421	13768	6823
MEAN	156	607	248	370	1242	2389	1962	1455	824	562	444	227
MAX	637	2840	859	1090	7050	6050	5540	6250	3440	2600	2150	973
MIN	55	105	153	170	169	1010	438	169	112	71	76	43
CFSM	.21	.81	.33	.50	1.66	3.20	2.63	1.95	1.10	.75	.59	.30
IN.	.24	.91	.38	.57	1.73	3.69	2.93	2.25	1.23	.87	.69	.34

CAL YR 1988 TOTAL 157424 MEAN 430 MAX 3330 MIN 14 CFSM .58 IN. 7.84
WTR YR 1989 TOTAL 317762 MEAN 871 MAX 7050 MIN 43 CFSM 1.17 IN. 15.82

CHOWAN RIVER BASIN

02052000 MEHERRIN RIVER AT EMPORIA, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1968 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1968 to September 1971, October 1972 to September 1978.

WATER TEMPERATURE: April 1968 to September 1971, October 1972 to September 1978.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
NOV 10...	1230	510	76	6.90	10.5	751	16	9.2	84	28	28
FEB 14...	1200	276	79	7.20	4.0	760	12	12.7	97	46	27
MAY 17...	1200	634	69	7.20	15.0	751	13	9.5	96	480	44
AUG 22...	1300	584	63	6.80	24.5	752	27	5.7	69	48	110

DATE	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	ALKA- LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3)	BICAR- BONATE WATER DIS IT FIELD (MG/L AS HCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
NOV 10...	24	5.4	2.5	4.9	2.6	22	21	26	12	4.9	0.10
FEB 14...	24	5.6	2.5	5.9	1.4	24	23	28	11	5.3	0.10
MAY 17...	22	5.1	2.3	4.9	1.4	22	22	26	5.0	3.6	0.10
AUG 22...	18	4.4	1.8	4.1	2.0	19	34	42	4.0	4.1	0.10

DATE	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)
NOV 10...	16	51	62	0.010	<0.100	0.030	0.040	0.40	0.030	0.020	<0.010
FEB 14...	17	57	64	<0.010	<0.100	0.020	0.020	0.40	0.020	0.010	<0.010
MAY 17...	18	53	55	<0.010	0.130	0.070	0.050	0.50	0.030	0.020	<0.010
AUG 22...	15	40	48	<0.010	0.110	0.060	0.080	0.50	0.070	0.020	0.010

CHOWAN RIVER BASIN

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02052000 MEHERRIN RIVER AT EMPORIA, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
NOV 10...	70	<1	23	<0.5	<1	<1	<3	2	440	<5	<4
FEB 14...	120	<1	17	<0.5	<1	<1	3	1	520	<5	<4
MAY 17...	40	<1	23	<0.5	<1	<1	<3	2	580	1	<4
AUG 22...	40	<1	25	<0.5	<1	<1	<3	2	500	1	<4

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 10...	74	<0.1	<10	1	<1	1.0	38	<6	<3	20	93
FEB 14...	48	<0.1	<10	1	<1	<1.0	41	<6	7	5	95
MAY 17...	100	<0.1	<10	<1	<1	<1.0	39	<6	3	18	96
AUG 22...	140	<0.1	<10	1	<1	<1.0	37	<6	9	38	98

CHOWAN RIVER BASIN

02052500 FOUNTAINS CREEK NEAR BRINK, VA

LOCATION.--Lat 36°36'55", long 77°42'00", Greenville County, Hydrologic Unit 03010204, on left bank 30 ft upstream from bridge on State Highway 603, 0.3 mi downstream from Quarrel Creek, 3.6 mi west of Brink, and 10 mi south-west of Emporia.

DRAINAGE AREA.--65.2 mi².

PERIOD OF RECORD.--October 1953 to current year. Prior to October 1980, published as Fontaine Creek near Brink.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 152.59 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for period with ice effect, Dec. 13, 14, which is fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--36 years, 68.9 ft³/s, 14.35 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,000 ft³/s, Oct. 6, 1972, gage height, 24.14 ft, from flood-mark, from rating curve extended above 3,000 ft³/s; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 850 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 22	1500	1,030	11.38	Mar. 25	0300	*1,230	*12.17
Mar. 1	0330	915	10.89	Apr. 8	1145	864	10.68
Mar. 7	1645	975	11.14	Apr. 16	0145	941	11.00

Minimum discharge, 2.5 ft³/s, Oct. 3, gage height, 2.61 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	132	29	23	18	766	244	149	13	23	13	5.8
2	2.6	176	24	33	17	356	160	490	13	19	12	5.1
3	2.8	103	21	29	17	184	108	436	20	17	15	4.7
4	6.6	48	19	25	17	435	102	232	18	16	13	4.3
5	14	30	17	21	19	306	91	141	33	15	10	4.0
6	14	33	16	19	41	208	260	372	40	15	8.3	3.9
7	13	29	17	21	76	784	352	233	55	19	7.0	4.0
8	9.6	23	16	20	95	466	763	146	43	27	7.3	4.2
9	6.9	19	16	21	67	239	443	99	33	18	6.7	4.1
10	5.3	15	21	26	46	196	211	116	29	15	11	3.8
11	4.4	14	22	28	36	154	158	105	22	14	33	3.6
12	4.0	13	20	43	32	118	143	88	20	14	27	3.4
13	3.6	12	e15	61	29	110	111	67	74	17	21	3.2
14	3.2	11	e16	57	28	299	94	57	131	16	18	3.4
15	3.1	11	17	45	27	233	453	52	56	12	17	3.6
16	3.1	11	17	38	25	499	681	53	160	28	16	3.9
17	3.0	12	17	32	24	449	287	52	427	95	14	4.6
18	3.0	13	16	27	35	224	147	45	142	57	118	5.2
19	3.1	13	15	24	49	206	108	39	58	37	83	5.7
20	3.7	13	15	23	56	167	96	34	53	25	43	6.8
21	6.6	13	15	20	323	160	77	31	161	19	26	33
22	30	13	16	19	953	167	65	28	163	15	18	20
23	26	12	16	19	768	153	58	33	85	13	14	11
24	19	14	16	18	305	751	53	63	130	11	12	7.8
25	14	14	16	18	156	1010	52	36	241	11	10	6.9
26	11	15	14	17	125	369	77	27	146	9.5	9.3	35
27	9.1	14	13	17	144	177	100	23	69	9.0	8.7	32
28	8.1	37	13	16	545	125	207	19	44	9.3	8.5	17
29	8.7	56	13	16	---	111	171	17	35	8.0	8.4	12
30	8.5	40	13	16	---	128	215	15	28	7.1	7.5	11
31	8.0	---	15	18	---	359	---	14	---	9.0	6.6	---
TOTAL	260.7	959	526	810	4073	9909	6087	3312	2542	619.9	622.3	273.0
MEAN	8.41	32.0	17.0	26.1	145	320	203	107	84.7	20.0	20.1	9.10
MAX	30	176	29	61	953	1010	763	490	427	95	118	35
MIN	2.6	11	13	16	17	110	52	14	13	7.1	6.6	3.2
CFSM	.13	.49	.26	.40	2.23	4.90	3.11	1.64	1.30	.31	.31	.14
IN.	.15	.55	.30	.46	2.32	5.65	3.47	1.89	1.45	.35	.36	.16

CAL YR 1988 TOTAL 11761.1 MEAN 32.1 MAX 354 MIN 2.4 CFSM .49 IN. 6.71
WTR YR 1989 TOTAL 29993.9 MEAN 82.2 MAX 1010 MIN 2.6 CFSM 1.26 IN. 17.11

e Estimated.

02053800 SOUTH FORK ROANOKE RIVER NEAR SHAWSVILLE, VA

LOCATION.--Lat 37°08'24", long 80°16'00", Montgomery County, Hydrologic Unit 03010101, on right bank 95 ft downstream from bridge on State Highway 637, 0.3 mi downstream from Georges Run, 1.3 mi downstream from Elliott Creek, and 2.0 mi southwest of Shawsville.

DRAINAGE AREA.--110 mi².

PERIOD OF RECORD.--October 1960 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,361.87 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 26, 1974, water-stage recorder, and Aug. 26, 1974, to July 24, 1975, nonrecording gage at site 95 ft upstream at same datum.

REMARKS.--Records good. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--29 years, 110 ft³/s, 13.58 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,200 ft³/s, June 21, 1972, gage height, 11.12 ft, from high-water mark in well, from rating curve extended above 3,700 ft³/s on basis of slope-area measurement of peak flow; minimum, 7.5 ft³/s, July 27-29, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Sept. 30, 1959, reached a stage of 9.89 ft, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 800 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	0400	1,110	2.97	Sept. 16	0100	997	2.85
May 6	0100	1,790	3.66	Sept. 16	1630	3,060	4.74
June 7	0800	1,560	3.43	Sept. 22	1400	*8,110	*8.05
June 7	1630	2,690	4.43				

Minimum discharge, 34 ft³/s, Oct. 1, Dec. 12, 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35	57	58	73	45	83	78	453	55	67	115	44
2	35	51	52	71	44	80	70	814	64	65	95	43
3	38	44	48	65	43	81	67	351	97	65	72	42
4	43	42	47	64	44	110	68	234	95	96	64	41
5	39	158	44	55	45	127	94	312	99	310	60	41
6	36	127	43	69	49	158	79	1030	147	226	58	42
7	36	73	42	75	54	211	86	452	1250	208	53	44
8	35	56	42	68	49	177	113	306	582	151	50	46
9	35	49	48	64	42	146	134	275	471	126	49	43
10	35	46	45	61	e40	123	139	342	407	114	48	41
11	35	45	42	59	50	105	123	288	271	92	49	41
12	35	42	36	82	48	93	112	238	216	82	50	139
13	36	41	e34	93	45	91	106	200	229	107	50	81
14	36	41	44	88	48	95	97	173	176	159	49	56
15	37	40	43	99	49	83	102	161	167	99	61	62
16	37	39	44	97	47	77	91	141	155	150	66	1090
17	37	74	40	86	49	70	80	125	142	208	51	414
18	38	60	38	79	49	70	74	116	122	165	73	216
19	39	50	43	74	51	70	71	105	112	136	118	157
20	39	50	40	67	56	73	66	99	159	117	66	130
21	45	48	47	59	172	138	63	95	158	100	68	135
22	49	44	72	55	245	154	61	86	170	99	84	3440
23	43	44	59	54	181	142	59	136	146	103	60	1300
24	41	45	63	52	142	181	57	93	128	82	60	481
25	41	43	77	50	123	195	55	81	113	85	70	346
26	41	42	67	49	106	171	62	77	102	90	62	594
27	41	43	62	48	100	144	63	74	92	106	58	431
28	41	89	59	46	91	123	77	66	84	86	52	321
29	41	71	55	45	---	108	136	62	78	72	49	271
30	41	63	51	48	---	96	117	60	71	79	50	276
31	42	---	51	49	---	88	---	58	---	123	46	---
TOTAL	1202	1717	1536	2044	2107	3663	2600	7103	6158	3768	1956	10408
MEAN	38.8	57.2	49.5	65.9	75.2	118	86.7	229	205	122	63.1	347
MAX	49	158	77	99	245	211	139	1030	1250	310	118	3440
MIN	35	39	34	45	40	70	55	58	55	65	46	41
CFSM	.35	.52	.45	.60	.68	1.07	.79	2.08	1.87	1.10	.57	3.15
IN.	.41	.58	.52	.69	.71	1.24	.88	2.40	2.08	1.27	.66	3.52

CAL YR 1988 TOTAL 24579 MEAN 67.2 MAX 340 MIN 31 CFSM .61 IN. 8.31
WTR YR 1989 TOTAL 44262 MEAN 121 MAX 3440 MIN 34 CFSM 1.10 IN. 14.97

e Estimated.

ROANOKE RIVER BASIN

02054500 ROANOKE RIVER AT LAFAYETTE, VA

LOCATION.--Lat 37°14'11", long 80°12'34", Montgomery County, Hydrologic Unit 03010101, on right bank 120 ft upstream from bridge on State Highway 603 at Lafayette, 0.4 mi downstream from confluence of North and South Forks, and 1.1 mi upstream from Cove Hollow.

DRAINAGE AREA.--257 mi².

PERIOD OF RECORD.--September 1943 to current year.

REVISED RECORDS.--WSP 1333: 1944-47(M), 1948-49.

GAGE.--Water-stage recorder. Datum of gage is 1,174.47 ft above National Geodetic Vertical Datum of 1929. Prior to July 30, 1949, nonrecording gage at same site and datum.

REMARKS.--Records good. Occasional diurnal fluctuation caused by meat-processing plant upstream from station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--46 years, 239 ft³/s, 12.63 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,500 ft³/s, June 21, 1972, gage height, 15.60 ft, from flood-marks, from rating curve extended above 12,000 ft³/s on basis of slope-area measurement of peak flow; minimum daily, 10 ft³/s, Jan. 14, 15, 18, 19, 1959.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of 12.2 ft, from information by local residents, discharge, 19,000 ft³/s, from rating curve extended above 12,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	0245	4,150	6.98	Sept. 22	1730	*10,500	*10.73
Sept. 16	1830	4,890	7.56				

Minimum discharge, 37 ft³/s, Dec. 12, Feb. 10, gage height, 0.90 ft, result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45	61	99	118	78	163	170	1110	122	119	171	61
2	45	73	90	138	75	149	151	1910	116	113	154	58
3	54	58	82	124	74	146	140	924	154	111	118	55
4	68	54	77	117	75	165	138	579	177	138	103	54
5	63	155	73	103	77	183	177	683	139	475	93	54
6	52	207	70	120	83	292	164	2810	228	377	89	56
7	49	120	68	149	93	485	172	1370	1030	310	83	60
8	47	92	66	138	88	366	249	843	818	236	76	63
9	47	77	81	129	77	294	345	830	631	206	73	58
10	45	69	82	120	65	249	340	1490	587	188	71	53
11	45	65	73	113	78	217	297	911	386	153	71	52
12	44	60	50	139	86	193	259	670	308	137	73	172
13	42	58	e47	172	80	184	234	526	398	180	72	150
14	42	58	71	167	83	197	213	433	291	273	70	94
15	44	55	69	179	88	179	214	388	264	169	77	83
16	45	53	72	197	84	183	194	338	237	249	97	1860
17	45	80	64	180	89	178	168	299	219	408	81	1000
18	45	94	55	163	93	176	154	267	195	281	89	432
19	44	75	60	148	94	177	146	242	177	229	188	299
20	44	73	65	133	113	183	137	228	218	196	107	241
21	52	69	69	118	274	370	129	216	224	169	89	223
22	75	64	115	101	515	376	123	202	242	147	132	4900
23	61	62	105	103	353	329	118	291	219	164	93	2120
24	53	65	110	98	274	497	112	216	197	132	82	870
25	50	61	143	95	217	498	109	188	245	128	114	602
26	49	58	131	90	205	406	117	174	227	154	94	1120
27	48	60	117	87	189	328	123	169	183	154	90	809
28	47	117	108	83	176	277	280	151	157	153	78	586
29	47	123	101	79	---	240	482	141	144	121	74	477
30	47	107	93	82	---	216	342	135	128	124	72	449
31	48	---	90	86	---	193	---	129	---	224	67	---
TOTAL	1532	2423	2596	3869	3876	8089	5997	18863	8661	6218	2941	17111
MEAN	49.4	80.8	83.7	125	138	261	200	608	289	201	94.9	570
MAX	75	207	143	197	515	498	482	2810	1030	475	188	4900
MIN	42	53	47	79	65	146	109	129	116	111	67	52
CFSM	.19	.31	.33	.49	.54	1.02	.78	2.37	1.12	.78	.37	2.22
IN.	.22	.35	.38	.56	.56	1.17	.87	2.73	1.25	.90	.43	2.48

CAL YR 1988 TOTAL 42829 MEAN 117 MAX 865 MIN 34 CFSM .46 IN. 6.20
WTR YR 1989 TOTAL 82176 MEAN 225 MAX 4900 MIN 42 CFSM .88 IN. 11.89

e Estimated.

02055000 ROANOKE RIVER AT ROANOKE, VA

LOCATION.--Lat 37°15'30", long 79°56'20", Roanoke City, Hydrologic Unit 03010101, on left bank 50 ft downstream from Walnut Street Bridge, 3.2 mi upstream from Tinker Creek, and at mile 360.6.

DRAINAGE AREA.--395 mi².

PERIOD OF RECORD.--February 1899 to current year. Monthly discharge only for some periods, published in WSP 1303. Records for July 1896 to January 1899 published in WSP 11, 15, 27, and 20th Annual Report, Part 4, are unreliable, due to doubtful gage-height record, and should not be used.

REVISED RECORDS.--WSP 972: 1928, 1930, 1933. WSP 1433: 1899-1904, 1914-17(M), 1918-24, 1925-27(M), 1929-34(M), 1935, 1936-39(M). WSP 2104: Drainage area. WDR VA-72-1: 1928(M), 1940(M). See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 906.84 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to June 7, 1937, nonrecording gage on downstream side of highway bridge 50 ft upstream at same datum.

REMARKS.--No estimated daily discharges. Records fair. Prior to 1949, diurnal fluctuation at low flow caused by powerplants upstream from station. Appalachian Power Company gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--90 years, 371 ft³/s, 12.75 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,300 ft³/s, Nov. 4, 1985, gage height, 23.35 ft, from floodmark, from rating curve extended above 26,000 ft³/s; practically no flow Dec. 23, 1909, Dec. 19, 1963, when flow was retarded by freezing, gage height, 0.0 ft; minimum daily discharge, 19 ft³/s, Aug. 29, 1981.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	1000	3,380	5.35	July 6	2300	5,650	7.28
May 6	0830	5,300	7.00	Sept. 16	0230	6,360	7.82
May 10	0830	2,910	4.89	Sept. 16	2400	5,780	7.38
July 5	0600	3,480	5.44	Sept. 23	0030	*11,900	*11.63

Minimum discharge, 43 ft³/s, Oct. 20, gage height, 0.40 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	86	118	146	96	215	242	1230	150	173	262	124
2	61	70	109	158	90	192	216	3050	150	160	231	124
3	66	76	99	153	88	185	195	1520	165	152	176	121
4	83	68	93	145	87	201	191	901	191	405	142	117
5	76	205	87	139	96	218	227	813	229	1900	126	112
6	67	273	83	150	94	376	226	4060	260	1510	114	113
7	61	184	79	166	101	723	239	2460	904	1460	107	121
8	57	128	77	180	103	543	311	1340	1250	635	99	125
9	56	105	118	165	96	404	406	1100	966	450	92	123
10	55	93	104	154	85	331	430	2450	851	387	90	116
11	54	84	92	147	83	282	403	1470	584	309	88	114
12	51	78	81	171	94	252	352	1020	586	396	89	393
13	50	76	61	200	100	239	315	793	842	646	89	373
14	48	72	72	211	96	242	287	645	552	467	93	252
15	48	70	80	225	97	228	282	560	428	347	89	244
16	50	66	78	238	104	273	269	495	383	561	106	4110
17	51	89	81	234	102	264	240	430	343	784	111	2660
18	50	103	72	217	119	254	218	378	294	549	171	945
19	50	98	67	194	117	260	204	335	275	417	227	598
20	48	92	70	172	121	266	190	304	404	342	179	445
21	68	84	83	153	216	433	175	286	542	292	140	409
22	67	79	96	137	626	519	165	260	464	254	157	4730
23	77	82	130	124	482	468	157	355	423	240	144	5100
24	67	80	127	120	372	678	149	290	464	213	127	1590
25	60	78	144	113	296	714	142	245	364	209	139	1020
26	58	74	159	108	272	596	152	224	360	211	150	1810
27	56	81	144	104	246	463	174	214	290	206	136	1450
28	55	110	133	99	236	380	224	198	246	202	130	942
29	56	144	124	95	---	328	546	178	216	165	127	711
30	56	127	116	94	---	292	448	167	191	207	127	675
31	57	---	110	96	---	265	---	158	---	327	126	---
TOTAL	1817	3055	3087	4808	4715	11084	7775	27929	13367	14576	4184	29767
MEAN	58.6	102	99.6	155	168	358	259	901	446	470	135	992
MAX	83	273	159	238	626	723	546	4060	1250	1900	262	5100
MIN	48	66	61	94	83	185	142	158	150	152	88	112
CFSM	.15	.26	.25	.39	.43	.91	.66	2.28	1.13	1.19	.34	2.51
IN.	.17	.29	.29	.45	.44	1.04	.73	2.63	1.26	1.37	.39	2.80
CAL YR 1988	TOTAL	59989	MEAN	164	MAX	1140	MIN	37	CFSM	.41	IN.	5.65
WTR YR 1989	TOTAL	126164	MEAN	346	MAX	5100	MIN	48	CFSM	.88	IN.	11.88

ROANOKE RIVER BASIN

02055100 TINKER CREEK NEAR DALEVILLE, VA

LOCATION.--Lat 37°25'03", long 79°56'08", Botetourt County, Hydrologic Unit 03010101, on left bank 1,100 ft downstream from Norfolk Southern Railway bridge, 0.2 mi downstream from unnamed tributary, 0.5 mi south of Glebe Mills, and 1.3 mi northwest of Daleville.

DRAINAGE AREA.--11.7 mi².

PERIOD OF RECORD.--April 1956 to current year.

REVISED RECORDS.--WSP 1904: 1958-60(P). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,217.47 ft above National Geodetic Vertical Datum of 1929 (Norfolk Southern Railway bench mark).

REMARKS.--Records good except those for periods with ice effect, Dec. 12-14, 18, 19, and Feb. 9-11, which are fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--33 years, 11.9 ft³/s, 13.81 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,400 ft³/s, Nov. 4, 1985, gage height, 13.36 ft, from flood-mark, from rating curve extended above 130 ft³/s on basis of contracted-opening measurement at gage height 9.82 ft and slope-area measurements at gage heights 8.52 ft, 9.82 ft, and 13.36 ft; minimum, 0.20 ft³/s, Jan. 24, 1961, result of freezeup; minimum daily, 0.90 ft³/s, July 26, 1966; minimum gage height, 0.99 ft, June 12, 24, 1970.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1940 reached a stage of 9.0 ft, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 250 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 1	1400	425	4.60	July 25	1815	1,100	6.61
May 5	2345	618	5.34	Aug. 21	1615	271	3.86
July 5	0645	252	3.75	Sept. 16	0330	*1,350	*7.11
July 12	1500	432	4.63	Sept. 16	1600	692	5.58
July 13	0330	260	3.80				

Minimum discharge, 2.4 ft³/s, Dec. 12, 13, Feb. 9, result of freezeup; minimum daily, 2.5 ft³/s, Dec. 13; minimum gage height, 1.13 ft, Feb. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	6.1	3.4	4.3	4.3	6.0	9.9	86	8.0	4.1	10	4.8
2	3.4	4.6	3.2	3.9	4.0	5.4	9.2	73	7.8	4.0	9.1	4.7
3	3.5	4.3	3.1	3.8	4.1	5.5	9.2	36	7.8	4.1	8.2	4.6
4	4.3	4.2	3.1	3.7	3.9	5.9	9.3	28	7.3	6.6	7.6	4.4
5	3.3	12	3.0	3.4	4.2	5.7	9.8	80	7.8	61	7.4	4.4
6	3.1	6.6	3.0	4.7	4.2	26	8.5	125	8.1	25	6.9	4.5
7	3.0	4.8	3.0	5.0	4.2	24	10	55	13	20	6.5	5.0
8	3.0	3.9	2.9	5.1	3.8	18	13	39	9.2	13	6.1	4.7
9	3.0	3.6	3.9	4.5	e3.5	14	13	56	17	10	5.9	4.4
10	3.0	3.4	3.5	4.3	e3.0	12	11	62	11	8.7	5.8	4.2
11	3.0	3.3	3.1	4.1	e3.1	11	9.6	42	8.3	7.2	6.0	4.2
12	3.3	3.0	e2.7	5.6	3.5	9.9	8.8	36	8.4	47	5.9	15
13	4.0	3.4	e2.5	5.3	3.7	9.9	8.4	31	12	56	5.7	7.6
14	3.2	3.2	e2.7	5.0	4.0	9.5	7.9	28	8.6	23	5.6	5.6
15	3.3	3.0	3.1	6.5	4.4	9.4	8.5	26	7.4	19	5.6	5.3
16	3.3	3.1	3.1	6.5	4.3	9.5	7.7	22	7.2	25	5.5	287
17	3.4	3.6	3.0	6.0	4.3	8.5	7.1	20	6.7	24	5.6	57
18	3.4	3.2	e2.8	5.7	4.5	9.8	6.7	19	6.1	19	7.1	36
19	3.7	3.1	e2.6	5.7	4.6	9.6	6.4	17	5.8	15	6.7	30
20	3.6	3.5	2.9	5.4	4.8	14	5.9	16	6.7	13	5.5	26
21	5.2	3.2	3.5	5.2	8.9	18	5.8	15	14	11	34	25
22	4.5	3.2	3.6	5.0	10	15	5.6	14	8.5	9.7	17	45
23	4.0	3.2	3.8	4.9	9.0	17	5.3	17	8.0	8.9	11	36
24	4.0	3.2	4.0	4.7	7.8	37	5.1	13	6.8	8.3	8.0	27
25	4.1	3.0	4.5	4.7	6.8	24	7.8	12	5.7	102	7.5	24
26	4.1	3.0	4.0	4.7	6.8	20	8.1	12	5.2	28	6.7	56
27	4.1	3.3	3.8	4.6	6.3	17	7.0	11	4.9	21	6.2	33
28	4.2	4.7	3.7	4.4	6.5	15	7.4	9.8	4.8	16	5.7	27
29	4.0	3.6	3.6	4.3	---	14	10	9.2	4.5	12	5.6	24
30	4.0	3.6	3.5	4.3	---	13	9.7	8.9	4.2	11	5.5	24
31	4.0	---	3.5	4.5	---	11	---	8.4	---	11	5.0	---
TOTAL	113.0	119.9	102.1	149.8	142.5	424.6	251.7	1027.3	240.8	643.6	244.9	840.4
MEAN	3.65	4.00	3.29	4.83	5.09	13.7	8.39	33.1	8.03	20.8	7.90	28.0
MAX	5.2	12	4.5	6.5	10	37	13	125	17	102	34	287
MIN	3.0	3.0	2.5	3.4	3.0	5.4	5.1	8.4	4.2	4.0	5.0	4.2
CFSM	.31	.34	.28	.41	.43	1.17	.72	2.83	.69	1.77	.68	2.39
IN.	.36	.38	.32	.48	.45	1.35	.80	3.27	.77	2.05	.78	2.67

CAL YR 1988 TOTAL 1800.2 MEAN 4.92 MAX 36 MIN 1.2 CFSM .42 IN. 5.72
WTR YR 1989 TOTAL 4300.6 MEAN 11.8 MAX 287 MIN 2.5 CFSM 1.01 IN. 13.67

e Estimated.

02056000 ROANOKE RIVER AT NIAGARA, VA

LOCATION.--Lat 37°15'18", long 79°52'18", Roanoke County, Hydrologic Unit 03010101, on right bank 200 ft downstream from powerplant of Appalachian Power Company at Niagara, 2 mi downstream from Tinker Creek, 2.1 mi southeast of Vinton, and at mile 355.3.

DRAINAGE AREA.--512 mi².

PERIOD OF RECORD.--July 1926 to current year.

REVISED RECORDS.--WSP 972: 1927(M), 1929(M), 1934(M), 1937(M). WSP 1303: 1928, 1930, 1933-38, 1940. WSP 2104: Drainage area. WDR VA-72-1: 1928(M), 1930(M), 1933(M), 1935-36(M), 1938(M), 1940, 1944-45(M), 1948-49(M), 1951(M), 1955(M), 1960(M), 1967(M), 1969(M).

GAGE.--Water-stage recorder. Datum of gage is 820.15 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--No estimated daily discharges. Records good. Flow regulated by dam and powerplant 200 ft upstream from station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--63 years, 513 ft³/s, 13.61 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 52,300 ft³/s, Nov. 4, 1985, gage height, 25.30 ft, from floodmark, from rating curve extended above 12,000 ft³/s on basis of slope-area measurements at gage heights 18.98 ft and 25.30 ft; minimum, 1.0 ft³/s, Oct. 16, 20, 1956; minimum daily, 8 ft³/s, Oct. 9, 1954; minimum gage height, 0.17 ft, Aug. 25, 1971.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	0200	4,940	8.93	July 6	2345	7,840	10.88
May 6	1800	7,360	10.60	Sept. 16	0500	10,200	12.13
May 10	0730	3,990	8.15	Sept. 16	1900	9,140	11.60
July 5	0745	5,100	9.05	Sept. 23	0030	*14,800	*14.20

Minimum discharge, 24 ft³/s, Oct. 27; minimum daily, 116 ft³/s, Oct. 29; minimum gage height, 0.70 ft, Aug. 31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	159	199	211	247	174	321	328	1640	232	255	540	211
2	158	159	224	240	179	286	334	4110	228	256	424	196
3	143	154	169	238	177	266	329	1920	231	251	310	195
4	207	149	162	229	177	308	298	1160	255	510	333	195
5	139	385	190	210	177	309	383	1150	343	2940	309	178
6	190	372	166	232	177	572	345	5940	384	1960	292	179
7	135	305	164	235	205	908	361	3470	1410	2130	281	207
8	125	243	167	267	187	716	454	1880	1520	845	264	205
9	128	201	233	264	182	572	556	1610	1440	634	252	194
10	157	184	213	243	173	453	562	3480	1080	575	248	194
11	137	173	179	229	177	428	548	2110	763	461	247	195
12	128	168	151	260	175	406	463	1430	888	781	247	629
13	149	168	147	278	173	343	441	1090	1360	1360	241	403
14	138	164	146	293	191	389	406	888	786	773	256	256
15	137	170	188	294	193	329	400	780	616	564	247	246
16	145	159	149	332	195	451	398	647	514	877	252	6110
17	149	191	169	310	199	399	326	604	477	1070	255	3390
18	137	176	167	289	207	379	321	489	418	785	337	1170
19	135	186	137	280	226	385	297	456	352	606	369	776
20	137	187	141	258	225	407	281	443	517	560	321	563
21	156	187	170	251	324	637	269	438	772	477	305	559
22	173	187	173	230	711	656	268	325	636	451	318	5230
23	168	164	220	207	610	622	266	527	494	442	286	6150
24	178	152	213	205	494	926	240	389	611	336	256	1730
25	148	156	233	193	394	910	237	328	467	378	262	1110
26	136	154	236	187	353	798	287	332	481	508	272	2170
27	128	169	242	186	341	638	275	322	372	464	252	1630
28	118	250	229	183	344	538	370	288	354	361	243	1120
29	116	227	214	183	---	488	721	252	317	348	281	874
30	117	207	204	180	---	437	536	242	273	392	265	778
31	122	---	198	170	---	391	---	252	---	639	157	---
TOTAL	4493	5946	5805	7403	7340	15668	11300	38992	18591	22989	8922	37043
MEAN	145	198	187	239	262	505	377	1258	620	742	288	1235
MAX	207	385	242	332	711	926	721	5940	1520	2940	540	6150
MIN	116	149	137	170	173	266	237	242	228	251	157	178
CFSM	.28	.39	.37	.47	.51	.99	.74	2.46	1.21	1.45	.56	2.41
IN.	.33	.43	.42	.54	.53	1.14	.82	2.83	1.35	1.67	.65	2.69

CAL YR 1988 TOTAL 99425 MEAN 272 MAX 1420 MIN 114 CFSM .53 IN. 7.22
WTR YR 1989 TOTAL 184492 MEAN 505 MAX 6150 MIN 116 CFSM .99 IN. 13.40

ROANOKE RIVER BASIN

02056650 BACK CREEK NEAR DUNDEE, VA

LOCATION.--Lat 37°13'39", long 79°52'06", Roanoke County, Hydrologic Unit 03010101, on right bank 65 ft (revised) upstream from bridge on State Highway 660, 0.9 mi upstream from Horseshoe Branch, 1.1 mi southeast of Dundee, 2.8 mi west of Hardy post office, and at mile 2.4.

DRAINAGE AREA.--56.8 mi².

PERIOD OF RECORD.--July 1974 to current year.

GAGE.--Water-stage recorder. Datum of gage is 822.67 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 4, 1975, nonrecording gage, and Apr. 4, 1975, to Nov. 4, 1985, water-stage recorder, at site 80 ft downstream at same datum.

REMARKS.--Records good except those for period of no gage-height record, Oct. 5 to Nov. 15, and periods with ice effect, Dec. 13, 14, 19, and Feb. 11, 12, which are fair. Several measurements of water temperature were made during the year.

AVERAGE DISCHARGE.--15 years, 60.1 ft³/s, 14.37 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,000 ft³/s, Nov. 4, 1985, gage height, 25.1 ft, from flood-mark, present site, from rating curve extended above 5,900 ft³/s on basis of slope-area measurement of peak flow; minimum daily, 0.90 ft³/s, Aug. 30, 1981.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods of May 30, 1971, and June 21, 1972, reached a stage of 17.5 ft and 20.0 ft, respectively, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
June 7	0745	910	6.84	July 7	0045	*3,370	*11.41
July 5	0700	947	6.94	Sept. 16	0500	899	6.81
July 5	1430	950	6.95	Sept. 22	1530	1,280	7.78

Minimum discharge, 6.3 ft³/s, Feb. 11, result of freezeup; minimum daily, 9.5 ft³/s, Feb. 11; minimum gage height, 2.45 ft, Dec. 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	e25	20	20	16	30	33	85	20	25	32	15
2	11	e20	18	25	15	27	30	182	19	24	30	15
3	13	e18	17	22	14	26	29	112	23	23	27	14
4	18	e17	17	20	14	34	29	79	21	39	26	13
5	e14	e60	15	18	14	35	33	74	22	518	24	14
6	e13	e30	15	22	16	107	29	329	42	373	22	15
7	e13	e20	15	28	17	127	32	182	337	771	21	16
8	e12	e16	15	25	17	75	49	121	108	159	20	18
9	e12	e15	18	24	14	58	59	107	283	107	19	16
10	e11	e14	21	22	12	48	47	202	155	84	19	14
11	e11	e13	17	21	e9.5	41	43	134	89	61	19	13
12	e11	e12	14	29	e12	37	39	102	66	72	21	57
13	e10	e14	e12	30	14	34	36	83	75	92	22	35
14	e10	e12	e14	26	15	37	34	69	53	84	22	23
15	e11	e11	16	27	15	33	35	61	47	55	23	20
16	e11	11	17	29	15	31	34	54	46	81	24	349
17	e12	20	15	25	16	29	30	48	43	148	20	149
18	e11	19	14	24	16	28	29	43	36	97	25	68
19	e11	15	e13	23	18	28	27	38	33	76	46	49
20	e10	14	15	21	20	28	26	36	68	71	28	40
21	e21	14	17	20	35	55	25	35	109	56	23	45
22	e18	12	20	17	62	52	24	32	120	48	23	389
23	e16	12	19	18	45	47	23	52	73	44	20	248
24	e15	13	20	18	39	117	22	34	64	38	18	115
25	e14	13	22	17	31	92	22	30	47	35	30	82
26	e13	12	21	17	32	71	24	28	40	53	24	278
27	e12	12	20	16	30	58	24	26	35	43	21	137
28	e11	31	19	15	30	50	27	24	32	35	20	94
29	e12	25	18	15	---	45	54	23	30	31	18	76
30	e12	21	17	15	---	40	40	22	27	32	18	70
31	e17	---	17	16	---	38	---	22	---	45	16	---
TOTAL	397	541	528	665	603.5	1558	988	2469	2163	3420	721	2487
MEAN	12.8	18.0	17.0	21.5	21.6	50.3	32.9	79.6	72.1	110	23.3	82.9
MAX	21	60	22	30	62	127	59	329	337	771	46	389
MIN	10	11	12	15	9.5	26	22	22	19	23	16	13
CFSM	.23	.32	.30	.38	.38	.88	.58	1.40	1.27	1.94	.41	1.46
IN.	.26	.35	.35	.44	.40	1.02	.65	1.62	1.42	2.24	.47	1.63

CAL YR 1988 TOTAL 9181.3 MEAN 25.1 MAX 151 MIN 4.7 CFSM .44 IN. 6.01
WTR YR 1989 TOTAL 16540.5 MEAN 45.3 MAX 771 MIN 9.5 CFSM .80 IN. 10.83

e Estimated.

02056900 BLACKWATER RIVER NEAR ROCKY MOUNT, VA

LOCATION.--Lat 37°02'42", long 79°50'40", Franklin County, Hydrologic Unit 03010101, on right bank 45 ft downstream from bridge on State Highway 122, 3.0 mi northeast of Rocky Mount, and 4.1 mi upstream from Maggodee Creek.

DRAINAGE AREA.--115 mi².

PERIOD OF RECORD.--October 1976 to current year.

GAGE.--Water-stage recorder. Datum of gage is 876.45 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for period with ice effect, Dec. 13, and periods of doubtful gage-height record, Mar. 30 to Apr. 4, Apr. 6, 14-17, which are fair. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--13 years, 135 ft³/s, 15.94 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,800 ft³/s, Nov. 5, 1985, gage height, 21.92 ft, from rating curve extended above 7,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 6.6 ft³/s, July 21, 1986, gage height, 1.13 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	1930	3,460	9.35	June 9	1330	2,030	6.88
May 5	2030	2,010	6.83	July 5	1700	*5,550	*12.61
June 7	0230	2,300	7.36	Sept. 16	0630	2,190	7.16

Minimum discharge, 28 ft³/s, Feb. 10, gage height, 1.57 ft, result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	51	64	59	50	81	e86	114	59	79	101	57
2	38	60	59	68	49	74	e79	258	63	76	99	57
3	43	47	57	59	49	72	e74	153	92	74	89	55
4	63	43	54	57	48	82	e78	118	106	93	83	52
5	52	68	52	54	50	86	103	343	73	1850	78	51
6	40	135	52	58	53	963	e85	796	225	725	74	55
7	37	70	50	67	55	647	90	359	1310	315	70	58
8	37	57	50	65	53	238	117	228	328	224	66	61
9	37	52	56	64	48	174	128	193	1130	186	64	57
10	37	50	64	60	43	145	107	293	534	156	64	53
11	37	48	56	59	47	127	100	228	274	132	65	51
12	35	46	47	66	49	115	94	191	204	310	68	204
13	34	46	e45	76	47	108	90	165	193	351	68	142
14	33	46	59	71	47	119	e84	149	156	407	71	83
15	35	44	52	71	48	103	e87	138	144	173	90	112
16	37	44	50	73	50	96	e92	126	149	355	97	1140
17	36	132	49	68	55	88	e74	113	142	481	74	565
18	36	89	45	65	58	86	74	105	121	258	71	201
19	34	61	52	62	58	88	72	96	109	201	109	145
20	35	56	55	61	61	84	69	91	121	242	88	124
21	41	55	49	58	97	118	67	88	279	178	78	123
22	56	49	55	56	186	113	67	83	275	150	118	479
23	48	48	57	55	124	105	66	195	195	139	77	515
24	41	50	56	55	102	267	64	107	160	124	72	264
25	39	48	56	54	83	185	64	85	135	114	86	206
26	39	46	55	53	83	147	65	79	119	141	77	696
27	39	52	52	53	78	129	65	74	109	125	75	332
28	39	160	52	51	80	118	67	69	99	113	73	238
29	39	94	51	50	---	110	83	65	92	103	68	201
30	40	71	49	51	---	e100	76	64	84	98	67	199
31	40	---	50	52	---	e94	---	62	---	108	61	---
TOTAL	1234	1918	1650	1871	1851	5062	2467	5228	7080	8081	2441	6576
MEAN	39.8	63.9	53.2	60.4	66.1	163	82.2	169	236	261	78.7	219
MAX	63	160	64	76	186	963	128	796	1310	1850	118	1140
MIN	33	43	45	50	43	72	64	62	59	74	61	51
CFSM	.35	.56	.46	.52	.57	1.42	.72	1.47	2.05	2.27	.68	1.91
IN.	.40	.62	.53	.61	.60	1.64	.80	1.69	2.29	2.61	.79	2.13

CAL YR 1988 TOTAL 27267 MEAN 74.5 MAX 388 MIN 24 CFSM .65 IN. 8.82
WTR YR 1989 TOTAL 45459 MEAN 125 MAX 1850 MIN 33 CFSM 1.08 IN. 14.70

e Estimated.

ROANOKE RIVER BASIN

02057400 SMITH MOUNTAIN LAKE NEAR PENHOOK, VA

LOCATION.--Lat 37°02'28", long 79°32'09", Pittsylvania County, Hydrologic Unit 03010101, at dam on Roanoke (Staunton) River 6.5 mi northeast of Penhook and at mile 314.0.

DRAINAGE AREA.--1,024 mi².

PERIOD OF RECORD.--September 1963 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to July 19, 1965, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by concrete dam. Two ungated spillways, one near each end of dam, with crests at elevation 795 ft, are each 105 ft long. Initial filling began in September 1963 during construction; water in reservoir first reached minimum power pool, elevation, 787 ft, in May 1965. Total capacity at maximum pool elevation, 811 ft, is 1,517,000 acre-ft of which 375,000 acre-ft is above the spillway crest; 157,800 acre-ft is normally used for power between elevation 787 ft, minimum power pool, and the spillway crest. Capacity at invert of lowest penstock, elevation, 601 ft, is 100 acre-ft. Figures given herein represent total contents. Reservoir is part of the Smith Mountain Combination Project (pumped storage) which is used for hydroelectric power, flood control, low-water regulation for pollution abatement and water supply, water releases for downstream fish spawning, and recreation.

COOPERATION.--Records were provided by the Appalachian Power Company.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,250,200 acre-ft, Apr. 27, 1978, elevation, 799.8 ft; minimum (after first filling to minimum power pool), 995,400 acre-ft, Jan. 23, 1970, elevation, 787.6 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,148,800 acre-ft, May 6, elevation, 795.3 ft; minimum, 1,056,300 acre-ft, Dec. 12, 13, Feb. 17, elevation, 790.8 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	793.1	1,103,200	-
Oct. 31.....	792.5	1,091,000	-12,200
Nov. 30.....	791.8	1,076,700	-14,300
Dec. 31.....	792.1	1,082,800	+6,100
CAL YR 1988.....	-	-	-32,700
Jan. 31.....	792.1	1,082,800	0
Feb. 28.....	792.0	1,080,800	-2,000
Mar. 31.....	793.8	1,117,500	+36,700
Apr. 30.....	794.9	1,140,000	+22,500
May 31.....	793.7	1,115,500	-24,500
June 30.....	793.9	1,119,600	+4,100
July 31.....	794.3	1,127,700	+8,100
Aug. 31.....	794.0	1,121,600	-6,100
Sept. 30.....	794.6	1,133,800	+12,200
WTR YR 1989.....	-	-	+30,600

02058400 PIGG RIVER NEAR SANDY LEVEL, VA

LOCATION.--Lat 36°56'45", long 79°31'30", Pittsylvania County, Hydrologic Unit 03010101, on left bank 300 ft downstream from Harpen Creek, 0.5 mi upstream from bridge on State Highway 40, and 1.1 mi south of Sandy Level.

DRAINAGE AREA.--350 mi².

PERIOD OF RECORD.--May 1963 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 617.00 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). Prior to Nov. 18, 1963, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Records for periods Mar. 21 to Apr. 11 and July 29 to Aug. 16 were provided by Appalachian Power Company. Appalachian Power Company gage-height transmitter at station, recorder at Roanoke. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--26 years, 373 ft³/s, 14.47 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 65,600 ft³/s, Sept. 8, 1987, gage height, 31.12 ft, from high-water marks, from rating curve extended above 25,500 ft³/s on basis of slope-area measurement of peak flow; minimum, 24 ft³/s, Aug. 29, 30, 1981, gage height, 1.95 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 7	0900	4,360	8.60	July 6	1030	8,220	14.15
May 6	1230	*8,380	*14.35	Sept. 16	0900	6,200	11.43
June 7	0530	4,550	8.92	Sept. 26	0930	4,740	9.24

Minimum discharge, 111 ft³/s, Dec. 13, gage height, 2.44 ft, result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	124	202	246	202	166	414	262	296	196	200	311	179
2	127	216	217	262	164	347	226	2220	185	196	254	171
3	156	179	200	228	163	305	226	769	301	196	246	164
4	257	157	190	199	164	319	233	436	239	205	196	156
5	224	181	180	183	165	323	302	386	227	1760	196	152
6	162	294	174	186	177	598	311	5560	464	5460	196	159
7	140	253	171	205	188	3060	330	1660	2910	1030	196	170
8	136	190	169	203	186	826	554	745	1050	548	171	175
9	134	170	180	204	170	513	516	536	1390	382	164	170
10	132	162	209	196	158	404	391	627	1100	319	164	158
11	132	159	190	188	153	346	330	529	514	284	164	151
12	128	153	165	210	163	314	299	428	365	259	192	177
13	122	152	137	269	163	300	281	377	388	774	196	537
14	119	152	189	283	159	336	266	341	342	1410	206	241
15	123	151	174	259	160	308	278	406	598	449	302	199
16	132	149	161	256	166	280	304	414	535	717	271	4730
17	126	619	157	231	205	259	269	319	638	651	212	2300
18	125	406	141	214	235	249	250	291	420	472	200	736
19	124	251	154	208	230	242	242	271	327	365	227	432
20	121	208	169	200	234	242	234	259	299	1020	260	337
21	131	203	160	190	489	345	224	255	369	594	207	330
22	174	189	170	182	1150	391	222	245	481	400	617	333
23	166	176	172	178	625	330	219	268	369	306	427	756
24	143	176	170	178	438	1270	213	319	300	274	245	443
25	132	172	189	175	337	842	211	247	269	280	242	321
26	131	163	180	173	301	498	223	231	244	249	293	3410
27	131	181	164	171	314	391	230	224	249	536	234	1220
28	131	796	163	167	354	345	301	212	234	271	225	613
29	133	556	163	167	---	320	353	204	221	246	209	445
30	134	306	158	169	---	293	330	200	209	229	221	434
31	134	---	160	170	---	279	---	198	---	593	200	---
TOTAL	4384	7322	5422	6306	7577	15289	8630	19473	15433	20675	7444	19799
MEAN	141	244	175	203	271	493	288	628	514	667	240	660
MAX	257	796	246	283	1150	3060	554	5560	2910	5460	617	4730
MIN	119	149	137	167	153	242	211	198	185	196	164	151
CFSM	.40	.70	.50	.58	.77	1.41	.82	1.79	1.47	1.91	.69	1.89
IN.	.47	.78	.58	.67	.81	1.63	.92	2.07	1.64	2.20	.79	2.10

CAL YR 1988 TOTAL 94892 MEAN 259 MAX 1860 MIN 90 CFSM .74 IN. 10.09
WTR YR 1989 TOTAL 137754 MEAN 377 MAX 5560 MIN 119 CFSM 1.08 IN. 14.64

ROANOKE RIVER BASIN

02059400 LEESVILLE LAKE NEAR LEESVILLE, VA

LOCATION.--Lat 37°05'35", long 79°24'09", Campbell County, Hydrologic Unit 03010101, at Leesville Dam on Roanoke (Staunton) River, 2.0 mi south of Leesville, 3.5 mi upstream from Goose Creek, and at mile 296.

DRAINAGE AREA.--1,505 mi².

PERIOD OF RECORD.--September 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to June 6, 1963, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by concrete dam. Spillway, with crest at elevation 578.0 ft, is equipped with 4 radial gates 35 ft high by 50 ft wide. Storage began on Sept. 29, 1962, during construction, and water in reservoir first reached minimum power pool, elevation, 600.0 ft, on Mar. 5, 1963. Total capacity at maximum pool elevation, 613 ft, is 94,960 acre-ft of which 75,960 acre-ft is above the spillway crest elevation; 38,200 acre-ft is normally used for power between elevations 600.0 ft, minimum power pool, and 613.0 ft. Capacity at invert of lowest penstock, elevation, 579.75 ft, is 21,010 acre-ft. Figures given herein represent total contents. Reservoir is part of the Smith Mountain Combination Project (see station 02057400).

COOPERATION.--Records were provided by the Appalachian Power Company.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 98,180 acre-ft, Feb. 1, 1965, elevation, 614.0 ft; minimum (after first filling to minimum power pool), 39,880 acre-ft, Mar. 19, 1963, elevation, 592.0 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 94,960 acre-ft, July 14, elevation, 613.0 ft; minimum, 57,470 acre-ft, Oct. 24, 31, Nov. 7, Dec. 5, elevation, 600.1 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	605.4	71,780	-
Oct. 31.....	601.3	60,680	-11,100
Nov. 30.....	607.3	77,360	+16,680
Dec. 31.....	601.8	62,020	-15,340
CAL YR 1988.....	-	-	-10,930
Jan. 31.....	601.2	60,420	-1,600
Feb. 28.....	606.4	74,720	+14,300
Mar. 31.....	611.5	90,130	+15,410
Apr. 30.....	604.9	70,330	-19,800
May 31.....	609.6	84,120	+13,790
June 30.....	610.3	86,270	+2,150
July 31.....	608.0	79,420	-6,850
Aug. 31.....	608.7	81,480	+2,060
Sept. 30.....	602.9	64,970	-16,510
WTR YR 1989.....	-	-	-6,810

02059500 GOOSE CREEK NEAR HUDDLESTON, VA

LOCATION.--Lat 37°10'23", long 79°31'14", Bedford County, Hydrologic Unit 03010101, on left bank 0.3 mi upstream from Haden Bridge on State Highway 732, 0.4 mi upstream from Rockcastle Creek, and 3.5 mi northwest of Huddleston.

DRAINAGE AREA.--188 mi².

PERIOD OF RECORD.--March 1925 to August 1928 (gage heights only), September 1930 to current year.

REVISED RECORDS.--WSP 892: 1933, 1935(M), 1939. WSP 972: 1931-32(M), 1934(M), 1935-38, 1940, 1941(M). WSP 1082: 1940(P). WSP 1142: 1938-40(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 592.91 ft above National Geodetic Vertical Datum of 1929. Mar. 15, 1925, to Aug. 4, 1928, nonrecording gage at site 1,300 ft downstream at different datum.

REMARKS.--Records good except those for periods of doubtful or no gage-height record, Oct. 23-25, Apr. 11-17, periods with ice effect, Dec. 13, 17, and period May to September, which are fair. Prior to October 1954, diurnal fluctuation at low flow caused by mill upstream from station. Appalachian Power Company gage-height transmitter at station, recorder at Roanoke. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--59 years, 180 ft³/s, 13.00 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,200 ft³/s, Sept. 8, 1987, gage height, 37.49 ft, from floodmarks, from rating curve extended above 11,000 ft³/s on basis of slope-area measurements at gage heights 19.25 ft, 24.1 ft, 24.89 ft, and 37.49 ft; minimum, 3 ft³/s, Aug. 31, 1932, Jan. 30, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	1830	6,000	14.08	July 27	0115	3,010	8.76
May 2	0015	2,890	8.52	Sept. 16	0415	2,750	8.59
May 6	Unknown	*19,500	*a25.34	Sept. 16	2230	3,200	9.15
May 10	0315	2,420	8.11	Sept. 26	0230	3,020	9.28
June 7	1400	2,430	7.52				

a From floodmarks.

Minimum daily discharge, 44 ft³/s, Oct. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	59	70	98	87	72	122	165	885	109	102	522	61
2	59	70	87	93	71	112	155	1930	106	97	290	59
3	71	51	81	85	72	109	149	952	105	96	202	87
4	80	49	78	82	74	148	149	614	103	121	154	69
5	63	82	72	78	76	155	186	e2500	102	966	126	60
6	50	144	70	86	83	1640	172	e6600	288	1070	122	60
7	47	94	70	98	88	1040	176	e1750	1730	789	117	68
8	48	76	69	94	83	556	231	e1000	600	287	86	97
9	48	69	86	92	73	396	266	e820	882	202	76	82
10	47	66	104	86	73	310	221	1650	734	183	73	71
11	48	66	85	84	77	256	e190	876	356	164	83	64
12	46	64	80	101	76	218	e170	622	270	151	103	153
13	44	65	e74	124	69	195	e160	479	765	244	86	218
14	45	68	110	105	73	199	e150	380	423	358	88	157
15	47	65	89	108	75	176	e160	342	302	202	100	192
16	47	62	74	115	82	202	e150	330	293	694	85	2030
17	47	152	e72	104	100	187	e128	248	290	479	78	1100
18	47	117	69	98	94	175	126	202	210	302	81	436
19	46	85	83	94	94	173	124	181	187	217	107	257
20	45	81	86	88	107	174	118	170	177	477	91	199
21	52	79	74	83	194	278	113	165	310	213	89	208
22	63	71	96	79	240	271	112	155	194	179	120	225
23	e60	69	87	80	195	232	110	254	165	158	138	238
24	e54	73	91	78	170	751	107	176	151	144	94	169
25	e50	71	101	76	144	534	129	151	141	192	94	214
26	46	67	94	75	136	383	293	144	139	196	86	1680
27	46	74	86	75	125	295	268	139	129	848	85	658
28	47	274	84	72	127	244	348	128	121	274	82	430
29	46	156	80	71	---	217	316	122	117	239	84	345
30	47	114	79	74	---	200	259	117	109	230	89	322
31	48	---	79	75	---	189	---	111	---	476	68	---
TOTAL	1593	2644	2588	2740	2943	10137	5401	24193	9608	10350	3699	10009
MEAN	51.4	88.1	83.5	88.4	105	327	180	780	320	334	119	334
MAX	80	274	110	124	240	1640	348	6600	1730	1070	522	2030
MIN	44	49	69	71	69	109	107	111	102	96	68	59
CFSM	.27	.47	.44	.47	.56	1.74	.96	4.15	1.70	1.78	.63	1.77
IN.	.32	.52	.51	.54	.58	2.01	1.07	4.79	1.90	2.05	.73	1.98

CAL YR 1988 TOTAL 39453 MEAN 108 MAX 746 MIN 30 CFSM .57 IN. 7.81
WTR YR 1989 TOTAL 85905 MEAN 235 MAX 6600 MIN 44 CFSM 1.25 IN. 17.00

e Estimated.

ROANOKE RIVER BASIN

02060500 ROANOKE (STAUNTON) RIVER AT ALTAVISTA, VA

LOCATION.--Lat 37°06'16", long 79°17'44", Pittsylvania County, Hydrologic Unit 03010101, on right bank 12 ft upstream from bridge on alternate U.S. Highway 29, 0.3 mi south of Altavista, 0.3 mi downstream from Sycamore Creek, 3.5 mi upstream from Big Otter River, and at mile 286.5.

DRAINAGE AREA.--1,789 mi².

PERIOD OF RECORD.--August 1930 to current year.

REVISED RECORDS.--WSP 892: 1938(M). WSP 972: 1931-33. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 503.10 ft above National Geodetic Vertical Datum of 1929. Prior to Feb. 21, 1951, on left bank 50 ft downstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1962 by Leesville Lake (station 02059400) 9.5 mi upstream and since 1963 by Smith Mountain Lake (station 02057400) 27.5 mi upstream. U.S. Army Corps of Engineers satellite gage-height telemeter at station. Appalachian Power Company gage-height transmitter at station, recorder at Roanoke. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--59 years, 1,788 ft³/s, 13.57 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 105,000 ft³/s, Aug. 15, 1940, gage height, 40.08 ft, from floodmark, from rating curve extended above 52,000 ft³/s on basis of unit hydrograph and flood-routing studies by U.S. Army Corps of Engineers and records for other stations in Roanoke River basin; minimum, 13 ft³/s, Jan. 30, 1966; minimum daily, 39 ft³/s, July 10, 1966; minimum gage height, 1.53 ft, Jan. 2, 1977, result of freezeup.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 18,600 ft³/s, May 6, gage height, 18.87 ft; minimum daily, 423 ft³/s, Feb. 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	799	863	883	865	821	938	945	3940	995	944	3460	946		
2	828	875	869	872	839	897	943	12400	958	934	2210	916		
3	844	818	835	867	840	887	946	5770	982	911	1060	894		
4	867	799	833	856	846	916	888	3990	957	1930	945	880		
5	842	824	846	842	836	935	1350	3280	963	8770	971	860		
6	817	889	832	849	855	1780	1710	16800	1070	10900	940	870		
7	814	883	833	850	877	3610	1150	14100	11100	10200	937	885		
8	816	849	815	864	834	1430	1750	12700	10700	5110	913	895		
9	822	845	828	865	827	1190	2760	10200	9740	1710	900	923		
10	799	833	849	843	847	1090	2060	6570	5610	1640	898	901		
11	805	830	846	834	825	1070	1600	2150	1900	1520	901	824		
12	797	824	819	865	822	1020	1530	2040	1110	1190	914	791		
13	797	826	792	920	824	1000	1150	2440	1660	2440	881	878		
14	807	816	818	902	880	1030	1080	2360	2370	2770	915	857		
15	784	808	830	892	1120	979	1080	2280	4670	3130	928	1060		
16	790	812	838	915	1120	961	1060	2170	2490	5030	919	10300		
17	786	999	821	883	1150	1190	1360	1960	1220	5190	958	14900		
18	805	936	801	843	423	843	1390	1690	1080	2770	1180	11300		
19	804	855	798	915	440	941	1380	1520	1020	1720	1210	3070		
20	795	849	831	881	847	973	1390	1470	3200	2050	963	3930		
21	807	859	843	846	1030	1120	1380	1460	1990	2460	917	9150		
22	831	843	874	829	1240	1160	1400	1440	2690	1550	1380	2940		
23	818	831	862	848	1120	1100	1400	1500	2050	1430	1710	1870		
24	817	834	866	844	1040	3840	1400	1520	1430	1120	1710	986		
25	857	832	871	947	994	3740	1430	1430	1030	1400	1490	3660		
26	862	822	876	1020	939	2600	1670	1430	996	1130	1080	10800		
27	867	841	854	975	947	2410	1520	1440	957	3850	1040	8580		
28	870	1200	844	470	942	1980	1630	1420	946	2410	993	3370		
29	548	1010	831	782	---	1340	1650	1400	943	1300	901	2290		
30	781	903	843	835	---	1020	1700	1390	949	1130	939	2970		
31	800	---	844	827	---	971	---	1380	---	1650	966	---		
TOTAL	25076	26008	26025	26646	25125	44961	42702	125640	77776	90289	36129	103496		
MEAN	809	867	840	860	897	1450	1423	4053	2593	2913	1165	3450		
MAX	870	1200	883	1020	1240	3840	2760	16800	11100	10900	3460	14900		
MIN	548	799	792	470	423	843	888	1380	943	911	881	791		
(*)	-379	+40	-150	-26	+221	+848	+45	-174	+105	+21	-65	-72		
MEAN†	430	907	690	834	1118	2298	1468	3879	2698	2934	1100	3378		
CFSM†	.24	.51	.39	.47	.62	1.28	.82	2.17	1.51	1.64	.61	1.89		
IN.†	.28	.57	.44	.54	.65	1.48	.92	2.50	1.68	1.89	.71	2.11		
CAL YR 1988	TOTAL	365645	MEAN	999	MAX	4600	MIN	340	MEAN†	939	CFSM†	.52	IN.†	7.15
WTR YR 1989	TOTAL	649873	MEAN	1780	MAX	16800	MIN	423	MEAN†	1813	CFSM†	1.01	IN.†	13.76

* Change in contents, equivalent in cubic feet per second, in Smith Mountain and Leesville Lakes; provided by Appalachian Power Company.

† Adjusted for change in contents.

02061500 BIG OTTER RIVER NEAR EVINGTON, VA

LOCATION.--Lat 37°12'30", long 79°18'14", Campbell County, Hydrologic Unit 03010101, on right bank 60 ft upstream from bridge on State Highway 682, 2.0 mi southwest of Evington, and 2.1 mi upstream from Flat Creek.

DRAINAGE AREA.--320 mi².

PERIOD OF RECORD.--October 1936 to current year. Monthly discharge only for some periods, published in WSP 1303.

Prior to October 1965, published as Otter River near Evington.

REVISED RECORDS.--WSP 852: 1937. WSP 892: 1938-39(M). WSP 972: 1937-39. WSP 1032: 1940. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 544.02 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for periods with ice effect, Dec. 13, 17, 18, and periods of doubtful gage-height record, May 19, 21, May 26 to June 5, June 24-26, and Sept. 18-21, 24, 25, which are fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--53 years, 333 ft³/s, 14.13 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 41,900 ft³/s, Sept. 8, 1987, gage height, 24.96 ft, from rating curve extended above 24,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 7.5 ft³/s, Sept. 14, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods in October 1937 and August 1939 reached a stage of 23.1 ft, discharge, 27,500 ft³/s, from rating curve extended above 7,000 ft³/s on basis of unit hydrograph and flood-routing studies by U.S. Army Corps of Engineers, and records for other stations in Roanoke River basin.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 7	0430	4,720	10.86	June 7	1030	4,640	10.71
May 2	0330	5,300	11.98	Sept. 16	0700	7,850	15.47
May 6	0530	*25,600	*22.27	Sept. 16	2300	4,920	11.27
May 10	1000	4,050	9.51	Sept. 26	0430	5,600	12.51

Minimum discharge, 57 ft³/s, Oct. 14, gage height, 0.19 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64	124	122	147	130	190	244	1990	e200	211	914	131
2	67	126	107	168	125	169	228	3680	e198	203	376	128
3	79	87	99	148	125	161	221	1290	e195	199	290	146
4	105	77	93	140	130	205	218	792	e220	235	241	131
5	94	84	87	127	141	250	265	989	e196	878	217	122
6	74	153	83	148	158	846	260	12400	374	1140	206	125
7	67	111	82	192	173	2450	246	2690	3470	714	197	150
8	65	87	81	181	178	684	348	1490	1250	396	180	190
9	64	82	95	183	148	461	439	1220	865	307	165	144
10	64	78	141	171	122	363	340	3110	975	285	161	130
11	65	76	113	157	166	301	295	1610	623	247	182	122
12	62	73	84	181	146	262	273	1120	604	218	197	514
13	59	73	e80	261	131	235	260	870	1130	259	181	353
14	58	79	114	221	134	256	233	708	883	386	171	203
15	62	77	99	219	142	223	250	719	593	269	177	211
16	67	72	103	260	158	313	246	1020	599	587	166	5230
17	69	187	e100	222	251	248	217	586	679	552	163	1920
18	71	194	e88	198	212	225	218	507	552	404	195	e500
19	68	115	93	186	202	241	198	e480	457	334	166	e410
20	67	101	108	173	218	227	189	469	440	528	159	e330
21	82	103	133	162	339	466	181	e450	692	383	159	e370
22	109	95	189	150	478	433	177	393	1080	307	222	413
23	99	90	160	151	354	341	174	571	675	265	245	438
24	87	92	157	149	275	1170	167	441	e500	240	221	e330
25	82	92	177	146	225	732	189	341	e420	232	332	e270
26	80	86	171	141	207	490	1030	e290	e350	305	221	3230
27	81	96	151	138	197	403	788	e260	310	970	181	708
28	86	544	147	132	195	357	1100	e235	271	334	167	514
29	87	258	143	128	---	322	666	e225	253	252	155	448
30	88	149	135	132	---	296	556	e215	227	270	149	397
31	88	---	135	138	---	274	---	e210	---	884	139	---
TOTAL	2360	3661	3670	5250	5460	13594	10216	41371	19281	12794	6895	18308
MEAN	76.1	122	118	169	195	439	341	1335	643	413	222	610
MAX	109	544	189	261	478	2450	1100	12400	3470	1140	914	5230
MIN	58	72	80	127	122	161	167	210	195	199	139	122
CFSM	.24	.38	.37	.53	.61	1.37	1.06	4.17	2.01	1.29	.70	1.91
IN.	.27	.43	.43	.61	.63	1.58	1.19	4.81	2.24	1.49	.80	2.13

CAL YR 1988 TOTAL 62328 MEAN 170 MAX 1150 MIN 32 CFSM .53 IN. 7.25
WTR YR 1989 TOTAL 142860 MEAN 391 MAX 12400 MIN 58 CFSM 1.22 IN. 16.61

e Estimated.

ROANOKE RIVER BASIN

02062500 ROANOKE (STAUNTON) RIVER AT BROOKNEAL, VA

LOCATION.--Lat 37°02'28", long 78°57'02", Campbell County, Hydrologic Unit 03010102, on left bank 1,600 ft upstream from bridge on U.S. Highway 501 at Brookneal, 2.9 mi upstream from Falling River, and at mile 255.9.

DRAINAGE AREA.--2,415 mi².

PERIOD OF RECORD.--April 1923 to current year.

REVISED RECORDS.--WSP 892: 1928(M). WSP 972: 1928-34. WSP 1303: 1924-27(M), 1929(M), 1941(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 351.96 ft above National Geodetic Vertical Datum of 1929. Apr. 30, 1923, to Aug. 29, 1929, nonrecording gage, Aug. 30, 1929, to Aug. 15, 1940, water-stage recorder, and Aug. 16 to Oct. 1, 1940, nonrecording gage at site 1,800 ft downstream at same datum. Oct. 2, 1940, to Sept. 30, 1941, nonrecording gage at site 1,600 ft downstream at same datum.

REMARKS.--Records fair except for period of doubtful gage-height record, May 21 to June 5, which is poor. Flow regulated since 1962 by Leesville Lake (station 02059400) 40.1 mi upstream and since 1963 by Smith Mountain Lake (station 02057400) 58.1 mi upstream. Gage-height and U.S. Army Corps of Engineers satellite telemeters at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--66 years, 2,388 ft³/s, 13.43 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 130,000 ft³/s, Aug. 15, 1940, gage height, 46.5 ft, at present site, from gage-height relation curve, from rating curve extended above 55,000 ft³/s on basis of slope-area measurement by Geological Survey, unit hydrograph and flood-routing studies by U.S. Army Corps of Engineers, and records for other stations in Roanoke River basin; minimum daily, 140 ft³/s, July 25, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 40,000 ft³/s, May 6, gage height, 29.50 ft; minimum daily, 606 ft³/s, Oct. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	841	1090	1250	1090	1000	1480	1360	3660	e1500	1820	5290	1260		
2	877	1130	1170	1150	994	1340	1310	18200	e1280	1800	5030	1220		
3	962	1080	1100	1130	1010	1240	1290	12600	e1310	1760	2030	1180		
4	1050	977	1060	1090	1030	1270	1250	5450	e1300	1820	1520	1170		
5	1050	992	1040	1060	1030	1380	1360	6200	e1500	7020	1430	1130		
6	973	1100	1030	1050	1050	1850	2250	27000	1810	12900	1400	1110		
7	920	1190	1020	1110	1110	10000	2080	27200	10400	12700	1320	1140		
8	916	1090	1010	1120	1130	3480	2240	18000	15000	8920	1310	1200		
9	911	1020	1020	1120	1060	2280	4050	12800	12900	3670	1250	1240		
10	929	1010	1070	1110	1010	1890	3320	12600	8910	2110	1240	1180		
11	899	995	1120	1060	1020	1670	2430	4820	4930	2150	1400	1120		
12	904	980	1040	1100	1010	1560	2160	3430	2320	1970	1440	1120		
13	889	973	947	1240	1010	1460	1820	3600	2780	1670	1330	1710		
14	887	970	977	1310	995	1520	1500	3450	4480	3790	1260	1300		
15	900	980	1050	1240	1170	1470	1490	3330	5310	3930	1300	1220		
16	883	965	1030	1270	1320	1390	1520	3860	5370	5300	1380	12000		
17	893	1460	1000	1250	1440	1470	1540	3200	3560	7070	1370	24100		
18	906	1600	965	1170	1250	1630	1750	2720	2590	4890	1520	16800		
19	919	1250	924	1100	712	1120	1700	2380	2160	3150	1860	7470		
20	908	1110	982	1170	872	1290	1680	2290	2660	2210	1490	3490		
21	934	1080	1030	1100	1710	1590	1670	e2150	4340	3760	1340	10100		
22	991	1080	1050	1040	2470	2050	1660	e2100	4970	2640	1800	5550		
23	999	1030	1110	1040	2040	1750	1670	e2090	4010	2110	2920	4360		
24	970	1020	1090	1040	1780	4900	1650	e2200	2810	1790	2480	1530		
25	963	1020	1120	1090	1490	6420	1720	e2000	2330	1370	4440	2450		
26	993	1010	1120	1160	1440	4510	3030	e1900	2070	2010	2150	19200		
27	996	1040	1090	1220	1440	3520	3390	e1850	2080	3500	1650	14600		
28	999	2440	1070	995	1490	3260	4220	e1800	1950	5270	1500	6100		
29	1000	2280	1050	746	---	2230	3200	e1750	1890	1970	1360	3840		
30	606	1460	1030	964	---	1670	3060	e1700	1840	1730	1340	2670		
31	918	---	1050	1010	---	1490	---	e1690	---	2290	1300	---		
TOTAL	28786	35422	32615	34345	35083	74180	63370	198020	120360	119090	58450	152560		
MEAN	929	1181	1052	1108	1253	2393	2112	6388	4012	3842	1885	5085		
MAX	1050	2440	1250	1310	2470	10000	4220	27200	15000	12900	5290	24100		
MIN	606	965	924	746	712	1120	1250	1690	1280	1370	1240	1110		
(*)	-379	+40	-150	-26	+221	+848	+45	-174	+105	+21	-65	-72		
MEAN†	550	1221	902	1082	1474	3241	2157	6214	4117	3863	1820	5013		
CFSM‡	.23	.51	.37	.44	.61	1.34	.89	2.57	1.70	1.60	.75	2.08		
IN.‡	.26	.56	.43	.52	.64	1.55	1.00	2.97	1.90	1.84	.87	2.32		
CAL YR 1988	TOTAL	497803	MEAN	1360	MAX	8660	MIN	572	MEAN†	1300	CFSM‡	.54	IN.‡	7.33
WTR YR 1989	TOTAL	952281	MEAN	2609	MAX	27200	MIN	606	MEAN†	2642	CFSM‡	1.09	IN.‡	14.85

* Change in contents, equivalent in cubic feet per second, in Smith Mountain and Leesville Lakes; provided by Appalachian Power Company.

† Adjusted for change in contents.

e Estimated.

02064000 FALLING RIVER NEAR NARUNA, VA

LOCATION.--Lat 37°07'36", long 78°57'36", Campbell County, Hydrologic Unit 03010102, on left bank at upstream side of bridge on State Highway 643, 2.7 mi northeast of Naruna, and 3.2 mi upstream from Little Falling River.

DRAINAGE AREA.--173 mi².

PERIOD OF RECORD.--July 1929 to January 1935, September 1941 to current year.

REVISED RECORDS.--WSP 1333: 1930, 1931-34(M), 1935. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 412.32 ft above National Geodetic Vertical Datum of 1929. Prior to Jan. 15, 1935, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 13, 14, 18, 19, and period of no gage-height record, Aug. 12 to Sept. 27, which are fair. Small diurnal fluctuation caused by gristmill at Spring Mills.

Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--53 years (water years 1930-34, 1942-89), 149 ft³/s, 11.70 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,600 ft³/s, June 22, 1972, gage height, 29.21 ft, from rating curve extended above 7,100 ft³/s on basis of slope-area measurement of peak flow; minimum, 3.0 ft³/s, Oct. 9, 1932, gage height, 2.18 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of 26.5 ft, from floodmarks, discharge, 22,000 ft³/s, by slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 7	0315	2,630	9.84	July 31	2115	2,920	10.51
May 2	0730	3,920	12.56	Sept. 16	Unknown	3,030	a10.74
May 6	0315	*5,520	15.13				

a From floodmarks.

Minimum discharge, 37 ft³/s, Oct. 13, 14, gage height, 2.67 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39	119	104	82	65	186	118	295	118	94	865	e90
2	40	102	89	90	64	154	111	2220	125	93	225	e80
3	54	64	81	79	65	138	111	497	141	92	168	e74
4	82	57	76	72	75	177	111	283	131	96	140	e70
5	64	62	69	67	80	169	141	335	124	108	126	e67
6	48	82	67	77	94	578	203	4000	132	282	117	e66
7	43	65	66	94	109	1300	239	932	523	183	107	e84
8	42	58	65	86	114	351	436	438	223	128	100	e102
9	41	56	72	85	93	238	365	322	437	106	97	e82
10	42	54	89	79	79	196	222	512	276	104	95	e72
11	42	54	76	76	79	166	176	313	169	94	348	e70
12	40	52	67	99	78	149	151	247	211	96	e205	e84
13	38	52	e62	123	72	138	137	209	448	91	e150	e110
14	37	54	e70	110	75	157	126	187	471	231	e100	e100
15	40	54	69	113	76	140	134	198	277	119	e165	e120
16	42	53	68	119	88	129	136	331	243	340	e120	e2250
17	43	235	65	103	163	118	118	205	524	275	e105	e1300
18	44	151	e62	93	128	113	111	174	241	163	e110	e550
19	42	90	e57	88	121	111	106	154	177	134	e125	e240
20	43	77	69	83	134	110	101	144	159	343	e110	e195
21	51	74	63	77	464	219	97	142	195	184	e105	e180
22	76	66	71	71	475	199	95	135	223	135	e420	e220
23	57	61	68	71	288	161	92	138	160	115	e320	e200
24	50	60	69	70	232	919	89	140	221	104	e150	e190
25	45	58	89	70	189	395	119	123	139	100	e170	e185
26	44	56	74	68	180	240	707	120	126	114	e165	e1350
27	45	85	68	68	199	187	561	124	117	486	e135	e460
28	46	567	67	65	198	161	931	131	109	176	e115	270
29	47	205	68	64	---	145	441	129	105	130	e105	207
30	50	128	65	65	---	136	320	128	98	112	e125	183
31	49	---	67	67	---	131	---	115	---	775	e100	---
TOTAL	1466	2951	2212	2574	4077	7711	6805	13421	6643	5603	5488	9251
MEAN	47.3	98.4	71.4	83.0	146	249	227	433	221	181	177	308
MAX	82	567	104	123	475	1300	931	4000	524	775	865	2250
MIN	37	52	57	64	64	110	89	115	98	91	95	66
CFSM	.27	.57	.41	.48	.84	1.44	1.31	2.50	1.28	1.04	1.02	1.78
IN.	.32	.63	.48	.55	.88	1.66	1.46	2.89	1.43	1.20	1.18	1.99

CAL YR 1988 TOTAL 36127 MEAN 98.7 MAX 672 MIN 23 CFSM .57 IN. 7.77
WTR YR 1989 TOTAL 68202 MEAN 187 MAX 4000 MIN 37 CFSM 1.08 IN. 14.67

e Estimated.

ROANOKE RIVER BASIN

02065500 CUB CREEK AT PHENIX, VA

LOCATION.--Lat 37°04'45", long 78°45'50", Charlotte County, Hydrologic Unit 03010102, on right bank 10 ft upstream from bridge on State Highway 40, 0.9 mi west of Phenix, 1.9 mi downstream from Rough Creek, and 6.4 mi upstream from Louse Creek.

DRAINAGE AREA.--98.0 mi².

PERIOD OF RECORD.--August 1946 to current year.

REVISED RECORDS.--WSP 1333: 1947(M), 1948, 1949(M). WSP 2104: Drainage area. WDR VA-76-1: 1975.

GAGE.--Water-stage recorder. Datum of gage is 370.19 ft above National Geodetic Vertical Datum of 1929. Prior to July 14, 1950, nonrecording gage at same site and datum.

REMARKS.--Records good except for period of no gage-height record, Dec. 13-19, which is fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--43 years, 97.7 ft³/s, 13.54 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,600 ft³/s, Sept. 8, 1987, gage height, 19.31 ft, from floodmark, from rating curve extended above 5,400 ft³/s on basis of contracted-opening measurement of peak flow; maximum gage height, 20.37 ft, June 22, 1972; minimum discharge, 2.6 ft³/s, Oct. 6, 1970, gage height, 0.74 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods in August 1940 and June 1972 reached stages of 17.5 ft and 20.37 ft, respectively, from floodmarks.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 28	1900	1,520	8.52	Sept. 17	0430	1,500	8.48
May 2	2100	*2,030	*9.62	Sept. 27	0130	1,560	8.63
May 6	2130	1,990	9.54				

Minimum discharge, 23 ft³/s, Oct. 1, 2, gage height, 1.30 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	84	75	61	44	137	89	205	50	40	124	48
2	25	90	63	71	42	109	75	1010	48	39	84	45
3	31	52	56	59	42	94	75	897	55	39	69	42
4	54	43	52	53	47	104	75	221	53	41	60	39
5	46	57	49	48	52	110	90	172	62	51	55	39
6	32	73	47	51	59	146	144	859	92	120	52	41
7	27	52	46	59	67	398	146	949	127	93	49	42
8	26	44	45	56	69	419	277	318	185	64	47	43
9	26	40	48	56	57	152	243	168	167	49	44	42
10	26	39	59	52	50	124	155	249	156	43	44	39
11	27	39	53	50	42	105	121	225	84	40	97	37
12	27	38	48	59	40	92	103	158	68	39	81	46
13	25	37	e40	77	40	87	95	130	230	39	61	62
14	24	37	e45	70	46	108	88	115	143	116	55	54
15	27	37	e42	68	48	95	98	114	129	75	81	58
16	27	37	e40	72	48	84	115	178	239	348	59	632
17	27	61	e40	63	60	75	92	136	341	607	52	1340
18	26	88	e38	57	59	71	84	107	233	235	58	630
19	27	57	e36	55	61	68	79	92	111	109	63	156
20	26	52	43	53	65	66	75	85	87	95	55	127
21	33	51	39	50	167	113	70	81	87	87	56	139
22	59	45	49	47	545	138	68	74	81	74	173	125
23	42	42	47	47	419	100	65	77	76	65	196	112
24	33	42	45	47	244	271	63	120	70	61	85	99
25	31	40	58	46	155	456	67	80	61	58	98	101
26	30	39	52	45	130	183	182	68	56	56	94	516
27	30	60	46	45	129	121	167	64	53	132	72	971
28	30	276	46	44	134	103	711	57	49	186	64	212
29	30	352	49	43	---	93	610	54	47	94	58	139
30	31	101	46	44	---	92	261	53	42	69	66	126
31	31	---	47	45	---	111	---	53	---	261	56	---
TOTAL	960	2105	1489	1693	2961	4425	4583	7169	3282	3425	2308	6102
MEAN	31.0	70.2	48.0	54.6	106	143	153	231	109	110	74.5	203
MAX	59	352	75	77	545	456	711	1010	341	607	196	1340
MIN	24	37	36	43	40	66	63	53	42	39	44	37
CFSM	.32	.72	.49	.56	1.08	1.46	1.56	2.36	1.12	1.13	.76	2.08
IN.	.36	.80	.57	.64	1.12	1.68	1.74	2.72	1.25	1.30	.88	2.32

CAL YR 1988 TOTAL 22689 MEAN 62.0 MAX 506 MIN 15 CFSM .63 IN. 8.61
WTR YR 1989 TOTAL 40502 MEAN 111 MAX 1340 MIN 24 CFSM 1.13 IN. 15.37

e Estimated.

02066000 ROANOKE (STAUNTON) RIVER AT RANDOLPH, VA

LOCATION.--Lat 36°54'54", long 78°44'28", Halifax County, Hydrologic Unit 03010102, on right bank 6 ft downstream from bridge on State Highway 746, 2.8 mi northwest of Randolph, 3.6 mi upstream from Roanoke Creek, and at mile 227.3.

DRAINAGE AREA.--2,977 mi².

PERIOD OF RECORD.--August 1900 to September 1906, October 1927 to September 1930, October 1950 to current year. Monthly discharge only for some periods, published in WSP 1303. Prior to October 1902, published as Staunton River at Randolph. Gage heights collected since 1905 at this site or at former site are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 1203: 1928-30. WSP 1303: 1901-6. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 307.59 ft above National Geodetic Vertical Datum of 1929. Aug. 27, 1900, to Oct. 13, 1902, nonrecording gage at site 3.2 mi downstream at datum about 5.9 ft lower. Oct. 14, 1902, to Aug. 11, 1906, and Oct. 1, 1927, to Mar. 31, 1930, nonrecording gage at site of original gage at datum 3.93 ft lower than present datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1962 by Leesville Lake (station 02059400) 68.7 mi upstream and since 1963 by Smith Mountain Lake (station 02057400) 86.7 mi upstream. Gage-height and U.S. Army Corps of Engineers satellite telemeters at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--48 years, 3,062 ft³/s, 13.97 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 97,000 ft³/s, Dec. 31, 1901, gage height, 35.0 ft, from graph based on gage readings, site and datum then in use; minimum daily, 179 ft³/s, Sept. 8, 1965, July 7, 1970.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Aug. 16, 1940, reached a stage of 41.6 ft, present site and datum, discharge, 150,000 ft³/s, from information by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 34,300 ft³/s, May 7, gage height, 26.79 ft; minimum daily, 918 ft³/s, Oct. 31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1030	1340	1790	1320	1190	2570	1900	4230	2080	1480	7930	1490
2	1040	1650	1560	1470	1180	2160	1650	16200	1700	1450	6390	1420
3	1110	1450	1440	1460	1180	1850	1590	23800	1550	1420	3620	1340
4	1320	1280	1360	1380	1210	1770	1600	11500	1630	1370	2140	1280
5	1380	1210	1310	1320	1250	1900	1560	7230	1610	3260	1740	1250
6	1260	1330	1290	1290	1270	2110	2350	15800	1950	13000	1640	1210
7	1150	1420	1260	1350	1360	9830	3200	30800	3900	13100	1570	1220
8	1100	1390	1240	1400	1450	8480	3800	28400	16900	10900	1480	1290
9	1090	1280	1240	1400	1380	3830	4440	19100	13500	5580	1420	1350
10	1090	1220	1310	1370	1270	2800	4880	14200	11700	2850	1350	1340
11	1080	1210	1380	1350	1210	2320	3510	9330	7070	2560	1660	1260
12	1060	1190	1340	1340	1210	2070	2700	5150	3290	2390	2320	1300
13	1050	1170	1210	1540	1210	1920	2480	4580	2800	2060	1790	1700
14	1030	1170	1170	1700	1200	2060	1970	4610	4780	3290	1560	1870
15	1040	1160	1250	1630	1200	2040	1830	4350	4860	4250	1530	1410
16	1040	1150	1280	1600	1490	1840	2010	4680	7030	4830	1550	6430
17	1030	1230	1250	1600	1650	1740	1890	4600	5640	7890	1550	21200
18	1040	2270	1180	1500	1890	1870	1960	3760	4080	7080	1920	24400
19	1060	1850	1150	1390	1310	1720	2030	3220	2780	4410	1920	15000
20	1060	1470	1160	1400	1030	1440	1950	2870	2290	3100	1940	4840
21	1080	1360	1210	1380	2680	1790	1910	2740	4550	3760	1590	7000
22	1200	1320	1270	1300	6190	2570	1880	2650	4430	3770	2390	8890
23	1240	1280	1300	1250	4690	2470	1870	2540	4710	2560	4170	4830
24	1170	1240	1330	1250	3530	5320	1860	2740	3580	2270	3270	3150
25	1130	1220	1330	1250	2620	8990	1840	2730	2710	1880	4260	2200
26	1130	1210	1380	1340	2180	6650	4210	2440	2000	1940	3290	11600
27	1140	1270	1340	1400	2170	4420	5280	2360	1850	2510	2190	21300
28	1150	3800	1290	1380	2450	3890	6230	2290	1740	6500	1850	12100
29	1160	4510	1280	1020	---	3240	5670	2200	1600	3640	1690	5400
30	1120	2710	1250	1040	---	2400	5210	2150	1540	2210	1580	4110
31	918	---	1250	1180	---	2150	---	2120	---	2800	1620	---
TOTAL	34498	47360	40400	42600	52650	100210	85260	245370	129850	130110	74920	173180
MEAN	1113	1579	1303	1374	1880	3233	2842	7915	4328	4197	2417	5773
MAX	1380	4510	1790	1700	6190	9830	6230	30800	16900	13100	7930	24400
MIN	918	1150	1150	1020	1030	1440	1560	2120	1540	1370	1350	1210
(*)	-379	+40	-150	-26	+221	+848	+45	-174	+105	+21	-65	-72
MEAN†	734	1619	1153	1348	2101	4081	2887	7741	4433	4218	2352	5701
CFSM†	.25	.54	.39	.45	.71	1.37	.97	2.60	1.49	1.42	.79	1.91
IN.†	.28	.61	.45	.52	.74	1.58	1.08	3.00	1.66	1.63	.91	2.14
CAL YR 1988	TOTAL	618135	MEAN	1689	MAX	9350	MIN	784	MEAN†	1629	CFSM†	.55
WTR YR 1989	TOTAL	1156408	MEAN	3168	MAX	30800	MIN	918	MEAN†	3201	CFSM†	1.08
											IN.†	7.45
											IN.†	14.60

* Change in contents, equivalent in cubic feet per second, in Smith Mountain and Leesville Lakes; provided by Appalachian Power Company.

† Adjusted for change in contents.

ROANOKE RIVER BASIN

02067800; 02067820 TALBOTT AND TOWNES RESERVOIRS NEAR KIBLER, VA

LOCATION.--Talbot Dam: Lat 36°40'39", long 80°23'52", Patrick County, Hydrologic Unit 03010103, on Dan River 4.5 mi northeast of Kibler. Townes Dam: Lat 36°41'10", long 80°25'50", Patrick County, Hydrologic Unit 03010103, on Dan River about 4 mi north of Kibler.

DRAINAGE AREA.--Talbot Dam, 20.2 mi²; Townes Dam, 32.9 mi².

PERIOD OF RECORD.--February 1939 to December 1945, January 1948 to September 1960 (published in WSP 1723), and October 1960 to current year.

REMARKS.--The two reservoirs are operated as a unit for storage of water for Pinnacles hydroelectric plant. Total capacity of Talbot Reservoir, 8,035 acre-ft, and Townes Reservoir, 1,377 acre-ft. Storage began in Talbot Reservoir on Feb. 13, 1939, and in Townes Reservoir several months earlier.

COOPERATION.--Records were provided by the city of Danville.

COMBINED MONTHEND CONTENTS AT 2400, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

Date	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	6,510	-
Oct. 31.....	5,840	-670
Nov. 30.....	7,040	+1,200
Dec. 31.....	7,350	+310
CAL YR 1988.....	-	-230
Jan. 31.....	7,310	-40
Feb. 28.....	7,140	-170
Mar. 31.....	7,210	+70
Apr. 30.....	7,040	-170
May 31.....	7,100	+60
June 30.....	8,060	+960
July 31.....	7,990	-70
Aug. 31.....	7,640	-350
Sept. 30.....	7,530	-110
WTR YR 1989.....	-	+1,020

02069700 SOUTH MAYO RIVER NEAR NETTLERIDGE, VA

LOCATION.--Lat 36°34'15", long 80°07'47", Patrick County, Hydrologic Unit 03010103, on right bank 60 ft downstream from bridge on State Highway 700, 1.2 mi southeast of Nettleridge, 1.4 mi downstream from Russell Creek, and 3.6 mi upstream from Spoon Creek.

DRAINAGE AREA.--84.6 mi².

PERIOD OF RECORD.--October 1962 to current year.

REVISED RECORDS.--WSP 2104: Drainage area. WDR VA-74-1: 1972(M).

GAGE.--Water-stage recorder. Datum of gage is 871.60 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 9, 1964, nonrecording gage and crest-stage gage at same site and datum.

REMARKS.--Records good except those for period with ice effect, Dec. 13, 14, and period of doubtful gage-height record, Aug. 1-5, which are fair. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--27 years, 127 ft³/s, 20.39 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,600 ft³/s, Sept. 22, 1979, gage height, 22.00 ft, from rating curve extended above 2,900 ft³/s on basis of contracted-opening measurements at gage heights 18.32 ft and 22.00 ft; minimum, 20 ft³/s, Aug. 29, 30, 1981.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	2130	1,390	7.36	July 6	0300	*3,390	*11.05
May 6	0130	2,110	8.82	Sept. 16	0530	1,870	8.34
July 5	0400	1,720	8.04	Sept. 22	1530	1,320	7.22

Minimum discharge, 42 ft³/s, Oct. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	74	98	106	72	141	113	143	94	149	e250	128
2	44	57	89	100	72	122	111	390	93	142	e175	124
3	70	52	85	88	72	116	111	188	124	140	e150	118
4	88	51	81	83	71	117	107	146	140	179	e140	115
5	63	81	78	78	73	115	128	363	286	1070	e130	116
6	55	87	77	86	75	373	112	1070	291	1460	154	120
7	53	64	75	86	78	522	131	395	226	422	148	121
8	52	58	74	88	73	241	159	268	242	296	140	121
9	51	56	80	87	70	187	163	261	612	247	137	115
10	51	54	81	84	66	161	139	329	337	233	134	113
11	50	54	75	81	71	144	130	246	209	204	134	110
12	48	52	70	91	70	136	125	215	209	238	135	131
13	47	52	e66	124	68	134	120	193	319	235	134	126
14	47	52	e69	115	69	135	115	178	234	191	185	116
15	48	51	71	114	69	126	127	180	328	174	165	151
16	48	51	70	106	70	120	123	165	325	322	147	1030
17	48	127	70	97	83	114	113	152	332	245	145	292
18	48	77	68	93	88	111	108	145	233	210	174	201
19	47	65	74	89	81	110	104	138	194	236	221	168
20	46	65	68	86	89	109	101	132	182	515	169	154
21	54	70	69	82	333	137	99	130	217	252	149	171
22	62	62	73	80	320	129	98	123	271	218	157	666
23	50	61	71	79	189	132	96	145	218	192	143	496
24	49	60	74	78	150	285	96	127	616	178	135	286
25	48	57	91	77	129	198	93	117	307	221	160	236
26	48	56	76	76	118	160	92	113	238	219	140	428
27	48	83	73	75	115	142	94	109	216	234	143	287
28	48	287	74	74	136	134	95	103	190	183	137	234
29	48	140	81	73	---	129	115	101	173	167	155	212
30	47	111	74	74	---	125	100	100	157	180	200	278
31	49	---	76	73	---	121	---	97	---	452	139	---
TOTAL	1598	2267	2351	2723	2970	5026	3418	6562	7613	9404	4825	6964
MEAN	51.5	75.6	75.8	87.8	106	162	114	212	254	303	156	232
MAX	88	287	98	124	333	522	163	1070	616	1460	250	1030
MIN	43	51	66	73	66	109	92	97	93	140	130	110
CFSM	.61	.89	.90	1.04	1.25	1.92	1.35	2.50	3.00	3.59	1.84	2.74
IN.	.70	1.00	1.03	1.20	1.31	2.21	1.50	2.89	3.35	4.14	2.12	3.06

CAL YR 1988 TOTAL 31489 MEAN 86.0 MAX 374 MIN 37 CFSM 1.02 IN. 13.85
WTR YR 1989 TOTAL 55721 MEAN 153 MAX 1460 MIN 43 CFSM 1.80 IN. 24.50

e Estimated.

ROANOKE RIVER BASIN

02070000 NORTH MAYO RIVER NEAR SPENCER, VA

LOCATION.--Lat 36°34'05", long 79°59'15", Henry County, Hydrologic Unit 03010103, on left bank 800 ft downstream from bridge on State Highway 629 at Moores Mill, 2.1 mi downstream from Horse Pasture Creek, and 3.8 mi south-east of Spencer.

DRAINAGE AREA.--108 mi².

PERIOD OF RECORD.--October 1928 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 1303: 1929-32(M), 1934(M).

GAGE.--Water-stage recorder. Datum of gage is 730.94 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Jan. 23, 1936, nonrecording gage at site 800 ft upstream at datum 1.50 ft higher. July 25 to Sept. 27, 1936, nonrecording gage at present site and datum.

REMARKS.--Records good. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--61 years, 128 ft³/s, 16.09 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,200 ft³/s, Oct. 9, 1947, gage height, 15.80 ft, from rating curve extended above 7,200 ft³/s on basis of slope-area measurement at gage height 13.41 ft and velocity-area study; minimum, 14 ft³/s, Aug. 11, 1956; minimum gage height, 1.08 ft, Oct. 8, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,400 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	0830	2,480	6.27	July 6	0900	*6,900	*10.16
June 9	0700	1,800	5.30	Sept. 16	1100	5,140	8.92
June 24	0500	1,490	4.80				

Minimum discharge, 45 ft³/s, Feb. 10, result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	56	84	85	97	63	174	88	141	68	98	519	106
2	55	73	78	103	62	122	84	585	67	95	195	101
3	68	63	74	84	63	107	85	182	84	94	153	95
4	96	61	71	76	62	106	86	124	78	97	136	91
5	71	78	68	70	63	101	96	278	141	714	125	91
6	61	108	68	76	66	186	94	1520	293	3870	171	97
7	59	77	67	79	68	695	109	387	205	529	152	94
8	58	68	65	79	65	208	170	215	542	369	108	96
9	57	66	69	81	61	148	171	184	1020	223	101	91
10	57	65	76	76	56	123	119	243	324	166	99	87
11	57	64	68	73	60	109	105	172	179	146	99	86
12	55	62	63	80	63	101	97	145	150	134	101	202
13	52	62	e60	104	59	100	92	129	460	135	100	136
14	53	62	e62	102	60	110	88	117	243	154	114	106
15	55	61	64	95	60	97	102	122	457	120	126	97
16	55	61	62	92	61	91	105	121	299	158	105	2840
17	55	193	61	84	74	86	91	103	364	147	97	531
18	55	110	60	80	80	85	87	97	196	129	106	282
19	54	79	65	77	76	83	84	93	154	125	213	178
20	53	75	61	74	81	82	81	90	134	432	134	155
21	58	79	61	71	344	101	80	89	141	177	109	156
22	70	70	64	69	488	100	79	85	144	138	235	322
23	59	68	62	69	215	109	78	107	128	121	167	327
24	57	67	65	68	141	525	77	90	731	112	109	198
25	56	64	75	68	111	227	76	82	197	108	173	209
26	56	63	68	67	102	149	76	80	147	160	118	879
27	56	81	64	66	100	122	78	77	132	409	111	304
28	56	309	65	64	147	110	83	73	119	305	107	207
29	57	137	68	64	---	102	98	71	113	152	164	180
30	56	97	64	65	---	97	84	72	103	134	273	309
31	58	---	65	64	---	96	---	70	---	169	125	---
TOTAL	1821	2607	2068	2417	2951	4652	2843	5944	7413	9920	4645	8653
MEAN	58.7	86.9	66.7	78.0	105	150	94.8	192	247	320	150	288
MAX	96	309	85	104	488	695	171	1520	1020	3870	519	2840
MIN	52	61	60	64	56	82	76	70	67	94	97	86
CFSM	.54	.80	.62	.72	.98	1.39	.88	1.78	2.29	2.96	1.39	2.67
IN.	.63	.90	.71	.83	1.02	1.60	.98	2.05	2.55	3.42	1.60	2.98

CAL YR 1988 TOTAL 31676 MEAN 86.5 MAX 491 MIN 32 CFSM .80 IN. 10.91
WTR YR 1989 TOTAL 55934 MEAN 153 MAX 3870 MIN 52 CFSM 1.42 IN. 19.27

e Estimated.

ROANOKE RIVER BASIN

271

02071900 PHILPOTT LAKE NEAR PHILPOTT, VA

LOCATION.--Lat 36°46'52", long 80°01'40", Henry County, Hydrologic Unit 03010103, at Philpott Dam on Smith River, 1.5 mi west of Philpott, 12.0 mi upstream from Reed Creek, and at mile 44.3.

DRAINAGE AREA.--216 mi².

PERIOD OF RECORD.--August 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by concrete dam. Spillway, with crest at elevation 985 ft, is ungated and 120 ft long. Storage began August 1950 during construction; initial filling started in December 1951; water in reservoir first reached rule-curve elevation in July 1953. Total capacity at maximum flood-control pool elevation, 998 ft, is 247,400 acre-ft of which 47,000 acre-ft is upstream from the spillway crest; 34,200 acre-ft is controlled flood storage between elevations 974 ft, maximum power pool, and 985 ft; 57,800 acre-ft is available for power between elevations 951 ft, minimum power pool, and 974 ft; and 108,400 acre-ft is inactive and dead storage below elevation 951 ft. Usable capacity is 92,000 acre-ft between elevations 951 ft and 985 ft. Figures given herein represent total contents. Reservoir is used for flood control, hydro-electric power, low-water regulation for pollution abatement and industrial water supply, and recreation.

COOPERATION.--Records were provided by the U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 191,700 acre-ft, June 22, 1972, elevation, 983.06 ft; minimum (after first filling to rule curve), 64,540 acre-ft, Sept. 26, 1956, elevation, 927.59 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 173,990 acre-ft, May 8, elevation, 976.64 ft; minimum, 137,720 acre-ft, Nov. 4, elevation, 963.54 ft.

CORRECTIONS.--The elevation for Dec. 31, 1987, was 972.27 ft with contents of 161,210 acre-ft; the previously published figures in WDR VA-88-1 are not correct.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	965.32	142,280	-
Oct. 31.....	963.77	138,300	-3,980
Nov. 30.....	965.13	141,790	+3,490
Dec. 31.....	965.38	142,440	+650
CAL YR 1988.....	-	-	-18,770
Jan. 31.....	966.35	144,980	+2,540
Feb. 28.....	967.96	149,270	+4,290
Mar. 31.....	973.56	164,920	+15,650
Apr. 30.....	974.14	166,600	+1,680
May 31.....	973.36	164,340	-2,260
June 30.....	973.94	166,020	+1,680
July 31.....	974.32	167,120	+1,100
Aug. 31.....	972.90	163,010	-4,110
Sept. 30.....	974.35	167,210	+4,200
WTR YR 1989.....	-	-	+24,930

ROANOKE RIVER BASIN

02072000 SMITH RIVER NEAR PHILPOTT, VA

LOCATION.--Lat 36°46'50", long 80°01'30", Franklin County, Hydrologic Unit 03010103, on left bank 900 ft downstream from Philpott Dam, 3.1 mi west of Philpott, 11.6 mi upstream from Reed Creek, and at mile 44.1.

DRAINAGE AREA.--216 mi².

PERIOD OF RECORD.--August 1946 to current year.

REVISED RECORDS.--WSP 1553: 1953(M), 1955-56(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 804.27 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). Prior to Oct. 8, 1952, at site 1.9 mi downstream at different datum.

REMARKS.--No estimated daily discharges. Records good. Since August 1950, flow regulated by Philpott Lake (station 02071900) 0.2 mi upstream. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--43 years, 277 ft³/s, 17.42 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,000 ft³/s, June 29, 1949, gage height, 20.3 ft, site and datum then in use, from rating curve extended above 9,700 ft³/s on basis of slope-area measurements at gage heights 18.2 ft and 20.3 ft; minimum observed, 2.3 ft³/s, Dec. 16, 1985 (result of repairs at dam), but may have been less during periods of estimated record; minimum daily, 20 ft³/s, Mar. 24, 1984, caused by turbines being shut down for repair at Philpott Dam.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,400 ft³/s, Nov. 21, gage height, 5.07 ft; minimum, 11 ft³/s, Aug. 17; minimum daily, 46 ft³/s, Oct. 8, Dec. 20, Apr. 8, 9, Aug. 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	47	152	96	49	97	99	47	193	191	50	540	538		
2	47	150	96	49	98	99	47	193	193	51	539	50		
3	203	153	47	152	99	98	189	631	49	493	541	50		
4	203	152	47	99	50	49	194	633	49	51	538	51		
5	211	47	98	98	50	49	186	633	243	488	52	291		
6	191	47	98	95	98	98	197	49	241	683	52	292		
7	193	98	97	49	97	96	196	49	246	926	487	290		
8	46	98	92	49	99	96	46	816	242	828	486	290		
9	47	97	94	100	100	96	46	1210	241	51	501	50		
10	193	98	47	98	100	96	192	1200	49	828	501	50		
11	195	98	47	97	50	49	192	1210	49	827	503	240		
12	201	47	94	97	50	49	190	1040	434	829	52	239		
13	198	47	255	98	99	96	190	49	729	834	53	240		
14	200	98	49	50	99	96	190	49	733	837	297	241		
15	47	98	48	50	98	96	47	385	738	55	275	243		
16	47	98	49	98	99	96	47	384	734	53	291	776		
17	200	94	49	98	99	97	190	383	49	578	294	1230		
18	198	94	49	99	49	49	191	382	49	1230	289	1240		
19	201	47	199	96	49	49	192	384	437	913	46	1240		
20	201	47	46	95	97	98	191	49	439	442	47	1250		
21	200	260	93	50	98	97	190	49	440	442	289	1150		
22	47	96	47	50	99	96	49	286	438	52	358	52		
23	47	47	93	96	99	95	49	288	438	52	647	863		
24	147	47	47	96	99	95	191	285	49	431	634	1240		
25	151	47	47	96	49	47	192	284	50	441	291	1250		
26	152	47	194	95	49	48	193	285	583	440	48	1250		
27	151	47	193	95	99	193	192	49	584	439	54	1250		
28	151	94	196	50	99	193	193	49	585	440	544	1250		
29	47	95	200	50	---	194	49	189	588	539	547	1150		
30	47	96	202	96	---	190	49	190	591	52	543	49		
31	152	---	48	96	---	189	---	190	---	541	540	---		
TOTAL	4361	2736	3057	2586	2368	3088	4307	12066	10481	14916	10879	18395		
MEAN	141	91.2	98.6	83.4	84.6	99.6	144	389	349	481	351	613		
MAX	211	260	255	152	100	194	197	1210	738	1230	647	1250		
MIN	46	47	46	49	49	47	46	49	49	50	46	49		
(*)	-65	+59	+11	-41	+77	+255	+28	-37	+28	+18	-67	+71		
MEAN†	76	150	110	42	162	355	172	352	377	499	284	684		
CFSM†	.35	.69	.51	.19	.75	1.64	.80	1.63	1.75	2.31	1.31	3.17		
IN.†	.41	.78	.59	.22	.78	1.90	.89	1.88	1.95	2.66	1.52	3.53		
CAL YR 1988	TOTAL	63456	MEAN	173	MAX	831	MIN	38	MEAN†	147	CFSM†	.68	IN.†	9.27
WTR YR 1989	TOTAL	89240	MEAN	244	MAX	1250	MIN	46	MEAN†	278	CFSM†	1.29	IN.†	17.48

* Change in contents, equivalent in cubic feet per second, in Philpott Lake; provided by U.S. Army Corps of Engineers.

† Adjusted for change in contents.

02072500 SMITH RIVER AT BASSETT, VA

LOCATION.--Lat 36°46'12", long 80°00'04", Henry County, Hydrologic Unit 03010103, on left bank 25 ft upstream from bridge on State Highway 666 at north edge of North Bassett, 1.0 mi northwest of Bassett, 3.0 mi downstream from Town Creek, 5.6 mi upstream from Reed Creek, 6.2 mi downstream from Philpott Dam, and at mile 38.1.

DRAINAGE AREA.--259 mi².

PERIOD OF RECORD.--April 1939 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 753.09 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--Records good except for period with sluggish intakes, July 15 to Sept. 30, which is fair. Since August 1950, flow regulated by Philpott Lake (station 02071900) 6.2 mi upstream. Diversion upstream from station by Henry County Public Service Authority, since 1985, has averaged less than 1.0 ft³/s. Gage-height and U.S. Army Corps of Engineers satellite telemeters at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--50 years, 331 ft³/s, 17.36 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,600 ft³/s, Aug. 14, 1940, gage height, 18.28 ft; minimum, 19 ft³/s, July 19, 1956; minimum daily, 44 ft³/s, Aug. 23, 1964; minimum gage height, 1.06 ft, Sept. 18, 26, 1953.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 19, 1937, reached a stage of about 22.9 ft, from information by local residents, discharge, 38,000 ft³/s, from rating curve extended above 23,000 ft³/s on basis of back-water studies and records for station at Martinsville.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,920 ft³/s, May 6, gage height, 8.72 ft; minimum, 54 ft³/s, Oct. 1, 2; minimum daily, 56 ft³/s, Oct. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	56	186	129	84	113	133	76	337	221	82	644	782		
2	59	177	128	80	113	128	75	596	232	75	639	320		
3	241	174	76	182	114	127	218	731	87	534	636	180		
4	247	175	76	122	65	84	223	715	77	98	592	130		
5	241	101	145	119	68	82	225	1230	327	1710	145	414		
6	222	89	131	121	114	400	228	968	346	1270	87	541		
7	225	125	129	74	113	258	237	180	610	1040	559	543		
8	59	121	124	75	111	155	98	830	365	1000	600	546		
9	58	119	129	122	111	139	93	1370	489	112	598	298		
10	222	120	77	119	111	130	232	1380	131	942	617	187		
11	225	121	73	117	66	84	228	1370	106	930	604	385		
12	229	67	122	123	66	82	228	1290	492	1200	115	591		
13	225	67	293	127	111	126	225	99	854	1030	85	320		
14	228	120	73	80	112	128	224	92	828	1010	421	307		
15	58	119	73	81	110	125	82	471	857	158	360	349		
16	58	118	72	123	114	122	78	455	872	443	355	2110		
17	229	130	72	121	120	122	223	449	118	656	353	1630		
18	225	122	71	126	76	78	223	446	100	1470	355	1450		
19	232	69	231	125	72	77	224	447	510	1200	171	1440		
20	230	70	67	122	120	124	222	84	518	595	97	1430		
21	238	301	111	73	194	141	221	82	516	553	398	1420		
22	68	123	66	71	184	134	75	336	515	116	428	297		
23	62	72	113	118	146	132	74	346	512	106	752	936		
24	173	72	68	114	132	215	221	336	94	520	756	1440		
25	174	71	71	113	81	114	221	332	82	533	406	1450		
26	174	71	223	116	79	96	224	331	656	536	206	1710		
27	173	80	223	111	126	235	235	77	662	549	122	1480		
28	173	201	225	66	130	231	233	75	661	531	635	1460		
29	61	144	230	66	---	229	92	229	664	630	775	1440		
30	61	133	234	110	---	224	81	225	663	107	778	199		
31	174	---	69	111	---	221	---	226	---	634	779	---		
TOTAL	5100	3658	3924	3312	3072	4676	5339	16135	13165	20370	14068	25785		
MEAN	165	122	127	107	110	151	178	520	439	657	454	859		
MAX	247	301	293	182	194	400	237	1380	872	1710	779	2110		
MIN	56	67	66	66	65	77	74	75	77	75	85	130		
(*)	-65	+59	+11	-41	+77	+255	+28	-37	+28	+18	-67	+71		
MEAN†	100	181	138	66	187	406	206	483	467	675	387	930		
CFSM†	.39	.70	.53	.25	.72	1.57	.80	1.86	1.80	2.61	1.49	3.59		
IN.†	.45	.78	.61	.29	.75	1.81	.89	2.15	2.01	3.01	1.72	4.01		
CAL YR 1988	TOTAL	79595	MEAN	217	MAX	966	MIN	51	MEAN†	191	CFSM†	.74	IN.†	10.04
WTR YR 1989	TOTAL	118604	MEAN	325	MAX	2110	MIN	56	MEAN†	359	CFSM†	1.39	IN.†	18.82

* Change in contents, equivalent in cubic feet per second, in Philpott Lake; provided by U.S. Army Corps of Engineers.

† Adjusted for change in contents.

ROANOKE RIVER BASIN

02073000 SMITH RIVER AT MARTINSVILLE, VA

LOCATION.--Lat 36°39'40", long 79°52'51", Henry County, Hydrologic Unit 03010103, on right bank at south edge of Martinsville, 800 ft downstream from bridge on U.S. Highways 58 and 220, and 5.0 mi downstream from Beaver Creek.

DRAINAGE AREA.--380 mi².

PERIOD OF RECORD.--August 1929 to current year.

REVISED RECORDS.--WSP 1032: 1933-35(M), 1936-39, 1940-41(P). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 657.22 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since August 1950 by Philpott Lake (station 02071900) 19.6 mi upstream from station. Some additional regulation by powerplant 1,000 ft upstream from station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--60 years, 462 ft³/s, 16.51 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 39,000 ft³/s, Oct. 19, 1937, gage height, 21.50 ft, from rating curve extended above 17,000 ft³/s on basis of computations of flow over dam at gage heights 16.76 ft and 21.50 ft; minimum, 3.8 ft³/s, Mar. 19, 1955; minimum daily, 19 ft³/s, Oct. 6, 1935; minimum gage height, 0.69 ft, Sept. 8, 1969.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,500 ft³/s, July 6, gage height, 10.98 ft; minimum, 7.8 ft³/s, Dec. 15; minimum daily, 71 ft³/s, Nov. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	113	346	229	235	208	330	116	659	354	399	1020	892
2	117	253	231	220	212	281	158	1640	360	175	944	486
3	402	231	152	313	196	280	350	939	234	473	907	165
4	414	239	139	233	177	157	370	1050	219	528	815	161
5	302	205	242	230	132	203	416	1610	640	3110	581	470
6	311	198	204	262	256	815	394	2920	748	4220	226	506
7	315	210	201	144	226	1130	462	637	1400	1640	533	508
8	112	198	193	151	230	338	351	1060	1180	1540	787	510
9	83	186	235	254	214	383	303	1960	1490	496	797	218
10	313	212	153	202	211	301	417	1970	521	1160	802	159
11	291	126	147	214	148	148	394	1900	312	1330	812	389
12	292	124	219	239	130	198	382	1890	642	1520	499	679
13	298	125	382	293	254	377	377	402	1580	1690	170	500
14	276	200	185	212	191	250	369	268	1360	1700	572	448
15	156	161	122	223	229	218	253	713	1800	511	625	492
16	75	203	162	257	204	268	220	715	1490	1320	502	4390
17	312	533	88	261	255	204	375	675	638	892	463	2350
18	289	262	144	223	202	194	365	663	335	2050	612	2040
19	274	146	349	232	202	172	366	654	605	2090	547	2010
20	301	141	172	217	298	248	361	235	803	1620	238	1970
21	361	431	156	176	725	304	359	200	845	966	486	2070
22	122	175	182	146	807	284	208	490	815	507	815	1070
23	103	172	154	232	394	313	159	575	805	273	984	1180
24	230	71	176	234	336	1030	353	512	610	571	1020	2010
25	229	147	204	205	127	343	358	497	239	808	700	2190
26	229	127	327	208	197	284	368	496	745	769	300	3270
27	227	164	346	204	281	413	364	200	954	1080	213	2220
28	255	667	328	173	379	461	407	183	925	832	619	2060
29	122	290	317	133	---	385	267	357	918	865	976	2030
30	83	250	345	245	---	379	210	366	914	519	942	1030
31	232	---	158	209	---	403	---	363	---	753	904	---
TOTAL	7239	6793	6642	6780	7421	11094	9852	26799	24481	36407	20411	38473
MEAN	234	226	214	219	265	358	328	864	816	1174	658	1282
MAX	414	667	382	313	807	1130	462	2920	1800	4220	1020	4390
MIN	75	71	88	133	127	148	116	183	219	175	170	159
(*)	-65	+59	+11	-41	+77	+255	+28	-37	+28	+18	-67	+71
MEAN†	169	285	225	178	342	613	356	827	844	1,192	591	1,353
CFSM†	.44	.75	.59	.47	.90	1.61	.94	2.18	2.22	3.14	1.56	3.56
IN.†	.51	.84	.68	.54	.94	1.86	1.05	2.51	2.48	3.62	1.79	3.97

CAL YR 1988 TOTAL 116999 MEAN 320 MAX 1750 MIN 54 MEAN† 294 CFSM† .77 IN.† 10.53
WTR YR 1989 TOTAL 202392 MEAN 554 MAX 4390 MIN 71 MEAN† 588 CFSM† 1.55 IN.† 21.01

* Change in contents, equivalent in cubic feet per second, in Philpott Lake; provided by U.S. Army Corps of Engineers.

† Adjusted for change in contents.

02074000 SMITH RIVER AT EDEN, NC

LOCATION.--Lat 36°31'31", long 79°45'57", Rockingham County, Hydrologic Unit 03010103, on right bank at Eden, 0.3 mi downstream from bridge on State Highway 14, 0.8 mi upstream from bridge on Secondary Road 1714, 1.2 mi south of Virginia-North Carolina State line, 1.3 mi downstream from Stuart Creek, and 3.9 mi upstream from mouth.

DRAINAGE AREA.--538 mi².

PERIOD OF RECORD.--October 1939 to current year. Prior to October 1970, published as "at Spray".

REVISED RECORDS.--WSP 1433: 1946.

GAGE.--Water-stage recorder. Datum of gage is 539.56 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow regulated since August 1950 by Philpott Lake (station 02071900) 40 mi upstream, usable capacity, 6,325,000 ft³. Additional regulation by hydroelectric plant at Martinsville, VA, 18 mi upstream. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--50 years, 625 ft³/s, 15.78 in/yr, adjusted for storage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 45,600 ft³/s, Aug. 15, 1940, gage height, 19.28 ft, from rating curve extended above 12,000 ft³/s on basis of computation of peak flow over dam 1.5 mi downstream; minimum, 38 ft³/s, Aug. 7, 1967; minimum daily, 46 ft³/s, Aug. 14, 1967.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 14,600 ft³/s, July 6, gage height, 12.23 ft; minimum, 87 ft³/s, Oct. 30, 31, but may have been less during period of no gage-height record, Oct. 1-28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e320	503	340	246	253	756	424	473	390	942	1120	842
2	e280	359	315	343	250	524	195	2190	377	196	956	875
3	e220	304	294	407	249	451	380	877	394	327	899	209
4	e140	296	164	339	259	409	411	1170	190	681	874	250
5	e220	350	285	285	135	284	518	1190	375	2230	896	280
6	e210	272	264	307	285	779	517	5340	1020	7940	317	529
7	e210	302	260	314	277	2180	601	1330	833	2100	283	536
8	e140	267	252	173	268	825	817	939	1880	1710	757	542
9	e230	251	290	326	251	553	533	1950	2150	1250	770	584
10	e200	245	300	289	242	460	547	2080	1250	717	767	185
11	e210	214	153	283	243	384	529	1920	576	1350	773	260
12	e210	214	272	322	133	258	489	1860	594	1280	845	543
13	e220	185	284	404	258	428	469	1110	1890	1770	203	672
14	e220	233	388	379	246	424	411	403	1470	2150	358	505
15	e140	237	211	268	247	375	450	460	2550	1290	717	469
16	e230	233	201	311	229	352	378	915	1880	1310	571	4210
17	e220	611	159	399	324	332	372	776	1740	989	554	2290
18	e220	478	166	311	316	329	486	728	744	1780	635	1900
19	e210	319	284	301	269	206	432	696	478	1910	873	1770
20	e220	178	310	290	298	351	420	670	901	1860	327	1770
21	e220	362	202	282	773	408	417	303	1010	1210	321	1870
22	e140	404	257	154	1720	434	406	311	1020	960	776	1360
23	e240	262	148	289	924	494	188	642	883	464	903	880
24	e220	163	238	272	590	2130	339	591	1030	365	1010	1830
25	e230	169	269	261	426	961	396	546	395	844	877	1810
26	e220	262	297	265	287	576	414	527	338	786	669	4220
27	e220	194	433	265	457	513	411	426	902	1060	296	2280
28	e240	1450	375	259	692	603	436	254	929	1010	284	1960
29	274	654	323	139	---	508	514	247	908	830	956	1880
30	112	413	428	275	---	497	273	481	887	915	974	1480
31	146	---	321	248	---	490	---	405	---	370	869	---
TOTAL	6532	10384	8483	9006	10901	18274	13173	31810	29984	42596	21430	38791
MEAN	211	346	274	291	389	589	439	1026	999	1374	691	1293
MAX	320	1450	433	407	1720	2180	817	5340	2550	7940	1120	4220
MIN	112	163	148	139	133	206	188	247	190	196	203	185
(*)	+65	+59	+11	-41	+77	+255	+28	-37	+28	+18	-67	+71

CAL YR 1988 TOTAL 153588 MEAN 420 MAX 3310 MIN 81 MEAN† 394 CFSM† .78 IN.† 10.62
WTR YR 1989 TOTAL 241364 MEAN 661 MAX 7940 MIN 112 MEAN† 695 CFSM† 1.23 IN.† 16.69

* Change in contents, equivalent in cubic feet per second, in Philpott Lake; provided by U.S. Army Corps of Engineers.

† Adjusted for change in contents.

e Estimated.

ROANOKE RIVER BASIN

02074500 SANDY RIVER NEAR DANVILLE, VA

LOCATION.--Lat 36°37'10", long 79°30'16", Pittsylvania County, Hydrologic Unit 03010103, on right bank 200 ft downstream from Hickory Forest Creek, 400 ft upstream from bridge on State Highway 863 between Callahans Store and Mount Cross, 5.5 mi northwest of western city limits of Danville, and 5.8 mi upstream from mouth.

DRAINAGE AREA.--112 mi².

PERIOD OF RECORD.--October 1929 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 972: 1930-41. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 460.38 ft above National Geodetic Vertical Datum of 1929. Prior to June 26, 1942, at site 1,200 ft downstream at datum 5.57 ft lower.

REMARKS.--Records good except those for periods with ice effect, Dec. 13, 14, 18-20, and Feb. 10, 11, and period of doubtful gage-height record, Mar. 13 to Apr. 18, which are fair. Diurnal fluctuation at low flow caused by small mill upstream from station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--60 years, 107 ft³/s, 12.97 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,000 ft³/s, Aug. 14, 1940, gage height, 14.8 ft, present datum, from floodmarks, from rating curve extended above 11,000 ft³/s; minimum, 3 ft³/s, Sept. 29, 1930, gage height, 0.40 ft, site and datum then in use; minimum daily, 8 ft³/s, Aug. 29, 31, Sept. 1, 2, 1932.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 7	0100	1,530	4.46	July 5	2030	*12,100	*10.63
May 2	0200	2,450	5.35	July 14	0230	1,670	4.61
May 6	0200	2,370	5.28	Sept. 26	0230	1,650	4.59
July 5	0300	1,680	4.62				

Minimum discharge, 35 ft³/s, Oct. 13, 20, gage height, 1.18 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	97	87	90	53	305	e120	211	63	70	88	61
2	41	65	76	87	53	174	e100	1120	62	68	85	59
3	66	48	70	73	54	140	e90	239	67	68	76	57
4	126	46	65	65	54	130	e98	152	66	74	71	54
5	64	52	61	60	56	116	e115	292	112	1790	68	54
6	48	55	59	66	61	387	e135	1350	134	2050	68	57
7	44	48	59	68	66	773	e150	387	129	291	67	60
8	42	45	57	66	61	226	e280	202	417	169	62	62
9	41	44	62	67	54	160	e240	173	605	129	60	58
10	41	46	67	62	e49	132	e175	196	208	110	59	56
11	39	48	60	61	e52	117	e140	147	113	98	62	54
12	37	45	54	70	54	108	e130	128	207	232	65	54
13	36	45	e50	91	52	e100	e110	115	490	305	65	61
14	36	46	e53	93	52	e110	e102	107	227	724	64	61
15	37	44	55	85	53	e102	e100	315	603	166	70	56
16	37	45	54	80	55	e120	e160	312	556	236	68	276
17	37	72	52	72	69	e102	e115	154	557	210	67	127
18	37	73	e47	68	77	e98	e94	122	204	150	85	78
19	37	55	e48	66	73	e103	88	107	147	124	73	68
20	36	55	e50	64	80	e97	83	100	126	120	67	69
21	42	54	52	60	317	e120	81	96	136	106	112	78
22	50	49	55	59	535	e150	79	88	128	95	156	80
23	40	49	53	59	267	e290	77	107	107	87	77	77
24	38	48	55	58	170	e890	75	87	95	82	73	69
25	36	47	65	57	126	e380	74	79	87	81	140	134
26	36	47	57	57	119	e240	75	76	83	82	87	957
27	36	102	54	57	147	e200	87	75	80	134	81	197
28	37	732	54	54	309	e155	124	69	78	103	76	117
29	37	185	53	54	---	e140	142	68	77	81	70	100
30	37	111	52	55	---	e130	129	67	72	77	71	178
31	39	---	56	54	---	e160	---	65	---	107	64	---
TOTAL	1352	2498	1792	2078	3168	6455	3568	6806	6036	8219	2397	3469
MEAN	43.6	83.3	57.8	67.0	113	208	119	220	201	265	77.3	116
MAX	126	732	87	93	535	890	280	1350	605	2050	156	957
MIN	36	44	47	54	49	97	74	65	62	68	59	54
CFSM	.39	.74	.52	.60	1.01	1.86	1.06	1.96	1.80	2.37	.69	1.03
IN.	.45	.83	.60	.69	1.05	2.14	1.19	2.26	2.00	2.73	.80	1.15

CAL YR 1988 TOTAL 26481 MEAN 72.4 MAX 732 MIN 18 CFSM .65 IN. 8.80
WTR YR 1989 TOTAL 47838 MEAN 131 MAX 2050 MIN 36 CFSM 1.17 IN. 15.89

e Estimated.

02075000 DAN RIVER AT DANVILLE, VA

LOCATION.--Lat 36°35'15", long 79°22'55", Danville City, Hydrologic Unit 03010104, on left bank 50 ft downstream from Norfolk Southern Railway bridge, 1,000 ft upstream from Fall Creek, and at mile 62.7.

DRAINAGE AREA.--2,050 mi², approximately.

PERIOD OF RECORD.--August 1934 to current year. Gage-height records collected in this vicinity 1890-1934, at same site 1934-49, and at Main Street bridge, 0.25 mi upstream 1949-68, are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 972: 1936.

GAGE.--Water-stage recorder. Datum of gage is 379.29 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good except those for May to September, which are fair. Diurnal fluctuation caused by mills upstream. Since August 1950, flow regulated by Philpott Lake (station 02071900) 74.7 mi upstream. Gage-height and U.S. Army Corps of Engineers satellite telemeters at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--55 years, 2,299 ft³/s, 15.23 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 75,000 ft³/s, Aug. 15, 1940, gage height, 20.96 ft; maximum gage height, 21.34 ft, June 22, 1972, backwater from debris; minimum discharge, 11 ft³/s, Sept. 5, 1966, gage height, 1.18 ft; minimum daily, 110 ft³/s, Sept. 5, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 23,300 ft³/s, July 6, gage height, 11.99 ft; minimum, 355 ft³/s, Dec. 24, gage height, 1.84 ft, result of temporary storage by Dan River Mills dam 3.3 mi upstream; minimum daily, 602 ft³/s, Oct. 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	839	1060	1630	1090	873	7020	2130	2140	1340	2040	8440	1820		
2	758	1360	1370	1480	864	4120	1650	13600	1310	1560	5640	1700		
3	752	1060	1210	1440	874	2710	1480	8880	1270	1320	3080	1330		
4	1770	881	1090	1310	876	2540	1620	4370	1180	1600	2500	1090		
5	1890	956	964	1120	869	2150	1870	3410	1390	4110	2170	1060		
6	1230	942	1010	1090	849	2790	2230	14100	3190	20400	1670	1200		
7	975	1080	962	1130	1100	9920	2570	14400	2680	15600	1430	1320		
8	890	990	961	1060	1100	6000	4430	5350	3960	4710	1670	1320		
9	771	848	949	1010	1010	3210	4440	4700	9760	3710	1660	1370		
10	651	841	1020	1130	930	2540	3070	5330	10900	2250	1560	1110		
11	795	835	982	1030	889	2090	2460	5670	4480	2760	1560	988		
12	776	732	874	1080	882	1730	2120	4740	3280	2740	1570	1150		
13	778	756	887	1310	808	1650	1910	4030	4980	3390	1240	1680		
14	759	741	943	1550	896	1860	1770	2440	5100	5370	1130	1530		
15	750	802	1000	1580	855	1700	1810	3120	5410	3130	1690	1340		
16	706	735	854	1420	884	2380	2560	4990	6380	3240	1990	4240		
17	602	1060	827	1340	940	2010	1970	3100	8340	5240	1660	7800		
18	748	1680	727	1280	1190	1640	1770	2430	5000	3590	1750	3740		
19	747	1410	770	1170	1300	1700	1660	2110	3000	3540	2740	2990		
20	721	1060	905	1140	1370	1630	1570	2000	2770	3750	3010	2700		
21	781	931	869	1070	2890	1910	1500	1790	2830	4530	1890	2700		
22	865	1150	832	996	8290	2360	1440	1530	3650	2800	2030	3230		
23	775	935	849	920	6450	2860	1320	3550	3900	1980	1900	5550		
24	634	886	873	1010	3760	12600	1220	3750	4890	1720	2230	4080		
25	712	805	891	968	2630	9410	1310	2380	5210	1910	2480	3490		
26	716	865	968	950	2080	4170	1340	1910	2610	1960	1940	7420		
27	690	1140	1020	942	2220	2890	1380	1720	2470	2970	1500	6840		
28	695	5770	1020	894	4330	2530	1780	1550	2380	4090	1450	4140		
29	717	4780	970	877	---	2330	2290	1430	2310	2900	1670	3460		
30	677	2320	944	813	---	2200	2270	1380	2170	2130	2260	3860		
31	604	---	1050	924	---	2310	---	1360	---	4750	2500	---		
TOTAL	25774	39411	30221	35124	52009	106960	60940	133260	118140	125790	70010	86248		
MEAN	831	1314	975	1133	1857	3450	2031	4299	3938	4058	2258	2875		
MAX	1890	5770	1630	1580	8290	12600	4440	14400	10900	20400	8440	7800		
MIN	602	732	727	813	808	1630	1220	1360	1180	1320	1130	988		
(*)	-65	+59	+11	-41	+77	+255	+28	-37	+28	+18	-67	+71		
MEAN†	766	1373	986	1092	1934	3705	2059	4262	3966	4076	2191	2946		
CFSM†	.37	.67	.48	.53	.94	1.81	1.00	2.08	1.93	1.99	1.07	1.44		
IN.‡	.43	.75	.55	.61	.98	2.08	1.12	2.40	2.16	2.29	1.23	1.60		
CAL YR 1988	TOTAL	47235	MEAN	1359	MAX	7480	MIN	418	MEAN†	1333	CFSM†	.65	IN.‡	8.85
WTR YR 1989	TOTAL	883887	MEAN	2422	MAX	20400	MIN	602	MEAN†	2449	CFSM†	1.19	IN.‡	16.22

* Change in contents, equivalent in cubic feet per second, in Philpott Lake; provided by U.S. Army Corps of Engineers.

‡ Adjusted for change in contents.

ROANOKE RIVER BASIN

02075500 DAN RIVER AT PACES, VA
(National stream-quality accounting network station)

LOCATION.--Lat 36°38'32", long 79°05'23", Halifax County, Hydrologic Unit 03010104, on right bank 100 ft upstream from bridge on State Highway 658, 0.5 mi southeast of Paces, 0.5 mi upstream from Big Toby Creek, 2.7 mi upstream from Birch Creek, and at mile 36.0.

DRAINAGE AREA.--2,550 mi², approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is 322.48 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Diurnal fluctuation by mills 23 mi upstream at Danville. Since August 1950, flow regulated by Philpott Lake (station 02071900) 101.4 mi upstream. Gage-height and U.S. Army Corps of Engineers satellite telemeters at station.

AVERAGE DISCHARGE.--38 years (water years 1952-89), 2,704 ft³/s, 14.40 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 64,800 ft³/s, June 23, 1972, gage height, 33.15 ft, from rating curve extended above 32,000 ft³/s; minimum, 193 ft³/s, Sept. 4, 1956, gage height, 1.71 ft; minimum daily, 244 ft³/s, Sept. 4, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Aug. 16, 1940, reached a stage of 32.3 ft, from floodmark.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 20,600 ft³/s, May 7, gage height, 20.89 ft, from high-water mark; minimum, 481 ft³/s, Dec. 25, gage height, 2.48 ft, result of temporary storage by Dan River Mills dam at Danville; minimum daily, 660 ft³/s, Oct. 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	881	1480	2640	1480	1150	10200	3150	2480	1560	2460	9520	2430		
2	928	2290	2070	1810	1100	8140	2690	11700	1510	2380	9230	2100		
3	766	1820	1770	2110	1080	4580	2180	16200	1570	1650	6100	2030		
4	1540	1350	1580	1860	1130	4280	2230	6210	1540	1710	3770	1380		
5	2630	1230	1360	1620	1120	3800	2320	4250	1850	3110	2770	1320		
6	1880	1450	1290	1450	1150	3500	3100	13000	3550	12600	2820	1320		
7	1330	1450	1290	1460	1310	10600	3510	e19400	4550	19700	1970	1570		
8	1110	1430	1290	1480	1540	11800	6770	11000	4260	9980	1840	1630		
9	1020	1200	1300	1350	1500	5500	7070	5360	9710	4720	2090	1630		
10	852	1080	1360	1390	1300	3860	5030	5830	15600	3590	2000	1690		
11	743	1100	1390	1420	1210	3210	3690	6570	7460	2970	1980	1200		
12	941	1080	1210	1410	1150	2700	3090	5340	4230	3180	2000	1280		
13	919	893	1110	1640	1110	2360	2730	4650	7610	3710	2080	1590		
14	887	905	1110	1980	1070	2610	2480	3460	7630	5720	1500	2060		
15	881	906	1290	2180	1150	2580	2460	3010	5940	4420	1570	1760		
16	856	957	1250	1940	1110	3450	3310	5770	7690	4500	2190	2030		
17	780	1150	1050	1840	1210	3560	3220	4170	11200	7520	2000	9580		
18	660	1800	1010	1720	1450	2680	2500	3200	8180	5040	1860	5170		
19	905	2090	894	1580	1790	2530	2390	2740	4800	4310	2160	3720		
20	863	1600	977	1500	1940	2390	2200	2530	3720	4010	4060	3250		
21	869	1310	1200	1440	4730	2590	2060	2400	4600	4940	2530	3330		
22	1100	1270	1130	1350	10300	3130	1960	2000	4370	3780	2770	3460		
23	1130	1410	1060	1220	11700	3850	1890	3450	4910	3000	2360	5440		
24	917	1160	1250	1220	7440	13700	1660	5170	4910	2360	2550	5480		
25	741	1120	911	1240	4460	19300	1700	3070	6660	2090	3280	4200		
26	852	1020	1170	1230	3510	10400	2020	2360	4110	2630	2710	7430		
27	832	1230	1210	1210	3410	4770	1850	2120	2780	3400	2280	10300		
28	803	6290	1280	1180	6360	3700	2160	1950	2940	4070	1880	5690		
29	803	7880	1250	1130	---	3340	2610	1600	2800	3850	1840	4310		
30	836	4180	1200	1070	---	3030	3170	1480	2670	2740	2340	4120		
31	745	---	1280	1070	---	3460	---	1600	---	3000	3050	---		
TOTAL	31000	54131	40182	46580	77480	165600	87200	164070	154910	143140	91100	102500		
MEAN	1000	1804	1296	1503	2767	5342	2907	5293	5164	4617	2939	3417		
MAX	2630	7880	2640	2180	11700	19300	7070	19400	15600	19700	9520	10300		
MIN	660	893	894	1070	1070	2360	1660	1480	1510	1650	1500	1200		
(*)	-65	+59	+11	-41	+77	+255	+28	-37	+28	+18	-67	+71		
MEAN†	935	1863	1307	1462	2844	5597	2935	5256	5192	4635	2872	3488		
CFSM‡	.37	.73	.51	.57	1.12	2.19	1.15	2.06	2.04	1.82	1.13	1.37		
IN.‡	.42	.82	.59	.66	1.16	2.53	1.28	2.38	2.27	2.10	1.30	1.53		
CAL YR 1988	TOTAL	611016	MEAN	1669	MAX	9820	MIN	424	MEAN‡	1644	CFSM‡	.64	IN.‡	8.78
WTR YR 1989	TOTAL	1157893	MEAN	3172	MAX	19700	MIN	660	MEAN‡	3200	CFSM‡	1.25	IN.‡	17.04

* Change in contents, equivalent in cubic feet per second, in Philpott Lake; provided by U.S. Army Corps of Engineers.

† Adjusted for change in contents.

‡ Estimated.

ROANOKE RIVER BASIN

279

02075500 DAN RIVER AT PACES, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1954 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: January 1954 to September 1956.

WATER TEMPERATURE: January 1954 to September 1956.

SUSPENDED-SEDIMENT DISCHARGE: January 1954 to September 1981.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
NOV 15...	1120	908	--	7.40	9.0	764	8.3	10.0	86	32	64
JAN 19...	1215	1550	270	8.40	5.0	762	12	12.2	96	K17	40
MAR 21...	1240	2470	180	7.30	12.0	755	27	10.4	97	45	620
MAY 03...	1030	17800	71	6.80	17.0	760	180	9.0	93	K400	K12000
JUN 13...	1015	7540	99	6.90	21.0	753	460	7.4	84	20000	15000
JUL 31...	1300	2800	101	7.00	24.0	745	110	7.2	88	820	960

DATE	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	ALKA- LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3)	BICAR- BONATE WATER DIS IT FIELD (MG/L AS HCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
NOV 15...	30	7.3	2.8	24	2.9	37	38	46	23	17	0.10
JAN 19...	27	6.7	2.5	23	2.5	31	32	39	21	19	0.10
MAR 21...	25	6.1	2.4	15	1.9	25	--	--	14	13	0.10
MAY 03...	18	4.2	1.7	5.1	2.2	13	14	17	10	4.2	0.20
JUN 13...	15	3.8	1.4	6.2	2.2	12	13	15	8.0	4.2	0.10
JUL 31...	22	5.5	2.1	11	2.3	23	21	26	8.0	9.5	0.10

DATE	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)
NOV 15...	18	110	120	0.010	0.380	0.150	0.150	0.80	0.140	0.120	0.100
JAN 19...	17	127	113	<0.010	0.410	0.100	0.070	0.60	0.100	0.090	0.070
MAR 21...	16	85	86	0.040	0.440	0.070	0.140	0.80	0.090	0.040	0.070
MAY 03...	10	55	47	<0.010	0.270	0.050	0.110	1.3	0.160	0.020	0.010
JUN 13...	9.3	58	45	0.010	0.500	0.050	0.090	0.70	0.140	0.030	0.010
JUL 31...	15	73	69	<0.010	0.400	0.020	0.050	0.50	0.170	0.030	0.030

ROANOKE RIVER BASIN

02075500 DAN RIVER AT PACES, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
NOV 15...	30	2	19	<0.5	<1	<1	<3	5	250	<5	8
JAN 19...	--	--	--	--	--	--	--	--	--	--	--
MAR 21...	20	1	20	<0.5	<1	<1	<3	3	90	<5	<4
MAY 03...	100	<1	30	<0.5	<1	<1	<3	3	190	<5	<4
JUN 13...	--	--	--	--	--	--	--	--	--	--	--
JUL 31...	80	<1	17	<0.5	<1	<1	<3	3	130	1	<4

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 15...	16	<0.1	<10	1	<1	<1.0	56	<6	20	9	91
JAN 19...	--	--	--	--	--	--	--	--	--	11	94
MAR 21...	12	<0.1	<10	<1	<1	<1.0	51	<6	10	33	92
MAY 03...	11	<0.1	<10	6	<1	<1.0	35	<6	20	392	84
JUN 13...	--	--	--	--	--	--	--	--	--	1080	93
JUL 31...	7	<0.1	<10	1	<1	<1.0	40	<6	7	132	94

02076500 GEORGES CREEK NEAR GRETN, VA

LOCATION.--Lat 36°56'11", long 79°18'42", Pittsylvania County, Hydrologic Unit 03010105, on left bank 15 ft downstream from bridge on State Highway 40, 2.8 mi southeast of Gretna, and 5.8 mi upstream from Whitethorn Creek.

DRAINAGE AREA.--9.24 mi².

PERIOD OF RECORD.--September 1949 to current year.

REVISED RECORDS.--WSP 1703: 1950-52. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 629.54 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for periods with ice effect, Dec. 13, 14, and Feb. 10, and period of doubtful gage-height record, Aug. 1-3, which are fair. Occasional regulation at low flow from unknown source. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--40 years, 9.64 ft³/s, 14.17 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,480 ft³/s, Sept. 22, 1979, gage height, 8.50 ft, from rating curve extended above 640 ft³/s on basis of slope-area measurements at gage heights 4.93 ft and 6.22 ft and contracted-opening measurements at gage heights 7.75 ft and 8.50 ft; minimum daily, 1.0 ft³/s, Mar. 12, Apr. 5, 1956, July 28, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 150 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	2030	161	2.76	July 30	2230	*1,060	*7.07
May 2	0100	302	3.75	July 31	0200	890	6.50
May 6	0100	502	4.81	Sept. 16	0330	281	3.61
July 5	1930	167	2.81	Sept. 26	0200	370	4.15
July 5	2330	259	3.46				

Minimum discharge, 3.0 ft³/s, Oct. 13-14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.4	12	6.2	7.0	5.1	9.9	7.7	23	7.5	6.0	e25	5.3
2	3.4	7.7	5.7	6.1	5.3	8.3	7.7	70	8.1	5.7	e16	5.1
3	4.2	7.1	5.2	5.2	5.5	7.5	7.8	17	9.3	5.8	e9.0	4.9
4	6.9	6.3	5.0	5.2	5.5	7.5	8.1	13	8.1	5.9	6.2	4.8
5	4.6	8.7	4.9	4.6	6.0	7.6	12	57	10	43	6.0	4.7
6	4.1	8.6	4.6	5.6	6.1	40	11	111	11	53	5.8	4.7
7	3.8	6.9	4.7	5.9	6.4	31	15	26	10	13	5.6	5.0
8	3.7	6.6	4.8	5.4	6.4	16	18	17	16	9.7	5.1	5.1
9	4.0	6.5	5.2	5.6	5.9	13	14	15	19	8.4	4.9	5.1
10	4.0	6.5	5.4	5.4	e4.9	11	11	17	11	7.9	4.9	5.1
11	3.8	6.4	5.1	5.0	5.3	10	10	13	9.0	7.3	5.9	5.1
12	3.7	5.9	4.6	6.6	5.0	9.3	9.3	12	9.8	7.0	5.1	5.1
13	3.5	6.1	e4.2	7.4	5.0	9.8	8.8	11	11	7.3	4.9	6.1
14	3.2	6.5	e4.3	6.6	5.1	11	8.3	11	8.9	7.4	4.9	7.2
15	3.4	6.2	4.4	6.9	5.3	9.3	9.5	14	13	6.5	4.9	5.1
16	3.7	6.1	4.4	6.8	6.5	8.5	9.4	13	20	12	4.9	59
17	3.9	18	4.5	6.0	8.4	7.7	8.5	11	20	10	5.2	27
18	3.8	7.5	4.3	6.0	7.6	7.7	7.8	11	11	8.3	5.9	25
19	3.9	5.7	4.0	6.1	7.9	7.9	7.3	10	9.9	8.1	5.4	23
20	4.5	5.5	3.9	5.7	8.6	8.8	7.3	9.2	9.7	11	5.0	22
21	5.1	5.4	4.0	5.7	13	12	7.2	9.2	13	8.3	4.2	22
22	5.3	5.1	4.6	5.7	13	9.7	6.9	9.3	11	7.0	8.2	22
23	4.8	4.3	4.4	5.8	10	11	6.9	12	9.4	6.5	6.6	21
24	4.9	4.4	4.5	5.6	9.1	28	6.8	9.9	8.1	6.8	6.2	21
25	5.0	4.4	5.2	5.5	7.7	15	9.1	8.5	7.7	6.8	8.7	28
26	5.3	4.6	4.7	5.6	7.4	12	15	8.0	7.6	6.6	7.5	100
27	5.4	9.0	4.4	5.4	8.7	10	16	7.7	7.3	13	6.2	19
28	5.2	20	4.3	5.0	10	9.4	16	7.7	6.5	7.6	5.9	14
29	5.4	8.7	4.4	5.0	---	9.0	15	7.7	6.0	6.5	5.6	12
30	5.3	6.8	4.3	5.1	---	8.6	11	7.7	5.8	76	5.9	14
31	5.5	---	4.2	5.0	---	8.4	---	7.7	---	152	5.5	---
TOTAL	136.7	223.5	144.4	178.5	200.7	374.9	308.4	576.6	314.7	540.4	211.1	507.4
MEAN	4.41	7.45	4.66	5.76	7.17	12.1	10.3	18.6	10.5	17.4	6.81	16.9
MAX	6.9	20	6.2	7.4	13	40	18	111	20	152	25	100
MIN	3.2	4.3	3.9	4.6	4.9	7.5	6.8	7.7	5.8	5.7	4.2	4.7
CFSM	.48	.81	.50	.62	.78	1.31	1.11	2.01	1.14	1.89	.74	1.83
IN.	.55	.90	.58	.72	.81	1.51	1.24	2.32	1.27	2.18	.85	2.04

CAL YR 1988 TOTAL 2242.9 MEAN 6.13 MAX 28 MIN 2.3 CFSM .66 IN. 9.03
WTR YR 1989 TOTAL 3717.3 MEAN 10.2 MAX 152 MIN 3.2 CFSM 1.10 IN. 14.97

e Estimated.

ROANOKE RIVER BASIN

02077000 BANISTER RIVER AT HALIFAX, VA

LOCATION.--Lat 36°46'35", long 78°54'58", Halifax County, Hydrologic Unit 03010105, on left bank 10 ft downstream from bridge on State Highway 360, 1,700 ft downstream from Terrible Creek, 1 mi northeast of Halifax, and 10 mi upstream from mouth.

DRAINAGE AREA.--547 mi².

PERIOD OF RECORD.--September 1904 to December 1905, October 1928 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 892: 1929-30, 1932-35. WSP 972: 1938(M), 1940. WSP 1112: 1943(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 318.54 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Sept. 28, 1904, to Dec. 31, 1905, nonrecording gage at site 400 ft upstream at different datum. Dec. 9, 1928, to Sept. 20, 1950, water-stage recorder at site 400 ft upstream at present datum.

REMARKS.--Records poor. Flow regulated by a reservoir 0.5 mi upstream from station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--62 years, 504 ft³/s, 12.51 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 50,000 ft³/s, Sept. 20, 1944, gage height, 40.8 ft, from floodmarks, from rating curve extended above 13,000 ft³/s on basis of slope-area measurement of peak flow and velocity-area study; minimum, 6.0 ft³/s many days in August and September 1932.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,170 ft³/s, May 3, gage height, 18.06 ft; minimum daily, 20 ft³/s, Oct. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e95	289	e475	197	186	1190	430	803	e235	e230	3830	356
2	e100	359	e400	336	e175	963	360	3500	e265	e140	1820	239
3	e103	274	e350	341	e90	622	327	5560	e150	e220	511	244
4	138	203	e300	336	261	507	322	2210	e225	e180	437	214
5	207	195	268	e140	245	488	343	890	341	e210	289	206
6	266	225	236	258	180	519	454	2930	688	836	339	219
7	156	247	292	280	e135	1690	608	4710	618	1820	252	e140
8	147	203	159	168	317	2370	1300	2650	1270	1190	204	196
9	144	179	216	305	258	1180	1460	1130	1700	823	317	305
10	142	172	258	e255	188	674	925	868	2110	406	233	e120
11	144	172	423	e230	221	515	602	813	990	e255	262	e140
12	144	167	420	288	228	436	479	641	599	e220	264	e190
13	142	165	411	270	167	396	413	541	529	e290	214	e175
14	142	165	382	361	160	520	367	481	666	e195	171	e190
15	143	165	348	373	183	552	380	463	834	415	333	e180
16	143	238	e144	374	238	446	491	555	974	546	387	491
17	382	212	e275	368	208	381	447	530	1860	e320	680	1110
18	427	304	e112	350	279	340	336	393	1790	e315	678	806
19	e166	254	255	261	282	332	349	400	931	392	791	424
20	e26	277	197	122	305	309	306	365	597	286	311	331
21	e24	273	232	292	820	403	281	339	568	e240	377	688
22	e23	231	220	e245	2390	608	267	282	515	e260	471	619
23	e22	e141	190	e215	2100	520	261	302	450	e200	647	513
24	e20	116	212	244	1200	1960	258	345	385	e195	460	297
25	e40	165	238	e175	729	2980	246	315	e340	e180	1020	266
26	e66	171	208	e160	555	1610	576	274	e320	246	942	1360
27	e45	307	222	e225	573	792	853	262	e250	268	483	3110
28	e30	1400	166	e200	867	542	581	249	e240	271	362	1630
29	e25	1690	247	e170	---	458	605	270	e285	187	416	630
30	e85	931	173	191	---	412	809	331	e150	340	238	571
31	114	---	224	186	---	468	---	e160	---	1140	219	---
TOTAL	3851	9890	8253	7916	13540	25183	15436	33562	20875	12816	17958	15960
MEAN	124	330	266	255	484	812	515	1083	696	413	579	532
MAX	427	1690	475	374	2390	2980	1460	5560	2110	1820	3830	3110
MIN	20	116	112	122	90	309	246	160	150	140	171	120
CFSM	.23	.60	.49	.47	.88	1.49	.94	1.98	1.27	.76	1.06	.97
IN.	.26	.67	.56	.54	.92	1.71	1.05	2.28	1.42	.87	1.22	1.09

CAL YR 1988 TOTAL 109738 MEAN 300 MAX 2360 MIN 20 CFSM .55 IN. 7.46
WTR YR 1989 TOTAL 185240 MEAN 508 MAX 5560 MIN 20 CFSM .93 IN. 12.60

e Estimated.

02077500 HYCO RIVER NEAR DENNISTON, VA

LOCATION.--Lat 36°35'16", long 78°53'56", Halifax County, Hydrologic Unit 03010104, on left bank 60 ft upstream from bridge on U.S. Highway 501, 0.8 mi upstream from Mayo Creek, 2.5 mi northeast of Denniston, and 7.3 mi south of South Boston.

DRAINAGE AREA.--289 mi².

PERIOD OF RECORD.--October 1928 to September 1934, October 1950 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 1383: Drainage area, 1930. WSP 1503: 1930(M). WDR VA-75-1: 1974.

GAGE.--Water-stage recorder. Datum of gage is 315.24 ft above National Geodetic Vertical Datum of 1929. July 10, 1929, to Mar. 14, 1934, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 13, 14, 19, which are fair. Small diurnal fluctuation at low flow in some years caused by mill upstream from station. Since 1964, flow regulated by Hyco Lake 15.7 mi upstream, capacity 75,480 acre-ft, and since Apr. 26, 1974, by Roxboro Steam-Electric Generating Plant afterbay Reservoir, capacity 12,000 acre-ft. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--45 years, 253 ft³/s, 11.89 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,800 ft³/s, July 15, 1975, gage height, 24.27 ft, from rating curve extended above 8,200 ft³/s; minimum, 0.004 ft³/s, Sept. 14, 1932, gage height, 3.58 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods in August 1928 and September 1945 reached stages of 26.4 ft and 25.6 ft, respectively, from floodmarks.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,110 ft³/s, Feb. 23, gage height, 17.77 ft; minimum, 17 ft³/s, Oct. 2, gage height, 4.50 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	425	61	54	35	2460	420	271	44	39	282	44
2	17	287	47	99	37	2580	642	2090	43	36	1090	42
3	36	80	43	60	36	2070	462	2690	43	34	1290	39
4	134	51	37	45	36	1670	426	2080	44	33	271	34
5	75	44	33	35	36	1180	425	1440	57	45	189	35
6	34	49	32	34	53	1100	487	1340	76	1210	239	37
7	26	42	31	50	90	1620	700	1340	78	1250	202	38
8	22	35	31	68	247	1860	1250	1210	64	241	178	37
9	20	31	31	94	215	1690	1310	1100	88	193	169	35
10	19	30	40	137	154	1020	1410	399	89	180	166	33
11	21	30	35	114	140	670	683	273	56	176	171	30
12	21	29	30	110	135	578	507	253	53	171	168	30
13	21	26	e29	134	127	294	459	237	222	193	162	32
14	21	24	e30	147	45	459	433	224	131	177	158	33
15	22	25	30	134	34	650	476	219	176	170	159	33
16	21	25	30	134	32	1050	558	231	130	191	157	35
17	19	60	28	130	34	879	464	188	290	252	155	47
18	20	236	25	180	55	607	410	76	110	192	159	34
19	22	70	e24	170	59	597	240	68	91	182	172	33
20	24	50	25	174	88	549	222	64	108	177	94	36
21	33	45	26	171	918	559	211	61	157	172	54	227
22	106	39	27	167	2070	451	204	57	438	169	117	78
23	49	34	27	166	3790	449	197	67	200	165	67	61
24	33	33	25	167	2890	2260	194	62	283	164	63	47
25	31	30	24	150	1890	3650	194	57	156	166	1010	49
26	32	28	22	87	1270	2990	762	54	144	292	229	648
27	31	31	21	42	826	1870	272	52	126	635	93	199
28	31	353	22	36	1470	955	273	48	47	845	100	83
29	31	202	24	34	---	413	181	45	43	474	70	63
30	29	83	21	34	---	379	229	46	41	177	59	62
31	28	---	21	37	---	439	---	45	---	244	50	---
TOTAL	1047	2527	932	3194	16812	37998	14701	16387	3628	8645	7543	2234
MEAN	33.8	84.2	30.1	103	600	1226	490	529	121	279	243	74.5
MAX	134	425	61	180	3790	3650	1410	2690	438	1250	1290	648
MIN	17	24	21	34	32	294	181	45	41	33	50	30
CFSM	.12	.29	.10	.36	2.08	4.24	1.70	1.83	.42	.96	.84	.26
IN.	.13	.33	.12	.41	2.16	4.89	1.89	2.11	.47	1.11	.97	.29

CAL YR 1988 TOTAL 42109 MEAN 115 MAX 1360 MIN 17 CFSM .40 IN. 5.42
WTR YR 1989 TOTAL 115648 MEAN 317 MAX 3790 MIN 17 CFSM 1.10 IN. 14.89

e Estimated.

ROANOKE RIVER BASIN

02079000 ROANOKE (STAUNTON) RIVER AT CLARKSVILLE, VA

LOCATION.--Lat 36°37'40", long 78°33'04", Mecklenburg County, Hydrologic Unit 03010102, at water treatment plant intake, in Clarksville.

DRAINAGE AREA.--7,320 mi².

PERIOD OF RECORD.--August 1987 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	PHENOLS TOTAL (UG/L)
OCT 19...	0930	4.1	<1
NOV 17...	1000	3.7	3
DEC 07...	0945	8.2	1
JAN 19...	0930	3.7	1
FEB 07...	0930	2.6	1
MAR 14...	1000	8.7	<1
APR 18...	1000	5.5	<1
MAY 16...	0915	4.9	<1
JUN 21...	0900	5.6	<1
JUL 19...	0915	4.8	1
AUG 15...	1030	4.0	<1
SEP 05...	1030	4.3	<1

ROANOKE RIVER BASIN

285

02079490 JOHN H. KERR RESERVOIR NEAR BOYDTON, VA

LOCATION.--Lat 36°35'56", long 78°18'06", Mecklenburg County, Hydrologic Unit 03010102, at John H. Kerr Dam on Roanoke River, 2.7 mi upstream from Allen Creek, 6.7 mi southeast of Boydton, 18 mi upstream from the Virginia-North Carolina State line, and at mile 178.7.

DRAINAGE AREA.--7,780 mi², approximately.

PERIOD OF RECORD.--July 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by concrete dam with earth embankments. Spillway, with crest at elevation 288.0 ft, is equipped with 22 radial gates 32 ft high by 42 ft wide. Storage began in September 1950 during construction; initial filling started June 30, 1952; water in reservoir first reached rule-curve elevation in March 1953. Total capacity at top of gates, elevation, 320 ft, is 2,770,000 acre-ft of which 1,281,400 acre-ft is controlled flood storage between elevations 300 ft, top of power pool, and 320 ft; 316,900 acre-ft is available for power between elevations 293.0 ft, bottom of power pool, and 300 ft; 1,171,700 acre-ft is inactive and dead storage below elevation 293.0 ft. Figures given herein represent total contents. Reservoir is used for flood control, hydroelectric power, low-water regulation for navigation and pollution abatement, release of water for downstream fish spawning, and recreation.

COOPERATION.--Records were provided by the U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 2,736,460 acre-ft, Apr. 29, 1987, elevation, 319.61 ft; minimum (after first filling to rule curve), 724,700 acre-ft, Feb. 3, 1956, elevation, 280.23 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 2,042,270 acre-ft, May 11, elevation, 309.96 ft; minimum, 1,258,540 acre-ft, Dec. 19, elevation, 295.06 ft.

CORRECTIONS.--The contents for Sept. 30, 1988, were 1,361,880 acre-ft; the previously published figure in WDR VA-88-1 is not correct.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	297.36	1,361,880	-
Oct. 31.....	297.56	1,371,200	+9,320
Nov. 30.....	297.72	1,378,650	+7,450
Dec. 31.....	295.46	1,276,140	-102,510
CAL YR 1988.....	-	-	-161,450
Jan. 31.....	296.06	1,302,610	+26,470
Feb. 28.....	301.50	1,564,900	+262,290
Mar. 31.....	301.95	1,588,120	+23,220
Apr. 30.....	303.35	1,662,360	+74,240
May 31.....	300.91	1,534,560	-127,800
June 30.....	302.34	1,608,650	+74,090
July 31.....	300.63	1,520,420	-88,230
Aug. 31.....	300.96	1,537,080	+16,660
Sept. 30.....	301.55	1,567,480	+30,400
WTR YR 1989.....	-	-	+205,600

ROANOKE RIVER BASIN

02079640 ALLEN CREEK NEAR BOYDTON, VA

LOCATION.--Lat 36°40'46", long 78°19'37", Mecklenburg County, Hydrologic Unit 03010106, on left bank at upstream side of bridge on U.S. Highway 58, 0.8 mi upstream from Coleman Creek, 2.3 mi downstream from Layton Creek, 3.7 mi east of Boydton, and 11.8 mi southwest of South Hill.

DRAINAGE AREA.--53.4 mi².

PERIOD OF RECORD.--October 1961 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 216.50 ft above National Geodetic Vertical Datum of 1929 (levels by Virginia Department of Transportation).

REMARKS.--Records good except for period of doubtful gage-height record, June 28 to July 17, which is fair.

Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Water Control Board.

AVERAGE DISCHARGE.--28 years, 45.8 ft³/s, 11.65 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,620 ft³/s, Oct. 23, 1971, gage height, 21.80 ft, from rating curve extended above 3,100 ft³/s; no flow many days in August, September, and October 1968, September and October 1970.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 850 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 21	2230	*2,270	*16.98	May 2	0930	1,150	13.41
Feb. 28	1430	1,040	12.83	May 6	0830	1,490	14.70
Mar. 7	0430	1,710	15.40	June 6	0830	1,100	13.19
Mar. 24	0700	1,250	13.83	Aug. 2	1500	1,200	13.66
Apr. 7	2400	1,440	14.54	Aug. 18	0730	1,260	13.90
Apr. 28	0130	850	11.57				

Minimum discharge, 1.2 ft³/s, Oct. 1, 2, gage height, 1.32 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	264	28	20	14	262	153	66	18	e17	37	14
2	1.3	64	23	29	14	117	67	526	17	e15	413	13
3	5.3	21	20	22	14	85	58	134	17	e14	88	13
4	32	14	18	20	16	128	59	74	17	e13	31	12
5	14	12	17	17	23	93	56	80	26	e12	22	12
6	6.3	15	16	18	53	235	416	773	560	e13	19	12
7	3.9	15	16	22	103	823	467	157	75	e17	17	12
8	3.0	11	15	20	81	154	521	87	286	e16	15	12
9	2.7	9.1	16	22	39	114	182	64	209	e15	14	12
10	2.5	8.0	19	23	28	124	104	113	89	e13	15	12
11	2.4	7.7	17	22	24	78	78	84	42	e12	80	11
12	2.4	7.2	16	80	22	61	62	76	33	e11	31	11
13	2.3	6.7	e16	107	20	74	52	53	35	e20	22	11
14	2.3	6.5	15	66	19	237	46	44	58	e24	18	11
15	2.5	6.7	15	42	18	122	363	41	36	e27	17	11
16	2.8	6.6	16	36	18	179	228	41	34	e200	16	14
17	2.9	132	17	28	18	101	99	37	113	e90	32	18
18	2.9	44	e16	24	22	79	68	33	41	16	576	14
19	3.2	22	14	22	24	214	53	30	27	11	63	13
20	3.6	19	13	20	36	80	45	28	23	10	33	14
21	14	19	13	19	972	155	40	27	22	9.5	26	28
22	61	16	14	18	838	119	37	25	24	8.7	132	17
23	16	14	14	17	195	131	35	24	20	7.8	49	14
24	9.5	14	14	17	108	758	32	24	21	7.2	26	13
25	7.4	13	15	17	75	195	32	22	20	6.7	21	14
26	6.3	12	16	16	77	109	411	22	18	11	19	114
27	6.3	12	14	16	102	75	174	21	98	41	18	32
28	5.9	341	14	15	623	59	369	20	e22	162	19	18
29	5.4	82	16	15	---	51	113	19	e19	259	18	15
30	6.2	38	16	15	---	69	94	19	e18	29	17	16
31	6.6	---	16	15	---	201	---	18	---	26	15	---
TOTAL	244.2	1252.5	505	840	3596	5282	4514	2782	2038	1133.9	1919	533
MEAN	7.88	41.7	16.3	27.1	128	170	150	89.7	67.9	36.6	61.9	17.8
MAX	61	341	28	107	972	823	521	773	560	259	576	114
MIN	1.3	6.5	13	15	14	51	32	18	17	6.7	14	11
CFSM	.15	.78	.31	.51	2.41	3.19	2.82	1.68	1.27	.68	1.16	.33
IN.	.17	.87	.35	.59	2.51	3.68	3.14	1.94	1.42	.79	1.34	.37

CAL YR 1988 TOTAL 9400.7 MEAN 25.7 MAX 417 MIN 1.0 CFSM .48 IN. 6.55
WTR YR 1989 TOTAL 24639.6 MEAN 67.5 MAX 972 MIN 1.3 CFSM 1.26 IN. 17.16

e Estimated.

0207987950 LAKE GASTON (LITTLE RIVER CHANNEL) NEAR HENRICO, NC

LOCATION.--Lat 36°30'34", long 77°51'49", Northampton County, Hydrologic Unit 03010106, in Lake Gaston, 2.0 mi southwest of Henrico.

PERIOD OF RECORD.--August 1987 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH (STAND- ARD UNITS)	PH LAB (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)
OCT												
19...	0900	3.00	118	114	7.40	7.70	18.5	755	1.6	8.5	92	1.0
19...	0915	12.0	117	115	7.50	7.60	18.5	755	1.4	3.6	39	<1.0
19...	0930	21.0	118	115	7.70	7.70	18.5	755	2.2	3.1	33	<1.0
19...	0945	39.0	119	116	7.70	7.60	18.0	755	2.4	2.6	28	<1.0
19...	1000	55.0	121	118	7.60	7.60	18.0	755	4.5	2.2	23	<1.0
NOV												
17...	1000	3.00	114	116	7.10	7.70	14.5	755	2.5	9.6	95	3.0
17...	1015	12.0	115	116	7.20	7.80	14.5	755	2.9	9.5	94	3.0
17...	1030	21.0	116	118	7.20	7.70	14.0	755	2.4	9.4	92	2.0
DEC												
07...	0845	3.00	126	125	7.70	7.60	10.5	755	2.9	10.2	92	<1.0
07...	0900	12.0	126	125	7.70	7.70	10.5	755	3.3	10.1	92	<1.0
07...	0915	21.0	125	125	7.70	7.70	10.5	755	2.6	10.0	91	<1.0
07...	0930	39.0	125	125	7.70	7.40	10.5	755	3.5	10.0	91	<1.0
07...	0945	56.0	125	126	7.60	7.80	10.5	755	3.1	10.0	91	<1.0
JAN												
19...	0845	3.00	130	133	7.90	7.80	7.5	759	2.1	11.7	98	2.0
19...	0900	12.0	130	132	7.90	7.80	7.5	759	2.6	11.6	97	2.0
19...	0915	21.0	130	133	7.80	7.60	7.5	759	2.8	11.6	97	1.0
19...	0930	39.0	129	132	7.80	7.80	7.0	759	2.1	11.6	96	1.0
19...	0945	55.0	130	132	7.80	8.10	7.0	759	2.1	11.6	96	1.0
FEB												
08...	0845	3.00	116	129	8.10	7.70	8.0	763	2.6	11.6	98	2.0
08...	0900	12.0	116	129	8.00	7.80	8.0	763	2.2	11.6	98	2.0
08...	0915	21.0	115	129	8.00	7.80	8.0	763	2.2	11.6	98	1.0
08...	0930	39.0	115	129	8.00	7.50	8.0	763	2.1	11.6	98	2.0
08...	0945	56.0	113	129	7.90	7.50	8.0	763	2.0	11.9	100	1.0
MAR												
15...	0830	3.00	119	117	7.80	7.50	6.5	753	7.6	11.7	96	3.0
15...	0845	12.0	119	117	7.70	7.50	6.0	753	8.4	11.6	95	3.0
15...	0900	21.0	119	117	7.70	7.60	6.0	753	9.5	11.5	93	4.0
15...	0915	39.0	118	117	7.70	7.50	6.0	753	8.7	11.5	93	3.0
15...	0930	55.0	118	117	7.70	7.50	6.0	753	8.4	12.3	99	2.0
APR												
19...	0900	3.00	91	94	7.70	7.50	15.0	754	9.5	10.8	108	2.0
19...	0915	12.0	90	94	7.60	7.50	14.5	754	9.4	10.7	106	2.0
19...	0930	21.0	89	95	7.60	7.60	14.0	754	9.7	10.3	101	2.0
19...	0945	39.0	89	95	7.40	7.60	12.0	754	11	9.7	91	1.0
19...	1000	56.0	89	95	7.20	7.30	11.5	754	13	9.3	86	1.0
MAY												
18...	0900	3.00	92	93	7.30	7.30	16.0	761	8.1	9.0	91	1.0
18...	0915	12.0	89	93	7.20	7.90	16.0	761	11	8.8	89	1.0
18...	0930	21.0	89	93	7.20	7.30	16.0	761	9.0	8.6	87	1.0
18...	0945	39.0	90	94	7.10	7.20	15.0	761	9.6	7.8	78	1.0
18...	1000	56.0	88	93	7.00	7.50	14.5	761	12	7.2	71	1.0
JUN												
22...	0900	3.00	82	88	7.80	7.60	24.5	761	3.5	8.9	107	2.0
22...	0915	12.0	82	90	7.20	7.50	23.5	761	3.4	7.3	86	1.0
22...	0930	21.0	83	92	6.80	7.40	21.0	761	8.6	4.9	55	1.0
22...	0945	39.0	83	92	6.70	7.40	20.0	761	9.5	4.1	45	1.0
22...	1000	57.0	89	98	6.70	7.40	17.0	761	19	1.0	10	2.0
JUL												
20...	0900	3.00	87	95	7.12	7.70	25.5	753	5.7	6.9	86	1.0
20...	0915	12.0	86	95	7.01	7.70	25.5	753	1.5	6.4	79	2.0
20...	0930	21.0	86	96	6.84	7.60	25.0	753	6.5	5.1	62	2.0
20...	0945	39.0	88	98	6.61	7.20	23.5	753	10	1.9	23	1.0
20...	1000	58.0	95	101	6.60	7.30	18.0	753	10	0.3	3	2.0
AUG												
16...	0930	3.00	91	97	6.95	7.30	25.5	755	2.8	6.5	80	<1.0
16...	0945	12.0	91	95	6.77	7.50	25.0	755	3.5	4.4	54	<1.0
16...	1000	21.0	91	95	6.73	7.40	24.5	755	3.1	4.6	56	<1.0
16...	1015	39.0	91	97	6.70	7.30	24.0	755	4.1	4.4	53	1.0
16...	1030	57.0	116	123	6.66	7.50	19.0	755	6.5	0.2	3	2.0
SEP												
06...	0845	3.00	96	95	7.20	7.30	25.0	762	2.1	5.7	69	1.0
06...	0900	12.0	95	96	7.10	7.40	25.0	762	1.7	5.6	68	<1.0
06...	0930	21.0	94	95	7.10	7.20	25.0	762	2.2	5.5	67	1.0
06...	0945	39.0	98	102	6.80	7.00	24.5	762	3.7	0.9	11	1.0
06...	1000	56.0	121	108	6.80	7.00	20.0	762	3.2	0	0	--

ROANOKE RIVER BASIN

0207987950 LAKE GASTON (LITTLE RIVER CHANNEL) NEAR HENRICO, NC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	COLI-FORM, TOTAL, IMMEDIATE (COLS. PER 100 ML)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CaCO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS Cl)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)
OCT												
19...	640	<1	33	7.9	3.3	9.4	3.1	33	9.5	8.2	0.10	7.8
19...	--	--	34	8.0	3.4	11	2.0	33	9.4	8.1	0.10	7.8
19...	--	--	33	7.9	3.2	9.3	3.4	33	9.4	8.1	0.10	7.8
19...	--	--	33	7.9	3.2	9.6	2.5	34	9.6	8.3	0.10	8.0
19...	--	--	34	8.1	3.4	11	2.0	34	9.5	8.5	0.10	8.2
NOV												
17...	410	<1	32	7.6	3.2	9.2	2.1	33	10	8.5	0.10	6.5
17...	--	--	32	7.6	3.2	9.2	2.1	33	10	8.5	0.10	6.5
17...	--	--	32	7.6	3.2	9.4	2.1	34	10	8.7	0.10	6.7
DEC												
07...	39	K6	33	7.9	3.2	12	2.2	34	11	9.8	0.10	7.5
07...	--	--	32	7.8	3.1	11	2.2	34	11	9.6	0.10	7.4
07...	--	--	32	7.9	3.1	11	2.2	34	11	9.8	0.10	7.4
07...	--	--	33	7.9	3.2	11	2.2	34	11	9.9	0.10	7.5
07...	--	--	32	7.7	3.1	11	2.3	34	11	9.9	0.10	7.3
JAN												
19...	57	<1	34	8.0	3.3	12	2.5	35	12	11	0.10	7.2
19...	--	--	34	8.0	3.3	12	2.5	35	13	11	0.10	7.3
19...	--	--	33	8.0	3.2	12	2.5	34	12	11	0.10	7.2
19...	--	--	33	7.9	3.2	12	2.5	34	11	11	0.10	7.1
19...	--	--	33	7.9	3.2	12	2.9	34	12	10	0.10	7.1
FEB												
08...	44	K3	33	7.8	3.2	12	2.4	36	12	11	0.10	6.7
08...	--	--	33	7.8	3.2	12	2.5	34	12	11	0.10	6.7
08...	--	--	33	7.8	3.2	12	2.4	34	12	11	0.10	6.7
08...	--	--	33	7.8	3.3	12	2.4	34	12	11	0.20	6.8
08...	--	--	33	7.8	3.2	12	2.4	34	13	11	0.10	6.8
MAR												
15...	K130	K15	31	7.4	3.0	10	2.3	31	13	9.6	0.10	9.4
15...	--	--	31	7.4	3.0	10	2.6	31	13	9.8	0.10	9.4
15...	--	--	31	7.3	3.0	10	2.2	31	13	9.7	0.10	9.3
15...	--	--	31	7.4	3.0	10	2.2	31	13	9.8	0.10	9.5
15...	--	--	31	7.3	3.0	10	2.3	31	13	9.7	0.10	9.3
APR												
19...	K91	K17	26	6.3	2.6	7.6	1.9	22	10	7.3	0.10	8.8
19...	--	--	26	6.3	2.6	7.7	1.9	22	9.9	7.3	0.10	8.7
19...	--	--	26	6.3	2.5	7.5	2.0	22	10	7.3	0.10	8.6
19...	--	--	26	6.3	2.5	7.5	1.9	22	9.9	7.4	0.10	9.0
19...	--	--	27	6.4	2.6	7.8	1.9	22	9.9	7.4	0.10	9.4
MAY												
18...	K6	K6	26	6.2	2.6	7.2	1.9	23	10	6.6	<0.10	9.1
18...	--	--	26	6.2	2.6	6.7	1.8	23	10	6.6	0.10	9.1
18...	--	--	26	6.2	2.6	6.9	2.0	23	10	6.6	0.10	9.1
18...	--	--	26	6.2	2.6	6.7	1.9	23	10	6.7	0.10	9.4
18...	--	--	26	6.2	2.6	6.8	1.8	22	10	6.6	0.10	9.6
JUN												
22...	K170	42	26	6.3	2.6	5.3	2.0	24	9.0	5.5	0.10	7.8
22...	--	--	27	6.4	2.6	5.4	2.0	24	9.0	5.3	0.10	8.1
22...	--	--	28	6.8	2.7	5.8	2.0	23	9.0	5.5	0.10	8.8
22...	--	--	27	6.6	2.6	5.6	2.0	24	9.0	5.6	0.10	9.0
22...	--	--	29	6.9	2.9	5.7	2.1	26	9.0	5.8	0.10	10
JUL												
20...	K13	K4	29	7.1	2.7	6.3	2.2	27	8.0	6.2	0.10	9.4
20...	--	--	29	7.1	2.8	6.3	2.2	27	8.0	6.2	0.10	9.3
20...	--	--	29	7.1	2.8	6.2	2.2	27	8.0	6.3	0.10	9.5
20...	--	--	30	7.3	2.8	6.3	2.2	27	8.0	6.3	0.10	10
20...	--	--	31	7.5	3.0	6.2	2.1	28	9.0	6.1	0.10	11
AUG												
16...	72	K1	30	7.2	2.9	6.1	2.2	28	8.0	5.8	0.10	9.0
16...	--	--	30	7.2	2.8	6.0	2.3	27	8.0	5.7	0.10	9.1
16...	--	--	30	7.4	2.9	6.3	2.3	27	8.0	5.6	0.10	9.4
16...	--	--	30	7.4	2.9	6.4	2.3	28	8.0	5.8	0.10	9.4
16...	--	--	32	8.0	2.9	6.3	2.4	43	7.0	5.7	0.10	12
SEP												
06...	>72	K3	29	6.8	2.8	6.7	2.2	28	8.0	5.3	0.10	9.1
06...	--	--	29	7.0	2.9	6.7	2.2	27	7.0	5.4	0.10	9.1
06...	--	--	29	7.0	2.8	6.6	2.4	28	<8.0	5.4	0.10	9.1
06...	--	--	31	7.5	2.9	6.4	2.4	25	8.0	6.0	0.10	10
06...	--	--	32	7.7	3.0	6.4	2.4	32	8.0	6.0	0.10	11

0207987950 LAKE GASTON (LITTLE RIVER CHANNEL) NEAR HENRICO, NC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L)	PHEOPHY- -TIN A FLUORO- METRIC METHOD (UG/L)	PHENOLS TOTAL (UG/L)
OCT											
19...	69	0.30	0.004	100	12	130	<1	--	6.70	2.30	--
19...	70	0.40	0.008	110	3	120	<1	3.2	7.60	3.00	<1
19...	69	0.30	0.006	120	12	110	<1	--	8.10	2.60	--
19...	70	0.50	0.021	240	34	90	<1	--	7.70	4.20	--
19...	71	0.50	0.008	420	8	120	5	3.3	11.0	5.20	1
NOV											
17...	67	0.40	0.003	100	11	50	<1	--	8.90	3.10	--
17...	67	0.30	0.005	150	11	40	<1	3.2	8.20	3.60	3
17...	68	0.40	0.006	150	12	50	<1	--	7.70	3.40	--
DEC											
07...	74	0.50	0.006	310	28	50	1	--	5.50	2.40	--
07...	73	0.40	0.007	190	24	50	<1	3.6	6.20	3.20	1
07...	73	0.40	0.013	220	23	50	2	--	6.20	2.60	--
07...	73	0.40	0.008	260	19	60	3	--	5.50	3.40	--
07...	73	0.20	0.007	250	24	60	3	3.5	5.40	2.60	1
JAN											
19...	77	0.60	0.007	130	37	40	18	--	8.30	2.00	--
19...	78	0.40	0.005	100	34	40	18	3.5	9.20	1.20	1
19...	76	0.60	0.007	120	31	40	18	--	9.60	0.900	--
19...	75	0.30	0.005	150	17	40	18	--	9.80	1.00	--
19...	76	0.40	0.006	120	14	40	19	3.3	9.90	1.00	2
FEB											
08...	77	0.20	0.009	130	20	30	3	--	8.50	2.00	--
08...	76	0.30	0.025	120	17	30	2	3.0	8.80	2.40	1
08...	76	0.30	0.005	140	16	30	2	--	7.40	3.50	--
08...	76	<0.20	0.009	150	19	30	2	--	9.10	2.50	--
08...	77	<0.20	0.004	150	18	30	2	3.1	8.30	2.00	1
MAR											
15...	74	0.30	0.026	460	180	40	13	--	6.20	2.10	--
15...	74	0.30	0.026	530	150	40	13	4.2	12.4	4.80	<1
15...	73	0.30	0.025	780	60	40	13	--	6.90	3.00	--
15...	74	0.30	0.028	490	160	30	13	--	6.50	2.30	--
15...	73	0.30	0.026	590	110	50	13	4.4	7.00	1.60	1
APR											
19...	58	0.70	0.020	540	240	30	2	--	13.2	4.90	--
19...	58	0.50	0.022	540	150	30	<1	4.9	12.1	3.10	<1
19...	58	0.50	0.040	670	230	30	3	--	11.3	6.50	--
19...	58	0.30	0.018	600	220	30	1	--	8.30	3.00	--
19...	59	0.50	0.004	680	230	50	7	4.8	9.30	3.20	2
MAY											
18...	58	0.50	0.022	350	190	40	7	--	10.2	4.00	--
18...	57	0.40	0.037	350	150	40	8	5.0	9.30	3.50	<1
18...	57	0.30	0.019	320	66	40	4	--	9.60	3.20	--
18...	58	0.30	0.021	460	200	50	8	--	4.70	2.30	--
18...	57	0.40	0.030	500	170	70	19	4.5	8.80	14.3	<1
JUN											
22...	53	0.20	0.008	300	120	30	2	--	4.70	8.70	--
22...	53	1.0	0.010	610	110	40	2	4.3	3.40	5.30	6
22...	55	0.20	0.026	770	67	80	8	--	1.80	4.00	--
22...	55	0.60	0.016	990	170	150	36	--	1.10	3.20	--
22...	59	0.30	0.031	1500	54	850	670	5.2	1.00	5.30	4
JUL											
20...	58	0.40	0.005	340	130	70	28	--	6.60	9.60	--
20...	58	0.40	0.005	350	120	70	5	3.9	6.60	5.30	7
20...	59	0.40	0.004	400	130	110	4	--	4.90	3.00	--
20...	60	<0.20	0.005	650	140	510	320	--	2.50	2.10	--
20...	63	<0.20	0.024	550	100	1300	970	3.8	0.800	2.50	4
AUG											
16...	58	0.40	0.009	190	95	70	4	--	10.4	2.30	--
16...	58	0.50	0.006	250	110	90	3	4.2	3.50	1.60	<1
16...	58	0.40	0.019	280	98	100	2	--	3.00	2.90	--
16...	59	0.40	0.011	370	96	170	37	--	3.40	2.80	--
16...	77	0.80	0.020	640	280	6200	6400	5.3	1.10	4.20	4
SEP											
06...	58	--	0.013	230	52	310	180	--	3.70	3.10	--
06...	57	0.30	0.009	180	50	310	170	4.0	3.70	3.20	--
06...	--	0.30	0.008	210	41	300	170	--	3.80	3.20	--
06...	59	0.30	0.009	460	51	1300	1100	--	1.50	2.00	--
06...	66	0.40	0.010	570	56	2300	2400	4.0	0.700	1.50	3

ROANOKE RIVER BASIN

02079880 PEA HILL CREEK AT ROUTE 665, NEAR GASBURG, VA

LOCATION.--Lat 36°34'57", long 77°53'20", Brunswick County, Hydrologic Unit 03010106, at bridge on State Highway 665, 1.0 mi north of Gasburg, and 3.3 mi west of Valentines.

PERIOD OF RECORD.--August 1987 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH (STAND- ARD UNITS)	PH LAB (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
OCT 19...	1130	--	90	87	6.90	7.10	15.0	750	4.5	5.5	55
NOV 17...	1230	1.8	78	80	7.00	7.40	13.0	750	5.0	8.6	83
DEC 07...	1200	1.7	83	78	7.10	7.30	10.0	752	6.0	8.2	74
JAN 19...	1115	2.4	80	77	7.00	7.70	5.0	752	7.0	7.9	63
FEB 07...	1015	9.5	78	72	6.70	7.00	6.5	752	19	10.2	84
MAR 14...	1200	19	60	50	6.60	6.90	6.5	748	26	11.8	98
APR 18...	1100	6.0	45	53	7.10	7.20	15.0	749	8.2	10.5	106
MAY 16...	1100	5.4	65	62	6.70	7.60	14.0	745	8.0	10.0	99
JUN 21...	1115	8.0	72	63	6.50	7.90	20.0	753	17	9.1	101
JUL 19...	1100	2.3	71	71	7.00	7.10	20.0	748	13	8.0	90
AUG 15...	1315	1.6	75	76	6.40	7.20	20.5	748	6.0	7.9	89
SEP 05...	1230	0.57	80	83	6.90	7.50	20.0	755	4.8	6.9	77

DATE	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	HARD- NESS TOTAL (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT 19...	10	5000	<1	28	6.4	3.0	6.6	2.9	34	6.1	4.0
NOV 17...	1.0	630	520	24	5.3	2.6	6.3	1.9	29	7.8	4.8
DEC 07...	<1.0	2200	190	22	5.1	2.3	6.7	1.5	29	6.3	4.4
JAN 19...	2.0	610	250	20	4.7	2.1	6.4	1.5	26	8.2	4.7
FEB 07...	2.0	3600	3300	19	4.4	2.0	6.3	1.5	21	12	4.6
MAR 14...	2.0	K10000	760	11	2.6	1.2	3.4	1.2	9.0	7.7	3.5
APR 18...	1.0	460	350	15	3.2	1.6	4.6	1.2	15	3.8	3.5
MAY 16...	<1.0	360	260	18	4.1	2.0	5.3	1.3	22	2.0	3.1
JUN 21...	--	4100	420	14	3.3	1.5	3.9	1.1	22	3.0	3.6
JUL 19...	1.0	2500	260	21	4.8	2.1	5.6	1.5	28	<1.0	3.9
AUG 15...	--	K1400	K54	23	5.3	2.3	5.8	1.5	30	1.0	3.6
SEP 05...	1.0	410	290	26	6.0	2.6	6.7	1.7	34	<1.0	3.7

ROANOKE RIVER BASIN

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02079880 PEA HILL CREEK AT ROUTE 665, NEAR GASBURG, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC TOTAL (MG/L AS C)	PHENOLS TOTAL (UG/L)
OCT 19...	0.10	22	72	0.40	0.047	940	310	70	79	11	1
NOV 17...	0.80	23	71	0.20	0.024	1400	530	100	110	5.3	3
DEC 07...	0.10	23	68	0.20	0.011	1800	1200	120	160	4.0	<1
JAN 19...	0.10	21	65	0.30	0.013	940	600	90	100	4.3	1
FEB 07...	0.10	18	62	0.70	0.045	2100	660	120	83	7.4	1
MAR 14...	0.10	10	35	0.40	0.057	1500	340	60	43	11	<1
APR 18...	0.10	15	42	0.20	0.015	1200	200	60	60	3.7	<1
MAY 16...	0.10	20	52	0.30	0.029	1800	860	100	110	5.0	<1
JUN 21...	0.10	14	45	0.40	0.040	2800	930	90	70	10	<1
JUL 19...	0.10	22	--	0.30	0.024	1800	1100	100	97	6.5	12
AUG 15...	0.10	23	61	0.20	0.028	2000	520	110	91	4.2	1
SEP 05...	0.10	24	--	--	0.029	1800	1900	130	130	3.7	<1

ROANOKE RIVER BASIN

0207988050 PEA HILL CREEK ABOVE ROUTE 667, NEAR GASBURG, VA

LOCATION.--Lat 36°34'33", long 77°52'15", Brunswick County, Hydrologic Unit 03010106, 1.5 mi northeast of Gasburg.

PERIOD OF RECORD.--October 1988 to September 1989.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
OCT								
18...	1030	3.00	100	6.70	17.0	756	9.5	99
NOV								
16...	1045	3.00	86	6.90	13.5	755	10.0	97
DEC								
06...	1015	3.00	88	7.70	8.0	761	11.2	94
JAN								
18...	1015	3.00	119	7.60	6.0	759	11.5	93
FEB								
07...	1030	3.00	77	7.90	8.0	758	11.3	96
MAR								
14...	0945	3.00	51	7.10	7.5	758	10.8	91
APR								
18...	1000	3.00	52	7.30	17.0	757	10.3	107
MAY								
17...	1000	3.00	62	7.10	19.0	756	9.1	99
JUN								
21...	1000	3.00	61	6.90	27.0	760	7.2	91
JUL								
19...	1000	3.00	62	7.02	26.0	758	7.2	89
AUG								
15...	1000	3.00	72	7.70	25.0	758	9.1	111
SEP								
05...	1000	3.00	76	7.20	25.0	764	6.9	83

DATE	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L)	PHEOPHY- -TIN A FLUORO- METRIC METHOD (UG/L)
OCT							
18...	340	<1	0.60	0.012	5.9	8.20	3.30
NOV							
16...	270	K10	0.60	0.006	6.3	15.1	2.70
DEC							
06...	290	K10	0.50	0.014	6.2	6.90	2.40
JAN							
18...	270	<1	0.60	0.014	5.3	6.60	2.30
FEB							
07...	390	K10	0.40	0.014	5.1	19.3	0.200
MAR							
14...	2100	K150	0.40	0.039	8.8	4.70	2.00
APR							
18...	200	K22	0.60	0.030	9.2	8.80	7.00
MAY							
17...	K8	K5	0.60	0.039	8.4	7.10	4.70
JUN							
21...	260	K4	0.40	0.021	8.7	21.4	7.90
JUL							
19...	K130	K5	0.30	0.027	8.7	34.4	6.50
AUG							
15...	41	K4	0.60	0.023	6.1	15.9	10.4
SEP							
05...	K45	K14	0.80	0.024	6.9	26.1	4.90

ROANOKE RIVER BASIN

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02079881 PEA HILL CREEK TRIBUTARY NO. 1, NEAR GASBURG, VA

LOCATION.--Lat 36°34'14", long 77°52'13", Brunswick County, Hydrologic Unit 03010106, 1.4 mi east of Gasburg.

PERIOD OF RECORD.--October 1988 to September 1989.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
OCT 18...	1100	3.00	100	6.80	17.5	756	8.7	92
NOV 16...	1100	3.00	90	6.90	14.0	755	9.9	97
DEC 06...	1030	3.00	92	7.70	8.0	761	11.4	97
JAN 18...	1030	3.00	119	7.50	6.5	759	11.3	92
FEB 07...	1045	3.00	82	7.90	8.5	758	11.6	100
MAR 14...	1000	3.00	60	7.00	7.0	758	11.2	92
APR 18...	1015	3.00	57	7.40	16.5	757	10.8	112
MAY 17...	1015	3.00	72	7.20	18.5	756	8.5	91
JUN 21...	1015	3.00	63	7.00	27.5	760	7.2	91
JUL 19...	1015	3.00	65	7.02	26.5	758	7.0	87
AUG 15...	1015	3.00	77	7.28	25.0	758	7.6	93
SEP 05...	1015	3.00	79	7.20	25.0	764	7.6	92

DATE	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L)	PHEOPHY- TIN A FLUORO- METRIC METHOD (UG/L)
OCT 18...	150	<1	0.40	0.010	4.8	5.60	3.10
NOV 16...	K220	<1	0.70	0.008	6.6	14.2	2.80
DEC 06...	310	K2	0.60	0.012	6.6	3.70	1.90
JAN 18...	220	<1	0.50	0.013	5.3	4.70	4.60
FEB 07...	360	K4	0.40	0.052	5.0	16.8	3.00
MAR 14...	2900	230	0.70	0.053	9.0	2.50	2.50
APR 18...	K110	23	<0.20	0.029	8.1	3.00	3.70
MAY 17...	K48	K15	0.40	0.034	8.7	1.90	4.70
JUN 21...	380	140	0.30	0.017	7.9	6.00	8.10
JUL 19...	K150	K16	0.30	0.024	8.8	22.3	5.80
AUG 15...	28	K4	0.60	0.032	6.7	15.1	9.60
SEP 05...	K11	K12	0.70	0.019	6.5	19.0	3.80

ROANOKE RIVER BASIN

0207988130 PEA HILL CREEK TRIBUTARY NO. 2, NEAR VALENTINES, VA

LOCATION.--Lat 36°34'08", long 77°51'37", Brunswick County, Hydrologic Unit 03010106, 2.0 mi southwest of Valentines.

PERIOD OF RECORD.--October 1988 to September 1989.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
OCT 18...	1115	3.00	102	7.50	17.0	756	9.1	95
NOV 16...	1115	3.00	92	7.10	13.5	755	10.4	101
DEC 06...	1045	3.00	95	7.60	9.0	761	11.0	95
JAN 18...	1045	3.00	118	7.40	6.5	759	11.5	94
FEB 07...	1100	3.00	83	7.90	8.5	758	11.8	102
MAR 14...	1015	3.00	65	7.10	6.0	758	11.1	89
APR 18...	1030	3.00	61	7.50	17.0	757	10.7	111
MAY 17...	1030	3.00	66	7.20	19.0	756	9.5	103
JUN 21...	1030	3.00	65	6.90	27.0	760	7.0	88
JUL 19...	1030	3.00	68	7.01	26.5	758	6.6	82
AUG 15...	1030	3.00	79	6.98	25.0	758	6.9	84
SEP 05...	1030	3.00	81	7.10	25.5	764	6.5	79

DATE	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L)	PHEOPHY- TIN A FLUORO- METRIC METHOD (UG/L)
OCT 18...	320	K14	0.30	0.008	5.0	8.10	3.60
NOV 16...	K280	<1	0.60	0.006	5.6	18.1	1.30
DEC 06...	360	K13	0.50	0.012	6.2	10.2	2.00
JAN 18...	960	3	0.60	0.019	5.3	7.10	3.70
FEB 07...	230	K14	0.40	0.017	4.8	17.6	2.50
MAR 14...	K1200	50	1.0	0.035	8.4	6.00	1.50
APR 18...	K82	K14	0.80	0.029	8.2	27.8	1.90
MAY 17...	K28	K27	0.50	0.025	7.9	8.30	6.60
JUN 21...	2200	54	0.40	0.010	7.5	11.3	5.10
JUL 19...	K91	26	0.20	0.008	7.9	15.1	6.30
AUG 15...	53	<1	0.80	0.027	5.8	19.8	5.90
SEP 05...	K45	K8	0.70	0.014	6.0	14.8	3.30

ROANOKE RIVER BASIN

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0207988160 PEA HILL CREEK TRIBUTARY NO. 3, NEAR VALENTINES, VA

LOCATION.--Lat 36°33'55", long 77°51'16", Brunswick County, Hydrologic Unit 03010106, 2.0 mi southwest of Valentines.

PERIOD OF RECORD.--October 1988 to September 1989.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
OCT 18...	1130	3.00	100	7.30	17.0	756	8.4	88
NOV 16...	1130	3.00	91	7.00	13.5	755	10.5	102
DEC 06...	1100	3.00	92	7.50	7.5	751	10.9	92
JAN 18...	1100	3.00	118	7.30	6.5	759	11.4	93
FEB 07...	1115	3.00	85	7.80	9.0	758	11.8	102
MAR 14...	1030	3.00	68	7.00	6.0	758	11.0	89
APR 18...	1045	3.00	58	7.30	17.0	757	11.0	115
MAY 17...	1045	3.00	64	7.20	19.5	756	9.3	102
JUN 21...	1045	3.00	65	7.00	27.0	760	7.7	97
JUL 19...	1045	3.00	69	6.93	26.5	758	6.5	82
AUG 15...	1045	3.00	79	6.87	25.0	757	5.9	72
SEP 05...	1045	3.00	81	7.10	25.5	764	6.8	83

DATE	COLI- FORM, TOTAL, IMMED. PER 100 ML)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L)	PHEOPHY- TIN A FLUORO- METRIC METHOD (UG/L)
OCT 18...	37	20	0.40	0.010	5.2	6.90	4.00
NOV 16...	230	--	0.60	0.007	5.5	12.9	3.40
DEC 06...	2800	K12	0.40	0.012	6.1	3.70	2.20
JAN 18...	4100	K6	0.50	0.013	5.4	6.20	4.90
FEB 07...	280	K2	0.80	0.022	4.6	14.6	2.30
MAR 14...	2200	470	0.40	0.036	6.9	7.60	1.70
APR 18...	K140	28	0.30	0.023	9.4	18.4	3.00
MAY 17...	K21	K13	0.40	0.019	8.0	11.8	4.70
JUN 21...	310	59	0.30	0.011	7.3	8.40	10.6
JUL 19...	K210	30	0.30	0.024	7.7	20.6	4.10
AUG 15...	58	K14	0.50	0.029	6.2	15.7	10.1
SEP 05...	K64	K7	0.90	0.014	5.4	14.8	2.00

ROANOKE RIVER BASIN

02079883 PEA HILL CREEK TRIBUTARY NO. 4, NEAR VALENTINES, VA

LOCATION.--Lat 36°33'15", long 77°50'41", Brunswick County, Hydrologic Unit 03010106, 2.4 mi southwest of Valentines.

PERIOD OF RECORD.--October 1988 to September 1989.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
OCT								
18...	1145	3.00	104	7.30	18.0	756	8.4	89
NOV								
16...	1200	3.00	97	7.00	14.0	755	14.1	138
DEC								
06...	1115	3.00	95	7.50	6.5	761	11.2	91
JAN								
18...	1115	3.00	119	7.40	7.0	759	12.0	99
FEB								
07...	1130	3.00	89	7.70	8.5	758	11.6	99
MAR								
14...	1045	3.00	71	7.00	6.0	758	11.3	91
APR								
18...	1100	3.00	65	7.40	17.5	757	10.7	113
MAY								
17...	1100	3.00	68	7.20	19.5	756	9.3	102
JUN								
21...	1100	3.00	67	6.90	27.0	761	7.4	93
JUL								
19...	1100	3.00	72	7.09	26.0	758	7.4	92
AUG								
15...	1100	3.00	83	6.59	25.0	758	7.3	89
SEP								
05...	1100	3.00	84	7.00	25.0	764	5.8	70

DATE	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L)	PHEOPHY- -TIN A FLUORO- METRIC METHOD (UG/L)
OCT							
18...	K82	K6	0.40	0.010	4.3	7.30	2.90
NOV							
16...	20	K9	0.50	0.007	6.7	12.9	2.90
DEC							
06...	K190	K2	0.40	0.009	5.4	6.30	3.10
JAN							
18...	380	<1	0.60	0.012	5.3	10.0	2.80
FEB							
07...	490	K5	0.50	0.027	4.5	13.2	3.60
MAR							
14...	K1100	44	0.50	0.020	7.7	6.70	2.50
APR							
18...	K82	K16	0.50	0.016	7.6	13.5	3.00
MAY							
17...	40	K25	0.40	0.018	7.4	13.2	5.60
JUN							
21...	330	70	0.30	0.010	6.7	11.4	3.40
JUL							
19...	K100	K5	0.20	0.006	7.2	19.3	4.50
AUG							
15...	K970	K17	0.40	0.021	5.6	14.3	9.80
SEP							
05...	K45	K5	0.70	0.012	5.3	15.4	1.40

ROANOKE RIVER BASIN

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0207988430 PEA HILL CREEK TRIBUTARY NO. 4 TRIBUTARY, NEAR VALENTINES, VA

LOCATION.--Lat 36°32'48", long 77°50'58", Brunswick County, Hydrologic Unit 03010106, 3.0 mi southwest of Valentines.

PERIOD OF RECORD.--October 1988 to September 1989.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
OCT 18...	1200	3.00	105	7.50	17.5	756	8.9	94
NOV 16...	1215	3.00	98	7.30	14.0	755	10.2	100
DEC 06...	1130	3.00	97	7.50	6.0	761	11.2	91
JAN 18...	1130	3.00	118	7.50	6.0	759	12.1	98
FEB 07...	1145	3.00	86	7.80	8.5	758	11.6	99
MAR 14...	1100	3.00	63	7.00	7.0	758	11.4	94
APR 18...	1115	3.00	67	7.50	16.0	757	11.4	116
MAY 17...	1115	3.00	68	7.30	19.5	756	9.5	105
JUN 21...	1115	3.00	67	6.90	27.0	761	7.3	91
JUL 19...	1115	3.00	73	7.08	26.0	758	7.2	90
AUG 15...	1115	3.00	82	7.05	25.5	758	7.8	96
SEP 05...	1115	3.00	84	7.10	25.0	764	7.4	89

DATE	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L)	PHEOPHY- TIN A FLUORO- METRIC METHOD (UG/L)
OCT 18...	K90	K13	0.40	0.006	4.6	9.90	2.60
NOV 16...	K20	K7	0.50	0.004	4.9	10.6	1.30
DEC 06...	510	K120	0.40	0.010	5.2	11.3	1.80
JAN 18...	84	K3	<0.20	0.006	5.4	11.3	4.90
FEB 07...	470	K5	0.50	0.010	4.8	15.7	1.20
MAR 14...	K700	K130	0.70	0.024	7.6	6.30	5.00
APR 18...	K110	28	0.60	0.018	7.4	19.3	3.20
MAY 17...	48	K25	0.40	0.023	6.8	15.1	2.40
JUN 21...	240	48	0.30	0.019	6.6	12.5	4.50
JUL 19...	K150	K17	0.50	0.020	7.2	16.2	3.60
AUG 15...	43	K8	0.90	0.023	5.6	16.5	10.9
SEP 05...	K54	K12	0.50	0.012	5.6	14.6	3.60

ROANOKE RIVER BASIN

0207988440 COLD SPRING BRANCH NEAR GASBURG, VA

LOCATION.--Lat 36°33'22", long 77°52'52", Brunswick County, Hydrologic Unit 03010106, 1.1 mi southeast of Gasburg.

PERIOD OF RECORD.--October 1988 to September 1989.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
OCT								
18...	1215	3.00	105	7.60	18.5	756	9.0	97
NOV								
16...	1145	3.00	93	6.80	14.0	755	10.3	101
DEC								
06...	1145	3.00	93	7.30	5.5	761	12.1	97
JAN								
18...	1145	3.00	118	7.50	7.0	759	11.9	98
FEB								
07...	1200	3.00	94	7.80	8.0	758	12.0	102
MAR								
14...	1115	3.00	82	7.00	7.0	758	11.4	94
APR								
18...	1130	3.00	80	7.60	16.5	757	10.7	111
MAY								
17...	1130	3.00	84	7.00	17.0	756	6.8	71
JUN								
21...	1130	3.00	72	7.10	27.5	762	7.7	98
JUL								
19...	1130	3.00	76	7.18	26.0	758	7.8	97
AUG								
15...	1130	3.00	83	7.20	25.5	758	8.1	99
SEP								
05...	1130	3.00	85	7.10	25.0	764	7.5	91

DATE	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLORO- PHYLL A FLUORO- METRIC CORR. (UG/L)	PHEOPHY- -TIN A FLUORO- METRIC METHOD (UG/L)
OCT							
18...	K130	K7	0.40	0.008	4.5	5.80	2.30
NOV							
16...	320	K4	0.40	0.009	4.5	7.60	2.70
DEC							
06...	420	K4	0.40	0.012	4.7	2.50	0.800
JAN							
18...	210	K2	<0.20	0.008	4.4	4.80	2.00
FEB							
07...	460	K5	0.50	0.017	4.0	12.1	1.80
MAR							
14...	K1600	K170	1.3	0.026	5.2	6.10	1.80
APR							
18...	K91	K7	0.60	0.014	6.4	10.4	3.70
MAY							
17...	K18	K7	0.40	0.020	5.1	8.50	5.30
JUN							
21...	280	39	0.20	0.016	6.4	11.1	3.20
JUL							
19...	K140	K8	<0.20	0.005	6.4	17.6	4.50
AUG							
15...	81	K8	0.60	0.037	5.6	7.70	11.1
SEP							
05...	K18	K22	0.40	0.012	5.2	14.0	2.50

ROANOKE RIVER BASIN

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0207988450 PEA HILL CREEK ABOVE NC STATELINE, NEAR GASBURG, VA

LOCATION.--Lat 36°32'43", long 77°51'52", Brunswick County, Hydrologic Unit 03010106, in Pea Hill Creek Arm of Lake Gaston, 0.1 mi north of North Carolina stateline, and 2.3 mi southeast of Gasburg.

PERIOD OF RECORD.--August 1987 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	SPECIFIC CONDUCTANCE LAB (US/CM)	PH (STANDARD UNITS)	PH LAB (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIOCHEMICAL, 5 DAY (MG/L)
OCT												
18...	1300	3.00	115	106	7.90	7.50	18.0	756	2.4	8.6	92	<1.0
18...	1315	12.0	114	106	8.00	7.70	18.0	756	2.0	3.2	34	1.0
18...	1330	21.0	108	102	8.00	7.60	17.5	756	4.0	2.2	23	<1.0
18...	1345	26.0	105	101	7.90	7.30	17.0	756	3.6	2.0	21	<1.0
NOV												
17...	0900	3.00	105	107	7.10	7.80	14.5	755	3.4	9.9	98	3.0
17...	0915	12.0	104	106	7.20	7.70	14.5	755	2.9	9.8	97	4.0
17...	0930	21.0	102	104	7.10	7.60	14.0	755	4.0	9.6	94	4.0
17...	0945	26.0	99	101	7.00	7.50	13.5	755	6.9	9.9	96	2.0
DEC												
07...	1030	3.00	107	108	7.20	8.00	10.0	755	2.5	10.6	95	<1.0
07...	1045	12.0	107	105	7.50	7.80	10.0	755	3.0	10.4	93	<1.0
07...	1100	21.0	104	103	7.50	7.70	10.0	755	3.9	10.4	93	<1.0
07...	1115	27.0	103	103	7.50	7.90	9.5	755	5.4	10.3	91	1.0
JAN												
19...	1000	3.00	107	107	7.60	7.70	7.0	758	2.8	11.5	96	1.0
19...	1015	12.0	107	107	7.70	7.80	7.0	758	2.9	11.3	94	2.0
19...	1030	21.0	106	107	7.60	7.70	7.0	758	2.9	11.3	94	1.0
19...	1045	31.0	106	107	7.60	8.40	7.0	758	3.0	11.4	94	1.0
FEB												
08...	1000	3.00	99	109	7.60	7.70	8.0	764	2.4	11.4	96	1.0
08...	1015	12.0	99	110	7.60	7.80	8.0	764	3.0	11.3	96	1.0
08...	1030	21.0	98	109	7.60	7.60	8.0	764	2.2	11.3	96	1.0
08...	1045	29.0	98	111	7.60	7.70	8.0	764	3.9	11.4	96	2.0
MAR												
15...	0945	3.00	93	90	7.50	7.60	7.0	754	7.1	11.7	97	4.0
15...	1000	12.0	92	89	7.50	7.20	6.5	754	7.8	11.5	94	4.0
15...	1015	21.0	97	89	7.40	7.10	6.0	754	7.8	11.2	91	2.0
15...	1030	28.0	90	92	7.30	7.40	6.0	754	6.9	11.2	91	3.0
APR												
19...	1015	3.00	81	78	7.70	7.50	17.0	754	4.0	10.8	113	2.0
19...	1030	12.0	74	79	7.40	7.40	14.5	754	6.5	9.2	92	1.0
19...	1045	21.0	83	88	7.10	7.10	12.5	754	6.5	7.7	73	1.0
19...	1100	27.0	82	89	7.00	7.20	12.0	754	8.6	7.2	68	1.0
MAY												
18...	1015	3.00	75	81	7.30	7.70	18.0	761	2.5	9.4	100	1.0
18...	1030	12.0	77	82	7.10	7.50	17.5	761	2.5	7.7	81	<1.0
18...	1045	21.0	84	91	6.80	7.90	16.0	761	4.0	5.3	54	1.0
18...	1100	33.0	86	92	6.70	7.00	15.5	761	3.9	3.9	39	<1.0
JUN												
22...	1015	3.00	73	80	7.30	7.50	27.0	761	3.4	7.9	99	2.0
22...	1030	12.0	78	86	6.80	7.20	24.5	761	2.2	4.6	55	1.0
22...	1045	21.0	81	91	6.50	7.30	22.0	761	3.3	0.2	2	1.0
22...	1100	27.0	98	95	6.70	7.10	18.5	761	6.9	0	0	2.0
JUL												
20...	1015	3.00	77	84	7.15	7.70	26.5	753	2.5	7.5	94	2.0
20...	1030	12.0	77	84	7.09	7.70	26.5	753	2.5	7.2	90	1.0
20...	1045	21.0	80	88	6.51	7.10	25.0	753	4.0	0.2	2	2.0
20...	1100	27.0	100	99	6.72	7.00	22.0	753	10	0.1	1	4.0
AUG												
16...	0830	3.00	85	86	7.29	7.70	25.5	754	2.0	7.8	97	1.0
16...	0845	12.0	88	91	6.88	7.70	25.0	754	1.6	4.7	58	1.0
16...	0900	21.0	85	88	6.74	7.30	24.5	754	2.1	3.0	36	<1.0
16...	0915	25.0	86	88	6.61	7.20	24.5	754	3.0	1.7	21	<1.0
SEP												
06...	1045	3.00	88	88	7.00	7.20	25.0	763	1.5	5.5	67	1.0
06...	1100	12.0	86	88	6.90	7.40	25.0	763	1.8	5.3	64	1.0
06...	1115	21.0	85	89	6.90	7.40	25.0	763	1.6	5.2	63	1.0
06...	1130	31.0	109	106	6.70	6.90	23.5	763	7.7	0.2	2	5.0

ROANOKE RIVER BASIN

0207988450 PEA HILL CREEK ABOVE NC STATELINE, NEAR GASBURG, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	COLI-FORM, TOTAL, IMMEDIATE (COLS. PER 100 ML)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS TOTAL (MG/L AS CaCO3)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CaCO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS Cl)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)
OCT												
18...	460	K3	30	7.1	3.1	8.4	2.1	32	9.1	7.5	0.10	5.0
18...	--	--	30	7.1	3.1	8.4	2.1	32	8.8	7.4	0.10	4.8
18...	--	--	30	7.0	3.1	8.3	2.0	30	8.8	7.1	0.10	4.0
18...	--	--	29	6.7	3.0	8.1	2.1	30	8.8	7.3	0.10	3.7
NOV												
17...	21	K1	30	6.9	3.0	8.3	2.0	31	9.8	7.5	0.10	4.3
17...	--	--	30	7.0	3.1	8.4	2.0	31	9.7	7.5	0.10	4.2
17...	--	--	29	6.8	3.0	8.1	2.0	30	9.7	7.3	0.10	3.7
17...	--	--	28	6.6	2.8	7.6	2.0	29	9.7	7.1	0.10	3.6
DEC												
07...	280	<1	29	7.0	2.9	8.6	2.0	30	9.3	7.8	0.10	3.9
07...	--	--	29	7.0	2.9	8.6	2.0	30	9.3	7.4	0.10	3.8
07...	--	--	29	6.9	2.8	8.4	2.0	30	9.5	7.3	0.10	3.5
07...	--	--	29	6.8	2.8	8.3	1.9	29	9.5	7.3	0.10	3.5
JAN												
19...	79	<1	29	7.0	2.9	9.0	2.1	30	10	7.9	0.10	4.0
19...	--	--	29	7.0	2.9	8.8	2.1	30	9.6	7.9	0.10	4.0
19...	--	--	29	6.9	2.8	8.7	2.2	30	10	7.8	0.10	4.0
19...	--	--	29	6.9	2.8	8.7	4.6	30	10	7.8	0.10	3.9
FEB												
08...	260	<1	29	6.9	2.9	9.2	2.1	30	10	8.4	0.10	4.3
08...	--	--	29	6.9	2.8	9.2	2.1	30	10	8.3	0.10	4.3
08...	--	--	29	6.9	2.9	9.2	2.1	30	10	8.3	0.10	4.4
08...	--	--	29	6.9	2.8	9.2	2.1	29	10	8.3	0.10	4.3
MAR												
15...	340	66	24	5.7	2.4	7.6	2.0	25	11	7.2	0.10	4.9
15...	--	--	24	5.7	2.4	7.6	2.0	24	11	7.2	0.10	4.9
15...	--	--	23	5.6	2.3	7.6	2.1	23	12	7.1	0.10	5.1
15...	--	--	24	5.7	2.4	8.0	2.0	24	11	7.2	0.10	5.0
APR												
19...	K36	K10	23	5.4	2.2	7.1	1.8	21	8.1	6.6	0.10	6.3
19...	--	--	21	5.1	2.1	6.7	1.8	19	7.7	6.2	0.10	6.8
19...	--	--	23	5.6	2.3	7.1	2.0	22	8.3	6.8	0.10	6.6
19...	--	--	24	5.8	2.3	7.4	2.0	22	8.2	7.0	0.10	6.8
MAY												
18...	K15	K8	22	5.2	2.2	6.1	1.7	20	8.0	5.7	0.10	6.9
18...	--	--	22	5.3	2.2	6.4	1.8	21	8.0	5.9	0.10	7.1
18...	--	--	25	5.9	2.5	6.4	1.9	22	9.0	6.6	0.10	7.5
18...	--	--	26	6.1	2.5	7.0	1.8	23	9.0	6.5	0.10	7.8
JUN												
22...	K45	K11	23	5.6	2.2	5.9	1.8	21	7.0	5.5	0.10	5.8
22...	--	--	25	6.0	2.4	5.8	1.9	22	8.0	5.3	0.10	7.0
22...	--	--	26	6.2	2.5	6.0	2.0	23	8.0	5.5	0.10	7.9
22...	--	--	27	6.7	2.4	6.2	2.0	26	7.0	6.4	0.20	9.4
JUL												
20...	K18	K8	26	6.3	2.4	6.0	2.1	24	7.0	5.6	0.10	7.0
20...	--	--	25	6.1	2.4	5.8	1.9	24	7.0	5.6	0.10	7.1
20...	--	--	26	6.2	2.5	5.8	2.0	24	7.0	5.7	0.10	8.2
20...	--	--	28	7.1	2.6	6.0	2.1	33	4.0	7.7	0.10	10
AUG												
16...	83	K3	25	6.0	2.4	5.6	2.1	26	7.0	5.0	0.10	7.2
16...	--	--	27	6.5	2.7	5.8	2.1	27	7.0	6.1	0.10	7.8
16...	--	--	25	6.1	2.4	5.7	2.0	26	7.0	5.0	0.10	7.9
16...	--	--	25	5.9	2.5	5.6	2.1	25	7.0	5.0	0.10	8.1
SEP												
06...	>72	K4	26	6.2	2.5	6.2	2.1	26	7.0	5.0	0.10	7.6
06...	--	--	26	6.2	2.5	6.3	2.1	25	7.0	5.1	0.20	7.6
06...	--	--	26	6.3	2.5	6.5	2.1	26	7.0	5.5	0.10	7.8
06...	--	--	30	7.8	2.6	6.4	2.2	30	4.0	6.2	0.10	11

ROANOKE RIVER BASIN

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0207988450 PEA HILL CREEK ABOVE NC STATELINE, NEAR GASBURG, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L)	PHEOPHY- TIN A FLUORO- METRIC METHOD (UG/L)	PHENOLS TOTAL (UG/L)
OCT											
18...	62	0.30	0.015	130	88	40	38	--	12.1	2.70	--
18...	61	0.30	0.004	100	14	40	2	3.2	13.2	4.00	1
18...	58	0.40	0.007	280	26	60	2	--	12.9	8.20	--
18...	58	0.40	0.006	310	20	70	8	4.7	13.3	6.30	<1
NOV											
17...	61	0.40	0.004	130	19	40	<1	--	16.5	0.300	--
17...	61	0.40	0.003	150	28	40	3	3.7	15.9	1.20	4
17...	59	0.40	0.005	200	36	40	4	--	21.7	1.00	--
17...	57	0.50	0.006	440	22	50	8	4.3	22.5	2.20	2
DEC											
07...	60	0.30	0.009	180	25	40	2	--	15.1	4.70	--
07...	59	0.40	0.008	190	22	40	2	4.6	18.7	4.70	1
07...	59	0.50	0.007	--	--	60	38	--	18.4	2.70	--
07...	58	0.40	0.009	340	46	50	18	4.8	19.5	3.20	<1
JAN											
19...	61	0.40	0.009	180	33	30	2	--	11.5	3.60	--
19...	60	0.30	0.008	200	32	30	2	4.5	10.4	6.00	1
19...	61	0.40	0.008	160	18	30	<1	--	11.5	4.90	--
19...	63	0.50	0.009	190	34	40	2	4.3	12.9	2.40	2
FEB											
08...	62	0.30	0.005	190	31	30	1	--	10.7	2.10	--
08...	62	0.40	0.008	200	24	30	2	3.7	12.1	3.40	1
08...	62	0.20	0.008	190	24	30	2	--	12.6	3.50	--
08...	61	0.30	0.008	210	18	30	3	3.7	11.0	6.20	2
MAR											
15...	56	0.40	0.016	420	110	40	3	--	11.5	1.80	--
15...	55	0.40	0.017	400	110	40	5	5.5	13.6	1.40	<1
15...	56	0.40	0.023	460	130	30	3	--	9.30	3.50	--
15...	56	0.30	0.022	420	69	30	3	5.4	10.4	2.70	<1
APR											
19...	50	0.30	0.013	340	120	30	2	--	16.5	1.60	--
19...	48	0.50	0.010	430	210	30	3	6.2	14.8	2.00	2
19...	52	0.40	0.014	420	92	40	2	--	10.4	3.40	--
19...	53	0.40	0.019	460	170	50	13	5.4	10.4	5.40	3
MAY											
18...	48	0.50	0.014	240	160	60	3	--	18.4	0.700	--
18...	50	0.40	0.016	260	170	70	2	5.4	16.5	4.30	<1
18...	53	0.20	0.012	240	110	160	100	--	5.80	3.10	--
18...	55	0.40	0.013	300	130	230	200	4.5	4.90	3.60	<1
JUN											
22...	47	1.8	0.006	340	100	50	7	--	3.80	11.4	--
22...	50	0.90	0.007	310	76	70	3	4.5	4.40	8.60	4
22...	52	0.30	0.015	560	58	440	350	--	3.10	6.30	--
22...	61	0.50	0.010	4300	4000	1600	1300	6.3	1.50	6.20	4
JUL											
20...	51	0.50	0.012	190	110	50	39	--	14.3	4.50	--
20...	50	0.80	<0.001	240	60	60	9	5.1	13.8	3.10	7
20...	52	0.30	0.032	680	100	530	340	--	5.20	5.00	--
20...	65	0.60	0.004	5200	4400	1300	1400	5.7	3.30	6.90	7
AUG											
16...	51	0.30	0.018	170	42	60	3	--	3.80	4.40	--
16...	54	0.30	0.008	200	51	80	2	4.7	11.3	2.60	<1
16...	52	0.40	0.010	240	46	140	16	--	9.60	3.60	--
16...	51	0.40	0.012	330	50	300	160	5.1	5.40	4.50	<1
SEP											
06...	52	0.50	0.008	230	40	120	25	--	8.00	2.10	--
06...	52	--	0.008	300	42	110	25	5.0	9.20	2.80	<1
06...	53	0.50	0.010	490	30	140	35	--	8.90	3.60	--
06...	64	--	0.208	4900	4600	1600	1500	6.6	6.20	7.50	1

ROANOKE RIVER BASIN

0207988490 LAKE GASTON (PEA HILL CREEK) NEAR HENRICO, NC

LOCATION.--Lat 36°31'38", long 77°52'11", Northampton County, Hydrologic Unit 03010106, 1.1 mi southwest of Henrico.

PERIOD OF RECORD.--October 1988 to September 1989.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH (STAND- ARD UNITS)	PH LAB (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML)
OCT												
19...	1015	3.00	112	108	7.90	7.40	18.0	755	1.9	9.7	103	580
19...	1030	12.0	114	107	8.00	7.60	18.0	755	2.2	5.1	54	--
19...	1045	21.0	113	107	8.00	7.80	18.0	755	1.6	3.5	37	--
19...	1100	37.0	107	103	7.90	7.50	17.0	755	4.6	2.4	25	--
NOV												
16...	1300	3.00	107	110	7.50	7.80	14.5	755	0.40	10.3	102	K100
16...	1315	12.0	107	108	7.20	7.70	13.5	755	0.60	9.5	92	--
16...	1330	21.0	105	106	7.10	7.60	13.5	755	1.3	9.2	89	--
16...	1345	38.0	106	107	7.00	7.50	13.5	755	8.5	8.3	80	--
DEC												
06...	1230	3.00	111	110	7.50	7.70	10.5	761	3.5	10.4	93	200
06...	1245	12.0	111	110	7.60	7.60	10.5	761	4.0	10.3	92	--
06...	1300	21.0	110	111	7.60	7.90	10.5	761	3.4	10.1	90	--
06...	1315	42.0	108	109	7.60	7.60	9.5	761	6.3	10.8	95	--
JAN												
18...	1230	3.00	116	115	7.60	7.60	7.5	759	2.5	11.7	98	44
18...	1245	12.0	116	115	7.70	7.50	7.0	759	3.3	11.6	96	--
18...	1300	21.0	114	116	7.60	7.80	7.0	759	2.3	11.4	94	--
18...	1315	38.0	114	115	7.60	7.70	7.0	759	2.8	11.4	94	--
FEB												
07...	1245	3.00	105	116	7.70	7.70	8.0	758	3.6	11.7	100	260
07...	1300	12.0	105	117	7.70	7.60	8.0	758	2.6	11.6	99	--
07...	1315	21.0	105	116	7.70	7.80	8.0	758	2.5	11.6	99	--
07...	1330	36.0	105	116	7.70	7.80	8.0	758	3.2	11.6	99	--
MAR												
14...	1200	3.00	107	105	7.50	7.70	6.5	756	4.3	12.2	100	450
14...	1215	12.0	109	105	7.50	7.70	6.0	756	4.5	12.0	98	--
14...	1230	21.0	107	105	7.50	7.70	6.0	756	4.7	11.9	97	--
14...	1245	38.0	109	107	7.50	7.60	5.5	756	5.0	11.7	94	--
APR												
18...	1215	3.00	87	90	7.90	7.40	16.0	757	4.6	11.0	112	K140
18...	1230	12.0	87	92	7.50	7.50	13.0	757	6.0	9.7	93	--
18...	1245	21.0	87	92	7.30	7.40	12.5	757	6.5	9.0	85	--
18...	1300	40.0	86	91	7.10	7.30	12.0	757	6.3	7.5	70	--
MAY												
17...	1215	3.00	81	84	7.60	7.80	18.5	756	2.6	9.9	106	--
17...	1230	12.0	80	83	7.70	7.30	18.5	756	3.0	9.8	105	--
17...	1245	21.0	83	84	7.30	7.60	16.5	756	2.5	7.4	76	--
17...	1300	38.0	90	94	6.70	7.40	14.0	756	5.1	2.4	24	--
JUN												
22...	1215	3.00	76	83	7.80	7.80	26.5	761	2.1	8.6	107	K8
22...	1230	12.0	79	99	7.00	7.60	24.5	761	2.4	5.2	62	--
22...	1245	21.0	81	89	6.50	7.80	21.5	761	2.9	1.4	16	--
22...	1300	40.0	95	98	6.60	8.00	16.5	761	1.2	0	0	--
JUL												
19...	1215	3.00	78	85	7.12	7.60	26.5	758	3.1	7.2	90	K73
19...	1230	12.0	79	86	6.97	7.60	25.5	758	3.3	5.8	72	--
19...	1245	21.0	83	91	6.62	7.00	24.0	758	4.2	1.7	21	--
19...	1300	41.0	106	101	6.85	7.00	17.0	758	7.3	0.1	1	--
AUG												
15...	1215	3.00	88	90	7.10	7.70	25.5	757	1.7	7.4	91	21
15...	1230	12.0	87	90	6.95	7.70	25.0	757	1.7	5.6	68	--
15...	1245	21.0	86	90	6.70	7.70	24.5	757	2.4	4.1	50	--
15...	1300	40.0	113	92	6.60	7.10	19.5	757	4.5	0.2	2	--
SEP												
05...	1215	3.00	87	91	7.00	7.40	25.5	764	1.5	6.7	82	--
05...	1230	12.0	87	93	7.00	7.50	25.5	764	1.4	6.6	81	--
05...	1245	21.0	86	91	7.00	8.00	25.5	764	1.3	6.7	82	--
05...	1300	37.0	109	106	6.60	7.00	22.5	764	6.0	0.1	1	--

ROANOKE RIVER BASIN

303

0207988490 LAKE GASTON (PEA HILL CREEK) NEAR HENRICO, NC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L)	PHEOPHY- TIN A FLUORO- METRIC METHOD (UG/L)	PHENOLS TOTAL (UG/L)
OCT											
19...	62	0.50	0.005	80	5	50	<1	--	12.1	4.10	--
19...	62	0.40	0.004	110	4	40	<1	3.5	13.2	3.60	2
19...	62	0.30	0.004	110	12	50	2	--	12.9	5.60	--
19...	63	0.40	0.006	240	12	50	9	4.1	13.1	4.10	<1
NOV											
16...	63	0.40	0.004	100	18	40	2	--	12.5	1.00	--
16...	62	0.50	0.003	130	12	40	<1	3.7	16.8	2.00	3
16...	61	0.40	0.005	190	17	30	2	--	12.4	3.50	--
16...	62	0.40	0.007	490	22	120	52	3.8	15.7	3.50	2
DEC											
06...	62	0.20	0.007	170	26	40	3	--	13.8	2.60	--
06...	63	0.40	0.008	260	22	50	2	4.1	14.8	7.60	2
06...	64	0.20	0.007	220	18	50	2	--	12.4	5.40	--
06...	62	0.50	0.012	470	22	60	26	4.5	11.8	4.30	1
JAN											
18...	68	0.50	0.006	160	19	30	1	--	--	--	--
18...	66	0.40	0.009	160	22	40	<1	4.2	10.6	5.60	2
18...	65	0.40	0.010	180	17	40	2	--	11.7	3.00	--
18...	66	0.30	0.010	220	23	40	9	4.2	11.5	2.60	2
FEB											
07...	67	1.4	0.009	130	21	20	<1	--	9.60	3.20	--
07...	67	0.90	0.011	130	20	30	<1	3.2	10.7	2.80	1
07...	66	1.5	0.020	120	16	30	<1	--	11.3	1.90	--
07...	69	0.40	0.012	150	21	30	<1	3.7	10.7	4.10	2
MAR											
14...	62	0.50	0.011	210	64	30	<1	--	5.40	2.90	--
14...	62	1.3	0.010	240	53	30	<1	4.5	6.90	3.00	<1
14...	64	0.50	0.013	240	37	30	<1	--	6.90	1.70	--
14...	65	0.50	0.015	210	23	30	2	4.0	7.40	1.80	<1
APR											
18...	53	0.40	0.013	270	150	20	2	--	10.4	2.70	--
18...	55	0.50	0.016	440	130	30	2	4.9	9.60	3.90	1
18...	55	0.40	0.012	420	160	30	1	--	6.00	4.50	--
18...	55	0.50	0.018	450	140	40	4	4.9	8.50	4.00	<1
MAY											
17...	49	0.50	0.016	150	110	40	1	--	20.6	2.50	--
17...	49	0.40	0.016	190	87	40	5	5.1	14.3	3.20	<1
17...	50	<0.20	0.019	260	120	50	3	--	12.9	6.20	--
17...	55	0.20	0.019	440	100	270	190	4.6	8.30	15.8	<1
JUN											
22...	48	0.40	0.006	190	50	40	7	--	13.9	6.10	--
22...	51	0.50	0.006	250	56	60	7	5.8	3.70	14.1	3
22...	54	0.40	0.012	360	91	280	180	--	0.700	5.30	--
22...	60	0.50	0.009	2000	1400	1500	1400	5.4	1.50	6.20	5
JUL											
19...	51	0.50	0.006	200	51	50	2	--	15.1	4.30	--
19...	49	0.40	0.003	250	55	60	<1	5.7	8.80	5.10	14
19...	54	0.70	0.002	360	130	640	460	--	1.40	7.20	--
19...	65	1.0	0.005	3800	4000	1800	1700	6.6	1.90	3.00	8
AUG											
15...	52	0.40	0.011	--	52	80	2	--	9.20	3.20	--
15...	52	0.30	0.006	--	33	80	1	4.7	4.80	3.90	<1
15...	52	0.60	0.011	210	61	140	2	--	3.00	3.90	--
15...	55	0.60	0.012	450	130	900	780	--	3.30	5.60	--
SEP											
05...	53	0.40	0.008	190	28	80	7	--	12.0	2.40	--
05...	52	0.50	0.007	170	25	80	4	4.5	11.3	3.10	<1
05...	55	0.50	0.007	240	24	80	5	--	4.90	2.00	--
05...	61	0.50	0.016	2700	2100	2000	2000	5.6	3.30	5.90	1

ROANOKE RIVER BASIN

0207988510 LAKE GASTON TRIBUTARY NEAR TILLANS CHAPEL, NEAR ELAMS, NC

LOCATION.--Lat 36°32'03", long 77°53'15", Northampton County, Hydrologic Unit 03010106, 0.5 mi north of Tillans Chapel.

PERIOD OF RECORD.--October 1988 to September 1989.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
OCT 18...	1230	3.00	110	8.00	18.0	756	9.6	102
NOV 16...	1230	3.00	105	7.60	15.0	755	10.7	107
DEC 06...	1200	3.00	107	7.60	8.0	761	11.6	99
JAN 18...	1200	3.00	118	7.60	7.0	759	12.0	99
FEB 07...	1215	3.00	102	7.70	7.5	758	12.2	103
MAR 14...	1130	3.00	85	7.20	7.0	758	11.6	96
APR 18...	1145	3.00	84	7.60	15.5	757	11.2	113
MAY 17...	1145	3.00	84	7.00	17.5	756	8.7	92
JUN 21...	1145	3.00	74	7.20	27.0	762	8.1	102
JUL 19...	1145	3.00	78	7.28	26.5	758	7.8	98
AUG 15...	1145	3.00	85	7.30	25.5	758	8.2	101
SEP 05...	1145	3.00	88	7.30	25.0	764	8.4	102

DATE	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L)	PHEOPHY- TIN A FLUORO- METRIC METHOD (UG/L)
OCT 18...	28	K7	0.30	0.006	5.0	8.20	2.00
NOV 16...	220	<1	0.40	0.002	4.0	8.20	1.00
DEC 06...	230	<1	0.40	0.009	4.4	6.20	1.90
JAN 18...	310	<1	0.40	0.004	4.0	9.80	1.80
FEB 07...	490	K4	0.40	0.013	3.3	9.10	1.50
MAR 14...	K1000	K130	0.70	0.037	5.8	5.90	1.50
APR 18...	K130	K16	0.60	0.014	5.6	7.70	3.80
MAY 17...	K23	K2	0.30	0.020	5.1	10.4	5.70
JUN 21...	200	K20	0.20	0.015	6.1	8.70	5.00
JUL 19...	33	K4	<0.20	0.006	6.6	17.9	7.20
AUG 15...	38	K8	0.50	0.016	5.4	7.70	8.80
SEP 05...	K18	K15	0.50	0.019	5.0	15.9	3.20

ROANOKE RIVER BASIN

305

0207988550 PEA HILL CREEK TRIBUTARY NO. 5, NEAR HENRICO, NC

LOCATION.--Lat 36°31'38", long 77°51'11", Northampton County, Hydrologic Unit 03010106, 1.2 mi west of Henrico.

PERIOD OF RECORD.--October 1988 to September 1989.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
OCT 18...	1245	3.00	120	7.80	18.5	756	8.9	96
NOV 16...	1245	3.00	108	7.40	14.5	755	10.5	104
DEC 06...	1215	3.00	111	7.60	9.5	761	11.1	98
JAN 18...	1215	3.00	120	7.70	7.5	759	11.9	100
FEB 07...	1230	3.00	109	7.70	8.0	758	12.0	102
MAR 14...	1145	3.00	105	7.30	6.0	756	11.7	94
APR 18...	1200	3.00	85	7.70	17.5	757	11.1	117
MAY 17...	1200	3.00	83	7.80	19.0	756	10.2	110
JUN 21...	1200	3.00	76	7.40	26.5	762	8.8	110
JUL 19...	1200	3.00	81	7.09	25.5	758	6.5	80
AUG 15...	1200	3.00	88	7.00	25.0	757	6.7	82
SEP 05...	1200	3.00	89	7.10	25.0	764	7.1	86

DATE	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLORO- PHYLL A FLUORO- METRIC METHOD CORR. (UG/L)	PHEOPHY- TIN A FLUORO- METRIC METHOD (UG/L)
OCT 18...	K220	K4	0.30	0.006	4.1	8.70	1.70
NOV 16...	23	<1	0.40	0.005	3.5	9.30	2.40
DEC 06...	240	<1	0.50	0.008	4.0	9.10	1.80
JAN 18...	290	<1	0.50	0.006	3.8	10.2	2.00
FEB 07...	220	K1	0.50	0.008	3.2	8.40	2.20
MAR 14...	K1300	K31	0.40	0.020	4.6	5.80	1.50
APR 18...	K210	29	0.50	0.014	5.6	15.4	5.10
MAY 17...	42	K31	0.40	0.016	5.3	21.0	0.00
JUN 21...	360	120	0.60	0.010	5.1	19.0	6.40
JUL 19...	--	K17	0.30	0.007	5.0	19.5	6.50
AUG 15...	K110	33	0.70	0.008	5.3	20.6	2.50
SEP 05...	K82	K28	0.40	0.008	4.3	8.30	5.60

OHIO RIVER BASIN

KANAWHA RIVER BASIN

03161000 SOUTH FORK NEW RIVER NEAR JEFFERSON, NC

LOCATION.--Lat 36°23'35", long 81°24'26", Ashe County, Hydrologic Unit 05050001, on right bank 600 ft upstream from bridge on State Highways 16 and 88, 0.2 mi downstream from Bear Creek, and 4 mi southeast of Jefferson.

DRAINAGE AREA.--205 mi².

PERIOD OF RECORD.--October 1924 to current year. Monthly discharge only for some periods, published in WSP 1305.

REVISED RECORDS.--WSP 1275: 1925-26(M), 1928-30(M), 1931-32, 1933-35(M), 1941-42(m), 1944(m). WDR NC-81-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,657.04 ft above National Geodetic Vertical Datum of 1929.

Prior to Oct. 14, 1934, nonrecording gage on bridge 400 ft downstream at same datum. Oct. 14, 1934, to

Mar. 25, 1935, nonrecording gage at present site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. U.S. Army Corps of Engineers satellite gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--65 years, 425 ft³/s, 28.15 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 52,000 ft³/s, Aug. 14, 1940, gage height, 22.50 ft, from rating curve extended above 5,100 ft³/s on basis of slope-area measurement of peak flow; minimum, 52 ft³/s, Dec. 24, 1943, result of freezeup; minimum daily, 65 ft³/s, Sept. 9, 1925.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 15, 1916, reached a stage of 18.0 ft, from floodmarks witnessed by local resident, discharge, 35,200 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
July 5	0630	4,360	6.69	Sept. 22	1800	*10,800	*9.99
July 7	0400	2,660	5.38				

Minimum discharge, 86 ft³/s, Dec. 13, result of freezeup.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	133	137	244	351	173	313	308	671	234	345	481	306
2	145	144	225	361	164	286	286	1260	229	328	690	298
3	199	137	207	260	162	293	280	733	238	323	507	284
4	218	133	199	230	164	376	291	506	367	1120	446	278
5	182	906	190	201	169	446	396	490	284	3190	415	273
6	146	882	185	203	178	528	393	986	281	1750	405	303
7	135	415	181	229	199	584	335	733	390	2000	392	379
8	131	302	178	221	194	469	355	584	324	1110	366	386
9	129	256	181	219	167	407	380	526	429	851	344	337
10	128	232	181	212	153	363	378	660	664	715	335	293
11	127	219	172	210	128	333	347	546	393	626	328	288
12	125	209	e138	275	208	310	321	483	319	569	406	364
13	123	191	e98	367	172	306	306	439	374	530	403	849
14	121	183	e112	406	154	321	293	406	361	499	363	504
15	121	177	e130	340	157	289	305	392	820	466	516	414
16	122	175	e143	325	157	294	329	381	841	487	471	838
17	122	208	e151	276	191	281	289	350	1560	459	398	1020
18	122	227	e120	250	247	266	273	332	819	434	539	587
19	122	186	e143	237	207	314	260	322	585	421	531	475
20	120	193	e148	223	206	307	251	314	535	436	539	423
21	145	235	e181	210	633	463	245	308	938	1500	412	517
22	184	208	162	197	1030	464	240	298	729	1180	376	4870
23	200	189	160	195	544	418	236	318	596	1580	352	5300
24	170	196	167	190	411	689	234	327	557	841	337	1520
25	148	191	187	182	360	564	231	285	486	689	392	1060
26	143	180	192	180	353	461	227	274	434	921	725	1170
27	138	206	159	179	307	405	223	273	436	818	470	984
28	135	378	155	175	306	369	230	277	447	705	435	796
29	133	344	156	169	---	345	306	257	393	590	416	716
30	129	269	156	172	---	336	355	249	362	529	358	805
31	131	---	167	177	---	332	---	244	---	500	327	---
TOTAL	4427	7908	5168	7422	7494	11932	8903	14224	15425	26512	13475	26637
MEAN	143	264	167	239	268	385	297	459	514	855	435	888
MAX	218	906	244	406	1030	689	396	1260	1560	3190	725	5300
MIN	120	133	98	169	128	266	223	244	229	323	327	273
CFSM	.70	1.29	.81	1.17	1.31	1.88	1.45	2.24	2.51	4.17	2.12	4.33
IN.	.80	1.44	.94	1.35	1.36	2.16	1.62	2.58	2.80	4.81	2.45	4.83

CAL YR 1988 TOTAL 79272 MEAN 217 MAX 906 MIN 94 CFSM 1.06 IN. 14.46
WTR YR 1989 TOTAL 149527 MEAN 410 MAX 5300 MIN 98 CFSM 2.00 IN. 27.10

e Estimated.

03164000 NEW RIVER NEAR GALAX, VA

LOCATION.--Lat 36°38'50", long 80°58'45", Grayson County, Hydrologic Unit 05050001, on left bank at upstream side of bridge on State Highway 94, 500 ft downstream from Meadow Creek, 1.2 mi southwest of Old Town, 3.1 mi southwest of Galax, and 3.6 mi downstream from Elk Creek.

DRAINAGE AREA.--1,131 mi².

PERIOD OF RECORD.--October 1929 to current year. Monthly discharge only for some periods, published in WSP 1305.

REVISED RECORDS.--WSP 758: Drainage area, 1933(M). WSP 893: 1930(M), 1935(M).

GAGE.--Water-stage recorder. Datum of gage is 2,208.04 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for periods with ice effect, Dec. 13-20 and Feb. 9, 10, and period of doubtful or no gage-height record, July 4-7, which are fair. Appalachian Power Company gage-height transmitter at station, recorder at Roanoke. U.S. Army Corps of Engineers satellite precipitation and gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--60 years, 1,886 ft³/s, 22.65 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 141,000 ft³/s, Aug. 14, 1940, gage height, 25.7 ft, from flood-mark, from rating curve extended above 32,000 ft³/s on basis of computation of peak flow over dam at Fries 6 mi downstream and slope-area measurement of peak flow; minimum, 193 ft³/s, Jan. 9, 1956, gage height, 0.52 ft, result of freezeup; minimum daily, 265 ft³/s, Sept. 19, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 9,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
July 5	1630	30,400	8.48	Sept. 22	2030	*54,100	*12.80
Sept. 16	2400	9,810	4.13				

Minimum discharge, 321 ft³/s, Dec. 13, gage height, 0.61 ft, result of freezeup; minimum daily, 420 ft³/s, Dec. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	468	547	1010	1070	801	1360	1260	2430	949	1250	1910	1170
2	480	578	890	1730	749	1250	1180	6190	905	1160	2120	1100
3	577	573	831	1580	725	1210	1130	5090	887	1130	1930	1060
4	712	541	784	1300	719	1280	1140	3210	891	e3500	1550	1030
5	710	1200	748	1100	774	1570	1290	2680	1050	e21200	1380	1020
6	616	3510	712	1050	797	1940	1460	5610	1440	e16500	1370	1030
7	544	2180	691	1210	890	2660	1410	5000	1760	e8560	1410	1140
8	492	1380	678	1310	991	2200	1440	3670	1490	6680	1250	1390
9	473	1090	707	1270	e800	1800	1550	3050	1670	4590	1180	1200
10	462	959	741	1190	e600	1560	1640	3700	1980	3640	1140	1100
11	456	890	724	1140	723	1390	1590	3670	1730	2880	1120	1010
12	448	860	590	1320	827	1250	1460	3110	1420	2520	1120	1220
13	440	794	e420	2000	843	1190	1360	2620	1570	2330	1280	3280
14	422	759	e450	2300	810	1290	1280	2270	1730	2070	1270	5130
15	422	732	e550	2130	794	1200	1290	2040	1680	1890	2160	2660
16	430	696	e700	1950	805	1140	1450	1900	2450	2310	2040	5970
17	426	752	e600	1650	831	1160	1370	1710	4490	2050	1680	7400
18	433	863	e520	1440	999	1110	1270	1530	4060	1790	2840	4070
19	429	822	e480	1310	1030	1350	1190	1410	2590	1710	3530	2810
20	422	775	e600	1200	990	1460	1140	1340	2320	1680	2450	2260
21	491	799	781	1070	1820	1680	1100	1280	2170	2420	1900	2150
22	630	799	769	952	6070	2260	1060	1220	2640	3730	1560	25900
23	784	781	740	911	3940	2090	1030	1400	3010	3470	1370	32100
24	773	753	713	905	2540	2480	1000	1440	2900	3390	1300	10100
25	656	747	889	874	1800	2770	991	1260	2350	2160	1270	6040
26	617	722	1140	838	1670	2300	960	1150	1830	2520	1820	5400
27	559	724	971	816	1510	1920	963	1160	1800	2680	2340	4820
28	546	1030	858	800	1430	1670	1070	1190	1900	2420	1780	3890
29	526	1280	826	765	---	1490	1510	1080	1700	2120	1790	3350
30	525	1190	851	749	---	1380	1590	1010	1440	1900	1550	4000
31	521	---	815	758	---	1340	---	989	---	1700	1310	---
TOTAL	16490	29326	22779	38688	37278	50750	38174	75409	58802	117950	52720	144800
MEAN	532	978	735	1248	1331	1637	1272	2433	1960	3805	1701	4827
MAX	784	3510	1140	2300	6070	2770	1640	6190	4490	21200	3530	32100
MIN	422	541	420	749	600	1110	960	989	887	1130	1120	1010
CFSM	.47	.86	.65	1.10	1.18	1.45	1.13	2.15	1.73	3.36	1.50	4.27
IN.	.54	.96	.75	1.27	1.23	1.67	1.26	2.48	1.93	3.88	1.73	4.76

CAL YR 1988 TOTAL 339413 MEAN 927 MAX 5150 MIN 283 CFSM .82 IN. 11.16
WTR YR 1989 TOTAL 683166 MEAN 1872 MAX 32100 MIN 420 CFSM 1.65 IN. 22.47

e Estimated.

KANAWHA RIVER BASIN

03165000 CHESTNUT CREEK AT GALAX, VA

LOCATION.--Lat 36°38'45", long 80°55'10", Galax City, Hydrologic Unit 05050001, on right bank 200 ft upstream from bridge on State Highway 89 and 1.7 mi downstream from Wards Mill Branch.

DRAINAGE AREA.--39.4 mi².

PERIOD OF RECORD.--September 1944 to current year.

REVISED RECORDS.--WSP 1385: 1953.

GAGE.--Water-stage recorder. Concrete control since Aug. 30, 1979. Datum of gage is 2,344.17 ft above National Geodetic Vertical Datum of 1929. Prior to June 25, 1948, nonrecording gage, and June 25, 1948, to May 28, 1953, water-stage recorder, at site 200 ft upstream at datum 0.86 ft higher.

REMARKS.--Records good except those for periods with ice effect, Dec. 12-14, 18, 19, and Feb. 9-12, which are fair.

Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--45 years, 66.8 ft³/s, 23.02 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,980 ft³/s, Oct. 17, 1947, gage height, 14.4 ft, from flood-mark, site and datum then in use, from rating curve extended above 2,200 ft³/s on basis of two slope-area and one contracted-opening measurements at gage heights 9.5 ft, 14.4 ft, and 17.4 ft, respectively, site and datum then in use; minimum, 12 ft³/s, part or all of each day Aug. 25-30, 1981.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Aug. 14, 1940, reached a stage of 17.4 ft, at site and datum used 1944-53, discharge, 11,000 ft³/s, by contracted-opening measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 850 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	0100	1,040	3.60	Aug. 1	1645	996	3.51
June 7	0045	1,610	4.85	Sept. 13	0015	1,060	3.64
June 9	0915	891	3.31	Sept. 14	0500	2,690	6.98
July 4	1415	1,460	4.53	Sept. 16	0045	1,390	4.37
July 5	1230	1,350	4.27	Sept. 22	1315	*4,190	*9.53
July 30	2400	1,200	3.94				

Minimum discharge, 13 ft³/s, Feb. 9, gage height, 1.18 ft, result of freezeup; minimum daily, 15 ft³/s, Feb. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	25	32	40	24	44	35	107	29	51	335	50
2	25	22	30	33	23	43	35	147	28	49	210	50
3	34	20	28	29	24	42	36	62	28	50	110	49
4	29	21	28	27	24	62	37	49	28	623	90	49
5	23	252	26	28	25	63	50	107	72	813	82	49
6	21	67	26	30	25	137	40	329	125	303	80	53
7	21	41	26	31	26	111	45	102	694	156	72	55
8	21	34	25	31	24	66	52	73	123	118	66	53
9	20	31	28	29	e15	54	50	83	355	181	64	49
10	20	30	27	29	e16	47	44	92	134	127	62	48
11	20	29	26	29	e18	43	40	68	82	91	62	49
12	20	27	e20	38	e21	40	38	60	111	83	62	133
13	20	27	e18	45	22	43	36	54	144	80	61	480
14	20	26	e24	37	23	41	35	50	80	73	75	1080
15	20	25	26	43	23	38	42	52	82	72	189	301
16	20	25	26	38	23	38	39	47	87	229	109	716
17	20	45	24	33	27	35	34	43	81	103	75	238
18	20	31	e22	31	28	38	33	41	64	87	83	148
19	20	28	e20	30	27	38	32	40	62	83	73	122
20	19	30	24	28	29	39	31	39	61	85	66	111
21	29	31	26	27	130	77	30	38	68	79	66	133
22	28	27	28	28	97	54	30	36	65	75	68	1720
23	23	27	27	27	63	58	30	43	62	69	60	487
24	21	27	29	26	46	92	30	36	91	65	61	236
25	20	26	33	26	62	62	30	34	113	70	59	183
26	20	25	27	26	45	52	29	34	64	98	59	248
27	20	36	26	25	50	46	30	39	107	139	62	160
28	20	75	25	24	45	43	39	32	76	80	57	136
29	20	42	24	24	---	41	47	31	60	71	55	131
30	20	35	24	25	---	39	42	31	53	180	54	314
31	21	---	25	24	---	38	---	30	---	257	51	---
TOTAL	676	1187	800	941	1005	1664	1121	2029	3229	4640	2678	7631
MEAN	21.8	39.6	25.8	30.4	35.9	53.7	37.4	65.5	108	150	86.4	254
MAX	34	252	33	45	130	137	52	329	694	813	335	1720
MIN	19	20	18	24	15	35	29	30	28	49	51	48
CFSM	.55	1.00	.65	.77	.91	1.36	.95	1.66	2.73	3.80	2.19	6.46
IN.	.64	1.12	.76	.89	.95	1.57	1.06	1.92	3.05	4.38	2.53	7.20

CAL YR 1988 TOTAL 12867 MEAN 35.2 MAX 252 MIN 16 CFSM .89 IN. 12.15
WTR YR 1989 TOTAL 27601 MEAN 75.6 MAX 1720 MIN 15 CFSM 1.92 IN. 26.06

e Estimated.

03166800 GLADE CREEK AT GRAHAMS FORGE, VA

LOCATION.--Lat 36°55'51", long 80°54'02", Wythe County, Hydrologic Unit 05050001, on left bank 30 ft downstream from bridge on State Highway 629, 1.0 mi southwest of Grahams Forge, and at mile 0.4.

DRAINAGE AREA.--7.15 mi².

PERIOD OF RECORD.--May 1976 to current year.

GAGE.--Water-stage recorder. Concrete control since June 1, 1979. Elevation of gage is 1,972 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records fair except those for period with ice effect, Feb. 10, 11, and periods of doubtful or no gage-height record, Sept. 16-22, 29, 30, which are poor. Several measurements of water temperature were made during the year.

AVERAGE DISCHARGE.--13 years, 1.32 ft³/s, 2.51 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,210 ft³/s, Sept. 16, 1989, gage height, 6.75 ft, from rating curve extended above 30 ft³/s on basis of slope-area measurement at gage height 5.11 ft; minimum, 0.01 ft³/s, July 8, 9, 1988, result of temporary pumpage, and Oct. 14, Dec. 5, 13, 1988; minimum daily, 0.01 ft³/s, July 8, 1988; minimum gage height, 1.36 ft, Sept. 7, 1976, Sept. 11, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 100 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
July 5	1300	123	3.17	Sept. 16	1230	*3,210	*6.75
July 9	1430	212	3.53	Sept. 22	Unknown	550	4.34
Aug. 1	2130	262	3.69				

Minimum discharge, 0.01 ft³/s, Oct. 14, Dec. 5, 13; minimum gage height, 1.37 ft, Feb. 10, 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	.03	.03	.21	.06	.10	.10	.38	.03	.12	17	.12
2	.04	.02	.03	.04	.05	.08	.10	.39	.03	.12	3.2	.12
3	.04	.02	.03	.03	.05	.08	.10	.19	.27	.12	.46	.10
4	.03	.02	.02	.03	.05	.08	.11	.11	.25	9.5	.32	.10
5	.03	.45	.02	.02	.05	.08	.14	1.3	.94	24	.26	.09
6	.03	.05	.02	.03	.06	.17	.10	1.3	1.2	4.0	.21	.08
7	.02	.03	.02	.03	.06	.12	.16	.61	2.2	2.4	.15	.08
8	.02	.03	.02	.02	.05	.12	.22	.42	.70	1.8	.15	.08
9	.02	.03	.07	.02	.04	.11	.13	.59	1.3	9.6	.12	.08
10	.02	.03	.03	.02	e.03	.08	.10	.70	.91	2.2	.12	.08
11	.02	.03	.02	.02	e.03	.08	.09	.49	.48	1.3	.12	.08
12	.02	.03	.02	.23	.04	.08	.07	.36	.46	1.1	.12	3.1
13	.02	.03	.02	.14	.04	.15	.05	.30	.83	.92	.11	4.8
14	.02	.03	.03	.11	.05	.12	.04	.24	.41	.77	.09	1.6
15	.02	.03	.03	.14	.05	.10	.07	.18	.34	.68	.10	6.1
16	.02	.03	.02	.12	.05	.10	.05	.20	.46	.81	.10	e1400
17	.02	.03	.02	.11	.05	.09	.04	.10	.58	.63	.08	e30
18	.02	.03	.02	.09	.06	.10	.03	.10	.37	.55	.56	e1.6
19	.03	.03	.02	.08	.11	.09	.03	.09	.30	.49	.57	e1.2
20	.03	.03	.02	.08	.15	.16	.03	.08	.28	.52	.32	e1.1
21	.06	.03	.02	.07	.64	.15	.03	.08	.28	.52	.25	e20
22	.03	.03	.03	.06	.38	.14	.03	.07	.27	.46	.20	e60
23	.02	.03	.03	.06	.26	.23	.03	.05	.21	.41	.15	4.9
24	.02	.03	.06	.06	.19	.37	.03	.05	.21	.36	.14	2.0
25	.02	.03	.05	.06	.16	.25	.03	.05	.21	.40	.13	1.5
26	.02	.03	.04	.06	.15	.21	.03	.05	.21	.39	.14	3.3
27	.02	.03	.03	.06	.15	.18	.10	.05	.21	.36	.12	1.5
28	.02	.07	.03	.06	.13	.15	.06	.04	.21	.36	.12	1.0
29	.02	.04	.03	.06	---	.15	.08	.04	.17	.35	.24	e1.0
30	.02	.04	.03	.06	---	.14	.05	.04	.12	.33	.24	e3.0
31	.02	---	.03	.06	---	.12	---	.04	---	1.3	.12	---
TOTAL	0.76	1.37	0.89	2.24	3.19	4.18	2.23	8.69	14.44	66.87	26.01	1548.71
MEAN	.025	.046	.029	.072	.11	.13	.074	.28	.48	2.16	.84	51.6
MAX	.06	.45	.07	.23	.64	.37	.22	1.3	2.2	24	17	1400
MIN	.02	.02	.02	.02	.03	.08	.03	.04	.03	.12	.08	.08
CFSM	.00	.01	.00	.01	.02	.02	.01	.04	.07	.30	.12	7.22
IN.	.00	.01	.00	.01	.02	.02	.01	.05	.08	.35	.14	8.06

CAL YR 1988 TOTAL 38.74 MEAN .11 MAX 2.0 MIN .01 CFSM .01 IN. .20
WTR YR 1989 TOTAL 1679.58 MEAN 4.60 MAX 1400 MIN .02 CFSM .64 IN. 8.74

e Estimated.

KANAWHA RIVER BASIN

03167000 REED CREEK AT GRAHAMS FORGE, VA

LOCATION.--Lat 36°56'22", long 80°53'13", Wythe County, Hydrologic Unit 05050001, on left bank 20 ft downstream from bridge on State Highway 619 at Grahams Forge, 2.2 mi downstream from Glade Creek, and at mile 7.3.

DRAINAGE AREA.--247 mi².

PERIOD OF RECORD.--July 1908 to September 1916, January 1927 to current year. Monthly discharge only for some periods, published in WSP 1305.

REVISED RECORDS.--WSP 1235: 1912-13, 1915-16. WSP 1275: 1911, 1927-28(M), 1930-34(M). WSP 1705: 1913(M), 1916(M), 1957 calendar year runoff. WSP 1725: 1915 calendar year runoff.

GAGE.--Water-stage recorder. Datum of gage is 1,924.65 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1916, nonrecording gage at same site at datum 0.68 ft lower. Feb. 3, 1927, to Oct. 28, 1934, and June 11, 1974, to July 22, 1975, nonrecording gage, at present site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 11, 12, 16-20, and Feb. 10-13, which are fair. Prior to October 1988, occasional diurnal fluctuation at low flow caused by mills upstream from station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--70 years, 266 ft³/s, 14.62 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,500 ft³/s, July 16, 1916, gage height, 11.4 ft, present datum, from floodmarks, from rating curve extended above 7,600 ft³/s on basis of velocity-area study and slope-area measurement at gage heights 11.4 ft and 10.01 ft, respectively; minimum observed, about 5 ft³/s, Dec. 22, 1909, gage height, 0.49 ft, present datum, result of freezeup; minimum daily, 22 ft³/s, Jan. 30, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 16	1330	2,420	4.15	Sept. 23	0600	*3,740	*5.03

Minimum discharge, 43 ft³/s, Oct. 13, 14, 19, gage height, 1.25 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57	72	85	125	92	195	201	371	132	115	214	89
2	60	65	78	171	89	183	184	1020	123	108	282	84
3	74	64	74	166	88	179	174	758	163	105	155	81
4	68	63	71	145	89	180	168	464	188	394	129	79
5	65	92	69	128	95	177	170	393	169	1840	114	76
6	63	114	70	123	108	192	163	973	171	945	114	76
7	58	110	64	132	151	253	169	895	308	1280	119	81
8	55	93	68	155	203	271	196	618	329	853	104	107
9	55	85	75	151	182	245	242	487	260	588	95	88
10	57	78	79	136	e110	219	352	743	238	512	90	79
11	57	76	e65	127	e75	198	343	688	202	348	87	77
12	62	75	e55	148	e90	183	284	516	177	468	86	188
13	53	70	64	196	e100	184	248	410	195	522	84	341
14	52	71	72	287	116	227	222	342	251	299	83	319
15	53	72	73	266	115	266	215	300	209	240	86	238
16	52	67	e68	307	112	249	210	289	190	294	92	1050
17	54	74	e60	262	113	218	190	256	384	260	87	837
18	59	73	e56	212	126	201	176	231	434	218	159	480
19	53	72	e62	180	130	199	169	212	302	193	422	347
20	54	76	e68	157	143	194	162	199	240	180	234	283
21	67	73	74	138	341	232	154	190	214	171	161	254
22	80	71	76	124	1020	276	147	179	191	163	141	1210
23	80	71	82	117	561	281	142	181	200	148	118	2590
24	71	70	99	109	376	364	138	175	185	136	109	941
25	67	69	144	106	279	486	132	161	170	128	108	611
26	65	72	186	100	252	429	127	150	147	131	113	1120
27	63	66	140	97	225	339	133	155	134	123	183	1070
28	64	76	118	93	209	284	183	188	139	123	135	639
29	57	84	106	90	---	248	332	166	140	125	119	494
30	59	93	99	89	---	226	381	153	131	124	120	716
31	61	---	96	90	---	214	---	140	---	135	98	---
TOTAL	1895	2307	2596	4727	5590	7592	6107	12003	6316	11269	4241	14645
MEAN	61.1	76.9	83.7	152	200	245	204	387	211	364	137	488
MAX	80	114	186	307	1020	486	381	1020	434	1840	422	2590
MIN	52	63	55	89	75	177	127	140	123	105	83	76
CFSM	.25	.31	.34	.62	.81	.99	.82	1.57	.85	1.47	.55	1.98
IN.	.29	.35	.39	.71	.84	1.14	.92	1.81	.95	1.70	.64	2.21

CAL YR 1988 TOTAL 44626 MEAN 122 MAX 1150 MIN 43 CFSM .49 IN. 6.72
WTR YR 1989 TOTAL 79288 MEAN 217 MAX 2590 MIN 52 CFSM .88 IN. 11.94

e Estimated.

03167500 BIG REED ISLAND CREEK NEAR ALLISONIA, VA

LOCATION.--Lat 36°53'20", long 80°43'40", Pulaski County, Hydrologic Unit 05050001, on left bank 700 ft downstream from bridge on State Highway 693, 3.5 mi southeast of Allisonia, 4 mi upstream from Little Reed Island Creek, and at mile 4.5.

DRAINAGE AREA.--278 mi².

PERIOD OF RECORD.--August 1908 to September 1916, April 1939 to current year.

REVISED RECORDS.--WSP 1033: 1939(P), 1940, 1941-43(P). WSP 1305: 1912(M). WSP 1625: 1940, 1945(M), 1947, 1951, 1952(M).

GAGE.--Water-stage recorder. Datum of gage is 1,902.74 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 30, 1916, nonrecording gage at site 4 mi downstream at different datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 13-20 and Feb. 10-13, which are fair. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--58 years, 397 ft³/s, 19.39 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,500 ft³/s, Sept. 30, 1959, gage height, 12.54 ft, from rating curve extended above 6,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 57 ft³/s, Jan. 28, 1986, gage height, 1.58 ft, result of freezeup; minimum daily, 75 ft³/s, Jan. 5, 1981, Jan. 28, 1986.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Mar. 6	2245	5,020	7.00	June 22	1330	5,940	7.63
May 6	0400	6,410	7.94	July 5	2345	3,840	6.15
June 7	0915	3,850	6.16	Sept. 16	0400	6,130	7.76
June 9	1930	3,800	6.12	Sept. 22	2000	*14,400	*12.52

Minimum discharge, 82 ft³/s, Feb. 10, gage height, 1.75 ft, result of freezeup; minimum daily, 110 ft³/s, Feb. 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	120	156	256	225	159	302	254	913	225	441	609	272
2	122	176	222	269	155	291	239	1950	215	428	1030	263
3	159	144	201	215	155	296	240	803	257	423	562	253
4	204	134	191	196	159	316	257	524	254	481	439	246
5	188	454	180	170	161	338	376	481	255	1570	395	239
6	144	607	180	210	174	998	340	3350	1260	2060	377	255
7	132	292	179	223	179	2000	313	1120	2520	953	366	270
8	129	210	169	211	173	677	402	750	1350	762	339	272
9	126	181	183	218	149	506	406	621	2170	610	321	251
10	125	169	182	203	e110	424	431	779	1770	688	310	236
11	125	168	174	195	e120	350	380	589	822	571	309	238
12	122	157	123	265	e130	309	330	515	648	505	314	715
13	116	151	e120	313	e160	307	303	462	1230	522	323	655
14	117	151	e140	327	190	368	280	427	812	479	315	400
15	119	146	e170	299	170	313	298	425	1060	446	348	389
16	120	143	e180	320	166	298	337	451	1300	548	486	4420
17	119	523	e160	260	179	269	279	389	1010	615	378	1940
18	119	444	e140	228	198	263	257	357	749	519	326	838
19	119	263	e130	222	194	298	247	336	609	474	706	601
20	117	222	e160	201	196	266	238	325	668	479	709	522
21	135	266	221	194	658	435	228	321	723	513	394	521
22	211	224	268	161	987	495	226	305	2790	481	386	5840
23	177	196	224	212	580	388	221	351	1070	726	355	3090
24	146	194	198	221	400	532	218	344	785	537	320	1140
25	133	179	277	200	310	524	216	291	727	444	479	836
26	128	170	236	171	354	417	216	278	603	451	381	1120
27	125	180	200	169	339	352	244	281	538	419	396	893
28	123	738	190	162	310	314	284	261	557	405	339	720
29	125	481	183	157	---	292	394	244	498	400	313	654
30	123	316	171	162	---	279	399	241	461	373	370	1020
31	127	---	170	169	---	273	---	235	---	461	302	---
TOTAL	4195	7835	5778	6748	7215	13490	8853	18719	27936	18784	12997	29109
MEAN	135	261	186	218	258	435	295	604	931	606	419	970
MAX	211	738	277	327	987	2000	431	3350	2790	2060	1030	5840
MIN	116	134	120	157	110	263	216	235	215	373	302	236
CFSM	.49	.94	.67	.78	.93	1.57	1.06	2.17	3.35	2.18	1.51	3.49
IN.	.56	1.05	.77	.90	.97	1.81	1.18	2.50	3.74	2.51	1.74	3.90

CAL YR 1988 TOTAL 79475 MEAN 217 MAX 1080 MIN 87 CFSM .78 IN. 10.63
WTR YR 1989 TOTAL 161659 MEAN 443 MAX 5840 MIN 110 CFSM 1.59 IN. 21.63

e Estimated.

KANAWHA RIVER BASIN

03168000 NEW RIVER AT ALLISONIA, VA

LOCATION.--Lat 36°56'15", long 80°44'45", Pulaski County, Hydrologic Unit 05050001, on left bank on State Highway 653, 0.2 mi downstream from Big Reed Island Creek, and 0.5 mi upstream from Allisonia.

DRAINAGE AREA.--2,202 mi².

PERIOD OF RECORD.--September 1929 to current year.

REVISED RECORDS.--WSP 783: Drainage area. WSP 823: 1936. WSP 1305: 1933(M).

GAGE.--Water-stage recorder. Datum of gage is 1,848.36 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for periods with ice effect, Dec. 13, 14, and Feb. 9, 10, and periods of no gage-height record, Apr. 15-19, June 4 to July 31, and Aug. 3-24, which are fair. Large diurnal fluctuation and some regulation by powerplant 25 mi upstream from station. U.S. Army Corps of Engineers satellite gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--60 years, 3,177 ft³/s, 19.59 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 185,000 ft³/s, Aug. 14, 1940, gage height, 23.42 ft, from rating curve extended above 52,000 ft³/s on basis of flood records for other stations on New River; minimum, 412 ft³/s, Sept. 7, 1930, gage height, 0.47 ft; minimum daily, 453 ft³/s, Sept. 6, 1930.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 17,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
July 5	Unknown	41,600	9.19	Sept. 22	2315	*98,900	*15.68
Sept. 17	0130	22,400	6.34				

Minimum discharge, 554 ft³/s, Dec. 13, gage height, 0.87 ft; minimum daily, 600 ft³/s, Dec. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	791	970	1560	1310	1380	2500	1750	4180	1460	e1900	3720	1930
2	810	909	1340	1900	1230	2230	2000	9850	1550	e1700	2960	1430
3	882	917	1270	2310	939	2040	2230	9510	1040	e1600	e2600	1720
4	1120	867	1260	2080	943	1910	1900	6210	e1300	e5000	e2400	1640
5	1090	1470	1110	1420	1160	2370	2100	4480	e1500	e30000	e2100	1870
6	1020	3190	852	1740	1270	3620	2260	11400	e2000	e25000	e2000	1710
7	905	3770	1280	1350	1370	5880	2310	9930	e2600	e13000	e2100	1760
8	850	2540	1100	1760	1360	3890	2290	6790	e2200	e10000	e1900	1860
9	824	1770	897	2000	e1100	3280	2540	5650	e2400	e7500	e1800	1820
10	763	1510	1130	1780	e850	2700	2970	6110	e2900	e5500	e1700	1810
11	772	1310	1100	1700	933	2460	2940	5870	e2600	e4500	e1600	1900
12	768	1230	961	1720	1120	2280	2720	5510	e2100	e3800	e1700	2280
13	753	1210	e600	2200	1470	2180	2190	4090	e2300	e3500	e1800	5320
14	737	1290	e650	2840	1300	2260	2430	3750	e2600	e3100	e1900	8710
15	746	1090	755	2990	1350	2280	e2100	3850	e2500	e2800	e3200	5420
16	728	1080	1260	3110	1390	2140	e2300	3170	e3500	e3400	e3000	15200
17	773	1430	1000	2680	952	2040	e2200	2890	e7000	e3000	e2500	16800
18	747	1320	854	2130	1210	1580	e2000	2560	e6000	e2700	e3500	8600
19	734	1130	725	1900	1540	1990	e1900	2020	e4000	e2600	e5000	5700
20	748	1280	962	1740	1730	2540	1740	2320	e3500	e2000	e4000	4340
21	764	1220	1210	1390	2420	2670	1710	2090	e3200	e3500	e3000	3960
22	1080	1170	1260	1450	8630	3520	1580	2050	e3700	e5500	e2800	29400
23	1010	1210	1230	1630	7640	3310	1690	2490	e4500	e5200	e2100	59200
24	1150	1190	1210	1270	5100	3880	1770	2270	e4300	e5000	e2000	19300
25	1190	1110	1240	1490	2760	4850	1560	2170	e3700	e3200	2200	10400
26	1020	1100	1630	1080	2760	3850	1630	2090	e2700	e3700	2030	9890
27	1030	1150	1450	1350	2910	3670	1690	1450	e2600	e4000	3420	9430
28	988	1810	1710	967	2450	2990	1760	1850	e2800	e3600	3280	7080
29	828	1970	1140	1090	---	2530	2100	1790	e2500	e3200	2170	5970
30	820	1800	1280	1310	---	2590	2660	2090	e2200	e2800	2720	7000
31	850	---	1040	1070	---	2270	---	1650	---	e2500	2220	---
TOTAL	27291	44013	35066	54757	59267	88300	63020	132130	87250	174800	79420	253450
MEAN	880	1467	1131	1766	2117	2848	2101	4262	2908	5639	2562	8448
MAX	1190	3770	1710	3110	8630	5880	2970	11400	7000	30000	5000	59200
MIN	728	867	600	967	850	1580	1560	1450	1040	1600	1600	1430
CFSM	.40	.67	.51	.80	.96	1.29	.95	1.94	1.32	2.56	1.16	3.84
IN.	.46	.74	.59	.93	1.00	1.49	1.06	2.23	1.47	2.95	1.34	4.28

CAL YR 1988 TOTAL 553287 MEAN 1512 MAX 8390 MIN 566 CFSM .69 IN. 9.35
WTR YR 1989 TOTAL 1098764 MEAN 3010 MAX 59200 MIN 600 CFSM 1.37 IN. 18.56

e Estimated.

KANAWHA RIVER BASIN

313

03169000 CLAYTOR RESERVOIR NEAR RADFORD, VA

LOCATION.--Lat 37°04'28", long 80°35'05", Pulaski County, Hydrologic Unit 05050001, at Claytor Dam on New River, 0.5 mi upstream from Little River, and 5.5 mi upstream from Radford.

DRAINAGE AREA.--2,382 mi².

PERIOD OF RECORD.--May 1939 to current year (monthly figures only).

REVISED RECORDS.--WSP 2108: 1961-65 monthend contents and change in contents.

GAGE.--Water-stage recorder. Datum of gage is approximately National Geodetic Vertical Datum of 1929 (levels by Appalachian Power Company). Prior to Sept. 11, 1943, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by gravity overflow concrete dam. Spillway with crest at elevation 1,818.5 ft is equipped with 9 lift gates 30 ft high by 50 ft wide. Dam completed and storage began May 22, 1939; water in reservoir reached minimum pool elevation in January 1940. Total level-pool capacity at elevation 1,847.0 ft, 1.5 ft below top of gates, is 230,100 acre-ft of which about 100,000 acre-ft is controlled storage above minimum pool elevation of 1,820.0 ft. Reservoir is used for hydroelectric power and recreation. U.S. Army Corps of Engineers satellite elevation telemeter at station.

COOPERATION.--Records were provided by the Appalachian Power Company.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1,844.16	217,600	-
Oct. 31.....	1,845.03	221,400	+3,800
Nov. 30.....	1,845.00	221,200	-200
Dec. 31.....	1,845.58	223,700	+2,500
CAL YR 1988.....	-	-	+9,800
Jan. 31.....	1,845.06	221,500	-2,200
Feb. 28.....	1,844.45	218,900	-2,600
Mar. 31.....	1,844.15	217,600	-1,300
Apr. 30.....	1,845.46	223,200	+5,600
May 31.....	1,844.89	220,800	-2,400
June 30.....	1,844.15	217,600	-3,200
July 31.....	1,845.66	224,100	+6,500
Aug. 31.....	1,844.46	218,900	-5,200
Sept. 30.....	1,844.15	217,600	-1,300
WTR YR 1989.....	-	-	0

03170000 LITTLE RIVER AT GRAYSONTON, VA

LOCATION.--Lat 37°02'15", long 80°33'25", Pulaski County, Hydrologic Unit 05050001, on left bank at upstream side of bridge on State Highway 693 at Snowville, 0.5 mi southeast of Grayson, 7 mi south of Radford, and at mile 8.6.

DRAINAGE AREA.--300 mi².

PERIOD OF RECORD.--October 1928 to current year.

REVISED RECORDS.--WSP 823: 1929-36. WSP 1143: 1945. WSP 1305: 1929(M). WSP 1555: Drainage area (at site used 1928-41). WSP 1625: 1951(M). WSP 1725: 1936(M).

GAGE.--Water-stage recorder. Datum of gage is 1,816.04 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 20, 1931, nonrecording gage at bridge 1.0 mi downstream at datum 17.99 ft lower. Nov. 20, 1931, to Nov. 12, 1941, water-stage recorder 1.2 mi downstream at datum 20.58 ft lower.

REMARKS.--Records good except those for periods with ice effect, Dec. 13-20 and Feb. 10, 11, which are fair. U.S. Army Corps of Engineers satellite gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--61 years, 361 ft³/s, 16.34 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,800 ft³/s, June 21, 1972, gage height, 13.40 ft, from rating curve extended above 16,000 ft³/s on basis of slope-area measurements at gage heights 12.76 ft and 13.40 ft; minimum, 21 ft³/s, Feb. 22, 1942, result of freezeup; minimum daily, 50 ft³/s, Sept. 21, 1932.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	0900	3,850	4.65	Sept. 22	2300	*15,400	*10.49
Sept. 16	1630	5,440	5.61				

Minimum discharge, 69 ft³/s, Dec. 13, Feb. 10, 11, result of freezeup, gage height, 0.76 ft; minimum daily, 90 ft³/s, Dec. 13, Feb. 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	129	144	195	182	164	268	241	442	188	275	749	219
2	129	184	180	253	152	255	226	1500	183	263	524	212
3	132	163	167	214	151	249	219	743	198	258	360	208
4	172	142	159	192	155	255	222	456	342	284	308	201
5	208	218	154	158	157	295	279	402	275	1360	282	199
6	156	711	148	185	164	298	295	2500	556	1430	269	203
7	136	282	147	209	178	1310	265	1050	1220	649	258	221
8	131	205	145	208	179	501	327	643	969	489	245	230
9	131	178	160	196	147	374	376	508	929	404	232	222
10	130	164	166	185	e90	321	373	570	1350	367	228	207
11	130	161	156	180	e110	287	329	492	612	332	231	199
12	128	152	98	215	157	264	290	418	449	306	237	541
13	122	144	e90	276	161	258	267	371	517	304	244	620
14	118	145	e110	272	172	308	251	337	447	464	238	320
15	118	141	e140	253	163	282	248	326	396	348	276	275
16	122	136	e150	274	163	260	263	322	477	417	359	3440
17	122	201	e130	237	165	241	245	294	441	592	288	2190
18	121	344	e120	208	188	231	222	273	376	474	263	768
19	122	206	e110	199	185	258	213	258	322	365	728	522
20	120	182	e120	189	188	252	206	247	380	335	402	437
21	132	177	170	173	426	357	198	245	442	419	318	449
22	177	172	205	144	847	436	197	236	1090	319	296	5760
23	187	157	217	159	473	348	196	314	633	510	290	5020
24	151	159	195	172	349	412	193	326	466	341	278	1190
25	135	161	191	175	246	493	189	246	691	286	335	785
26	128	150	182	162	291	399	200	228	417	359	287	1650
27	127	151	164	161	306	335	211	226	363	400	298	1160
28	125	286	157	155	278	299	227	221	494	415	272	762
29	127	331	157	149	---	281	279	203	347	322	253	634
30	128	222	153	153	---	268	291	198	299	287	249	785
31	128	---	152	166	---	257	---	194	---	428	237	---
TOTAL	4222	6169	4788	6054	6405	10652	7538	14789	15869	13802	9834	29629
MEAN	136	206	154	195	229	344	251	477	529	445	317	988
MAX	208	711	217	276	847	1310	376	2500	1350	1430	749	5760
MIN	118	136	90	144	90	231	189	194	183	258	228	199
CFSM	.45	.69	.51	.65	.76	1.15	.84	1.59	1.76	1.48	1.06	3.29
IN.	.52	.76	.59	.75	.79	1.32	.93	1.83	1.97	1.71	1.22	3.67

CAL YR 1988 TOTAL 75075 MEAN 205 MAX 925 MIN 82 CFSM .68 IN. 9.31
WTR YR 1989 TOTAL 129751 MEAN 355 MAX 5760 MIN 90 CFSM 1.18 IN. 16.09

e Estimated.

03171000 NEW RIVER AT RADFORD, VA

LOCATION.--Lat 37°08'30", long 80°34'10", Pulaski County, Hydrologic Unit 05050001, on left bank 2,000 ft downstream from bridge on U.S. Highway 11 at Radford, 5 mi downstream from Little River, and 5.5 mi downstream from Claytor Dam.

DRAINAGE AREA.--2,748 mi².

PERIOD OF RECORD.--October 1907 to September 1915, August 1939 to current year. Records for August 1898 to September 1907, published in WSP 27, 36, 48, 65, 83, 98, 128, 169, 205, 243, and 536, are unreliable and should not be used. Gage-height records collected at same site since 1895 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 873: Drainage area. WSP 953: 1940-41. WSP 1305: 1908-12. See also PERIOD OF RECORD. GAGE.--Water-stage recorder. Datum of gage is 1,712.16 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 30, 1939, nonrecording gage at highway bridge 2,000 ft upstream at datum 0.85 ft lower.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1939 by Claytor Reservoir (station 03169000). Some additional regulation at low flow by dam and powerplant on Little River. U.S. Army Corps of Engineers satellite precipitation and gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--58 years, 3,834 ft³/s, 18.95 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 218,000 ft³/s, Aug. 14, 1940, gage height, 35.96 ft, from rating curve extended above 76,000 ft³/s on basis of records for other stations on New River and flow over Claytor Dam, computed by Appalachian Power Company; minimum, 165 ft³/s, Aug. 25, 27, 1944, gage height, 1.08 ft; minimum daily, 550 ft³/s, Aug. 22, 1911.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 16, 1916, reached a stage of 35.7 ft, discharge, 200,000 ft³/s, at site and datum used by Geological Survey 1907-15, from reports of the National Weather Service.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 92,600 ft³/s, Sept. 23, gage height, 21.73 ft, from rating curve extended as explained above; minimum, 657 ft³/s, Dec. 11, gage height, 1.62 ft; minimum daily, 894 ft³/s, Oct. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	1050	1340	3250	1400	1280	3270	1150	6980	2680	2770	6060	3540		
2	1070	1110	2200	2670	1660	3280	1140	10000	2030	1520	7560	1220		
3	1090	1150	1100	2860	1620	2820	2860	9300	1210	3330	5110	1180		
4	1130	1080	1120	2710	1070	1280	3310	7570	1400	6020	3610	1210		
5	1200	3020	1860	2740	1110	1290	3340	8250	1860	22100	1310	2050		
6	1150	3310	1240	2150	1530	6180	3080	11300	3950	29800	1280	2610		
7	1120	2720	1250	1180	1630	6870	3280	9950	8330	16200	3140	2440		
8	1130	2410	1120	1200	1550	5770	1340	9130	8520	13000	2890	2320		
9	1100	2930	1210	3130	1680	3450	1330	8880	5540	11800	2670	1200		
10	1070	3010	1180	2190	1800	3170	3400	8870	6920	8100	2210	1210		
11	985	3040	1170	2740	1060	2880	3560	7550	4510	7520	1780	2110		
12	955	1110	1080	3410	1040	1240	3980	5860	4520	6470	1270	3500		
13	894	1120	1050	2970	1660	3200	3670	4990	4500	5430	1250	7540		
14	915	1740	1030	1880	1530	3340	3690	2270	4600	5320	3460	9140		
15	930	1270	1060	2110	1820	2960	1390	4240	5890	3300	4240	7250		
16	928	1420	1070	4470	2130	3160	1200	4480	4930	2960	4030	15400		
17	895	1120	1080	4170	2260	3210	2860	3730	5770	5850	4580	19700		
18	947	1380	1040	4520	1190	1270	3000	3640	5820	5110	6730	13000		
19	929	1120	1130	2710	1130	1210	2900	3060	5280	4270	6950	12000		
20	999	1010	1120	1590	2250	3910	2270	2580	6580	3720	2990	7820		
21	985	1200	1170	1110	5440	3980	2230	1270	5540	3200	4210	8600		
22	1000	1790	1180	1080	10700	4030	1070	2970	6720	4430	3830	19100		
23	1210	1600	1350	1480	7340	5270	1220	2670	5410	3560	3720	65600		
24	1070	1240	1270	1610	6580	4460	2870	3240	4430	5050	3480	21500		
25	1120	1570	1240	2330	4640	4890	1870	3980	2510	5020	3130	12800		
26	1140	1100	1820	1620	1250	2790	2670	3880	3050	4740	1280	12600		
27	1330	1350	1870	1570	3370	4070	2850	1230	5450	6210	2370	11400		
28	1380	2020	2280	1160	3350	4070	2930	1240	3900	4320	4720	10300		
29	1080	2960	2050	1140	---	4510	1890	1200	4650	2670	4110	9130		
30	1070	3310	1660	1280	---	3240	1540	2870	3900	1800	3410	8180		
31	1230	---	1090	1280	---	3710	---	3050	---	4440	3330	---		
TOTAL	33102	54550	43340	68460	73670	108780	73890	160230	140400	210030	110710	295650		
MEAN	1068	1818	1398	2208	2631	3509	2463	5169	4680	6775	3571	9855		
MAX	1380	3310	3250	4520	10700	6870	3980	11300	8520	29800	7560	65600		
MIN	894	1010	1030	1080	1040	1210	1070	1200	1210	1520	1250	1180		
(*)	+62	-3	+41	-36	-47	-21	+94	-39	-54	+106	-85	-22		
MEAN†	1130	1815	1439	2172	2584	3488	2557	5130	4626	6881	3486	9833		
CFSM†	.41	.66	.52	.79	.94	1.27	.93	1.87	1.68	2.50	1.27	3.58		
IN.†	.47	.74	.60	.91	.98	1.46	1.04	2.15	1.88	2.89	1.46	3.99		
CAL YR 1988	TOTAL	698284	MEAN	1908	MAX	8650	MIN	754	MEAN†	1921	CFSM†	.70	IN.†	9.52
WTR YR 1989	TOTAL	1372812	MEAN	3761	MAX	65600	MIN	894	MEAN†	3761	CFSM†	1.37	IN.†	18.58

* Change in contents, equivalent in cubic feet per second, in Claytor Reservoir; provided by Appalachian Power Company.

† Adjusted for change in contents.

KANAWHA RIVER BASIN

03173000 WALKER CREEK AT BANE, VA

LOCATION.--Lat 37°16'05", long 80°42'35", Giles County, Hydrologic Unit 05050002, on left bank at Bane, 0.2 mi downstream from bridge on State Highway 100, 0.2 mi downstream from Sugar Run, and at mile 7.9.

DRAINAGE AREA.--305 mi².

PERIOD OF RECORD.--March 1938 to current year.

REVISED RECORDS.--WSP 1143: 1939(M), 1940, 1944, 1946. WSP 1305: 1938(M).

GAGE.--Water-stage recorder. Datum of gage is 1,665.92 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 1, 1938, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 11-20 and Feb. 10-15, which are fair. U.S. Army Corps of Engineers satellite gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--51 years, 321 ft³/s, 14.29 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,900 ft³/s, Apr. 5, 1977, gage height, 16.69 ft, from rating curve extended above 7,200 ft³/s on basis of slope-area measurement at gage height 16.50 ft; minimum, 15 ft³/s, Dec. 21, 1958, gage height, 2.42 ft, result of freezeup; minimum daily, 24 ft³/s, Sept. 27, 28, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in September 1878 reached a stage of about 23.5 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 23	0100	*7,410	*11.48	No other peak equal to or greater than base discharge.			

Minimum discharge, 31 ft³/s, Oct. 20, 21, gage height, 2.71 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45	56	107	145	101	264	279	645	123	111	100	101
2	46	56	98	238	96	238	244	1250	118	100	122	91
3	53	61	88	262	94	230	220	1110	119	94	127	84
4	53	61	80	239	101	230	207	748	134	110	98	78
5	53	77	75	202	120	227	198	619	119	739	85	74
6	48	249	69	184	138	248	187	1460	129	720	79	72
7	44	197	64	213	200	350	186	1350	412	679	89	74
8	40	141	63	254	253	391	206	971	437	804	94	79
9	38	111	68	241	226	366	237	754	340	508	76	82
10	38	93	68	209	e150	325	345	1120	298	391	69	74
11	37	83	e55	185	e110	287	370	1060	245	287	65	71
12	36	75	e45	187	e95	259	332	829	203	225	63	208
13	36	68	e38	331	e100	246	301	654	204	248	62	443
14	35	64	e46	422	e120	290	276	534	213	237	61	249
15	33	61	e50	414	e130	351	264	454	179	190	62	252
16	34	58	e52	504	144	351	261	407	172	208	64	1200
17	35	59	e48	438	139	308	233	349	524	193	81	1580
18	35	59	e40	353	145	285	212	301	555	167	168	710
19	34	61	e42	291	153	322	203	266	393	144	1310	468
20	33	61	e50	246	172	331	194	241	317	138	566	354
21	41	62	74	210	320	442	182	226	267	139	355	296
22	57	64	83	177	901	522	171	209	244	121	259	1240
23	109	63	142	160	763	477	161	215	322	111	213	3790
24	112	63	161	148	572	634	153	235	286	99	179	1280
25	85	62	318	136	427	857	145	207	240	91	166	777
26	72	60	355	128	383	709	145	190	196	89	150	1780
27	62	60	261	121	331	551	167	186	169	104	175	1560
28	57	66	211	114	293	449	450	178	152	136	200	894
29	52	106	181	108	---	383	711	155	143	103	149	639
30	50	119	153	104	---	334	677	141	126	96	127	568
31	50	---	137	103	---	313	---	132	---	90	113	---
TOTAL	1553	2476	3322	7067	6777	11570	7917	17196	7379	7472	5527	19168
MEAN	50.1	82.5	107	228	242	373	264	555	246	241	178	639
MAX	112	249	355	504	901	857	711	1460	555	804	1310	3790
MIN	33	56	38	103	94	227	145	132	118	89	61	71
CFSM	.16	.27	.35	.75	.79	1.22	.87	1.82	.81	.79	.58	2.09
IN.	.19	.30	.41	.86	.83	1.41	.97	2.10	.90	.91	.67	2.34

CAL YR 1988 TOTAL 47827 MEAN 131 MAX 1410 MIN 26 CFSM .43 IN. 5.83
WTR YR 1989 TOTAL 97424 MEAN 267 MAX 3790 MIN 33 CFSM .88 IN. 11.88

e Estimated.

KANAWHA RIVER BASIN

317

03175100 COX BRANCH ABOVE TAZEWEEL RESERVOIR, NEAR GRATTON, VA

LOCATION.--Lat 37°09'12", long 81°24'51", Tazewell County, Hydrologic Unit 06010205, in Jefferson National Forest, 200 ft upstream from town of Tazewell Reservoir, 1.2 mi north of Gratton, 1.6 mi upstream from bridge on State Highway 61, and 1.8 mi upstream from Clear Fork.

DRAINAGE AREA.--2.06 mi/.

PERIOD OF RECORD --June 1988 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,990 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good. Several measurements of water temperature were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 104 ft³/s, Sept. 22, 1989, gage height, 2.81 ft; minimum, 0.24 ft³/s, Aug. 18-19, 1988, gage height, 0.57 ft.

EXTREMES FOR CURRENT PERIOD.--June to September 1988: Maximum discharge during period, 9.2 ft³/s, Sept. 17, gage height, 1.55 ft; minimum, 0.24 ft³/s, Aug. 18-19, gage height, 0.57 ft.

Water year 1989: Maximum discharge, 104 ft³/s, Sept. 22, gage height, 2.81 ft; minimum, 0.34 ft³/s, Oct. 15-17; minimum gage height, 0.66 ft Oct. 1, 2.

DISCHARGE, CUBIC FEET PER SECOND, JUNE TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	.48	.31	.35
2	---	---	---	---	---	---	---	---	---	.45	.29	.32
3	---	---	---	---	---	---	---	---	---	.43	.27	.31
4	---	---	---	---	---	---	---	---	---	.42	.28	2.4
5	---	---	---	---	---	---	---	---	---	.40	.27	.69
6	---	---	---	---	---	---	---	---	---	.38	1.2	.65
7	---	---	---	---	---	---	---	---	---	.36	.58	.49
8	---	---	---	---	---	---	---	---	e.80	.35	.40	.42
9	---	---	---	---	---	---	---	---	1.2	.43	.35	.40
10	---	---	---	---	---	---	---	---	1.1	.45	.34	.40
11	---	---	---	---	---	---	---	---	.97	.39	.35	.37
12	---	---	---	---	---	---	---	---	.88	.57	.34	.36
13	---	---	---	---	---	---	---	---	.82	.69	.33	.35
14	---	---	---	---	---	---	---	---	.76	.56	.29	.35
15	---	---	---	---	---	---	---	---	.72	.47	.33	.33
16	---	---	---	---	---	---	---	---	.69	.44	.37	.33
17	---	---	---	---	---	---	---	---	.68	.49	.29	2.6
18	---	---	---	---	---	---	---	---	.66	.51	.26	.81
19	---	---	---	---	---	---	---	---	.63	.47	.32	.53
20	---	---	---	---	---	---	---	---	.61	.39	.62	.50
21	---	---	---	---	---	---	---	---	.57	.67	.47	.44
22	---	---	---	---	---	---	---	---	.53	.58	.36	.38
23	---	---	---	---	---	---	---	---	.56	.49	.39	.42
24	---	---	---	---	---	---	---	---	.61	.44	.52	1.8
25	---	---	---	---	---	---	---	---	.54	.40	.34	2.0
26	---	---	---	---	---	---	---	---	.77	.38	.30	1.2
27	---	---	---	---	---	---	---	---	.69	.37	.28	.73
28	---	---	---	---	---	---	---	---	.53	.36	.29	.56
29	---	---	---	---	---	---	---	---	.49	.33	.49	.50
30	---	---	---	---	---	---	---	---	.52	.33	.48	.47
31	---	---	---	---	---	---	---	---	---	.33	.40	---
TOTAL	---	---	---	---	---	---	---	---	---	13.81	12.11	21.46
MEAN	---	---	---	---	---	---	---	---	---	.45	.39	.72
MAX	---	---	---	---	---	---	---	---	---	.69	1.2	2.6
MIN	---	---	---	---	---	---	---	---	---	.33	.26	.31

e Estimated.

KANAWHA RIVER BASIN

03175100 COX BRANCH ABOVE TAZEWEEL RESERVOIR, NEAR GRATTON, VA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.45	.75	2.5	3.9	2.1	3.3	3.5	30	3.0	2.1	2.7	1.4
2	.62	.69	2.3	3.7	2.4	3.2	3.4	39	2.9	2.1	2.7	1.4
3	.59	.66	2.1	3.7	5.1	3.3	3.5	20	2.7	2.0	1.9	1.3
4	.63	.63	2.0	3.5	8.9	4.1	4.0	12	2.5	2.5	1.5	1.2
5	.46	3.9	1.8	3.2	7.5	5.2	4.1	18	2.5	2.5	1.5	1.2
6	.41	2.1	1.8	4.0	9.0	5.9	4.5	29	2.6	2.5	1.9	1.2
7	.41	1.7	1.7	4.5	9.2	5.8	4.8	19	2.7	2.5	1.4	1.2
8	.39	1.6	1.6	4.7	7.8	5.4	5.0	14	2.4	2.3	1.2	1.1
9	.39	1.5	1.6	4.2	6.1	4.8	5.1	12	3.0	2.0	1.1	1.0
10	.36	1.4	1.5	3.7	5.1	4.4	5.1	12	2.7	1.8	.99	.94
11	.37	1.3	1.4	3.4	4.3	4.0	5.1	15	2.5	1.7	.95	1.7
12	.36	1.3	1.3	5.9	3.8	3.7	5.0	15	2.9	1.6	.92	2.3
13	.36	1.2	1.3	13	3.5	4.0	4.7	12	3.9	1.5	.86	1.3
14	.36	1.1	1.4	11	3.3	4.0	4.4	8.8	3.6	1.4	.82	1.2
15	.36	1.1	1.5	15	3.1	4.2	4.3	7.3	3.5	1.4	2.0	1.3
16	.34	1.1	1.4	12	3.3	4.2	4.1	5.8	5.1	1.8	1.5	3.2
17	.35	4.0	1.3	8.7	3.1	4.1	3.7	4.9	11	1.4	1.2	3.0
18	.39	3.1	1.3	6.5	3.2	4.4	3.6	4.3	7.9	1.2	14	2.6
19	.39	2.8	1.3	5.1	3.2	4.1	3.5	3.9	5.6	1.2	17	2.3
20	.39	2.6	1.4	4.3	3.3	4.2	3.3	3.7	4.7	1.3	7.5	2.1
21	.96	2.2	5.8	3.7	7.9	5.8	3.1	3.4	3.8	1.3	4.7	1.9
22	2.7	2.0	9.9	3.3	10	6.4	2.8	3.2	3.3	1.1	3.5	47
23	1.8	1.9	7.1	3.0	8.4	6.2	2.7	3.2	2.9	.96	3.4	30
24	1.7	1.8	7.6	2.8	6.3	6.0	2.6	2.9	3.4	.87	2.9	14
25	1.3	1.6	8.9	2.6	5.2	5.6	2.6	2.7	3.0	.85	2.6	11
26	1.1	1.5	6.7	2.6	4.6	5.1	2.5	3.6	2.7	.83	2.7	26
27	.93	1.7	5.2	2.5	4.1	4.6	3.9	4.3	2.6	1.1	2.5	16
28	.85	2.9	4.5	2.4	3.7	4.2	4.6	4.2	2.5	1.1	2.3	10
29	.79	2.6	3.7	2.2	---	3.9	5.4	4.0	2.4	.93	2.2	7.2
30	.74	2.6	3.4	2.5	---	4.0	13	3.6	2.3	1.4	2.3	13
31	.72	---	3.1	2.3	---	3.8	---	3.2	---	1.6	1.9	---
TOTAL	21.97	55.33	98.4	153.9	147.5	141.9	127.9	324.0	106.6	48.84	94.64	209.04
MEAN	.71	1.84	3.17	4.96	5.27	4.58	4.26	10.5	3.55	1.58	3.05	6.97
MAX	2.7	4.0	9.9	15	10	6.4	13	39	11	2.5	17	47
MIN	.34	.63	1.3	2.2	2.1	3.2	2.5	2.7	2.3	.83	.82	.94

WTR YR 1989 TOTAL 1530.02 MEAN 4.19 MAX 47 MIN .34

03175500 WOLF CREEK NEAR NARROWS, VA

LOCATION.--Lat 37°18'20", long 80°51'00", Giles County, Hydrologic Unit 05050002, on right bank at downstream side of bridge on State Highway 724, 2.8 mi southwest of Narrows, and at mile 3.5.

DRAINAGE AREA.--223 mi².

PERIOD OF RECORD.--July 1908 to September 1916, March 1938 to current year.

REVISED RECORDS.--WSP 973: 1940-41(M). WSP 1235: 1912-13, 1915-16. WSP 1505: 1940, monthly and yearly runoff. WSP 1725: 1913(M), 1915-16(M), 1941 calendar year runoff.

GAGE.--Water-stage recorder. Datum of gage is 1,583.83 ft above National Geodetic Vertical Datum of 1929. July 22, 1908, to Sept. 30, 1916, and Mar. 31 to Nov. 7, 1938, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 11-20 and Feb. 9-15, which are fair. U.S. Army Corps of Engineers satellite gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--59 years, 297 ft³/s, 18.09 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,900 ft³/s, Jan. 29, 1957, gage height, 12.55 ft, from floodmark in gage well, 13.8 ft, from floodmark at downstream side of bridge, from rating curve extended above 5,700 ft³/s on basis of contracted-opening measurement of peak flow; minimum, 8.8 ft³/s, Dec. 25, 1953, result of freezeup; minimum daily, 16 ft³/s, Sept. 17, 18, 26-28, 1964; minimum gage height, 2.19 ft, Dec. 24, 1943.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 23	0200	*4,510	*8.68	Sept. 26	1200	3,000	7.44

Minimum discharge, 21 ft³/s, Dec. 13, gage height, 2.65 ft, result of freezeup; minimum daily, 32 ft³/s, Oct. 13-16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	60	137	225	134	320	335	579	144	104	98	130
2	39	59	121	302	128	288	296	1310	136	97	167	116
3	42	55	104	292	136	282	277	1150	171	91	134	106
4	45	54	94	281	234	286	270	809	146	126	106	98
5	44	67	83	234	330	300	273	693	131	405	91	91
6	40	190	76	245	420	339	263	1640	136	378	125	86
7	37	166	71	396	539	386	282	1490	239	395	162	86
8	35	132	66	401	532	388	336	1080	236	385	113	88
9	33	109	68	353	e350	369	451	876	219	259	96	84
10	33	94	65	301	e240	340	516	1160	254	206	85	76
11	33	85	e55	263	e160	310	506	1100	213	162	78	75
12	33	76	e45	361	e150	285	461	959	184	136	72	189
13	32	69	e38	715	e160	281	420	802	221	142	68	179
14	32	65	e45	780	e170	367	379	665	214	130	63	204
15	32	60	e47	773	e200	387	365	576	183	113	66	395
16	32	57	e50	783	222	374	357	513	193	113	94	522
17	33	61	e45	633	221	334	309	433	663	128	101	610
18	34	85	e40	514	235	332	281	376	598	110	567	403
19	36	90	e42	423	245	439	267	328	439	100	1280	293
20	37	90	e55	351	282	422	248	296	346	101	638	232
21	49	92	71	293	397	598	227	276	284	97	404	203
22	137	86	260	244	848	692	210	248	233	94	295	1370
23	189	83	347	220	741	631	197	270	253	86	227	3400
24	135	78	304	199	605	749	185	249	222	76	198	1280
25	114	74	612	181	486	758	173	218	189	70	186	798
26	97	68	511	167	449	669	174	199	162	79	206	2230
27	83	67	388	158	398	567	176	226	145	95	290	1610
28	75	106	313	148	355	481	392	213	140	86	248	953
29	68	169	274	137	---	415	621	185	128	85	194	697
30	63	152	228	132	---	379	569	169	116	82	174	669
31	60	---	206	142	---	368	---	157	---	79	154	---
TOTAL	1792	2699	4861	10647	9367	13136	9816	19245	6938	4610	6780	17273
MEAN	57.8	90.0	157	343	335	424	327	621	231	149	219	576
MAX	189	190	612	783	848	758	621	1640	663	405	1280	3400
MIN	32	54	38	132	128	281	173	157	116	70	63	75
CFSM	.26	.40	.70	1.54	1.50	1.90	1.47	2.78	1.04	.67	.98	2.58
IN.	.30	.45	.81	1.78	1.56	2.19	1.64	3.21	1.16	.77	1.13	2.88

CAL YR 1988 TOTAL 47214 MEAN 129 MAX 1230 MIN 17 CFSM .58 IN. 7.88
WTR YR 1989 TOTAL 107164 MEAN 294 MAX 3400 MIN 32 CFSM 1.32 IN. 17.88

e Estimated.

KANAWHA RIVER BASIN

03176500 NEW RIVER AT GLEN LYN, VA
(National stream-quality accounting network station)

LOCATION.--Lat 37°22'22", long 80°51'39", Giles County, Hydrologic Unit 05050002, on right bank 90 ft upstream from bridge on U.S. Highway 460 at Glen Lyn, 0.3 mi upstream from East River, and 6.3 mi downstream from Wolf Creek.

DRAINAGE AREA.--3,768 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1927 to current year.

REVISED RECORDS.--WSP 758: Drainage area. WSP 1305: 1928(M), 1930(M).

GAGE.--Water-stage recorder. Datum of gage is 1,490.11 ft above National Geodetic Vertical Datum of 1929. Aug. 11, 1927, to Oct. 16, 1934, on left bank opposite present site at same datum, and Oct. 17, 1934, to June 16, 1939, on left bank at site 200 ft upstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1939 by Claytor Reservoir (station 03169000) 55 mi upstream from station. U.S. Army Corps of Engineers satellite gage-height telemeter at station.

AVERAGE DISCHARGE.--62 years, 4,959 ft³/s, 17.87 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 226,000 ft³/s, Aug. 14, 1940, gage height, 27.50 ft, from rating curve extended above 89,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 697 ft³/s, July 5, 1988; minimum daily, 787 ft³/s, July 8, 1988; minimum gage height, 2.10 ft, Sept. 8, 1930.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 103,000 ft³/s, Sept. 23, gage height, 17.71 ft, from rating curve extended as explained above; minimum, 832 ft³/s, Oct. 14, gage height, 2.33 ft; minimum daily, 918 ft³/s, Oct. 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1250	1400	3630	1840	1810	4250	4550	5070	3490	3990	4580	3440
2	1330	1530	3500	2210	1830	3920	2280	13900	3160	2950	7110	3620
3	1320	1310	2530	3320	2170	4010	2120	13700	2630	1890	6300	1750
4	1270	1330	1440	3520	2100	3550	3650	11400	1810	3410	4970	1640
5	1280	1470	1390	3310	1730	2170	4170	9740	1810	11700	3530	1480
6	1360	3710	2090	3340	1800	2360	4040	15700	2420	31700	1740	2130
7	1280	3500	1460	3030	2370	7620	3930	15800	6770	20900	1630	2660
8	1230	3080	1450	2160	2620	7490	4210	13200	10700	14200	3080	2570
9	1220	2740	1410	2140	2430	6380	2690	11800	7670	12400	2920	2450
10	1140	3070	1550	3740	2400	4510	2840	13600	5980	8800	2760	1490
11	1230	3210	1490	2930	2520	4140	4820	12900	6690	7490	2370	1500
12	1050	3210	1320	3470	1780	3670	4650	9400	4930	6880	2050	2410
13	1010	1400	1270	4810	1720	2440	4960	8020	5100	6130	1590	5040
14	947	1310	1250	4390	2230	4030	4660	7030	5110	5350	1400	9240
15	954	1920	1260	3660	2130	4350	4610	4160	5670	5430	3310	9080
16	962	1430	1270	3970	2410	4060	2500	5870	6060	3680	4300	14500
17	974	1600	1280	5810	2670	4110	2300	5960	6990	4170	3720	27600
18	918	1410	1280	5510	2890	4180	3710	4880	7450	5170	8230	15800
19	993	1640	1250	5410	1860	2590	3760	4670	6460	5030	8700	13000
20	964	1470	1370	3480	1830	2660	3640	4630	6600	4260	8110	10800
21	1070	1320	1430	2530	3940	5510	2990	3040	7180	3830	3320	7400
22	1320	1430	1710	2010	9810	6000	3050	2160	6070	3300	4720	10800
23	1380	2030	1910	1870	10300	5830	1980	3990	8230	4270	4240	74800
24	1440	1880	2170	2190	8730	7750	2100	3680	6500	3550	4050	34800
25	1430	1450	2480	2290	7060	6680	3570	4050	6260	4880	4020	16200
26	1360	1870	2610	2910	5570	7280	2810	4680	6160	4750	3520	17900
27	1300	1380	2850	2200	2520	4760	3510	4730	5560	4900	2010	16900
28	1430	1680	2830	2160	4260	5670	4190	2160	4970	5750	2850	13200
29	1490	2460	3050	1730	---	5150	5440	1890	3970	4230	4800	11000
30	1230	3250	2750	1710	---	5990	4720	1800	4540	2720	4240	9770
31	1200	---	2330	1830	---	4150	---	3380	---	2190	3560	---
TOTAL	37332	60490	59610	95480	95490	147260	108450	226990	166940	209900	123730	344970
MEAN	1204	2016	1923	3080	3410	4750	3615	7322	5565	6771	3991	11500
MAX	1490	3710	3630	5810	10300	7750	5440	15800	10700	31700	8700	74800
MIN	918	1310	1250	1710	1720	2170	1980	1800	1810	1890	1400	1480
(*)	+62	-3	+41	-36	-47	-21	+94	-39	-54	+106	-85	-22
MEAN†	1266	2013	1964	3044	3363	4729	3709	7283	5511	6877	3906	11480
CFSM†	.34	.53	.52	.81	.89	1.26	.98	1.93	1.46	1.83	1.04	3.05
IN.†	.39	.60	.60	.93	.93	1.45	1.10	2.23	1.63	2.10	1.20	3.40
CAL YR 1988 TOTAL	875453			MEAN 2392	MAX 11500	MIN 787	MEAN† 2405	CFSM† .64	IN.† 8.69			
WTR YR 1989 TOTAL	1676642			MEAN 4594	MAX 74800	MIN 918	MEAN† 4594	CFSM† 1.22	IN.† 16.55			

* Change in contents, equivalent in cubic feet per second, in Claytor Reservoir; provided by Appalachian Power Company.

† Adjusted for change in contents.

KANAWHA RIVER BASIN

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03176500 NEW RIVER AT GLEN LYN, VA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1931, 1950, 1952, 1955-56, 1965 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1968 to September 1988 (discontinued).

WATER TEMPERATURE: October 1964 to September 1988 (discontinued).

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
NOV 08...	0930	3540	160	7.90	9.5	725	7.2	10.2	94	92	48
JAN 24...	0900	2820	195	7.20	3.0	730	1.7	13.3	103	K6	K10
MAR 15...	0830	4100	145	7.40	7.0	717	6.0	11.0	96	29	25
MAY 10...	0830	13700	120	7.40	12.0	718	8.2	9.4	93	350	660
JUL 25...	0815	7950	130	7.70	25.5	732	8.1	7.5	96	180	530
AUG 29...	0845	7350	155	7.50	25.0	727	7.5	7.0	89	97	130

DATE	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
NOV 08...	67	16	6.6	4.8	3.7	53	49	60	15	6.0	0.10
JAN 24...	84	21	7.7	4.6	1.8	60	57	70	23	5.5	0.10
MAR 15...	61	15	5.6	5.1	1.6	46	43	52	14	6.1	0.10
MAY 10...	51	13	4.5	3.8	2.1	40	39	47	10	4.8	0.10
JUL 25...	57	14	5.3	3.3	2.0	45	40	49	10	4.1	0.10
AUG 29...	65	16	6.0	4.5	1.8	53	50	61	13	4.9	0.10

KANAWHA RIVER BASIN

03176500 NEW RIVER AT GLEN LYN, VA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)
NOV 08...	5.1	96	93	0.020	0.720	0.050	0.070	0.60	0.070	0.030	0.020
JAN 24...	4.4	115	112	0.030	1.70	0.030	0.030	0.30	0.200	0.180	0.120
MAR 15...	6.4	84	86	<0.010	0.890	0.020	0.050	0.30	0.050	0.030	0.020
MAY 10...	6.5	76	72	<0.010	0.650	0.020	0.050	0.50	0.050	0.020	<0.010
JUL 25...	8.2	88	77	<0.010	0.670	0.020	0.040	0.50	0.070	0.030	0.010
AUG 29...	8.2	92	90	<0.010	0.810	0.020	0.020	0.40	0.090	0.060	0.040

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
NOV 08...	<10	<1	28	<0.5	3	<1	<3	21	20	<5	<4
JAN 24...	--	--	--	--	--	--	--	--	--	--	--
MAR 15...	<10	<1	26	<0.5	2	<1	<3	11	29	<5	<4
MAY 10...	20	<1	27	<0.5	2	<1	<3	4	29	1	<4
JUL 25...	--	--	--	--	--	--	--	--	--	--	--
AUG 29...	20	<1	30	<0.5	1	<1	<3	4	41	<1	<4

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 08...	5	2.4	<10	8	<1	1.0	74	<6	26	14	93
JAN 24...	--	--	--	--	--	--	--	--	--	2	84
MAR 15...	8	0.4	<10	6	<1	<1.0	69	<6	25	23	39
MAY 10...	2	0.6	<10	3	<1	<1.0	53	<6	8	28	86
JUL 25...	--	--	--	--	--	--	--	--	--	374	99
AUG 29...	2	0.1	<10	2	<1	<1.0	75	<6	8	29	82

03177710 BLUESTONE RIVER AT FALLS MILLS, VA

LOCATION.--Lat 37°16'17", long 81°18'18", Tazewell County, Hydrologic Unit 05050002, on right bank at upstream side of bridge on State Highway 717, 0.3 mi upstream from Brush Fork, and 0.4 mi southeast of Falls Mills.

DRAINAGE AREA.--44.2 mi².

PERIOD OF RECORD.--October 1980 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,310.41 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for periods with ice effect, Dec. 11-13, 16-19, and Feb. 9-14, and period of doubtful or no gage-height record, Feb. 22-24, which are fair. Some diurnal fluctuation caused by discharge from sewage treatment plant 2.3 mi upstream. About 65 percent of water discharged from the treatment plant was diverted from another drainage basin for municipal supply. Several measurements of water temperature were made during the year.

AVERAGE DISCHARGE.--9 years, 57.3 ft³/s, 17.60 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,050 ft³/s, May 7, 1984, gage height, 8.37 ft, from rating curve extended above 670 ft³/s; minimum, 1.0 ft³/s, Jan. 18, 1981, gage height, 0.92 ft, result of freezeup; minimum daily, 3.9 ft³/s, Jan. 19, 1981.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 450 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	0100	633	5.55	Aug. 19	0300	716	6.11
May 5	2345	488	4.55	Sept. 22	2045	*825	*6.86

Minimum discharge, 11 ft³/s, Oct. 18, 20, Nov. 4; minimum daily, 13 ft³/s, Nov. 4; minimum gage height, 0.99 ft, Oct. 18, 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	15	25	49	33	65	71	315	38	30	66	46
2	28	15	22	44	33	63	65	463	49	28	64	41
3	25	14	20	42	52	63	64	235	48	27	39	36
4	23	13	19	41	81	62	70	167	40	61	32	31
5	19	57	18	37	80	62	69	250	38	80	30	29
6	17	42	17	50	101	69	71	403	50	78	107	29
7	17	31	17	52	119	75	79	282	60	55	44	28
8	17	27	16	52	98	75	98	210	47	46	34	27
9	16	23	18	47	e70	71	124	190	65	37	28	25
10	16	22	17	43	e50	66	107	185	59	34	25	23
11	15	21	e16	41	e40	62	88	185	46	32	22	72
12	15	19	e14	92	e35	58	76	179	49	34	21	229
13	14	18	e15	157	e37	63	66	152	85	36	20	73
14	14	18	16	122	e40	62	62	124	59	32	23	54
15	14	16	19	202	48	59	64	117	57	28	32	57
16	14	17	e17	150	52	56	58	99	89	43	39	150
17	14	44	e16	102	52	52	52	85	233	29	23	110
18	15	31	e14	82	55	97	50	76	124	26	305	75
19	15	27	e15	69	56	123	48	68	89	24	399	60
20	14	28	18	61	62	94	45	64	78	28	151	54
21	53	24	42	53	96	126	43	58	65	40	106	50
22	66	22	70	48	e190	131	41	53	57	33	84	429
23	37	20	56	44	e160	120	39	55	52	23	67	428
24	35	19	71	41	e120	131	38	49	54	21	91	201
25	24	18	91	39	83	112	36	44	56	47	99	148
26	20	17	68	37	79	97	40	43	47	36	89	282
27	19	22	55	37	75	84	142	55	42	47	77	197
28	17	41	50	32	71	74	133	43	38	31	62	144
29	16	28	43	30	---	68	104	39	36	29	58	113
30	15	25	38	37	---	73	145	38	32	26	66	157
31	15	---	35	35	---	74	---	40	---	36	52	---
TOTAL	657	734	968	1968	2068	2487	2188	4366	1882	1157	2355	3398
MEAN	21.2	24.5	31.2	63.5	73.9	80.2	72.9	141	62.7	37.3	76.0	113
MAX	66	57	91	202	190	131	145	463	233	80	399	429
MIN	14	13	14	30	33	52	36	38	32	21	20	23
(*)	3.64	3.63	3.94	4.89	5.59	5.45	5.12	5.59	4.51	4.21	5.32	5.59

CAL YR 1988 TOTAL 9652.3 MEAN 26.4 MAX 140 MIN 6.2 (*) 3.73
WTR YR 1989 TOTAL 24228 MEAN 66.4 MAX 463 MIN 13 (*) 4.79

* Discharge from sewage treatment plant, equivalent in cubic feet per second; provided by the Sanitary Board of Bluefield.
e Estimated.

BIG SANDY RIVER BASIN

03207800 LEVISA FORK AT BIG ROCK, VA

LOCATION.--Lat 37°21'13", long 82°11'45", Buchanan County, Hydrologic Unit 05070202, on left bank at Big Rock, 2,000 ft downstream from Rocklick Creek, and 2,500 ft downstream from bridge on State Highway 645.

DRAINAGE AREA.--297 mi².

PERIOD OF RECORD.--October 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 866.37 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair. U.S. Army Corps of Engineers satellite precipitation and gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--22 years, 370 ft³/s, 16.92 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 56,000 ft³/s, Apr. 4, 1977, gage height, 27.38 ft, from rating curve extended above 7,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 5.0 ft³/s, Oct. 1, 13, 14, 17, 18, 19, 20, 1969.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Jan. 29, 1957, reached a stage of about 23.0 ft, information from local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	0100	*9,630	*11.70	June 17	0530	6,080	9.82

Minimum discharge, 24 ft³/s, Oct. 20; minimum gage height, 3.01 ft, Sept. 9, 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51	42	150	210	151	486	556	1330	266	184	562	121
2	55	39	127	235	144	462	536	2510	234	188	466	135
3	58	38	109	234	218	460	544	1360	359	181	213	95
4	49	37	101	224	700	445	736	908	280	224	145	78
5	43	119	90	188	600	445	1020	2020	258	235	139	68
6	38	193	80	244	486	491	851	5300	347	356	187	60
7	35	159	77	278	491	533	738	2420	1110	244	143	66
8	34	125	74	306	453	526	701	1490	621	199	107	62
9	35	105	76	291	381	497	747	1310	582	168	90	56
10	35	105	72	272	329	460	733	1890	651	146	80	74
11	32	121	e60	256	305	432	663	1480	491	131	73	84
12	31	104	e48	592	277	407	585	1170	415	118	69	95
13	28	97	e50	1650	262	412	521	947	623	123	69	91
14	28	88	e55	1030	317	444	467	773	574	112	71	507
15	28	77	e60	1580	451	431	465	704	1310	102	66	262
16	29	86	e56	1070	556	421	430	638	1530	97	64	765
17	30	381	e54	645	732	393	383	553	4390	94	63	466
18	28	317	e52	475	695	442	355	482	1570	87	66	256
19	28	230	e48	382	581	663	339	428	958	81	148	167
20	27	272	e55	322	556	651	317	410	1060	89	123	130
21	53	251	140	277	1130	1180	297	368	766	87	82	109
22	140	198	548	246	1930	1430	284	320	591	117	86	609
23	154	160	478	225	1450	989	276	385	493	92	72	1100
24	122	136	616	203	948	913	265	319	423	81	76	664
25	95	117	1160	188	726	830	253	280	351	72	105	427
26	76	104	553	176	644	721	243	298	300	69	124	439
27	63	112	370	169	582	620	342	796	282	148	174	389
28	55	167	299	153	534	549	696	662	272	203	106	308
29	51	183	247	145	---	499	1120	495	249	242	78	245
30	48	170	203	163	---	488	1190	386	211	138	163	270
31	46	---	189	172	---	531	---	311	---	243	177	---
TOTAL	1625	4333	6297	12601	16629	18251	16653	32743	21567	4651	4187	8198
MEAN	52.4	144	203	406	594	589	555	1056	719	150	135	273
MAX	154	381	1160	1650	1930	1430	1190	5300	4390	356	562	1100
MIN	27	37	48	145	144	393	243	280	211	69	63	56
CFSM	.18	.49	.68	1.37	2.00	1.98	1.87	3.56	2.42	.51	.45	.92
IN.	.20	.54	.79	1.58	2.08	2.29	2.09	4.10	2.70	.58	.52	1.03

CAL YR 1988 TOTAL 49556 MEAN 135 MAX 1160 MIN 14 CFSM .46 IN. 6.21
WTR YR 1989 TOTAL 147735 MEAN 405 MAX 5300 MIN 27 CFSM 1.36 IN. 18.50

e Estimated.

BIG SANDY RIVER BASIN

325

03208000 LEVISA FORK BELOW FISHTRAP DAM, NEAR MILLARD, KY

LOCATION.--Lat 37°25'33", long 82°24'45", Pike County, Hydrologic Unit 05070202, on right bank, 0.4 mi downstream from Fishtrap Dam, 1.1 mi upstream from Lower Pompey Branch, 1.9 mi northeast of Millard, 2.4 mi upstream from confluence with Russell Fork, and at mile 129.6.

DRAINAGE AREA.--392 mi².

PERIOD OF RECORD.--February 1938 to current year. Prior to April 1968, published as "Levisa Fork at Fishtrap."

REVISED RECORDS.--WSP 953. Drainage area. WSP 1335: 1938(M), 1939, 1940(M), 1942-43, 1944-45(M), 1946, 1948.

GAGE.--Water-stage recorder. Datum of gage is 600.00 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Apr. 19, 1968, nonrecording gage at site 3.7 mi upstream at different datum. Apr. 19, 1968, to June 18, 1973, water-stage recorder at site 1.0 mi downstream at datum 59.96 ft higher.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Fishtrap Lake beginning October 1968. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--51 years, 474 ft³/s, 16.42 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,000 ft³/s, Jan. 29, 1957, gage height, 33.9 ft, from floodmark, site and datum then in use, from rating curve extended above 15,000 ft³/s on basis of slope-area measurement of peak flow; maximum gage height, 107.55 ft, Apr. 5, 1977, from floodmark, backwater from Russell Fork; no flow Apr. 5, 1977, all gates on Fishtrap Dam closed; minimum observed discharge prior to Fishtrap Lake, 0.1 ft³/s, Nov. 8, 9, 1939, site then in use.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,330 ft³/s, May 6, gage height, 84.42 ft; minimum daily, 37 ft³/s, Sept. 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	388	152	298	285	276	521	70	1630	262	294	805	191
2	230	151	268	285	217	506	70	3180	218	294	959	187
3	180	151	218	509	202	453	73	2560	228	294	400	201
4	134	151	218	408	203	455	78	1160	262	518	266	233
5	132	152	218	346	628	526	77	2040	323	476	218	147
6	134	153	255	359	1040	929	74	5040	414	267	193	155
7	115	332	258	359	1030	922	74	3960	1230	267	188	226
8	83	504	215	359	896	776	76	4090	809	267	185	251
9	82	520	215	571	751	674	77	3840	754	267	184	251
10	113	399	215	593	498	582	78	3600	811	267	184	252
11	136	199	215	473	363	452	79	2360	552	205	141	328
12	136	199	212	665	363	452	79	1640	482	169	111	348
13	136	199	178	1720	527	447	79	1310	736	169	111	272
14	136	357	153	2150	540	201	118	1040	583	169	90	653
15	136	358	181	2460	781	581	169	1040	1310	123	76	644
16	136	239	199	2330	957	692	169	1200	2270	117	76	1040
17	135	609	199	1310	996	537	265	747	2650	167	76	768
18	136	629	199	875	923	452	401	464	3020	104	79	255
19	138	315	171	697	1160	452	406	670	3200	67	79	254
20	138	310	149	473	1190	840	318	556	2610	78	87	143
21	138	971	300	381	1250	1160	225	552	1620	115	180	37
22	138	1080	580	381	2240	1910	224	408	858	171	240	218
23	138	583	764	381	2760	1520	245	458	705	172	182	1570
24	299	483	519	381	1710	1210	263	381	619	131	211	1310
25	333	443	1250	348	1050	1080	230	279	403	94	186	818
26	324	414	1610	281	708	902	230	279	306	92	150	515
27	326	414	1120	239	857	812	300	978	307	129	149	441
28	238	304	668	239	741	662	865	879	417	222	151	441
29	155	579	377	239	---	588	1590	548	427	414	66	269
30	155	429	240	229	---	269	1830	398	334	333	44	199
31	155	---	285	275	---	70	---	285	---	267	147	---
TOTAL	5353	11779	11947	20601	24857	21633	8832	47572	28720	6719	6214	12617
MEAN	173	393	385	665	888	698	294	1535	957	217	200	421
MAX	388	1080	1610	2460	2760	1910	1830	5040	3200	518	959	1570
MIN	82	151	149	229	202	70	70	279	218	67	44	37

CAL YR 1988 TOTAL 72946 MEAN 199 MAX 1610 MIN 51
WTR YR 1989 TOTAL 206844 MEAN 567 MAX 5040 MIN 37

BIG SANDY RIVER BASIN

03208500 RUSSELL FORK AT HAYSI, VA

LOCATION.--Lat 37°12'25", long 82°17'45", Dickenson County, Hydrologic Unit 05070202, on right bank 180 ft downstream from bridge on State Highway 63, at Haysi, and 700 ft downstream from McClure River.

DRAINAGE AREA.--286 mi².

PERIOD OF RECORD.--July 1926 to current year. Monthly discharge only for some periods, published in WSP 1305.

REVISED RECORDS.--WSP 1003: 1926-43. WSP 1385: 1928(M), 1929, 1933(M), 1935(M), 1937-38(M).

GAGE.--Water-stage recorder. Datum of gage is 1,237.61 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 21, 1939, nonrecording gage at highway bridge 180 ft upstream at same datum.

REMARKS.--Records good except for period with ice effect, Dec. 11-20, which is fair. U.S. Army Corps of Engineers satellite precipitation and gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--63 years, 328 ft³/s, 15.57 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 59,000 ft³/s, Apr. 4, 1977, gage height, 28.24 ft, from rating curve extended above 32,000 ft³/s on basis of slope-area measurement of peak flow; minimum observed, 0.2 ft³/s, June 27, 28, 1936.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	0030	*12,800	*11.73	Sept. 16	0700	5,260	7.25
June 7	0100	4,670	6.86	Sept. 22	1800	5,610	7.48
June 17	0430	9,950	10.12				

Minimum discharge, 13 ft³/s, Oct. 14, 15; minimum gage height, 1.77 ft, Oct. 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	23	110	169	110	384	494	1050	96	150	762	173
2	28	22	90	229	107	379	486	2640	87	174	717	215
3	31	21	74	229	205	380	481	1300	93	163	285	146
4	33	21	66	203	746	353	752	794	91	207	177	112
5	27	100	58	160	571	330	1200	2480	115	212	162	90
6	23	209	51	220	491	357	879	6610	517	307	203	80
7	20	123	49	292	608	388	705	2730	2270	507	151	81
8	19	87	47	304	550	378	653	1450	766	436	115	75
9	18	68	48	271	421	349	728	1120	605	269	93	66
10	17	63	46	244	331	318	687	1280	583	195	80	76
11	18	69	e45	220	292	295	587	1060	345	154	72	167
12	17	55	e35	755	250	274	490	850	255	138	65	161
13	15	53	e37	1820	221	303	413	668	599	187	63	140
14	13	50	e40	1060	274	390	353	515	508	136	119	1500
15	14	45	e38	1400	418	404	343	434	873	114	85	561
16	14	48	e36	1050	536	364	311	349	1640	101	74	3270
17	15	258	e35	632	910	316	266	290	6040	94	66	1160
18	15	213	e33	447	816	441	245	243	1620	85	82	554
19	16	153	e32	338	686	796	235	214	824	79	79	336
20	15	206	e35	269	737	686	218	214	688	81	66	236
21	29	243	85	219	1780	1290	204	191	506	77	59	192
22	58	181	337	184	2220	1330	193	165	409	88	66	1690
23	69	132	311	168	1400	898	185	316	378	74	67	2110
24	54	102	636	154	850	846	179	263	301	64	75	1210
25	42	83	1120	146	613	764	170	207	241	61	72	720
26	35	70	472	137	527	627	164	177	200	56	173	867
27	31	76	287	131	464	506	293	199	180	166	219	832
28	29	115	224	118	417	423	515	162	242	321	129	576
29	26	145	181	113	---	366	576	136	205	202	90	411
30	24	129	148	120	---	351	819	120	159	131	399	433
31	24	---	145	121	---	410	---	107	---	323	310	---
TOTAL	818	3163	4951	11923	17551	15696	13824	28334	21436	5352	5175	18240
MEAN	26.4	105	160	385	627	506	461	914	715	173	167	608
MAX	69	258	1120	1820	2220	1330	1200	6610	6040	507	762	3270
MIN	13	21	32	113	107	274	164	107	87	56	59	66
CFSM	.09	.37	.56	1.34	2.19	1.77	1.61	3.20	2.50	.60	.58	2.13
IN.	.11	.41	.64	1.55	2.28	2.04	1.80	3.69	2.79	.70	.67	2.37

CAL YR 1988 TOTAL 49438 MEAN 135 MAX 1220 MIN 11 CFSM .47 IN. 6.43
WTR YR 1989 TOTAL 146463 MEAN 401 MAX 6610 MIN 13 CFSM 1.40 IN. 19.05

e Estimated.

BIG SANDY RIVER BASIN

327

03208680 NORTH FORK POUND RIVER LAKE AT POUND, VA

LOCATION.--Lat 37°07'27", long 82°37'52", Wise County, Hydrologic Unit 05070202, in control tower of North Fork Pound Dam at Pound, 1,200 ft upstream from Stacy Branch, and 1.2 mi upstream from South Fork Pound River.

DRAINAGE AREA.--17.2 mi².

PERIOD OF RECORD.--July 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical datum of 1929 (U.S. Army Corps of Engineers bench mark). Prior to Aug. 29, 1966, nonrecording gage at same site and datum.

REMARKS.--Lake is formed by rockfill dam. Spillway with crest at elevation 1,644.0 ft is in a saddle 350 ft southeast of dam. Except during major floods, all discharge will be through a diversion tunnel, the invert of the entrance of which is at elevation 1,556.5 ft. Storage began in September 1964 during construction with peak discharge affected thereafter; initial filling for regular operation started July 13, 1966. Total capacity at elevation 1,644.0 ft, top of spillway, is 11,290 acre-ft of which 8,110 acre-ft is flood-control storage for summer operations between elevations 1,611.0 ft, top of summer conservation pool, and 1,644.0 ft; an additional 1,290 acre-ft is available for flood control during the period December to March between elevations 1,601.0 ft, top of winter conservation pool, and 1,611.0 ft; contents at established minimum pool, 1,601.0 ft, is 1,900 acre-ft; dead storage is 7 acre-ft below elevation 1,556.5 ft. Figures given herein represent total contents. Lake is used for flood control, low-water augmentation for water-quality control, and recreation. U.S. Army Corps of Engineers satellite elevation telemeter at station.

COOPERATION.--Records were provided by the U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 6,920 acre-ft, Apr. 8, 1977, elevation, 1,629.41 ft; minimum (after initial filling for regular operation), 1,660 acre-ft, Jan. 23, 1969, elevation, 1,598.62 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 4,360 acre-ft, Apr. 28, elevation, 1,617.84 ft; minimum, 1,960 acre-ft, Jan. 29, elevation, 1,601.64 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1,607.71	2,706	-
Oct. 31.....	1,606.51	2,546	-160
Nov. 30.....	1,605.41	2,405	-141
Dec. 31.....	1,602.53	2,062	-343
CAL YR 1988.....	-	-	+74
Jan. 31.....	1,601.76	1,976	-86
Feb. 28.....	1,601.89	1,990	+14
Mar. 31.....	1,602.12	2,016	+26
Apr. 30.....	1,616.21	4,055	+2,039
May 31.....	1,612.21	3,375	-680
June 30.....	1,611.61	3,280	-95
July 31.....	1,611.69	3,292	+12
Aug. 31.....	1,611.72	3,297	+5
Sept. 30.....	1,611.48	3,259	-38
WTR YR 1989.....	-	-	+553

BIG SANDY RIVER BASIN

03208950 CRANES NEST RIVER NEAR CLINTWOOD, VA

LOCATION.--Lat 37°07'26", long 82°26'20", Dickenson County, Hydrologic Unit 05070202, on left bank on State Highway 649, 500 ft downstream from Clinchfield Railway bridge, 1,000 ft downstream from Rush Creek, and 2.1 mi southeast of Clintwood.

DRAINAGE AREA.--66.5 mi².

PERIOD OF RECORD.--October 1963 to current year.

REVISED RECORDS.--WDR VA-77-1: 1967(M).

GAGE.--Water-stage recorder. Datum of gage is 1,440.30 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for periods of doubtful or no gage-height record, Oct. 1, 2, 4, 5, and period with ice effect, Dec. 13-20, which are fair. U.S. Army Corps of Engineers satellite precipitation and gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--26 years, 78.5 ft³/s, 16.03 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,000 ft³/s, Apr. 4, 1977, gage height, 26.09 ft, from flood-mark, from rating curve extended above 3,100 ft³/s on basis of slope-area measurement of peak flow; minimum, 0.48 ft³/s, Sept. 28, 1964, gage height, 0.91 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Jan. 29, 1957, reached a stage of about 20.0 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 5	2330	*2,060	*9.87	June 17	0400	1,800	9.17
June 7	0030	1,260	7.55				

Minimum discharge, 5.2 ft³/s, Oct. 6, gage height, 1.29 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e11	13	27	70	30	91	167	335	47	51	190	58
2	e10	13	24	81	29	85	140	539	43	50	164	70
3	12	13	19	68	69	82	126	265	50	61	82	44
4	e10	13	16	53	160	77	215	175	64	73	61	36
5	e6.5	99	14	41	111	74	255	564	119	64	56	29
6	5.5	67	16	97	111	87	190	1060	312	66	73	27
7	9.8	41	19	114	133	81	167	512	678	248	53	34
8	9.4	29	17	111	117	74	168	312	268	146	43	30
9	6.5	19	18	100	90	70	181	258	331	90	39	27
10	5.8	18	18	82	87	66	157	261	273	65	36	26
11	5.7	23	14	69	66	63	131	218	159	52	33	28
12	8.8	18	11	179	55	60	110	186	127	76	31	28
13	9.2	15	e9.0	378	50	85	95	153	248	126	30	34
14	9.2	15	e11	215	75	108	86	126	172	73	30	155
15	9.1	12	e11	380	106	99	88	115	572	57	32	93
16	6.5	14	e10	224	134	86	78	99	747	50	39	498
17	5.6	89	e9.8	135	180	74	69	86	1130	46	30	199
18	5.7	47	e9.4	98	166	125	67	76	386	40	86	106
19	5.6	39	e9.0	78	143	165	61	69	229	37	43	72
20	5.9	72	e10	65	184	142	57	78	170	39	34	56
21	15	63	28	54	580	259	53	67	137	40	31	51
22	26	43	65	48	512	243	51	60	135	36	30	157
23	23	36	56	45	284	185	49	108	150	32	29	229
24	19	29	184	41	188	206	48	88	108	29	38	165
25	17	22	231	38	142	176	46	73	87	27	38	115
26	11	20	96	36	123	143	43	65	75	26	35	217
27	9.0	23	61	35	109	117	87	141	70	85	36	176
28	13	31	54	32	98	97	136	86	67	104	29	120
29	14	29	50	31	---	87	143	70	61	46	27	91
30	13	29	43	34	---	87	160	59	52	67	198	108
31	14	---	43	33	---	142	---	52	---	146	85	---
TOTAL	331.8	994	1203.2	3065	4132	3536	3424	6356	7067	2148	1761	3079
MEAN	10.7	33.1	38.8	98.9	148	114	114	205	236	69.3	56.8	103
MAX	26	99	231	380	580	259	255	1060	1130	248	198	498
MIN	5.5	12	9.0	31	29	60	43	52	43	26	27	26
CFSM	.16	.50	.58	1.49	2.22	1.72	1.72	3.08	3.54	1.04	.85	1.54
IN.	.19	.56	.67	1.71	2.31	1.98	1.92	3.56	3.95	1.20	.99	1.72

CAL YR 1988 TOTAL 12784.2 MEAN 34.9 MAX 373 MIN 3.0 CFSM .53 IN. 7.15
WTR YR 1989 TOTAL 37097.0 MEAN 102 MAX 1130 MIN 5.5 CFSM 1.53 IN. 20.75

e Estimated.

BIG SANDY RIVER BASIN

329

03208990 JOHN W. FLANNAGAN RESERVOIR NEAR HAYSI, VA

LOCATION.--Lat 37°14'00", long 82°20'56", Dickenson County, Hydrologic Unit 05070202, in control tower of John W. Flannagan Dam on Pound River, 1.3 mi upstream from Blacklog Branch, and 3.7 mi northwest of Haysi.

* DRAINAGE AREA.--221 mi².

PERIOD OF RECORD.--September 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). Prior to Mar. 31, 1965, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by rockfill dam. Spillway with crest at elevation 1,410.0 ft is in a saddle 0.3 mi upstream from dam and is equipped with 6 radial gates 36 ft high by 42 ft wide. Except during major floods, all discharge will be through a diversion tunnel, the invert of the entrance of which is at elevation 1,230.0 ft. Storage began in September 1961 during construction with peak discharge affected thereafter; initial filling for regular operations started in March 1965. Total capacity at elevation 1,446.0 ft, top of gates, is 145,700 acre-ft of which 78,600 acre-ft is controlled flood storage for summer operations between elevations 1,396.0 ft, top of summer conservation pool, and 1,446.0 ft; an additional 16,500 acre-ft is available for flood control during the period December to March between elevations 1,380.0 ft, top of winter conservation pool, and 1,396.0 ft; contents at established minimum pool, 1,314.0 ft, is 12,000 acre-ft; dead storage is 300 acre-ft below elevation 1,230.0 ft. Figures given herein represent total contents. Reservoir is used for flood control, low-water augmentation for water-quality control, and recreation. U.S. Army Corps of Engineers satellite elevation telemeter at station.

COOPERATION.--Records were provided by the U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 116,500 acre-ft, Apr. 7, 1977, elevation, 1,430.80 ft; minimum (after initial filling for regular operation), 11,800 acre-ft, Apr. 1, 1965, elevation, 1,313.42 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 77,700 acre-ft, May 7, elevation, 1,404.81 ft; minimum, 50,600 acre-ft, Nov. 4, elevation, 1,380.00 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1,381.80	52,300	-
Oct. 31.....	1,380.18	50,700	-1,600
Nov. 30.....	1,385.37	55,700	+5,000
Dec. 31.....	1,380.99	51,500	-4,200
CAL YR 1988.....	-	-	+800
Jan. 31.....	1,380.83	51,300	-200
Feb. 28.....	1,380.85	51,400	+100
Mar. 31.....	1,386.69	57,100	+5,700
Apr. 30.....	1,396.84	68,100	+11,000
May 31.....	1,396.82	68,000	-100
June 30.....	1,396.55	67,700	-300
July 31.....	1,396.65	67,800	+100
Aug. 31.....	1,396.13	67,200	-600
Sept. 30.....	1,396.62	67,800	+600
WTR YR 1989.....	-	-	+15,500

03209000 POUND RIVER BELOW FLANNAGAN DAM, NEAR HAYSI, VA

LOCATION.--Lat 37°14'13", long 82°20'36", Dickenson County, Hydrologic Unit 05070202, on right bank 1,100 ft upstream from Blacklog Branch, 1,700 ft downstream from John W. Flannagan Dam, 1.4 mi upstream from mouth, and 3.4 mi northwest of Haysi.

DRAINAGE AREA.--221 mi².

PERIOD OF RECORD.--July 1926 to current year. Monthly discharge only for some periods, published in WSP 1305. Prior to October 1963, published as Pound River near Haysi.

REVISED RECORDS.--WSP 953: 1940-41. WSP 1003: 1942, 1943(P). WSP 1275: 1927-30, 1931(M), 1932-39.

GAGE.--Water-stage recorder. Datum of gage is 1,200.00 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). Prior to Dec. 20, 1939, nonrecording gage at site 3.8 mi upstream at different datum. Dec. 20, 1939, to Sept. 30, 1963, water-stage recorder at site 4.6 mi upstream at datum 79.91 ft higher.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since March 1965 by John W. Flannagan Reservoir (station 03208990) 1,700 ft upstream and since August 1966 by North Fork Pound River Lake (station 03208680) 33 mi upstream. U.S. Army Corps of Engineers satellite precipitation and gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--63 years, 273 ft³/s, 16.78 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 30,000 ft³/s, Mar. 23, 1929, gage height, 16.5 ft, from floodmarks, site and datum then in use; minimum, less than 0.1 ft³/s on several days in September 1932. Maximum discharge since construction of John W. Flannagan Dam in 1965, 4,540 ft³/s, Apr. 8, 1977, gage height, 8.20 ft; minimum, 1.2 ft³/s, Feb. 16, 1968, Aug. 26, 1986; minimum daily, 2.3 ft³/s, June 26-29, 1965; minimum gage height, 1.42 ft, Feb. 16, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,110 ft³/s, May 8, gage height, 7.85 ft; minimum, 36 ft³/s, May 6, gage height, 2.02 ft; minimum daily, 40 ft³/s, Oct. 8-21, Jan. 28, 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	42	45	57	251	137	354	51	1350	158	191	293	52		
2	42	45	131	251	121	246	51	2050	158	163	564	112		
3	42	45	194	192	104	215	52	1380	158	163	312	253		
4	42	47	192	153	81	215	53	797	158	388	204	187		
5	42	50	192	153	298	215	53	795	159	451	143	149		
6	42	50	192	153	490	489	53	212	492	602	195	119		
7	41	50	192	153	564	708	54	1770	1560	1580	171	98		
8	40	50	153	154	569	637	54	3960	1410	1500	126	100		
9	40	50	117	339	331	412	54	2540	956	775	128	100		
10	40	50	118	513	163	286	54	1350	1240	287	100	101		
11	40	51	119	513	131	226	244	1210	657	189	67	155		
12	40	51	119	603	131	224	337	870	408	189	68	213		
13	40	51	119	1140	202	290	335	625	776	320	68	250		
14	40	51	158	903	317	447	254	446	460	286	61	543		
15	40	51	189	907	446	477	215	406	1140	169	52	588		
16	40	51	155	1270	576	403	215	407	2850	150	53	1580		
17	40	51	126	1570	788	268	246	353	852	150	82	947		
18	40	51	126	1150	632	200	261	235	3510	96	869	592		
19	40	52	128	420	501	200	219	187	2000	70	544	445		
20	40	52	129	209	527	685	194	272	778	70	222	229		
21	40	53	129	150	1370	1060	168	312	372	70	96	146		
22	258	53	246	150	1800	1010	129	270	339	70	54	286		
23	45	53	274	150	1790	785	129	215	339	70	54	676		
24	45	54	203	119	1180	342	142	275	339	70	54	507		
25	45	54	206	77	412	85	158	305	340	70	58	408		
26	45	54	206	109	412	87	159	272	182	70	54	475		
27	45	55	649	100	462	87	744	390	147	237	54	528		
28	45	56	1030	40	461	87	1080	314	247	636	122	402		
29	45	56	1020	40	---	166	831	179	247	345	158	286		
30	45	56	569	125	---	121	1240	158	247	193	576	461		
31	45	---	251	165	---	51	---	158	---	301	461	---		
TOTAL	1516	1538	7689	12222	14996	11078	7829	24063	22679	9921	6063	10988		
MEAN	48.9	51.3	248	394	536	357	261	776	756	320	196	366		
MAX	258	56	1030	1570	1800	1060	1240	3960	3510	1580	869	1580		
MIN	40	45	57	40	81	51	51	158	147	70	52	52		
(*)	-29	+82	-74	-4	+2	+93	+219	-13	-7	+2	-10	+9		
MEAN‡	19.9	133	174	390	538	450	480	763	749	322	186	375		
CFSM‡	.09	.60	.79	1.76	2.43	2.04	2.17	3.45	3.39	1.46	.84	1.70		
IN.‡	.10	.67	.91	2.04	2.53	2.35	2.42	3.98	3.78	1.68	.97	1.90		
CAL YR 1988	TOTAL	44103	MEAN	120	MAX	1130	MIN	39	MEAN‡	122	CFSM‡	.55	IN.‡	7.49
WTR YR 1989	TOTAL	130582	MEAN	358	MAX	3960	MIN	40	MEAN‡	380	CFSM‡	1.72	IN.‡	23.33

* Change in contents, equivalent in cubic feet per second, in North Fork Pound River Lake and John W. Flannagan Reservoir; provided by U.S. Army Corps of Engineers.

‡ Adjusted for change in contents.

BIG SANDY RIVER BASIN

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03209300 RUSSELL FORK AT ELKHORN CITY, KY

LOCATION.--Lat 37°18'14", long 82°20'35", Pike County, Hydrologic Unit 05070202, on left bank 10 ft downstream from steel highway bridge on abandoned section of State Highway 80, at Elkhorn City, 0.9 mi upstream from Elkhorn Creek, and at mile 13.2.

DRAINAGE AREA.--554 mi².

PERIOD OF RECORD.--Annual maximum, water years 1957-60 and occasional low-flow measurements, 1958-60. October 1960 to current year.

GAGE.--Water-stage recorder. Datum of gage is 773.00 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Mar. 12, 1957, to Jan. 4, 1961, nonrecording gage at site 10 ft upstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since August 1966 by North Fork Pound River Lake (station 03208680) and since March 1965 by John W. Flannagan Lake (station 03208990). Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--29 years, 706 ft³/s, 17.31 in/yr, unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 54,200 ft³/s, Apr. 4, 1977, gage height, 24.80 ft; minimum, 4.2 ft³/s, Sept. 20, 1967.

EXTREMES OUTSIDE PERIOD OF RECORD.--A discharge of 2.4 ft³/s was measured on Oct. 18, 1930 (exact location unknown).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,800 ft³/s, May 6, gage height, 13.22 ft; minimum, 62 ft³/s, Oct. 15, 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	84	79	202	435	311	772	609	2360	321	415	840	252
2	80	78	219	501	288	652	598	5250	308	371	1260	320
3	81	77	313	471	311	620	603	2880	308	364	637	390
4	84	77	304	393	844	600	828	1580	309	576	432	346
5	80	137	298	349	885	585	1350	3120	333	728	328	262
6	74	309	290	388	1000	818	1020	7450	867	849	404	222
7	70	217	279	490	1130	1080	830	4950	3900	1960	382	183
8	68	171	266	512	1140	1040	770	6030	2230	1870	277	182
9	67	146	200	602	844	804	852	4200	1580	1070	246	170
10	66	136	194	781	566	660	806	2950	1890	558	214	187
11	66	142	191	752	502	567	837	2410	1120	389	155	329
12	66	135	179	1260	459	543	836	1790	789	362	145	362
13	65	126	181	3180	467	596	758	1360	1420	508	141	378
14	63	123	203	2050	649	845	642	1080	1100	473	179	1690
15	63	118	261	2530	961	896	585	966	2100	335	160	1110
16	63	115	247	2350	1150	806	548	881	5030	297	138	4860
17	64	296	196	2140	1690	645	524	778	7410	277	151	2160
18	66	351	192	1650	1490	607	517	615	5840	230	826	1200
19	67	259	186	873	1250	986	477	522	2980	172	651	865
20	66	314	198	593	1260	1260	424	582	1480	171	355	585
21	77	346	230	456	3230	2420	392	606	955	170	190	421
22	345	304	575	410	4520	2610	332	541	783	169	124	1780
23	135	236	683	389	3350	1820	322	614	762	171	125	2940
24	125	199	802	359	2140	1390	321	630	699	152	131	1780
25	107	177	1580	282	1060	1010	331	603	628	148	137	1190
26	98	158	783	284	966	844	322	550	473	140	202	1320
27	91	157	855	313	935	690	892	652	344	333	266	1380
28	87	188	1210	197	901	579	1500	600	520	922	256	1050
29	84	227	1150	188	---	562	1370	416	494	605	272	779
30	81	221	813	252	---	539	2060	360	443	360	715	909
31	80	---	422	350	---	504	---	337	---	549	846	---
TOTAL	2713	5619	13702	25780	34299	28350	22256	57663	47416	15694	11185	29602
MEAN	87.5	187	442	832	1225	915	742	1860	1581	506	361	987
MAX	345	351	1580	3180	4520	2610	2060	7450	7410	1960	1260	4860
MIN	63	77	179	188	288	504	321	337	308	140	124	170

CAL YR 1988 TOTAL 102667 MEAN 281 MAX 2110 MIN 63
WTR YR 1989 TOTAL 294279 MEAN 806 MAX 7450 MIN 63

03471500 SOUTH FORK HOLSTON RIVER AT RIVERSIDE, NEAR CHILHOWIE, VA

LOCATION.--Lat 36°45'37", long 81°37'53", Smyth County, Hydrologic Unit 06010102, on right bank 400 ft upstream from highway bridge at Riverside, 900 ft upstream from Spring Branch, 3.2 mi downstream from Redstone Branch, 4.0 mi southeast of Chilhowie, and at mile 97.2.

DRAINAGE AREA.--76.1 mi².

PERIOD OF RECORD.--October 1920 to December 1931, July 1942 to current year. Monthly discharge only for some periods, published in WSP 1306. Prior to October 1924, published as "near Chilhowie." June 1907 to December 1909, at site 4.5 mi downstream also published as "near Chilhowie"; records not equivalent.

REVISED RECORDS.--WSP 1033: 1943-44(m). WSP 1306: Drainage area, 1921-31(M).

GAGE.--Water-stage recorder. Datum of gage is 2,106.77 ft above National Geodetic Vertical Datum of 1929. Nov. 1, 1920, to Nov. 14, 1931, nonrecording gage at site 400 ft downstream at same datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 11-14, 17-20, which are fair. Prior to August 1951, diurnal fluctuation at low flow caused by mill 500 ft upstream from station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--58 years, 111 ft³/s, 19.81 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,600 ft³/s, Nov. 6, 1977, gage height, 10.20 ft, from rating curve extended above 3,700 ft³/s on basis of slope-area measurement of peak flow; minimum recorded, 2 ft³/s, Aug. 26, Oct. 15, 1943, Aug. 9, 11, 1944, Oct. 19, 1945, but may have been less in 1925 and 1926 before installation of water-stage recorder; minimum daily, 8 ft³/s, July 19, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 650 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 21	2130	821	3.73	July 7	1830	796	3.68
July 4	2130	862	3.81	Sept. 22	1730	*4,980	*8.19
July 6	0330	884	3.85				

Minimum discharge, 17 ft³/s, Oct. 1, gage height, 1.17 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	23	38	70	44	115	102	153	75	66	81	51
2	22	22	35	84	43	106	92	547	71	61	98	50
3	23	22	33	81	43	112	90	347	69	60	78	48
4	22	22	32	74	47	127	87	223	66	274	68	47
5	21	50	30	66	50	137	89	198	65	629	62	45
6	20	52	29	71	66	152	90	494	68	743	194	45
7	20	40	29	92	104	169	101	410	82	608	118	46
8	20	34	29	95	119	161	113	296	67	585	91	45
9	20	31	32	87	102	144	136	253	66	339	77	43
10	19	30	30	81	87	126	165	271	66	222	68	42
11	20	29	e27	76	80	112	161	267	60	167	62	54
12	19	28	e21	92	73	102	141	227	59	135	59	83
13	19	28	e22	195	66	105	126	191	101	118	55	128
14	19	28	e24	241	63	102	113	164	92	104	56	235
15	19	27	27	202	60	98	112	152	83	92	69	139
16	19	26	28	178	58	98	105	142	91	84	75	214
17	19	31	e26	149	58	93	96	127	166	80	63	304
18	19	29	e24	122	59	100	91	119	158	75	87	194
19	19	28	e22	101	59	131	88	110	126	72	195	142
20	19	29	e24	87	62	143	84	104	106	71	135	116
21	21	28	27	76	387	188	80	97	91	68	102	103
22	26	27	33	68	694	237	76	90	100	63	85	1940
23	28	27	36	63	441	211	73	102	216	61	75	1340
24	29	27	41	59	271	198	71	95	151	57	73	557
25	27	27	67	55	195	192	68	89	115	59	72	333
26	25	26	64	53	167	176	65	90	96	56	68	345
27	23	29	57	51	147	154	67	123	83	64	64	283
28	23	42	57	48	131	135	80	110	88	72	59	219
29	22	42	61	46	---	122	78	101	93	107	55	180
30	22	39	59	48	---	116	96	90	73	72	59	239
31	22	---	61	47	---	111	---	81	---	65	54	---
TOTAL	665	923	1125	2858	3776	4273	2936	5863	2843	5329	2557	7610
MEAN	21.5	30.8	36.3	92.2	135	138	97.9	189	94.8	172	82.5	254
MAX	29	52	67	241	694	237	165	547	216	743	195	1940
MIN	19	22	21	46	43	93	65	81	59	56	54	42
CFSM	.28	.40	.48	1.21	1.77	1.81	1.29	2.49	1.25	2.26	1.08	3.33
IN.	.33	.45	.55	1.40	1.85	2.09	1.44	2.87	1.39	2.60	1.25	3.72

CAL YR 1988 TOTAL 18567 MEAN 50.7 MAX 676 MIN 16 CFSM .67 IN. 9.08
WTR YR 1989 TOTAL 40758 MEAN 112 MAX 1940 MIN 19 CFSM 1.47 IN. 19.92

e Estimated.

03473000 SOUTH FORK HOLSTON RIVER NEAR DAMASCUS, VA

LOCATION.--Lat 36°39'06", long 81°50'39", Washington County, Hydrologic Unit 06010102, on right bank 500 ft upstream from bridge on U.S. Highway 58, 0.7 mi downstream from Laurel Creek, 3.2 mi northwest of Damascus, 4.9 mi upstream from Middle Fork, and at mile 77.2.

DRAINAGE AREA.--301 mi².

PERIOD OF RECORD.--October 1931 to current year. Monthly discharge only for some periods, published in WSP 1306. Published as "at Vestal" prior to October 1978.

REVISED RECORDS.--WSP 823: Drainage area. WSP 1306: 1932-33(M).

GAGE.--Water-stage recorder. Datum of gage is 1,792.30 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for periods of no gage-height record, Oct. 1-7, Jan. 14-18, June 7-16, and Sept. 10-25, and periods with ice effect, Dec. 12-14, 18-20, which are fair. Prior to 1980, some diurnal fluctuation at low flow caused by powerplant upstream from station. Tennessee Valley Authority satellite gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--58 years, 473 ft³/s, 21.34 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,000 ft³/s, Apr. 5, 1977, gage height, 17.11 ft, from rating curve extended above 10,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 30 ft³/s, Oct. 14, 1941, Dec. 24, 1943; minimum daily, 40 ft³/s, Dec. 27, 1983; minimum gage height, 2.07 ft, Aug. 19, 1988.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Feb. 21	2045	3,470	7.66	Sept. 22	Unknown	*7,380	*10.75

Minimum discharge, 65 ft³/s, Oct. 1, gage height, 2.12 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e70	116	293	619	261	575	509	943	310	268	276	175
2	e100	117	254	728	254	550	470	2300	323	250	328	167
3	e130	109	223	616	254	592	474	1450	325	242	258	157
4	e110	100	206	501	317	719	468	979	301	411	222	148
5	e100	213	186	407	348	745	498	921	324	913	202	140
6	e92	354	173	467	550	797	507	2090	440	1290	340	138
7	e89	294	164	572	891	783	541	1780	e750	1070	293	155
8	86	248	157	617	866	712	592	1290	e600	1150	238	148
9	84	219	175	591	689	628	728	1150	e500	812	209	135
10	84	189	163	545	559	556	781	1360	e600	604	189	e133
11	81	196	151	507	489	501	744	1240	e450	485	176	e180
12	107	169	e110	891	431	462	651	1050	e400	413	169	e230
13	80	168	e120	1650	380	463	578	879	e750	375	163	e450
14	76	162	e130	e1100	361	440	521	749	e800	345	196	e700
15	75	149	146	e900	348	413	532	698	e650	303	260	e450
16	75	144	148	e750	323	421	500	644	e750	280	273	e700
17	75	255	134	e650	366	387	459	568	1660	273	213	e1000
18	74	243	e125	e580	395	456	432	519	1180	253	234	e600
19	74	218	e120	548	389	676	414	478	820	253	362	e450
20	72	231	e130	478	416	657	389	450	644	242	301	e380
21	91	210	143	412	1990	948	364	422	526	236	246	e300
22	139	192	185	357	2680	1170	343	396	442	213	215	e6000
23	147	184	190	327	1710	1000	328	480	530	220	200	e4000
24	172	179	251	302	1160	1020	316	415	452	197	255	e1800
25	154	165	581	285	867	929	301	382	384	186	261	e900
26	139	154	500	271	747	795	285	362	339	201	252	1090
27	121	169	403	283	675	678	307	497	391	235	244	903
28	117	433	386	251	615	588	411	438	354	249	208	718
29	115	396	418	238	---	528	390	403	369	335	196	597
30	108	333	383	266	---	535	514	369	301	249	229	763
31	108	---	422	283	---	525	---	338	---	220	210	---
TOTAL	3145	6309	7170	16992	19331	20249	14347	26040	16665	12773	7418	23707
MEAN	101	210	231	548	690	653	478	840	555	412	239	790
MAX	172	433	581	1650	2680	1170	781	2300	1660	1290	362	6000
MIN	70	100	110	238	254	387	285	338	301	186	163	133
CFSM	.34	.70	.77	1.82	2.29	2.17	1.59	2.79	1.85	1.37	.79	2.63
IN.	.39	.78	.89	2.10	2.39	2.50	1.77	3.22	2.06	1.58	.92	2.93

CAL YR 1988 TOTAL 90502 MEAN 247 MAX 3000 MIN 65 CFSM .82 IN. 11.18
WTR YR 1989 TOTAL 174146 MEAN 477 MAX 6000 MIN 70 CFSM 1.59 IN. 21.52

e Estimated.

TENNESSEE RIVER BASIN

03473500 MIDDLE FORK HOLSTON RIVER AT GROSECLOSE, VA

LOCATION.--Lat 36°53'19", long 81°20'51", Smyth County, Hydrologic Unit 06010102, on left bank 10 ft downstream from culverts on State Highway 679 at Groseclose, 0.2 mi upstream from Rocky Spring Branch, 10 mi northeast of Marion, and at mile 54.7.

DRAINAGE AREA.--7.39 mi².

PERIOD OF RECORD.--October 1947 to September 1957, October 1957 to September 1987 (annual maximum only), October 1987 to September 1989 (discontinued as a continuous-record station; converted to a crest-stage partial-record station). Monthly discharge only for some periods, published in WSP 1306.

REVISED RECORDS.--WSP 1236: 1948(M), 1949(P), 1950, 1951(P).

GAGE.--Water-stage recorder. Datum of gage is 2,442.86 ft above National Geodetic Vertical Datum of 1929. Concrete control prior to October 1957. Oct. 1, 1957, to Sept. 30, 1987, crest-stage gage at same site and datum.

REMARKS.--Records good except for period of no gage-height record, Apr. 24 to May 2, which is fair. Water-quality records at this location are published in this report under "Analyses of samples collected at special study sites."

AVERAGE DISCHARGE.--12 years, 8.53 ft³/s, 15.67 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 819 ft³/s, July 6, 1953, gage height, 7.42 ft, from rating curve extended above 300 ft³/s on basis of slope-area measurement of peak flow; minimum, 1.8 ft³/s, Jan. 24, 1948, result of freezeup; minimum daily, 2.1 ft³/s, Dec. 6, 12, 19, 1988; minimum gage height, 1.48 ft, Nov. 25, 1950.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 90 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Aug. 18	1045	193	4.10	Sept. 22	1245	*398	*5.41

Minimum daily discharge, 2.1 ft³/s, Dec. 6, 12, 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	3.1	2.6	5.4	4.1	9.5	8.2	e14	4.7	5.0	5.0	5.0
2	3.0	2.7	2.4	4.6	4.0	8.8	7.4	e11	4.7	4.7	4.9	4.9
3	2.9	2.6	2.4	4.5	4.4	8.5	7.1	10	4.7	4.7	4.6	4.7
4	2.6	2.6	2.4	4.2	4.6	8.3	7.0	8.9	4.7	26	4.4	4.6
5	2.5	4.3	2.2	4.0	5.3	8.1	7.2	12	5.0	20	4.2	4.4
6	2.4	3.7	2.1	4.9	7.2	10	7.1	21	6.2	20	6.4	4.4
7	2.4	3.2	2.2	4.6	8.7	10	8.3	18	6.8	18	4.6	4.6
8	2.4	2.8	2.2	4.9	7.5	9.1	9.7	13	5.1	14	4.4	4.7
9	2.4	2.7	2.7	4.4	6.1	8.6	10	13	5.3	11	4.3	4.2
10	2.4	2.8	2.4	4.2	5.7	8.1	9.1	14	5.4	8.9	4.1	4.1
11	2.4	2.7	2.3	4.2	5.7	7.9	8.4	12	4.7	7.7	3.9	6.1
12	2.4	2.6	2.1	6.3	5.6	7.5	8.0	11	5.2	7.0	3.9	8.4
13	2.4	2.7	2.3	9.0	5.4	9.3	7.5	8.7	9.3	7.0	3.9	14
14	2.4	2.6	2.2	7.6	5.8	8.5	7.2	7.8	6.0	6.8	3.9	15
15	2.4	2.6	2.6	11	5.6	7.9	8.3	7.8	5.6	6.2	4.1	11
16	2.4	2.6	2.4	8.3	5.6	8.1	7.3	7.5	9.2	6.0	4.6	19
17	2.3	3.0	2.3	6.9	5.6	7.3	6.8	6.5	16	5.9	4.4	18
18	2.4	2.6	2.2	6.2	5.6	9.4	6.5	6.2	11	5.5	64	13
19	2.4	2.6	2.1	5.7	5.9	9.5	6.3	5.9	8.8	5.3	18	10
20	2.4	2.6	2.2	5.4	6.4	11	6.2	5.6	7.7	5.5	11	9.2
21	3.1	2.4	2.7	4.9	22	14	6.0	5.5	7.3	6.3	8.6	8.7
22	3.3	2.4	2.8	4.7	24	13	6.0	5.3	6.7	5.5	7.4	138
23	2.9	2.4	3.0	4.4	19	13	6.0	5.5	6.3	5.0	6.6	38
24	3.5	2.3	3.9	4.2	14	15	e5.8	5.3	5.8	4.7	6.8	18
25	2.8	2.2	4.0	4.1	11	13	e5.5	5.0	5.5	4.5	8.1	15
26	2.8	2.2	3.5	4.3	10	12	e5.4	7.0	5.5	4.7	6.8	27
27	2.6	3.0	3.3	4.4	9.8	10	e6.0	8.4	5.7	6.3	7.0	17
28	2.6	3.5	3.7	4.1	9.8	9.1	e6.6	5.5	6.0	6.0	6.3	15
29	2.5	2.7	3.4	3.9	---	8.7	e6.8	5.0	6.4	5.4	5.9	14
30	2.5	2.7	3.4	4.9	---	8.9	e7.0	4.9	5.2	4.8	5.6	25
31	2.7	---	3.8	4.5	---	9.0	---	4.7	---	5.0	5.5	---
TOTAL	80.8	82.9	83.8	164.7	234.4	301.1	214.7	276.0	196.5	253.4	243.2	485.0
MEAN	2.61	2.76	2.70	5.31	8.37	9.71	7.16	8.90	6.55	8.17	7.85	16.2
MAX	3.5	4.3	4.0	11	24	15	10	21	16	26	64	138
MIN	2.3	2.2	2.1	3.9	4.0	7.3	5.4	4.7	4.7	4.5	3.9	4.1
CFSM	.35	.37	.37	.72	1.13	1.31	.97	1.20	.89	1.11	1.06	2.19
IN.	.41	.42	.42	.83	1.18	1.52	1.08	1.39	.99	1.28	1.22	2.44

CAL YR 1988 TOTAL 1557.0 MEAN 4.25 MAX 30 MIN 2.1 CFSM .58 IN. 7.84
WTR YR 1989 TOTAL 2616.5 MEAN 7.17 MAX 138 MIN 2.1 CFSM .97 IN. 13.17

e Estimated.

03474000 MIDDLE FORK HOLSTON RIVER AT SEVEN MILE FORD, VA

LOCATION.--Lat 36°48'26", long 81°37'20", Smyth County, Hydrologic Unit 06010102, on right bank at downstream side of bridge on U.S. Highway 11 at Seven Mile Ford, 0.3 mi upstream from Meade Creek, 3.3 mi downstream from Walker Creek, and at mile 32.1.

DRAINAGE AREA.--132 mi².

PERIOD OF RECORD.--July 1942 to December 1981, January 1982 to September 1987 (annual maximum only), October 1987 to September 1989 (discontinued as a continuous-record station; converted to a crest-stage partial-record station).

REVISED RECORDS.--WSP 973: 1942(m). WSP 1306: 1947(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,960.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for period with ice effect, Dec. 11-20, which is fair. Prior to April 1977, some diurnal fluctuation at low flow caused by mill 9 mi above station. Since May 1936, flow occasionally regulated by the filling or draining of Hungry Mother Lake on Hungry Mother Creek, capacity, about 1,600 acre-ft. Tennessee Valley Authority gage-height Automatic Data Acquisition System at station, called at 6-hour intervals by computer at Knoxville, TN. Water-quality records at this location are published in this report under "Analyses of samples collected at special study sites."

COOPERATION.--Gage-height record of extremes were provided by Tennessee Valley Authority for the period Jan. 1, 1982, to Sept. 30, 1987.

AVERAGE DISCHARGE.--41 years, 164 ft³/s, 16.87 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,500 ft³/s, Nov. 6, 1977; maximum gage height, 10.75 ft, Jan. 29, 1957; minimum discharge, 9 ft³/s, Sept. 26, 1944; minimum daily, 20 ft³/s, Sept. 26, 1944, Aug. 2, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 22	1800	*4,860	*5.14	No other peak equal to or greater than base discharge.			

Minimum discharge, 24 ft³/s, part of each day Oct. 12-15, 18-20; minimum daily, 26 ft³/s, Oct. 12-15, 18-20; minimum gage height, 0.97 ft, Oct. 12-15, 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	32	50	108	92	152	187	167	85	69	186	83
2	37	31	46	125	89	144	171	625	88	66	516	79
3	41	30	41	103	86	143	163	372	97	64	219	74
4	38	29	41	89	106	140	158	250	89	184	149	70
5	33	46	39	73	127	135	155	245	96	487	119	65
6	30	75	37	79	277	154	147	667	117	1030	298	64
7	29	59	36	88	422	181	155	557	253	886	195	68
8	28	48	53	96	334	182	188	368	178	472	137	68
9	29	42	61	99	232	167	280	319	151	305	110	64
10	28	39	60	92	171	148	310	437	169	226	97	61
11	27	51	e45	83	140	133	266	379	123	180	88	65
12	26	49	e30	136	121	122	225	305	107	160	83	93
13	26	49	e32	326	105	125	190	254	266	225	80	83
14	26	48	e33	302	101	143	164	214	228	162	74	91
15	26	45	e36	297	98	143	160	201	173	130	93	97
16	28	45	e36	284	92	142	147	191	222	115	157	198
17	28	73	e34	201	97	126	128	173	592	108	104	220
18	26	66	e33	154	106	146	121	158	334	99	216	149
19	26	58	e31	125	112	191	116	142	224	99	235	114
20	26	56	e35	106	126	198	110	133	174	102	147	97
21	35	52	43	91	573	276	103	124	142	100	112	90
22	45	49	57	79	752	312	99	113	119	86	94	1770
23	43	48	60	72	452	296	92	118	109	81	84	1050
24	54	47	78	68	299	388	90	110	99	74	85	435
25	49	46	143	65	223	367	88	101	87	72	514	284
26	39	36	96	63	197	301	83	94	80	77	264	766
27	34	38	73	69	179	243	90	157	74	116	178	460
28	31	86	66	62	162	199	106	141	86	124	132	300
29	30	71	67	60	---	174	107	121	97	276	110	242
30	30	57	61	73	---	172	108	107	77	139	107	369
31	30	---	71	92	---	180	---	97	---	117	94	---
TOTAL	1005	1501	1624	3760	5871	5923	4507	7440	4736	6431	5077	7669
MEAN	32.4	50.0	52.4	121	210	191	150	240	158	207	164	256
MAX	54	86	143	326	752	388	310	667	592	1030	516	1770
MIN	26	29	30	60	86	122	83	94	74	64	74	61
CFSM	.25	.38	.40	.92	1.59	1.45	1.14	1.82	1.20	1.57	1.24	1.94
IN.	.28	.42	.46	1.06	1.65	1.67	1.27	2.10	1.33	1.81	1.43	2.16

CAL YR 1988 TOTAL 27122 MEAN 74.1 MAX 989 MIN 23 CFSM .56 IN. 7.64
WTR YR 1989 TOTAL 55544 MEAN 152 MAX 1770 MIN 26 CFSM 1.15 IN. 15.65

e Estimated.

TENNESSEE RIVER BASIN

03475000 MIDDLE FORK HOLSTON RIVER NEAR MEADOWVIEW, VA

LOCATION.--Lat 36°42'47", long 81°49'08", Washington County, Hydrologic Unit 06010102, on left bank 48 ft downstream from bridge on State Highway 803, 0.9 mi upstream from Cedar Creek, 4.1 mi southeast of Meadowview, and at mile 13.2.

DRAINAGE AREA.--211 mi².

PERIOD OF RECORD.--October 1931 to September 1953, May 1976 to current year. Monthly discharge only for October 1931, published in WSP 1306.

REVISED RECORDS.--WSP 823: Drainage area. WSP 1276: 1932-34.

GAGE.--Water-stage recorder. Datum of gage is 1,820.22 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for periods with ice effect, Dec. 11-14, 17-20, which are fair. Prior to 1954, flow regulated by powerplant 0.9 mi upstream from station. Water-quality records at this location are published in this report under "Analyses of samples collected at special study sites".

AVERAGE DISCHARGE.--35 years, 238 ft³/s, 15.32 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,500 ft³/s, Nov. 7, 1977, gage height, 13.41 ft; minimum, 6 ft³/s, Nov. 10, 1933, Dec. 4, 1936, Jan. 21, 22, Feb. 1, 1940, Jan. 8, 1942, Oct. 15, 16, 31, 1943; minimum daily, 7 ft³/s, Nov. 19, 1950.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Jan. 29, 1957, reached a stage of 11.8 ft, from floodmark, discharge, 10,000 ft³/s, and flood of Dec. 10, 1972, reached a stage of 11.0 ft, from floodmark, discharge, 8,540 ft³/s, from information by Tennessee Valley Authority. Flood of Mar. 30, 1975, reached a stage of 10.37 ft, discharge, 7,410 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 23	0230	*4,580	*8.40	No other peak equal to or greater than base discharge.			

Minimum discharge, 36 ft³/s, Oct. 19, 20, gage height, 1.78 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	46	70	135	130	258	270	197	132	133	253	124
2	57	45	61	186	127	241	249	700	135	125	700	118
3	74	43	54	156	122	235	240	580	150	122	371	112
4	66	41	51	129	144	229	231	383	136	153	244	105
5	57	52	47	108	165	221	229	345	146	531	196	99
6	50	108	43	112	305	235	219	802	167	1470	336	96
7	46	103	42	135	589	264	226	829	327	1340	310	100
8	44	77	46	146	516	268	268	578	277	830	214	100
9	45	63	72	152	361	247	394	468	220	516	174	95
10	45	55	76	138	267	226	459	601	262	378	152	90
11	44	55	e60	129	224	208	407	572	203	305	139	119
12	41	64	e42	196	196	194	329	471	170	259	130	158
13	40	62	e45	465	171	195	277	394	347	313	125	130
14	39	60	e46	489	163	215	242	337	365	265	121	135
15	41	56	50	434	159	213	234	313	289	218	118	148
16	42	54	50	445	148	215	224	304	308	195	198	271
17	43	96	e47	329	159	193	198	273	1010	183	155	359
18	42	102	e45	251	180	198	182	251	652	168	191	242
19	39	81	e43	204	194	269	176	231	424	166	357	184
20	39	75	e45	173	216	271	166	213	328	164	213	154
21	49	70	51	150	687	379	156	202	271	161	162	139
22	66	62	67	131	1370	482	149	185	230	149	136	932
23	73	59	82	119	836	429	140	186	208	139	123	2380
24	84	58	96	110	558	594	138	175	188	127	130	670
25	91	56	199	103	408	571	134	164	171	120	466	391
26	69	52	158	99	347	470	128	151	158	131	444	1170
27	57	48	117	106	311	375	131	188	147	148	258	812
28	50	98	99	96	282	309	156	202	156	188	191	475
29	46	113	98	91	---	269	161	177	179	339	166	357
30	44	85	87	99	---	262	166	157	149	228	158	442
31	44	---	93	131	---	261	---	144	---	181	144	---
TOTAL	1609	2039	2182	5747	9335	8996	6679	10773	7905	9745	7075	10707
MEAN	51.9	68.0	70.4	185	333	290	223	348	263	314	228	357
MAX	91	113	199	489	1370	594	459	829	1010	1470	700	2380
MIN	39	41	42	91	122	193	128	144	132	120	118	90
CFSM	.25	.32	.33	.88	1.58	1.38	1.06	1.65	1.25	1.49	1.08	1.69
IN.	.28	.36	.38	1.01	1.65	1.59	1.18	1.90	1.39	1.72	1.25	1.89

CAL YR 1988 TOTAL 40676 MEAN 111 MAX 1370 MIN 39 CFSM .53 IN. 7.17
WTR YR 1989 TOTAL 82792 MEAN 227 MAX 2380 MIN 39 CFSM 1.08 IN. 14.60

e Estimated.

TENNESSEE RIVER BASIN

337

03478400 BEAVER CREEK AT BRISTOL, VA

LOCATION.--Lat 36°37'54", long 82°08'02", Bristol City, Hydrologic Unit 06010102, on right bank 50 ft upstream from bridge on State Highway 1405, 75 ft downstream from Goose Creek, 0.9 mi downstream from Clear Creek, 3.7 mi northeast of Bristol, VA post office, and at mile 20.6.

DRAINAGE AREA.--27.7 mi².

PERIOD OF RECORD.--July 1957 to current year. Published as "near Bristol" prior to October 1974.

GAGE.--Water-stage recorder. Datum of gage is 1,780.98 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for periods with ice effect, Dec. 11-14, 17-20, and period of doubtful or no gage-height record, June 19-22, which are fair. Small diurnal fluctuation at low flow caused by withdrawal of water, which is returned to stream 600 ft upstream from station, for car-washing operation. Since September 1965, some regulation at high flow by flood-control reservoirs, capacity, 7,600 acre-ft. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--32 years, 34.2 ft³/s, 16.77 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,600 ft³/s, Oct. 2, 1977, gage height, 9.94 ft, from rating curve extended above 390 ft³/s on basis of slope-area measurement of peak flow; minimum, 3.4 ft³/s, Dec. 30, 1963; minimum daily, 7.4 ft³/s, Sept. 28, 29, Oct. 5, 15, 18, 19, 23, 24, 1969.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1936 reached a stage of about 12 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 216 ft³/s, Sept. 26, gage height, 4.90 ft; minimum, 7.5 ft³/s, Oct. 19, 20, 30, gage height, 2.60 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.4	8.8	14	26	24	42	42	37	25	33	29	17
2	14	9.0	13	23	23	40	36	42	27	32	26	17
3	12	9.3	13	21	25	39	38	32	26	31	25	16
4	11	9.5	12	19	27	37	42	29	25	34	24	16
5	9.8	14	12	18	33	36	44	41	28	34	23	15
6	9.4	15	12	25	46	50	41	58	36	41	24	15
7	9.3	13	12	25	56	43	41	51	33	44	22	16
8	9.1	12	11	26	51	40	48	46	28	47	21	16
9	9.1	11	13	25	44	38	49	49	34	42	21	15
10	9.1	11	12	24	39	36	45	47	32	37	20	15
11	9.1	11	e11	24	36	35	41	45	29	35	19	18
12	8.6	10	e8.5	46	34	34	38	42	30	34	19	20
13	8.4	11	e9.0	66	33	37	37	39	39	32	20	16
14	8.5	10	e9.6	52	34	35	36	38	33	31	21	20
15	8.4	10	11	53	32	34	38	39	34	31	19	25
16	8.6	11	11	48	33	34	35	38	73	32	21	61
17	20	22	e10	41	38	32	33	35	114	30	23	29
18	23	15	e9.4	37	42	36	32	33	69	29	23	23
19	7.7	15	e9.0	34	42	35	31	34	e60	32	23	22
20	7.6	19	e10	32	48	37	30	33	e54	35	21	20
21	9.5	16	12	30	77	51	29	32	e50	30	20	20
22	9.1	14	13	28	76	48	28	31	e45	28	20	41
23	8.4	13	13	27	64	55	28	31	43	26	20	35
24	11	12	24	26	56	61	27	30	41	25	24	28
25	9.0	12	25	25	50	54	27	29	39	26	21	29
26	8.6	11	20	25	48	49	27	30	37	29	20	109
27	8.2	16	18	25	46	46	32	31	36	42	19	50
28	8.2	21	18	23	46	43	29	28	36	35	18	41
29	8.2	17	16	22	---	41	28	27	35	29	17	37
30	8.0	15	16	29	---	43	27	27	34	26	20	54
31	8.3	---	17	26	---	44	---	26	---	29	17	---
TOTAL	308.6	393.6	414.5	951	1203	1285	1059	1130	1225	1021	660	856
MEAN	9.95	13.1	13.4	30.7	43.0	41.5	35.3	36.5	40.8	32.9	21.3	28.5
MAX	23	22	25	66	77	61	49	58	114	47	29	109
MIN	7.6	8.8	8.5	18	23	32	27	26	25	25	17	15
CFSM	.36	.47	.48	1.11	1.55	1.50	1.27	1.32	1.47	1.19	.77	1.03
IN.	.41	.53	.56	1.28	1.62	1.73	1.42	1.52	1.65	1.37	.89	1.15
CAL YR 1988	TOTAL 5946.8 MEAN 16.2 MAX 118 MIN 7.6 CFSM .59 IN. 7.99											
WTR YR 1989	TOTAL 10506.7 MEAN 28.8 MAX 114 MIN 7.6 CFSM 1.04 IN. 14.11											

e Estimated.

TENNESSEE RIVER BASIN

03488000 NORTH FORK HOLSTON RIVER NEAR SALTVILLE, VA

LOCATION.--Lat 36°53'48", long 81°44'47", Smyth County, Hydrologic Unit 06010101, on right bank 0.5 mi upstream from Cedar Branch bridge, 1.5 mi northeast of Saltville, 7.8 mi downstream from Laurel Creek, and at mile 85.0.

DRAINAGE AREA.--222 mi².

PERIOD OF RECORD.--June 1907 to December 1908 (published as "at Saltville"), October 1920 to current year. Monthly discharge only for some periods, published in WSP 1306.

REVISED RECORDS.--WSP 758: Drainage area. WSP 1113: 1944-47. WSP 1306: 1907(M), 1921-22(M), 1924-30(M), 1932-34(M), drainage area at site used 1907-8. WSP 1726: 1947, monthly and yearly runoff.

GAGE.--Water-stage recorder. Datum of gage is 1,703.53 ft above National Geodetic Vertical Datum of 1929. June 11, 1907, to Nov. 12, 1908, nonrecording gage on highway bridge 2.1 mi downstream at different datum. Nov. 2, 1920, to May 23, 1934, nonrecording gage on highway bridge 0.5 mi downstream at datum 7.74 ft lower.

REMARKS.--Records good except for period with ice effect, Dec. 11-20, which is fair. National Weather Service gage-height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--70 years, 297 ft³/s, 18.17 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,500 ft³/s, Jan. 29, 1957, gage height, 13.20 ft; maximum gage height, 13.57 ft, Nov. 6, 1977; minimum discharge, 1.0 ft³/s, Oct. 15, 16, 1947, gage height, 0.13 ft, flow retarded by mine cave-in; minimum daily, 2.0 ft³/s, Oct. 15, 1947.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Sept. 23	0300	*4,830	*7.00	Sept. 26	1230	3,620	5.96

Minimum discharge, 20 ft³/s, Oct. 13, 14, 15, gage height, 0.40 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	40	122	220	146	248	251	443	143	124	207	88
2	30	40	102	340	139	223	231	1570	136	111	247	79
3	36	41	86	288	139	218	225	1000	297	103	207	74
4	39	40	76	229	241	222	234	617	224	117	163	68
5	36	55	68	176	326	230	254	546	185	239	137	63
6	31	180	60	166	490	265	254	1650	180	1010	184	61
7	27	176	57	218	765	320	270	1310	462	844	189	67
8	25	127	54	253	699	321	307	867	397	535	138	68
9	24	98	57	232	498	297	457	706	338	356	114	63
10	24	86	52	199	357	266	579	1050	389	260	100	58
11	23	77	e45	175	297	240	512	936	326	202	90	60
12	22	68	e35	271	254	220	420	787	262	168	83	158
13	21	64	e40	844	216	222	358	630	330	312	78	184
14	21	60	e42	799	200	275	307	492	331	207	74	142
15	21	56	e45	735	199	292	296	411	283	158	77	108
16	21	53	e42	720	190	286	283	386	318	447	168	226
17	22	73	e38	517	200	252	248	327	1380	317	110	461
18	22	125	e37	379	234	242	228	289	902	203	104	286
19	22	115	e35	298	251	247	214	256	560	165	196	200
20	22	106	e40	243	293	234	198	236	399	152	141	157
21	29	104	55	203	790	317	182	220	315	161	108	134
22	50	95	133	172	1350	406	170	196	252	149	92	1100
23	94	85	240	153	866	400	160	193	242	129	84	3090
24	87	77	265	141	594	535	152	189	249	108	84	1010
25	81	68	701	129	428	558	144	167	214	95	202	610
26	69	61	448	122	367	471	135	153	178	89	247	2440
27	57	61	284	121	317	382	137	299	160	138	207	1360
28	50	111	214	114	280	318	177	282	216	212	151	741
29	45	178	179	103	---	276	255	213	189	629	120	516
30	41	147	149	113	---	266	295	182	149	316	112	561
31	40	---	145	145	---	264	---	160	---	241	106	---
TOTAL	1158	2667	3946	8818	11126	9313	7933	16763	10006	8297	4320	14233
MEAN	37.4	88.9	127	284	397	300	264	541	334	268	139	474
MAX	94	180	701	844	1350	558	579	1650	1380	1010	247	3090
MIN	21	40	35	103	139	218	135	153	136	89	74	58
CFSM	.17	.40	.57	1.28	1.79	1.35	1.19	2.44	1.50	1.21	.63	2.14
IN.	.19	.45	.66	1.48	1.86	1.56	1.33	2.81	1.68	1.39	.72	2.38

CAL YR 1988 TOTAL 49229 MEAN 135 MAX 1730 MIN 17 CFSM .61 IN. 8.25
WTR YR 1989 TOTAL 98580 MEAN 270 MAX 3090 MIN 21 CFSM 1.22 IN. 16.52

e Estimated.

03521500 CLINCH RIVER AT RICHLANDS, VA

LOCATION.--Lat 37°05'10", long 81°46'52", Tazewell County, Hydrologic Unit 06010205, on right bank 1.0 mi southeast of Richlands, 1.6 mi downstream from Middle Creek, 2.2 mi upstream from Big Creek, and at mile 321.0.

DRAINAGE AREA.--137 mi².

PERIOD OF RECORD.--October 1945 to September 1989 (discontinued as a continuous-record station; converted to a crest-stage partial-record station). Monthly discharge only for some periods, published in WSP 1306.

REVISED RECORDS.--WSP 1306: 1946(M), 1948-50(M).

GAGE.--Water-stage recorder. Datum of gage is 1,924.08 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 6, 1950, nonrecording gage at bridge 1.1 mi downstream at datum 6.53 ft lower.

REMARKS.--Records good except for period with ice effect, Dec. 11-19, which is fair. Prior to October 1970, diurnal fluctuation at low flow caused by mill 1.7 mi upstream from station. National Weather Service gage-height telemeter at station. Several measurements of water temperature were made during the year.

Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--44 years, 190 ft³/s, 18.83 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,640 ft³/s, Jan. 29, 1957, gage height, 19.3 ft, from floodmark, from rating curve extended above 4,900 ft³/s on basis of contracted-opening measurement of peak flow; minimum, 3.2 ft³/s, Sept. 8, 1955; minimum daily, 8.8 ft³/s, July 6, Sept. 10, 16, 1964; minimum gage height, 0.45 ft, July 2, 3, 1951.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 22, 1901, reached a stage of 21.3 ft, present site and datum, from floodmark, discharge, 11,500 ft³/s, from report by Tennessee Valley Authority. Flood of Feb. 18, 1944, reached a stage of 13.7 ft, present site and datum, from floodmark, discharge, 5,500 ft³/s, from report by Tennessee Valley Authority.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,600 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 2	1000	2,060	6.82	June 17	0400	2,530	7.88
May 6	0030	*3,770	*10.23	Sept. 23	0100	2,830	8.42

Minimum discharge, 15 ft³/s, Oct. 18, 19, 20, gage height, 0.77 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	28	85	113	76	210	172	502	114	72	196	89
2	32	27	76	133	73	196	152	1740	115	68	180	80
3	42	27	67	132	144	192	146	911	117	66	132	69
4	40	25	61	121	415	187	169	548	100	81	104	60
5	35	70	55	104	322	184	201	1060	100	102	88	53
6	29	160	50	120	393	203	202	2460	166	147	117	50
7	25	112	48	173	489	224	206	1170	371	118	98	54
8	23	85	47	173	404	221	237	699	204	100	79	53
9	21	68	49	151	300	206	365	541	185	81	65	53
10	20	58	47	132	237	187	361	643	182	70	58	62
11	19	53	e38	120	202	172	289	597	141	63	52	47
12	18	46	e30	404	174	158	237	572	130	62	49	453
13	17	42	e35	1000	152	160	206	473	224	63	47	194
14	17	40	e38	653	152	184	178	372	179	58	49	129
15	16	39	e40	780	147	171	174	310	174	57	58	108
16	17	40	e35	650	161	166	164	268	319	129	79	232
17	17	188	e32	405	220	147	139	224	1730	100	58	389
18	16	173	e31	289	243	157	126	192	622	71	271	219
19	16	118	e36	228	237	230	123	168	360	64	432	156
20	16	104	56	184	272	220	119	155	258	70	187	125
21	27	91	99	151	549	384	110	144	210	73	126	110
22	64	78	297	128	880	519	101	128	174	70	107	769
23	86	70	223	115	656	386	95	129	163	58	90	1630
24	67	64	242	105	434	424	91	126	139	51	96	572
25	62	59	459	97	316	367	87	113	126	50	109	352
26	49	54	272	91	272	295	83	152	111	47	183	688
27	41	56	190	88	247	244	170	724	98	84	156	536
28	36	94	151	80	224	207	415	308	93	205	114	347
29	33	114	127	75	---	182	500	206	94	234	91	262
30	31	97	106	79	---	177	349	159	79	135	124	334
31	28	---	99	83	---	178	---	132	---	126	120	---
TOTAL	987	2280	3221	7157	8391	7138	5967	15926	7078	2775	3715	8275
MEAN	31.8	76.0	104	231	300	230	199	514	236	89.5	120	276
MAX	86	188	459	1000	880	519	500	2460	1730	234	432	1630
MIN	16	25	30	75	73	147	83	113	79	47	47	47
CFSM	.23	.55	.76	1.69	2.19	1.68	1.45	3.75	1.72	.65	.87	2.01
IN.	.27	.62	.87	1.94	2.28	1.94	1.62	4.32	1.92	.75	1.01	2.25

CAL YR 1988 TOTAL 28235 MEAN 77.1 MAX 593 MIN 12 CFSM .56 IN. 7.67
WTR YR 1989 TOTAL 72910 MEAN 200 MAX 2460 MIN 16 CFSM 1.46 IN. 19.80

e Estimated.

TENNESSEE RIVER BASIN

03524000 CLINCH RIVER AT CLEVELAND, VA

LOCATION.--Lat 36°56'41", long 82°09'18", Russell County, Hydrologic Unit 06010205, on right bank 500 ft upstream from highway bridge at Cleveland, 0.5 mi downstream from Muddy Hollow, 2.3 mi downstream from Weaver Creek, 4.4 mi downstream from Thompson Creek, and at mile 271.6.

DRAINAGE AREA.--528 mi².

PERIOD OF RECORD.--October 1920 to current year. Monthly discharge only for some periods, published in WSP 1306.

REVISED RECORDS.--WSP 823: Drainage area. WSP 1306: 1921-23(M), 1926(M), 1929-31(M). WSP 1706: 1927(M).

GAGE.--Water-stage recorder. Datum of gage is 1,500.24 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 1, 1931, nonrecording gage on highway bridge 500 ft downstream at datum 1.0 ft lower.

REMARKS.--Records good except for period with ice effect, Dec. 11-20, which is fair. National Weather Service gage-height telemeter at station. Tennessee Valley Authority gage-height Automatic Data Acquisition System at station, called at 6-hour intervals by computer at Knoxville, TN. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--69 years, 703 ft³/s, 18.08 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 34,500 ft³/s, Apr. 5, 1977, gage height, 26.40 ft; minimum, 35 ft³/s, Sept. 28, 1964; minimum gage height, 0.96 ft, Feb. 10, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 5,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
May 6	0600	*9,290	*13.01	Sept. 23	1430	5,180	8.86
June 17	1130	6,140	9.90				

Minimum discharge, 52 ft³/s, Oct. 20, gage height, 1.24 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	116	92	321	446	310	857	693	1380	399	343	491	476
2	109	90	280	608	285	801	631	3830	367	316	545	425
3	113	84	246	590	308	769	599	3000	432	298	455	336
4	125	82	219	530	1120	743	658	1760	391	329	362	276
5	121	110	197	445	1180	724	867	2320	390	441	308	237
6	107	311	178	409	1260	762	843	8530	656	1150	305	214
7	98	463	164	456	1650	852	801	4750	1500	1210	338	213
8	87	345	157	516	1560	820	805	2840	987	1130	286	211
9	81	273	160	511	1220	760	1020	2030	729	766	242	200
10	76	227	157	464	957	699	1170	1950	779	565	211	186
11	73	206	e140	426	818	642	1050	1950	647	451	194	180
12	70	186	e120	916	708	594	892	1870	533	379	183	851
13	67	170	e100	3210	616	586	771	1660	849	358	176	963
14	65	158	e125	2700	585	643	683	1370	849	328	181	576
15	62	148	e130	2430	596	640	635	1150	722	290	175	513
16	61	144	e125	2360	627	607	622	1010	1010	431	294	1270
17	60	542	e115	1610	899	559	560	867	5240	732	239	1510
18	61	685	e110	1190	1050	529	494	754	3040	457	241	1040
19	60	483	e100	942	1080	618	459	667	1630	361	1070	720
20	56	417	e110	773	1190	683	439	617	1320	368	725	550
21	66	390	177	641	1800	812	414	577	997	333	422	454
22	88	332	527	539	3090	1320	389	522	824	298	327	1530
23	154	284	804	471	2710	1210	366	498	715	269	341	4790
24	215	248	713	428	1840	1240	350	491	643	244	365	2630
25	195	220	1480	392	1370	1250	335	454	557	217	309	1540
26	170	197	1220	367	1150	1080	317	416	515	205	789	1990
27	148	186	821	349	1020	918	321	1120	442	245	835	2420
28	128	233	624	323	922	788	650	1070	522	333	553	1550
29	113	365	521	301	---	698	871	706	439	567	396	1150
30	104	372	431	299	---	658	922	545	390	568	506	1090
31	97	---	391	319	---	663	---	452	---	494	747	---
TOTAL	3146	8043	10963	25961	31921	24525	19627	51156	28514	14476	12611	30091
MEAN	101	268	354	837	1140	791	654	1650	950	467	407	1003
MAX	215	685	1480	3210	3090	1320	1170	8530	5240	1210	1070	4790
MIN	56	82	100	299	285	529	317	416	367	205	175	180
CFSM	.19	.51	.67	1.59	2.16	1.50	1.24	3.13	1.80	.88	.77	1.90
IN.	.22	.57	.77	1.83	2.25	1.73	1.38	3.60	2.01	1.02	.89	2.12

CAL YR 1988 TOTAL 109883 MEAN 300 MAX 2260 MIN 39 CFSM .57 IN. 7.74
WTR YR 1989 TOTAL 261034 MEAN 715 MAX 8530 MIN 56 CFSM 1.35 IN. 18.39

e Estimated.

03528000 CLINCH RIVER ABOVE TAZEWEILL, TN

LOCATION.--Lat 36°25'30", long 83°23'54", Claiborne County, Hydrologic Unit 06010205, on right bank 0.4 mi up-stream from Grissom Island, 4.6 mi downstream from Big War Creek, 10 mi east of Tazewell, and at mile 159.8.

DRAINAGE AREA.--1,474 mi².

PERIOD OF RECORD.--October 1918 to current year. Published as "near Lone Mountain" October 1918 to September 1927; as "near Tazewell" August 1927 to December 1936; and as "above Tazewell" July 1935 to current year.

Prior to April 1919 monthly discharge only, published in WSP 1306. Gage-height record "near Tazewell" January 1937 to July 1941.

REVISED RECORDS.--WSP 803: Drainage area at site "near Tazewell". WSP 1306: Drainage area at site "near Lone Mountain". WSP 1336: 1928.

GAGE.--Water-stage recorder. Datum of gage is 1,060.7 ft above National Geodetic Vertical Datum of 1929.

Apr. 1, 1919, to Sept. 30, 1927, nonrecording gage on railroad bridge 23.3 mi downstream at datum 102.7 ft lower. Aug. 8, 1927, to July 16, 1941, water-stage recorder at site 8.0 mi downstream at datum 47.2 ft lower. Water-stage recorder at present site and datum since July 29, 1935.

REMARKS.--No estimated daily discharges. Records good. Several measurements of water temperature were made during the year.

AVERAGE DISCHARGE.--71 years, 2,067 ft³/s, 19.04 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 98,100 ft³/s, Apr. 5, 1977, gage height, 29.32 ft, from floodmarks; minimum, 108 ft³/s, Sept. 11, 1925; minimum gage height, at present site and datum, 0.33 ft, Sept. 20, 1955.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in February 1862 reached a stage of about 24 ft, present site and datum, from information by local resident, discharge, about 66,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 14,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
May 7	0300	*25,800	*13.77	June 18	0600	17,100	10.74

Minimum discharge, 168 ft³/s, Oct. 20, 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	420	262	1100	2790	961	2490	2190	2310	1130	1830	1720	2120
2	358	247	1020	2990	929	2240	2240	5260	1010	1980	2850	1660
3	321	233	888	2800	900	2090	2170	8430	966	1520	2390	1330
4	304	227	781	2340	1020	1990	2670	6430	1020	1470	1670	1130
5	284	369	699	1890	2240	1960	5140	5150	1040	1470	1220	905
6	266	1850	634	1840	3620	2020	4920	19100	1720	1530	1020	770
7	258	2210	582	2430	4430	2280	3750	23600	4080	1940	960	703
8	248	1520	544	2680	5020	2440	3350	13400	5710	3380	913	648
9	235	1220	526	3100	4330	2330	3980	7420	3830	3350	812	610
10	222	945	513	2750	3360	2120	3920	5920	2970	2530	723	580
11	212	800	494	2280	2700	1930	3690	5330	2460	1840	636	557
12	201	698	469	5290	2280	1780	3240	4790	2010	1480	575	545
13	191	637	440	12300	1980	1650	2770	4250	2430	1610	534	638
14	184	608	411	11800	1820	1620	2380	3720	3880	1620	509	1380
15	177	603	398	9590	1940	1660	2140	3220	4590	1260	502	3300
16	173	577	385	9860	2120	1610	1990	2790	7480	1050	529	7350
17	173	940	405	6990	2670	1500	1810	2430	13400	924	565	11500
18	175	2040	410	4680	4310	1440	1640	2120	16000	1180	645	5470
19	174	2090	403	3460	4550	1440	1490	1870	8970	1280	738	3510
20	169	2490	397	2730	4290	1470	1370	1790	4850	1020	777	2520
21	175	2910	464	2240	5900	2380	1270	1780	3640	1040	1430	1960
22	186	2480	1120	1870	9450	3730	1200	1610	3550	1280	1030	1620
23	205	1730	1380	1610	8650	3750	1130	1460	4420	1070	773	3270
24	218	1300	2440	1420	6560	3620	1080	1420	3190	859	1450	8030
25	242	1040	4920	1280	4650	3460	1050	1350	2500	739	2470	5770
26	309	865	4990	1180	3590	3290	992	1290	2030	688	2030	4210
27	370	790	3430	1110	3060	2880	1010	2330	1720	751	2460	4740
28	349	865	2450	1020	2740	2480	1000	1730	1720	897	2050	4870
29	321	1050	1970	949	---	2160	1310	2290	1840	1670	1670	3530
30	295	1070	1660	931	---	1960	1900	1670	1780	1350	1330	2930
31	278	---	1540	979	---	2000	---	1340	---	1240	1800	---
TOTAL	7693	34666	37863	109179	100070	69770	68792	147600	115936	45848	38781	88156
MEAN	248	1156	1221	3522	3574	2251	2293	4761	3865	1479	1251	2939
MAX	420	2910	4990	12300	9450	3750	5140	23600	16000	3380	2850	11500
MIN	169	227	385	931	900	1440	992	1290	966	688	502	545
CFSM	.17	.78	.83	2.39	2.42	1.53	1.56	3.23	2.62	1.00	.85	1.99
IN.	.19	.87	.96	2.76	2.53	1.76	1.74	3.73	2.93	1.16	.98	2.22

CAL YR 1988 TOTAL 352575 MEAN 963 MAX 9920 MIN 132 CFSM .65 IN. 8.90
WTR YR 1989 TOTAL 864354 MEAN 2368 MAX 23600 MIN 169 CFSM 1.61 IN. 21.81

TENNESSEE RIVER BASIN

03531500 POWELL RIVER NEAR JONESVILLE, VA

LOCATION.--Lat 36°39'43", long 83°05'42", Lee County, Hydrologic Unit 06010206, on right bank 175 ft downstream from highway bridge, 2 mi southeast of Jonesville, 10 mi upstream from Wallen Creek, and at mile 143.1.

DRAINAGE AREA.--319 mi².

PERIOD OF RECORD.--October 1931 to current year. Monthly discharge only for some periods, published in WSP 1306.

REVISED RECORDS.--WSP 823: Drainage area. WSP 1033: 1932-44. WSP 1436: 1946(M), 1948(M).

GAGE.--Water-stage recorder. Datum of gage is 1,259.08 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for period with ice effect, Dec. 12, 13, which is fair. National Weather Service gage-height telemeter at station. Tennessee Valley Authority gage-height Automatic Data Acquisition System at station, called at 6-hour intervals by computer at Knoxville, TN. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

AVERAGE DISCHARGE.--58 years, 532 ft³/s, 22.65 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 57,000 ft³/s, Apr. 5, 1977, gage height, 44.32 ft, from flood-mark, from rating curve extended above 20,000 ft³/s on basis of slope-area measurement of peak flow; minimum, 17 ft³/s, Sept. 19, 20, 1954, and as result of storage behind temporary dam Oct. 18, 1961; minimum gage height, 0.68 ft, Oct. 18, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 5,000 ft³/s and maximum (*)

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Jan. 13	0530	6,250	12.09	June 16	0530	*10,000	*17.62
May 6	0700	9,770	17.25				

Minimum discharge, 41 ft³/s, Oct. 14-16, 17, gage height, 1.17 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	81	62	274	745	253	570	931	1360	318	562	229	608
2	77	58	235	976	236	505	811	2620	298	461	351	487
3	74	57	200	800	233	479	775	1680	316	402	293	358
4	70	55	184	628	531	457	1250	1100	294	413	210	268
5	62	155	167	477	603	453	2160	2220	425	392	169	216
6	59	769	150	634	724	679	1470	7700	1760	347	158	190
7	57	432	143	1070	932	866	1110	3420	3580	354	210	190
8	53	294	136	1150	894	731	1070	2010	1800	485	160	176
9	48	219	133	1270	721	613	1310	1530	1290	463	135	152
10	48	178	129	981	576	529	1150	1560	1510	372	122	137
11	47	223	120	760	505	474	995	1370	1040	308	113	134
12	45	202	e100	2340	446	437	842	1190	822	271	108	139
13	44	179	e80	5140	400	407	715	996	1490	451	102	126
14	42	183	105	2470	456	424	608	844	1520	316	99	362
15	41	158	102	3430	707	380	574	755	3630	260	97	552
16	42	145	100	2540	736	352	536	682	7970	223	97	2730
17	43	384	95	1510	982	317	459	571	6610	219	100	1560
18	43	451	90	1090	1150	326	413	496	3280	198	192	819
19	43	327	83	865	1100	471	388	448	1850	176	272	549
20	45	746	84	704	1020	460	362	552	1380	173	163	410
21	52	1020	131	580	2720	1170	335	679	1090	175	120	326
22	87	597	527	487	3470	1520	315	525	1010	195	106	344
23	103	405	552	435	1860	1090	300	713	861	169	105	1350
24	106	310	986	391	1250	1010	291	748	772	144	404	946
25	91	251	2590	353	965	889	286	599	650	134	794	674
26	88	208	1210	326	827	780	266	511	557	129	1070	812
27	71	220	755	312	733	663	544	659	512	137	762	833
28	66	326	581	284	658	569	684	540	507	362	410	647
29	65	362	559	263	---	506	915	448	489	336	279	502
30	66	310	462	263	---	492	1130	397	410	213	1030	471
31	66	---	452	284	---	679	---	353	---	181	1250	---
TOTAL	1925	9286	11515	33558	25688	19298	22995	39276	48041	9021	9710	17068
MEAN	62.1	310	371	1083 ^e	917	623	766	1267	1601	291	313	569
MAX	106	1020	2590	5140	3470	1520	2160	7700	7970	562	1250	2730
MIN	41	55	80	263	233	317	266	353	294	129	97	126
CFSM	.19	.97	1.16	3.39	2.88	1.95	2.40	3.97	5.02	.91	.98	1.78
IN.	.22	1.08	1.34	3.91	3.00	2.25	2.68	4.58	5.60	1.05	1.13	1.99

CAL YR 1988 TOTAL 103599 MEAN 283 MAX 4180 MIN 35 CFSM .89 IN. 12.08
WTR YR 1989 TOTAL 247381 MEAN 678 MAX 7970 MIN 41 CFSM 2.12 IN. 28.85

e Estimated.

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or floodflow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to these events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at crest-stage partial-record stations are presented in the following table. Discharge measurements made at low-flow partial-record sites and at miscellaneous sites and for special studies are given in separate tables.

Crest-stage partial-record stations

The following table contains annual maximum discharges for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained but is not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations during water year 1989

Annual maximum discharge at crest-stage partial-record stations during water year 1969							
Station No.	Station Name	Location	Drainage area (mi ²)	Period of record	Annual Maximum		
					Date	Gage height (ft)	Dis-charge (ft ³ /s)
POTOMAC RIVER BASIN							
01613900	Hogue Creek near Hayfield, Va.	Lat 39°12'52", long 78°17'18", Frederick County, on right bank 15 ft upstream from bridge on State Highway 614, 0.8 mi upstream from Gap Run, 1.3 mi south-southeast of Hayfield, and opposite mouth of small unnamed branch from southwest. Datum of gage is 668.60 ft above National Geodetic Vertical Datum of 1929.	15.0	1961-86†, 1987-89	3- 6-89	3.67	378
01622400	Buffalo Branch tributary near Christian, Va.	Lat 38°11'55", long 79°13'10", Augusta County, on left upstream wingwall of culvert on State Highway 42, 0.8 mi upstream from mouth, and 1.3 mi north of Christian. Datum of gage is 1,622.53 ft above National Geodetic Vertical Datum of 1929.	.49	1967-89	5- 2-89	3.26	33
01629945	Chub Run near Stanley, Va.	Lat 38°34'31", long 78°27'32", Page County, at culvert on State Highway 689, 2.2 mi east of Stanley, and 3.1 mi upstream from mouth. Datum of gage is 1,023.05 ft above National Geodetic Vertical Datum of 1929.	3.16	1959-69a, 1970-89	5- 2-89	2.28	194
01632970	Crooked Run near Mt. Jackson, Va.	Lat 38°45'44", long 78°41'06", Shenandoah County, on right upstream wingwall of culvert on State Highway 263, 0.4 mi upstream from mouth, and 2.3 mi west of Mt. Jackson. Datum of gage is 962.84 ft above National Geodetic Vertical Datum of 1929.	6.49	1972-89	7-12-89	5.65	1,010
01633650	Pughs Run near Woodstock, Va.	Lat 38°55'48", long 78°32'43", Shenandoah County, on left upstream wingwall of culvert on State Highway 623, 4.0 mi northwest of Woodstock, and 5.4 mi upstream from mouth. Datum of gage is 1,027.27 ft above National Geodetic Vertical Datum of 1929.	3.66	1972-89	5- 2-89	3.58	39

† Operated as a continuous-record gaging station.

‡ Records provided by U.S. Department of Agriculture, Soil Conservation Service.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at crest-stage partial-record stations during water year 1989--Continued

Annual maximum discharge at crest-stage partial-record stations during water year 1989--Continued					Annual Maximum		
Station No.	Station Name	Location	Drainage area (mi ²)	Period of record	Date	Gage height (ft)	Dis-charge (ft ³ /s)
POTOMAC RIVER BASIN--Continued							
01645784	Snakeden Branch at Reston, Va.	Lat 38°55'48", long 77°20'43", Fairfax County, on right bank at upstream side of culvert on Soapstone Drive, 1.1 mi upstream from Lake Elsa Dam, in Reston.	0.79	1973-78†, 1985-89b	2-12-85 8- 8-86 6- 4-87 5-18-88 5- 5-89	2.29 2.75 4.50 5.44 4.90	141 196 447 (*) (*)
01652500	Fourmile Run at Alexandria, Va.	Lat 38°50'35", long 77°05'09", Arlington County, on left upstream wingwall of bridge on Shirlington Road, at Arlington County-Alexandria City line, 0.1 mi upstream from Interstate Highway 395, and 2.5 mi upstream from mouth. Datum of gage is 28.57 ft above National Geodetic Vertical Datum of 1929.	13.8	1951-69†, 1970-73, 1974-75†, 1976-77c, 1979-82†, 1983-89	5- 5-89	8.25	3,100
01655500	Cedar Run near Warrenton, Va.	Lat 38°44'25", long 77°47'16", Fauquier County, on right bank at bridge on State Highway 672, 1.9 mi north of Warrenton. Datum of gage is 419.40 ft above National Geodetic Vertical Datum of 1929.	12.3	1951-86†, 1987-89	5- 5-89	8.26	1,660
01656000	Cedar Run near Catlett, Va.	Lat 38°38'12", long 77°37'31", Fauquier County, on right bank 100 ft downstream from bridge on State Highway 806, 0.9 mi downstream from Licking Run, and 1.4 mi southeast of Catlett. Datum of gage is 199.15 ft above National Geodetic Vertical Datum of 1929.	93.4	1951-86†, 1987-89	5- 5-89	16.45	8,380
01656200	Broad Run near Warrenton, Va.	Lat 38°48'25", long 77°48'47", Fauquier County, on left downstream wingwall of culvert on State Highway 17, 7 mi north of Warrenton, and 8.6 mi upstream from Mill Run.	2.94	1950-78, 1983-89	5- 6-89	4.03	54
GREAT WICOMICO RIVER BASIN							
01661600	Great Wicomico River near Horse Head, Va.	Lat 37°53'15", long 76°27'00", Northumberland County, on right upstream wingwall of culvert on State Highway 604, 1.5 mi upstream from Bush Mill Stream, and 1.7 mi west of Horse Head.	6.98	1969-89	8-18-89	4.61	622
01661800	Bush Mill Stream near Heathsville, Va.	Lat 37°52'36", long 76°29'42", Northumberland County, on right bank 12 ft upstream from bridge on State Highway 601, 2.2 mi northwest of Howland, and 3.0 mi southwest of Heathsville. Datum of gage is 22.22 ft above National Geodetic Vertical Datum of 1929.	6.82	1964-69†, 1970-86†, 1987-89	4- 7-89	5.98	186

* Discharge not determined.

† Operated as a continuous-record gaging station.

b Operated as a stage-only station.

c Prior to Sept. 28, 1973, at site 0.4 mi downstream at datum 6.02 ft lower.

Annual maximum discharge at crest-stage partial-record stations during water year 1989--Continued

Annual Maximum Discharge at Crest Stage Partial Record Stations during water year 1989 - continued					Annual Maximum		
Station No.	Station Name	Location	Drainage area (mi ²)	Period of record	Date	Gage height (ft)	Dis-charge (ft ³ /s)
RAPPAHANNOCK RIVER BASIN							
01661900	Carter Run near Marshall, Va.	Lat 38°47'57", long 77°52'09", Fauquier County, on left bank 50 ft upstream from farm road, 1.2 mi downstream from Horner Run, 4.7 mi south of Marshall, 6.7 mi southwest of The Plains, and 9 mi upstream from mouth. Datum of gage is 388.39 ft above National Geodetic Vertical Datum of 1929.	19.5	1976-82†, 1983-89	5- 6-89	6.56	1,220
01662000	Rappahannock River near Warrenton, Va.	Lat 38°41'05", long 77°54'15", Fauquier County, on left bank 50 ft downstream from west-bound bridge on U.S. Highway 211, 0.9 mi downstream from Carter Run, 6.2 mi southwest of Warrenton, and 15 mi upstream from Hazel River. Datum of gage is 312.57 ft above National Geodetic Vertical Datum of 1929.	195	1942-86†, 1987-89	5- 6-89	10.62	3,360
01665050	Pony Mountain Branch near Culpeper, Va.	Lat 38°27'04", long 77°57'24", Culpeper County, at culvert on State Highway 3, 0.3 mi upstream from mouth, and 2.7 mi southeast of Culpeper.	.30	1958-69a, 1970-89	5- 5-89	5.78	(*)
01668300	Farmers Hall Creek near Champlain, Va.	Lat 38°00'05", long 76°58'40", Essex County, on left upstream wingwall of culvert on U.S. Highway 17, 1.0 mi upstream from Rouzie Swamp, and 1.2 mi southeast of Champlain. Datum of gage is 42.10 ft above National Geodetic Vertical Datum of 1929.	2.18	1966-89	7-16-89	7.31	180
01668800	Hoskins Creek near Tappahannock, Va.	Lat 37°55'38", long 76°57'16", Essex County, at bridge on State Highway 717, 0.4 mi upstream from Criddlin Swamp, and 5.0 mi west of Tappahannock. Datum of gage is 36.28 ft above National Geodetic Vertical Datum of 1929.	15.5	1965-69†, 1971-86†, 1987-89	7-16-89	5.24	291
PIANKATANK RIVER BASIN							
01669800	My Ladys Swamp near Saluda, Va.	Lat 37°34'34", long 76°31'30", Middlesex County, on left upstream wingwall of culvert on State Highway 629, 1.45 mi upstream from mouth, and 4.4 mi southeast of Saluda. Datum of gage is 4.16 ft above National Geodetic Vertical Datum of 1929.	4.81	1969-89	4- 7-89	5.84	217
YORK RIVER BASIN							
01670300	Contrary Creek near Mineral, Va.	Lat 38°03'53", long 77°52'45", Louisa County, on left bank 400 ft downstream from bridge on U.S. Highway 522, 4.0 mi northeast of Mineral.	5.53	1976-86†, 1987-89	5- 6-89	2.84	457

* Discharge not determined.

† Operated as a continuous-record gaging station.

a Records provided by U.S. Department of Agriculture, Soil Conservation Service.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at crest-stage partial-record stations during water year 1989--Continued

Annual Maximum Discharge at Crest-Stage Partial-Record Stations during water year 1969--Continued							
Station No.	Station Name	Location	Drainage area (mi ²)	Period of record	Annual Maximum		
					Date	Gage height (ft)	Dis-charge (ft ³ /s)
YORK RIVER BASIN--Continued							
01671615	Foster Creek near Ferncliff, Va.	Lat 37°57'35", long 78°11'20", Louisa County, at culvert on U.S. Highway 250, 1.9 mi southeast of Zion Crossroads, 4.6 mi northwest of Ferncliff, and 5.0 mi upstream from mouth. Datum of gage is 424.22 ft above National Geodetic Vertical Datum of 1929.	0.61	1960-68a, 1969-89	7- 6-89	7.51	216
01671650	Waldrop Creek near Louisa, Va.	Lat 38°00'08", long 78°04'22", Louisa County, on left upstream wingwall of culvert on State Highway 632, 2.3 mi upstream from mouth, and 4.2 mi southwest of Louisa. Datum of gage is 361.41 ft above National Geodetic Vertical Datum of 1929.	2.85	1969-89	7- 6-89	9.51	641
01671750	Harris Creek near Trevilians, Va.	Lat 38°01'02", long 78°03'06", Louisa County, on right upstream wingwall of culvert on State Highway 632, 2.7 mi southeast of Trevilians, and 6 mi upstream from mouth.	3.43	1969-89	5- 6-89	5.43	464
01674200	Reedy Creek near Dawn, Va.	Lat 37°52'55", long 77°21'35", Caroline County, at bridge on U.S. Highway 301, 3.3 mi north of Dawn, and 11 mi south of Bowling Green.	16.8	1950-69, 1972-89	6-26-89	5.49	249
01674700	Aylett Creek at Aylett, Va.	Lat 37°47'05", long 77°06'23", King William County, on right upstream wingwall of culvert on U.S. Highway 360 at Aylett and 2.8 mi upstream from mouth. Datum of gage is 26.72 ft above National Geodetic Vertical Datum of 1929.	6.17	1969-89	11- 1-88	d3.79	(*)
JAMES RIVER BASIN							
02012500	Jackson River at Falling Spring, Va.	Lat 37°52'36", long 79°58'39", Alleghany County, on right bank 20 ft upstream from Smith Bridge, 0.8 mi south of Falling Spring, and 5.5 mi north of Covington. Datum of gage is 1,333.49 ft above National Geodetic Vertical Datum of 1929.	411	1925-84†, 1987-89	5- 8-89	9.08	5,160
02012950	Sweet Springs Creek tributary at Sweet Chalybeate, Va.	Lat 37°39'25", long 80°14'10", Alleghany County, on left bank 20 ft upstream from culvert on State Highway 311, 0.1 mi upstream from mouth, and 0.9 mi north of Sweet Chalybeate. Datum of gage is 1,926.94 ft above National Geodetic Vertical Datum of 1929.	.66	1966-75, 1978-89	-	<4.14	<36

* Discharge not determined.

† Operated as a continuous-record gaging station.

< Less than.

d Stage affected by beaver dams just downstream from gage.

Annual maximum discharge at crest-stage partial-record stations during water year 1989--Continued

Annual maximum discharge at crest-stage partial-record stations during water year 1989--Continued					Annual Maximum		
Station No.	Station Name	Location	Drainage area (mi ²)	Period of record	Date	Gage height (ft)	Dis-charge (ft ³ /s)
JAMES RIVER BASIN--Continued							
02015600	Cowpasture River near Head Waters, Va.	Lat 38°19'30", long 79°26'14", Highland County, on left downstream wingwall of bridge on U.S. Highway 250, 1.2 mi west of Head Waters, and 3 mi upstream from Shaw Fork. Datum of gage is 1,985.65 ft above National Geodetic Vertical Datum of 1929.	11.3	1949-89	-	<2.97	<110
02017300	Craig Creek at New Castle, Va.	Lat 37°30'06", long 80°06'18", Craig County, on left upstream pier of old bridge, about 20 ft downstream from new bridge on State Highway 616, 800 ft upstream from Johns Creek, and 0.3 mi southeast of New Castle. Datum of gage is 1,245.69 ft above National Geodetic Vertical Datum of 1929.	112	1967-89	9-22-89	11.54	4,960
02017700	Craig Creek tributary near New Castle, Va.	Lat 37°33'21", long 79°59'52", Craig County, on right upstream wingwall of culvert on State Highway 606, 0.4 mi upstream from mouth, and 7.1 mi northeast of New Castle.	2.05	1968-89	5- 6-89	6.65	272
02018800	North Fork near Fincastle, Va.	Lat 37°32'07", long 79°56'03", Botetourt County, on left upstream wingwall of culvert on State Highway 606, 3.5 mi upstream from mouth, and 3.9 mi northwest of Fincastle. Datum of gage is 1,248.65 ft above National Geodetic Vertical Datum of 1929.	4.17	1968-89	5- 6-89	5.58	482
02020100	Renick Run near Buchanan, Va.	Lat 37°35'27", long 79°38'04", Botetourt County, on left upstream wingwall of culvert on Frontage Road of Interstate Highway 81 between exits 48 and 49, 2.2 mi upstream from mouth, and 4.8 mi northeast of Buchanan. Datum of gage is 1,261.85 ft above National Geodetic Vertical Datum of 1929.	2.06	1967-89	5- 6-89	5.23	374
02021700	Cedar Grove Branch near Rockbridge Baths, Va.	Lat 37°53'00", long 79°23'10", Rockbridge County, on right upstream wingwall of culvert on State Highway 39, 0.1 mi upstream from mouth, and 1.8 mi southeast of Rockbridge Baths. Datum of gage is 1,041.22 ft above National Geodetic Vertical Datum of 1929.	12.3	1967-89	5- 6-89	5.14	178
02023300	South River near Steeles Tavern, Va.	Lat 37°55'50", long 79°09'55", Augusta County, at bridge on State Highway 608, 2.5 mi northeast of Vesuvius, 3 mi east of Steeles Tavern, and 5 mi south of Greenville.	15.7	1951-89	-	<3.68	<685
02024750	James River at Major, Va.	Lat 37°34'40", long 79°22'36", Amherst County, on left bank 10 ft upstream from headgates on headrace to city of Bedford hydroelectric plant, 1.2 mi north of Major, and 1.4 mi upstream from Blue Ridge Parkway.	3,070	1988-89	1-21-88 5- 6-89	7.54 9.09	(*) (*)

* Discharge not determined.
< Less than.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at crest-stage partial-record stations during water year 1989--Continued

Annual Maximum Discharge at Crest-Stage Partial-Record Stations during water year 1969--Continued					Annual Maximum		
Station No.	Station Name	Location	Drainage area (mi ²)	Period of record	Date	Gage height (ft)	Dis-charge (ft ³ /s)
JAMES RIVER BASIN--Continued							
02027700	Buffalo River tributary near Amherst, Va.	Lat 37°33'45", long 78°57'35", Amherst County, on left bank just upstream from culvert on U.S. Highway 60, 0.8 mi upstream from mouth, and 5.2 mi southeast of Amherst. Datum of gage is 583.66 ft above National Geodetic Vertical Datum of 1929.	.46	1966-89	5- 6-89	6.30	(*)
02030800	Stockton Creek near Afton, Va.	Lat 38°01'48", long 78°48'30", Albemarle County, on left upstream wingwall of culvert on State Highway 6, 1.7 mi east of Afton, and 4.3 mi upstream from Stony Run. Datum of gage is 835.27 ft above National Geodetic Vertical Datum of 1929.	2.80	1967-89	5- 5-89	6.96	345
02032200	Doyles River near White Hall, Va.	Lat 38°12'10", long 78°40'17", Albemarle County, on right downstream abutment of bridge on State Highway 810, 5.5 mi upstream from mouth, and 5.9 mi north of White Hall. Datum of gage is 928.08 ft above National Geodetic Vertical Datum of 1929.	6.70	1967-89	-	<10.09	<218
02032300	Muddy Run near Stanardsville, Va.	Lat 38°14'05", long 78°37'02", Albemarle County, on right downstream abutment of bridge on State Highway 810, 0.7 mi upstream from mouth, and 11 mi southwest of Stanardsville. Datum of gage is 756.79 ft above National Geodetic Vertical Datum of 1929.	3.36	1967-89	-	<6.06	(*)
02032540	Haneytown Creek near Stanardsville, Va.	Lat 38°16'48", long 78°30'50", Greene County, on left downstream wingwall of bridge on State Highway 810, 0.2 mi upstream from mouth, and 4.5 mi west of Stanardsville. Datum of gage is 616.34 ft above National Geodetic Vertical Datum of 1929.	4.45	1967-89	-	<12.33	<390
02032550	Lynch River at Nortonville, Va.	Lat 38°14'16", long 78°32'32", Albemarle County, on right downstream abutment of bridge on State Highway 810, 4 mi upstream from mouth, and 7 mi southwest of Stanardsville. Datum of gage is 591.70 ft above National Geodetic Vertical Datum of 1929.	13.6	1967-89	5- 5-89	12.73	2,160
02032700	Schenks Branch at Charlottesville, Va.	Lat 38°02'32", long 78°28'30", Charlottesville City, on right downstream retaining wall of small road culvert, 25 ft upstream from U.S. Highway 250 bypass culvert, 200 ft southeast of intersection of U.S. Highway 250 bypass and McIntire Road, and 1.2 mi upstream from mouth. Datum of gage is 371.63 ft above National Geodetic Vertical Datum of 1929.	1.34	1950-77, 1979-89	5- 5-89	6.63	(*)

* Discharge not determined.
 < Less than.

Annual maximum discharge at crest-stage partial-record stations during water year 1989--Continued

Station No.	Station Name	Location	Drainage area (mi ²)	Period of record	Annual Maximum		
					Date	Gage height (ft)	Dis-charge (ft ³ /s)
JAMES RIVER BASIN--Continued							
02033300	Moore's Creek near Charlottesville, Va.	Lat 38°00'25", long 78°34'25", Albemarle County, on right downstream wingwall of culvert on access road, 30 ft north of U.S. Highway 29, 2.8 mi upstream from Morey Creek, and 4 mi southwest of Charlottesville.	3.52	1967-77, 1979-89	5- 5-89	14.44	161
02034500	Willis River at Lakeside Village, Va.	Lat 37°40'00", long 78°10'00", Cumberland County, on left bank 15 ft upstream from bridge on State Highway 690, 0.4 mi east of Lakeside Village, 6.9 mi upstream from mouth, and 7.7 mi downstream from Reynolds Creek. Datum of gage is 178.98 ft above National Geodetic Vertical Datum of 1929.	262	1927-86†, 1987-89	5- 6-89	14.17	2,185
02037800	Falling Creek near Midlothian, Va.	Lat 37°27'15", long 77°35'20", Chesterfield County, at bridge on State Highway 653, 2.25 mi upstream from Horners Run, and 4 mi southeast of Midlothian. Datum of gage is 170.06 ft above National Geodetic Vertical Datum of 1929.	18.1	1951-89	6- 7-89	4.31	296
02038840	Holiday Creek near Toga, Va.	Lat 37°25'58", long 78°41'12", Buckingham County, 40 ft downstream from State Forest Road 2307, 5.9 mi southwest of Toga.	1.68	1967-89	5- 5-89	3.57	296
02038845	North Holiday Creek near Toga, Va.	Lat 37°26'09", long 78°40'04", Buckingham County, 18 ft upstream from State Forest Road 2307, 4.5 mi southwest of Toga.	1.31	1967-89	5- 5-89	2.62	55
02040500	Flat Creek near Amelia, Va.	Lat 37°23'27", long 78°03'45", Amelia County, at bridge on State Highway 681, 0.5 mi downstream from Horsepen Creek, and 6.0 mi northwest of Amelia.	73.0	1946-70, 1972-89	11-28-88	6.58	703
02042250	Bailey Branch tributary at Spring Grove, Va.	Lat 37°10'29", long 76°59'13", Surry County, on right upstream wingwall of culvert on State Highway 10, 1.0 mi northwest of Spring Grove. Datum of gage is 61.39 ft above National Geodetic Vertical Datum of 1929.	.71	1967-89	5- 2-89	3.63	52
02042300	Horsepen Branch at Richmond, Va.	Lat 37°35'45", long 77°30'40", Henrico County, on left downstream retaining wall at culverts on U.S. Highway 250 (Broad Street), at Richmond, and 0.9 mi upstream from mouth.	1.35	1965-89	5- 5-89	3.79	730
02042400	Jordans Branch at Richmond, Va.	Lat 37°35'10", long 77°29'55", Henrico County, on left downstream wall of bridge on U.S. Highway 250 (Broad Street), at Richmond, and 2.0 mi upstream from mouth.	2.41	1965-89	5- 5-89	8.70	(*)

* Discharge not determined.

† Operated as a continuous-record gaging station.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at crest-stage partial-record stations during water year 1989--Continued

Annual maximum discharge at crest-stage partial-record stations during water year 1989--Continued					Annual Maximum		
Station No.	Station Name	Location	Drainage area (mi ²)	Period of record	Date	Gage height (ft)	Dis-charge (ft ³ /s)
JAMES RIVER BASIN--Continued							
02042780	West Branch Long Hill Swamp near Lightfoot, Va.	Lat 37°18'50", long 77°46'01", James City County, on left upstream wingwall of culvert on State Highway 612, 1.1 mi upstream from mouth, and 2.0 mi south of Lightfoot.	2.47	1970-76, 1978-89	8- 8-89	4.63	170
CHOWAN RIVER BASIN							
02044000	Nottoway River near Burkeville, Va.	Lat 37°04'40", long 78°11'52", Lunenburg County, on right bank at downstream side of bridge on State Highway 723, 4.0 mi upstream from Modest Creek, 5.6 mi north of Victoria, and 7.5 mi south of Burkeville. Datum of gage is 354.58 ft above National Geodetic Vertical Datum of 1929.	38.7	1947-86†, 1987-89	5- 6-89	12.15	1,145
02044200	Falls Creek tributary near Victoria, Va.	Lat 37°02'04", long 78°10'26", Lunenburg County, at upstream end of culvert on State Highway 49, 3.6 mi northeast of Victoria.	.73	1962-89	5- 6-89	4.42	73
02050050	Blackwater River tributary near Holland, Va.	Lat 36°38'44", long 76°51'29", Suffolk City, on left upstream wingwall of culvert on State Highway 189, 3.0 mi upstream from mouth, and 4.9 mi southwest of Holland. Datum of gage is 29.25 ft above National Geodetic Vertical Datum of 1929.	2.76	1967-89	7-13-89	7.08	331
02051600	Great Creek near Cochran, Va.	Lat 36°48'46", long 77°55'19", Brunswick County, on left bank at upstream side of bridge on State Highway 763, 1.4 mi southwest of Cochran. Datum of gage is 215.72 ft above National Geodetic Vertical Datum of 1929.	30.7	1958-86†, 1987-89	8- 8-89	8.45	711
ROANOKE RIVER BASIN							
02057700	Powder Mill Creek at Rocky Mount, Va.	Lat 37°00'26", long 79°52'25", Franklin County, on right upstream wingwall of westernmost culvert in the interchange between U.S. Highway 220 bypass and State Highways 40 and 122 at Rocky Mount, 3.5 mi upstream from mouth.	.64	1967-89	5- 5-89	16.78	305
02065100	Snake Creek near Brookneal, Va.	Lat 37°00'42", long 78°57'52", Halifax County, on left upstream wingwall of culvert on U.S. Highway 501, 0.5 mi upstream from mouth, and 2.1 mi south of Brookneal.	1.68	1967-89	5- 6-89	7.27	397
02065300	Right Hand Fork near Appomattox, Va.	Lat 37°16'12", long 78°49'14", Appomattox County, on right upstream wingwall of culvert on State Highway 727, 0.5 mi upstream from Maple Spring Branch, and 5.2 mi south of Appomattox.	2.08	1967-89	5- 6-89	6.89	223

† Operated as a continuous-record gaging station.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Annual maximum discharge at crest-stage partial-record stations during water year 1989--Continued

Annual Maximum Discharge at Crest-stage partial-record stations during water year 1989--Continued					Annual Maximum		
Station No.	Station Name	Location	Drainage area (mi ²)	Period of record	Date	Gage height (ft)	Dis-charge (ft ³ /s)
ROANOKE RIVER BASIN--Continued							
02075350	Powells Creek near Turbeville, Va.	Lat 36°34'50", long 79°11'20", Halifax County, at culvert on U.S. Highway 58, 0.8 mi upstream from mouth, 1.1 mi east of Halifax-Pittsylvania County line, and 8.8 mi southwest of Turbeville. Datum of gage is 383.95 ft above National Geodetic Vertical Datum of 1929.	.28	1958-69a, 1970-89	7- 6-89	5.08	83
02076000	Dan River at South Boston, Va.	Lat 36°41'37", long 78°54'09", South Boston City, on left bank 100 ft upstream from Norfolk and Western Railroad bridge at South Boston.	2,730	1900-07†, 1923-52†, 1953-62c, 1980-89c	5- 8-89	23.23	(*)
02076200	Bearskin Creek near Chatham, Va.	Lat 36°50'30", long 79°29'05", Pittsylvania County, on left upstream wingwall of culvert on State Highway 57, 4.5 mi west of Chatham, and 6 mi upstream from mouth.	4.06	1967-89	7- 6-89	5.93	450
02076700	Blacks Creek near Mt. Airy, Va.	Lat 36°56'40", long 79°09'56", Pittsylvania County, on left upstream wingwall of culvert on State Highway 40, 1.5 mi east of Mt. Airy, and 3.5 mi upstream from mouth.	3.44	1966-89	11-11-87 5- 6-89	2.76 5.82	e29 292
02079500	Roanoke River at Buggs Island, Va.	Lat 36°36'06", long 78°17'56", Mecklenburg County, on left bank 1,200 ft downstream from John H. Kerr dam, 5.3 mi upstream from bridge on U.S. Highway 1, and 6.7 mi south-east of Boydton.	7,780	1947-62†, 1963-89	9- 8-89	10.73	(*)
KANAWHA RIVER BASIN							
03165700	Cripple Creek at Cedar Springs, Va.	Lat 36°49'31", long 81°16'45", Wythe County, on right downstream wingwall of bridge on State Highway 749, 0.6 mi southeast of Cedar Springs.	11.3	1967-89	9-22-89	16.33	873
03167300	Mira Fork tributary near Dugspur, Va.	Lat 36°50'16", long 80°35'47", Carroll County, on left upstream wingwall of culvert on U.S. Highway 221, 1.3 mi upstream from mouth, and 2.2 mi northeast of Dugspur. Datum of gage is 2,602.96 ft above National Geodetic Vertical Datum of 1929.	.62	1967-89	5- 6-89	5.98	184
03167700	Beaverdam Creek at Hillsville, Va.	Lat 36°46'05", long 80°43'33", Carroll County, at bridge on private road to Burlington Industries, 0.2 mi east of Hillsville corporate limits, and 3.0 mi upstream from mouth. Datum of gage is 2,373.04 ft above National Geodetic Vertical Datum of 1929.	4.75	1968-89	7- 5-89	6.85	720

* Discharge not determined.

† Operated as a continuous-record gaging station.

a Records provided by U.S. Department of Agriculture, Soil Conservation Service.

c Operated as a stage-only station.

e Revised.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at crest-stage partial-record stations during water year 1989--Continued

Annual maximum discharge at crest-stage partial-record stations during water year 1989--Continued							
Station No.	Station Name	Location	Drainage area (mi ²)	Period of record	Annual Maximum		
					Date	Gage height (ft)	Dis-charge (ft ³ /s)
KANAWHA RIVER BASIN--Continued							
03168750	Thorne Springs Branch near Dublin, Va.	Lat 37°05'30", long 80°44'34", Pulaski County, at pond dam just upstream from U.S. Highway 11, 3.3 mi southwest of Dublin, and 4.3 mi upstream from mouth.	4.77	1957-69a, 1970-89	9-22-89	2.51	198
BIG SANDY RIVER BASIN							
03207500	Levisa Fork near Grundy, Va.	Lat 37°17'52", long 82°07'34", Buchanan County, on right bank 200 ft upstream from Six and Twenty Mile Creek, 2.4 mi northwest of Grundy.	f235	1942-74†, 1986-87†, 1988-89	5- 5-89	13.80	9,630
03208040	Russell Fork at Council, Va.	Lat 37°04'41", long 82°03'56", Buchanan County, on left bank 50 ft upstream from bridge on State Highway 80, 750 ft downstream from Ball Creek, 0.6 mi southeast of Council, and 4.7 mi upstream from Hurricane Creek.	10.2	1981-83†, 1984-89	5- 5-89	4.37	810
03208100	Russell Fork near Birchleaf, Va.	Lat 37°09'50", long 82°15'20", Dickenson County, on right bank 125 ft upstream from bridge on State Highway 80, 150 ft upstream from Fryingpan Creek, 1.3 mi southeast of Birchleaf, and 3.5 mi southeast of Haysi.	87.4	1981-83†, 1984-89	5- 5-89	10.98	5,570
03208700	North Fork Pound River at Pound, Va.	Lat 37°07'32", long 82°37'36", Wise County, on right bank 700 ft downstream from Stacy Branch, 1,600 ft downstream from North Fork Pound River dam, at Pound. Datum of gage is 1,500.00 ft above National Geodetic Vertical Datum of 1929.	18.5	1962-87†, 1988-89	6-17-89	51.65	366
03208800	Pound River above Indian Creek, at Pound, Va.	Lat 37°07'26", long 82°36'29", Wise County, on left bank at Pound, 1,600 ft downstream from confluence of North and South Forks, 0.5 mi upstream from bridge on U.S. Highway 23, and 0.7 mi upstream from Indian Creek. Datum of gage is 1,535.64 ft above National Geodetic Vertical Datum of 1929.	36.7	1966-78†, 1979-89	6-17-89	10.27	1,270
03208850	Pound River below Bold Camp Creek, at Pound, Va.	Lat 37°07'19", long 82°35'55", Wise County, at Pound, on left bank 1,000 ft upstream from bridge on State Highway 83, 0.3 mi downstream from Bold Camp Creek, and 0.5 mi downstream from Indian Creek. Datum of gage is 1,527.36 ft above National Geodetic Vertical Datum of 1929.	61.2	1966-78†, 1979-89	6-17-89	13.56	1,820

† Operated as a continuous-record station.

a Records provided by U.S. Department of Agriculture, Soil Conservation Service.

f Includes drainage area of Six and Twenty Mile Creek.

Annual maximum discharge at crest-stage partial-record stations during water year 1989--Continued

Annual Maximum Discharge at Crest-Stage Partial-Record Stations during water year 1989--Continued					Annual Maximum		
Station No.	Station Name	Location	Drainage area (mi ²)	Period of record	Date	Gage height (ft)	Dis-charge (ft ³ /s)
BIG SANDY RIVER BASIN--Continued							
03208900	Pound River near Georges Fork, Va.	Lat 37°09'51", long 82°31'30", Dickenson County, on right bank 50 ft upstream from bridge on State Highway 624, 150 ft upstream from Camp Creek, and 2.6 mi northwest of Georges Fork. Datum of gage is 1,470.39 ft above National Geodetic Vertical Datum of 1929.	82.5	1964-82†, 1983-89	9-16-89	7.48	1,900
03209200	Russell Fork at Bartlick, Va.	Lat 37°14'45", long 82°19'25", Dickenson County, on left bank at Bartlick just upstream from bridge on State Highway 611, 0.2 mi downstream from Pound River, and 1.1 mi upstream from Fall Branch. Datum of gage is 1,165.00 ft above National Geodetic Vertical Datum of 1929.	526	1963-82†, 1983-89	5- 6-89	15.37	9,570
03213590	Knox Creek at Kelsa, Va.	Lat 37°27'02", long 82°03'34", Buchanan County, on downstream end of center bridge pier on State Highway 697, 0.3 mi downstream from Pawpaw Creek, 0.8 mi northeast of Kelsa, and 10.0 mi upstream from mouth.	84.3	1980-81†, 1982-89	5- 6-89	8.52	2,410
TENNESSEE RIVER BASIN							
03471200	South Fork Holston River at Teas, Va.	Lat 36°46'22", long 81°27'08", Smyth County, at Teas, on right downstream pier of bridge on State Highway 601, and 0.1 mi downstream from Mullins Branch. Datum of gage is 2,496.98 ft above National Geodetic Vertical Datum of 1929.	31.1	1967-89	9-22-89	15.27	3,780
03472500	Beaverdam Creek at Damascus, Va.	Lat 36°37'40", long 81°47'28", Washington County, at Damascus, on right bank 350 ft west of State Highway 716, in old plant area of Mobay Chemical Corporation, and 0.6 mi upstream from mouth. Datum of gage is 1,946.66 ft above National Geodetic Vertical Datum of 1929.	56.0	1948-59†, 1960-89	2-21-89	3.57	1,310
03474700	Hutton Creek near Chilhowie, Va.	Lat 36°47'00", long 81°44'05", Washington County, on left downstream wingwall of bridge on U.S. Highway 11, 3.3 mi southwest of Chilhowie, and 1.4 mi upstream from mouth.	8.32	1967-89	9-22-89	10.77	244
03474800	Hall Creek near Glade Spring, Va.	Lat 36°45'47", long 81°48'15", Washington County, on right downstream wingwall of bridge on U.S. Highway 11, 2.0 mi upstream from Tattle Branch, and 2.5 mi southwest of Glade Spring.	7.90	1967-89	9-22-89	11.51	1,310

† Operated as a continuous-record gaging station.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at crest-stage partial-record stations during water year 1989--Continued							
Station No.	Station Name	Location	Drainage area (mi ²)	Period of record	Annual Maximum		
					Date	Gage height (ft)	Dis-charge (ft ³ /s)
TENNESSEE RIVER BASIN--Continued							
03475600	Cedar Creek near Meadowview, Va.	Lat 36°44'50", long 81°51'20", Washington County, on left downstream wingwall of culvert on U.S. Highway 11, 1.2 mi south of Meadowview, and 2.5 mi upstream from mouth. Datum of gage is 2,034.66 ft above National Geodetic Vertical Datum of 1929.	3.38	1967-89	9-22-89	5.89	32
03475700	Spring Creek near Abingdon, Va.	Lat 36°40'43", long 82°02'29", Washington County, on right upstream and left downstream wingwall of culvert on U.S. Highway 11, 1.5 mi upstream from Sinking Creek, and 3.8 mi southwest of Abingdon. Datum of gage is 1,977.54 ft above National Geodetic Vertical Datum of 1929.	2.99	1967-89	9-22-89	4.65	195
03487800	Lick Creek near Chatham Hill, Va.	Lat 36°57'44", long 81°28'21", Smyth County, on left bank 270 ft upstream from bridge on State Highway 42, 2.9 mi northeast of Chatham Hill, and 1.6 mi upstream from mouth. Datum of gage is 2,076.97 ft above National Geodetic Vertical Datum of 1929.	25.5	1966-68†, 1969-89	9-22-89	6.09	1,460
03488450	Brumley Creek at Brumley Gap, Va.	Lat 36°47'30", long 82°01'10", Washington County, on left downstream wingwall of bridge on State Highway 611, 0.2 mi upstream from mouth, 0.8 mi southeast of Brumley Gap, and 2.7 mi downstream from Lee Creek. Datum of gage is 1,489.16 ft above National Geodetic Vertical Datum of 1929.	21.1	1979-81†, 1982-89	5- 6-89	4.86	661
03489800	Cove Creek near Shelleys, Va.	Lat 36°39'13", long 82°21'16", Scott County, on right downstream wingwall of bridge on U.S. Highways 58 and 421, 1.5 mi northwest of Shelleys. Datum of gage is 1,381.53 ft above National Geodetic Vertical Datum of 1929.	17.3	1951-89	6-17-89	5.79	815
03489870	Big Moccasin Creek at Collinwood, near Hansonville, Va.	Lat 36°44'16", long 82°19'25", Russell County, at Collinwood, on left downstream wingwall of bridge on State Highway 612, and 50 ft downstream from Meade Branch. Datum of gage is 1,796.34 ft above National Geodetic Vertical Datum of 1929.	41.9	1967-68†, 1969-89	6-17-89	4.16	1,460
03490000	North Fork Holston River near Gate City, Va.	Lat 36°36'31", long 82°34'05", Scott County, on left bank 75 ft upstream from bridge on U.S. Highway 23, 1.6 mi downstream from Big Moccasin Creek, 2.1 mi southeast of Gate City, and 8.8 mi upstream from mouth. Datum of gage is 1,197.56 ft above National Geodetic Vertical Datum of 1929.	672	1931-81†, 1982-89g	6-17-89	8.58	8,840

† Operated as a continuous-record gaging station.

g Records provided by Tennessee Valley Authority since Jan. 1, 1982.

Annual maximum discharge at crest-stage partial-record stations during water year 1989--Continued

Annual maximum discharge at crest-stage partial-record stations during water year 1989--Continued					Annual Maximum		Dis-charge (ft ³ /s)
Station No.	Station Name	Location	Drainage area (mi ²)	Period of record	Date	Gage height (ft)	
TENNESSEE RIVER BASIN--Continued							
03524500	Guest River at Coeburn, Va.	Lat 36°55'45", long 82°27'23", Wise County, on right bank 30 ft downstream from bridge on State Highway 72, 1.0 mi southeast of Coeburn, 1.4 mi upstream from Jaybird Branch, 1.8 mi downstream from Pine Camp Creek, and 6.3 mi up- stream from mouth. Datum of gage is 1,925.80 ft above National Geodetic Vertical Datum of 1929.	87.3	1949-59†, 1960-78, 1979-81†, 1982-89	5- 6-89	9.71	3,120
03524900	Stony Creek at Ka, Va.	Lat 36°48'57", long 82°37'02", Scott County, at Ka, on left bank 300 ft upstream from bridge on State Highway 619, 600 ft downstream from Straight Fork, and 4.2 mi upstream from mouth.	30.9	1980-81†, 1982-89	5- 6-89	5.90	2,970
03526000	Copper Creek near Gate City, Va.	Lat 36°40'26", long 82°33'57", Scott County, on right bank 50 ft upstream from bridge on State Highway 619, 0.2 mi upstream from Plank Camp Creek, 1.1 mi downstream from Obeys Creek, and 2.6 mi northeast of Gate City. Datum of gage is 1,301.95 ft above National Geodetic Vertical Datum of 1929.	106	1948-72†, 1973-89	6-17-89	10.03	3,250
03527000	Clinch River at Speers Ferry, Va.	Lat 36°38'55", long 82°45'02", Scott County, on right bank 200 ft downstream from bridge on U.S. Highway 58, 0.5 mi downstream from Copper Creek, 0.8 mi northwest of Speers Ferry, 1.8 mi south of Clinch- port, and 211.0 mi upstream from mouth. Datum of gage is 1,196.54 ft above National Geodetic Vertical Datum of 1929.	1,126	1920-76†, 1977-78, 1979-81†, 1982-89	5- 6-89	20.42	23,400
03529500	Powell River at Big Stone Gap, Va.	Lat 36°52'08", long 82°46'32", Wise County, on right bank 10 ft upstream from bridge on U.S. Highway 23, at Big Stone Gap, 1.0 mi upstream from South Fork Powell River, 2.5 mi downstream from Pigeon Creek, and 179.2 mi upstream from mouth. Datum of gage is 1,459.07 ft above National Geodetic Vertical Datum of 1929.	112	1945-59†, 1960-77, 1979-81†, 1982-89	6-16-89	7.92	6,080
03530500	North Fork Powell River at Pennington Gap, Va.	Lat 36°46'26", long 83°01'59", Lee County, near right bank on downstream side of bridge on State Highway 621, 0.8 mi north of Pennington Gap, 1.3 mi downstream from Straight Creek, and 4.7 mi upstream from mouth. Datum of gage is 1,363.02 ft above National Geodetic Vertical Datum of 1929.	71.4	1945-51†, 1952-77, 1979-81†, 1982-89	6-16-89	7.97	3,770

† Operated as a continuous-record gaging station.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Special study and miscellaneous sites

Discharge measurements in the following table were made at special study and miscellaneous sites throughout the State. Data for miscellaneous sites provided by the Virginia Water Control Board are noted by an "[a]".

Discharge measurements made at special study and miscellaneous sites during water year 1989

Discharge measurements made at special study and miscellaneous sites during water year 1989						
Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements	
					Date	Discharge (ft ³ /s)
NASSAWADOX CREEK BASIN						
Nassawadox Creek [a]	Chesapeake Bay	Lat 37°31'31", long 75°52'37", Northampton County, at culvert on State Highway 606, 2.7 mi upstream from Kelly Cove, and 3.5 mi north of Nassawadox.	b4.2	1968-88	11-15-88	0.83
					1- 9-89	1.12
					4-19-89	11.3
					8-16-89	13.7
POTOMAC RIVER BASIN						
01633500 Stony Creek [a]	North Fork Shenandoah	Lat 38°51'55", long 78°37'45", Shenandoah County, on right bank, 0.8 mi south of Columbia Furnace, 3.6 mi downstream from Little Stony Creek, 4.7 mi northwest of Edinburg, and 6.4 mi upstream from mouth. Datum of gage is 895.29 ft above National Geodetic Vertical Datum of 1929.	79.4	1948-56†, 1957-76	7-13-89	62.6
					8- 7-89	61.7
					9- 6-89	20.9
01659000 North Branch Chopawamsic Creek	Chopawamsic Creek	Lat 38°33'58", long 77°25'48", Prince William County, on left bank 0.3 mi upstream from State Highway 618, on Quantico Marine Corps Base, and 4.8 mi south of Independent Hill.	5.79	1951-57†	9-27-89	2.24
01659500 Middle Fork Chopawamsic Creek	North Branch Chopawamsic Creek	Lat 38°33'26", long 77°25'32", Stafford County, on left bank 300 ft upstream from State Highway 618, on Quantico Marine Corps Base, 0.4 mi upstream from mouth, and 5.6 mi north of Garrisonville.	4.51	1951-57†	9-28-89	1.17
01660000 South Branch Chopawamsic Creek	Chopawamsic Creek	Lat 38°32'22", long 77°25'30", Stafford County, on right bank 300 ft downstream from State Highway 618, on Quantico Marine Corps Base, 1.8 mi upstream from mouth, and 4.3 mi north of Garrisonville.	2.56	1951-57†	9-28-89	3.65
01660500 Beaverdam Run	Aquia Creek	Lat 38°30'25", long 77°25'45", Stafford County, on left bank 600 ft upstream from Military Road 2, on Quantico Marine Corps Base, 2.2 mi north of Garrisonville, and 3.4 mi upstream from mouth.	12.7	1951-57†	9-29-89	4.53
GREAT WICOMICO RIVER BASIN						
01661800 Bush Mill Stream	Great Wicomico River	Lat 37°52'36", long 76°29'42", Northumberland County, at bridge on State Highway 601, 2.2 mi northwest of Howland, 3.0 mi southwest of Heathsville, and 3.5 mi upstream from mouth.	6.82	1964-69†, 1970-86†, 1987-88	1-26-89 4-26-89	1.97 6.66

† Operated as a continuous-record gaging station.
a Provided by the Virginia Water Control Board.
b Approximately.

Discharge measurements made at special study and miscellaneous sites during water year 1989--Continued

Discharge measurements made at special study and miscellaneous sites during water year 1989-Continued				Measurements		
Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Date	Discharge (ft ³ /s)
RAPPAHANNOCK RIVER BASIN						
01665500 Marsh Run	Rapidan River	Lat 38°13'33", long 78°15'30", Orange County, at bridge on State Highway 609, 0.5 mi upstream from mouth, and 2.9 mi northwest of Somerset.	16.0	1963	7-24-89 9- 5-89	8.97 1.77
01665570 Blue Run	Rapidan River	Lat 38°10'01", long 78°16'33", Orange County, at bridge on State Highway 678, at Barboursville.	4.83	-	7-27-89 9- 7-89	4.67 .93
01665580 Blue Run	Rapidan River	Lat 38°14'15", long 78°11'57", Orange County, at bridge on State Highway 641, 0.7 mi upstream from mouth, and 2.3 mi northeast of Somerset.	32.3	-	7-24-89 9- 5-89	14.4 2.69
01665600 Poplar Run	Rapidan River	Lat 38°15'53", long 78°09'25", Orange County, at culvert on State Highway 633, 0.1 mi upstream from mouth, and 1.3 mi southwest of Madison Mills.	8.75	-	7-24-89 9- 5-89	.03 .01
01667670 Long Branch	Rapidan River	Lat 38°21'01", long 77°58'31", Orange County, at bridge on State Highway 636, 0.65 mi upstream from mouth, and 1.7 mi southwest of Raccoon Ford.	1.74	-	7-26-89 9- 7-89	.63 .26
01667840 Black Walnut Run	Mine Run	Lat 38°18'22", long 77°52'56", Orange County, at bridge on State Highway 602, 3.5 mi northeast of Rhoadesville, and 3.8 mi upstream from mouth.	6.88	-	7-26-89 9- 6-89	2.36 1.10
01667850 Mine Run	Rapidan River	Lat 38°20'36", long 77°51'33", Orange County, at bridge on State Highway 611, at Burr Hill, and 4.3 mi upstream from mouth.	31.8	1943, 1952-53, 1963, 1981-85	7-24-89 9- 5-89	10.1 2.99
01667860 Mountain Run	Mine Run	Lat 38°18'16", long 77°57'58", Orange County, at bridge on State Highway 617, 3.1 mi north of Unionville, and 10.3 mi upstream from mouth.	12.3	-	7-26-89 9- 7-89	5.69 1.16
01667870 Mountain Run	Mine Run	Lat 38°21'13", long 77°53'38", Orange County, at bridge on State Highway 611, 2.1 mi northwest of Burr Hill, and 4.9 mi upstream from mouth.	28.8	1943, 1952-54 1963	7-25-89 9- 6-89	15.5 3.80
01667880 Russell Run	Rapidan River	Lat 38°22'10", long 77°47'58", Orange County, at culvert on State Highway 603, 0.3 mi upstream from mouth, and 1.8 mi west of Flat Run.	5.22	-	7-24-89 9- 5-89	2.09 .53
01667890 Flat Run	Rapidan River	Lat 38°21'11", long 77°45'13", Orange County, at culvert on State Highway 3, 0.2 mi downstream from Lake of the Woods dam, 1.1 mi southeast of Flat Run, and 3.0 mi upstream from mouth.	7.30	-	7-24-89 9- 5-89	2.90 .15
01667910 Wilderness Run	Rapidan River	Lat 38°19'32", long 77°43'33", Orange-Spotsylvania County line, at bridge on State Highway 3, at Wilderness, and 4.1 mi upstream from mouth.	10.7	1952-54, 1963	7-24-89 9- 5-89	2.84 .86

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at special study and miscellaneous sites during water year 1989--Continued

Discharge measurements made at special study and miscellaneous sites during water year 1989--Continued						
Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Date	Discharge (ft ³ /s)
RAPPAHANNOCK RIVER BASIN--Continued						
01668800 Hoskins Creek	Rappahannock River	Lat 37°55'38", long 76°57'16", Essex County, at bridge on State Highway 717, 0.4 mi upstream from Criddlin Swamp, 2.9 mi downstream from former site of Hutchinson Mill Pond, and 5.0 mi west of Tappahannock.	15.5	1965-69†, 1970-86†, 1987-88	10- 6-88	3.42
					1-27-89	6.10
					4-27-89	15.3
					5-25-89	12.9
					7-31-89	18.5
YORK RIVER BASIN						
01670120 Mountain Run	North Anna River	Lat 38°09'39", long 78°06'06", Orange County, at bridge on State Highway 643, 0.9 mi upstream from confluence with Negro Run, and 4.4 mi north- east of Gordonsville.	14.2	1981-85	7-25-89	7.32
					9- 5-89	2.14
01670122 Negro Run	North Anna River	Lat 38°07'48", long 78°10'22", Orange-Louisa County line, at culvert on private road, 0.6 mi east of Gordonsville, and 5.3 mi upstream from confluence with Mountain Run.	.22	-	7-26-89	.026
					9- 7-89	.036
01670130 Negro Run	North Anna River	Lat 38°09'05", long 78°05'36", Orange-Louisa County line, 300 ft upstream from confluence with Mountain Run, 5.1 mi northeast of Gordonsville.	13.4	-	9-18-89	7.6
01670140 Beaver Creek	North Anna River	Lat 38°09'43", long 78°02'17", Orange County, at bridge on State Highway 638, 1.3 mi southwest of Daniel, and 2.0 mi upstream from mouth.	7.58	-	7-25-89	3.19
					9- 5-89	1.65
01670150 Church Run	Pamunkey Creek	Lat 38°13'31", long 78°04'16", Orange County, at bridge on State Highway 631, 0.1 mi upstream from confluence with Tomahawk Creek, and 1.7 mi southeast of Orange.	6.13	-	7-26-89	2.94
					9- 7-89	1.30
01670160 Tomahawk Creek	Pamunkey Creek	Lat 38°13'29", long 78°04'22", Orange County, at culvert on State Highway 612, 0.1 mi upstream from confluence with Church Run, and 1.7 mi south- east of Orange.	7.60	-	7-26-89	3.31
					9- 7-89	1.52
01670165 Pamunkey Creek	North Anna River	Lat 38°11'36", long 77°59'05", Orange County, at bridge on State Highway 630, 1.2 mi southwest of Lahore.	26.2	-	7-25-89	12.7
					9- 6-89	5.39
01670170 Clear Creek	Pamunkey Creek	Lat 38°12'07", long 77°58'51", Orange County, at culvert on State Highway 629, at Lahore, 0.1 mi upstream from Berry Run, 0.8 mi upstream from mouth, and 2.4 mi downstream from Lake Orange dam.	6.56	-	7-25-89	4.32
					9- 6-89	1.06
01670180 Pamunkey Creek	North Anna River	Lat 38°11'33", long 77°58'09", Orange County, at bridge on State Highway 669, at Lahore, and 0.8 mi downstream from Clear Creek.	40.5	-	7-25-89	20.4
					9- 6-89	7.79
01670220 Rocky Run	Terrys Run	Lat 38°14'03", long 77°53'35", Orange County, at culvert on State Highway 619, 0.2 mi upstream from mouth, and 3.3 mi southwest of Mine Run.	3.43	-	7-25-89	.60
					9- 6-89	.32

† Operated as a continuous-record gaging station.

Discharge measurements made at special study and miscellaneous sites during water year 1989--Continued

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements	
					Date	Discharge (ft ³ /s)
YORK RIVER BASIN--Continued						
01670230 Terrys Run	Pamunkey Creek	Lat 38°11'13", long 77°55'39", Orange County, at bridge on State Highway 629, 0.3 mi downstream from Riga Run, 1.6 mi upstream from Lake Anna, and 2.5 mi southwest of Tatum.	26.9	-	7-25-89	4.06
					9- 6-89	4.10
01670235 Pleasant Run	Terrys Run	Lat 38°10'38", long 77°54'23", Orange County, at culvert on State Highway 653, 0.9 mi upstream from Lake Anna, 1.4 mi upstream from former mouth, and 2.5 mi south of Tatum.	2.71	-	7-25-89	.82
					9- 6-89	.93
01670300 Contrary Creek	North Anna River	Lat 38°03'53", long 77°52'45", Louisa County, at bridge on U.S. Highway 522, 1.2 mi up- stream from Lake Anna, 4.0 mi northeast of Mineral, and 5.1 mi upstream from former mouth.	5.53	1976-87†	7-26-89	1.24
					9- 6-89	.78
01671500 Bunch Creek	Hudson Creek	Lat 38°01'54", long 78°11'30", Louisa County, at culvert on U.S. Highway 15, 1.5 mi up- stream from confluence with Fielding Creek, and 2.7 mi south of Boswells Tavern.	4.37	1949-79†	7-27-89	19.2
					9- 7-89	.83
01674500 Mattaponi River	York River	Lat 37°53'02", long 77°09'55", King William-King and Queen County line, at bridge on State Highway 628, 2.2 mi northeast of Beulahville.	619	1941-87†, 1988	11-21-88	301
					1-24-89	220
					2-23-89	805
					4-20-89	944
					6-28-89	280
					8-23-89	251
JAMES RIVER BASIN						
02042270 Chicka- hominy River	James River	Lat 37°41'10", long 77°32'35", Hanover County, at bridge on U.S. Highway 33, 2.7 mi north- west of Glen Allen.	-	1976, 1985, 1987-88	4- 4-89	14.2
					9-12-89	1.55
02042275 Chicka- hominy River	James River	Lat 37°42'02", long 77°30'49", Hanover-Henrico County line, at bridge on State Highway 625, 2.1 mi north of Glen Allen.	-	1984-85, 1987	4- 4-89	28.2
					9-12-89	2.43
02042284 Stony Run	Chickahominy River	Lat 37°41'05", long 77°26'58", Hanover County, 50 ft upstream from culvert on State Highway 656, 3.0 mi northwest of Atlee.	17.9	1984-85, 1987-88	4- 4-89	15.7
					9-12-89	.62
02042288 Chicka- hominy River	James River	Lat 37°36'41", long 77°22'18", Hanover-Henrico County line, at bridge on State Highway 627, 2.2 mi northeast of Richmond.	-	1984-85, 1987-88	4- 4-89	42.5
					9-12-89	(c)
02042226 Upham Brook	Chickahominy River	Lat 37°36'47", long 77°25'28", Henrico County, at bridge on Wilkinson Road, 1.2 mi north of Richmond.	-	1987-88	9-12-89	.37
02042433 Beaverdam Creek	Chickahominy River	Lat 37°35'45", long 77°21'32", Hanover County, at bridge on State Highway 156, 0.7 mi southeast of Mechanicsville.	-	1984-85, 1987-88	4- 5-89	12.1
					9-12-89	20.2

† Operated as a continuous-record gaging station.

c No apparent flow.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at special study and miscellaneous sites during water year 1989--Continued						
Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements	
					Date	Discharge (ft ³ /s)
JAMES RIVER BASIN--Continued						
02042435 Chickahominy River	James River	Lat 37°34'36", long 77°20'03", Hanover-Henrico County line, at bridge on State Highway 615, 1.5 mi north of Highland Springs.	-	1976, 1984-85, 1987-88	4- 5-89 9-12-89	124 7.07
02042440 Chickahominy River	James River	Lat 37°33'07", long 77°16'17", Hanover-Henrico County line, at bridge on State Highway 156, 2.7 mi northeast of Seven Pines.	-	1953-54, 1984-85, 1987-88	4- 5-89 9-12-89	166 12.1
02042443 Chickahominy River	James River	Lat 37°31'03", long 77°12'34", New Kent-Henrico County line, at bridge on Interstate Highway 64, 2.2 mi northwest of White Oak Swamp.	164	1985, 1987-88	4- 5-89 9-12-89	217 18.8
02042455 White Oak Swamp	Chickahominy River	Lat 37°28'05", long 77°12'32", Henrico County, at bridge on State Highway 156, at Elko.	-	1984-85, 1987-88	4- 5-89 9-13-89	37.2 (c)
02042465 Toe Ink Swamp	Chickahominy River	Lat 37°29'03", long 77°07'56", New Kent County, at outfall downstream from Kent Lake dam, and 1.5 mi north of Roxbury.	-	1984-85, 1987-88	4- 5-89 9-13-89	18.8 2.12
02042470 Chickahominy River	James River	Lat 37°28'11", long 77°08'17", New Kent-Charles City County line, 600 ft upstream from bridge on State Highway 609, 0.4 mi north of Roxbury.	-	1942, 1984-85, 1987-88	4- 5-89 9-13-89	485 (c)
02042610 Jones Run	Chickahominy River	Lat 37°26'28", long 77°02'48", New Kent County, at Chesapeake and Ohio railroad bridge, at Providence Forge.	-	1985, 1987-88	4- 5-89 9-13-89	19.9 6.01
02042726 Diascund Creek	Chickahominy River	Lat 37°28'52", long 76°58'21", New Kent County, at bridge on State Highway 628, 2.4 mi south of New Kent, and 6.0 mi upstream from Timber Swamp.	9.25	1985, 1987-88	10-26-88 12-21-88 2-14-89 4- 6-89 5-10-89 6-14-89 7-12-89	5.11 4.12 5.53 33.9 19.1 7.96 5.32
02042736 Beaverdam Creek	Diascund Reservoir	Lat 37°28'53", long 76°54'23", New Kent County, at bridge on State Highway 632, 4.0 mi northwest of Barhamsville, and 4.1 mi upstream from mouth.	4.82	1985, 1987-88	10-26-88 12-21-88 2-14-89 4- 6-89 5-10-89 6-14-89 7-12-89 9-13-89	.67 .96 1.14 42.0 13.6 4.46 4.18 (c)
02042742 Wahrani Swamp	Diascund Reservoir	Lat 37°27'30", long 76°51'57", New Kent County, at culvert on State Highway 632, 1.3 mi west of Barhamsville, and 1.8 mi upstream from Barnes Swamp.	4.02	1985, 1987-88	10-26-88 12-21-88 2-14-89 4- 6-89 5-10-89 6-14-89 7-12-89	.62 1.54 2.20 27.3 9.32 7.87 2.01
ROANOKE RIVER BASIN						
02079880 Pea Hill Creek	Lake Gaston	Lat 36°34'57", long 77°53'20", Brunswick County, at bridge on State Highway 665, 1.1 mi north of Gasburg.	-	1987-88	11-17-88 12- 7-88 1-19-89 2- 7-89 3-14-89 4-18-89 5-16-89 6-21-89 7-19-89 8-15-89 9- 5-89	1.83 1.66 2.41 9.51 18.8 5.77 5.36 7.98 2.31 1.59 .57

c No apparent flow.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Discharge measurements made at special study and miscellaneous sites during water year 1989--Continued

Stream	Tributary to	Location	Drainage area (mi ²)	Measured previously (water years)	Measurements	
					Date	Discharge (ft ³ /s)
TENNESSEE RIVER BASIN						
03473500 Middle Fork Holston River	South Fork Holston River	Lat 36°53'19", long 81°20'51", Smyth County, 15 ft down- stream from culvert on State Highway 679, at Groseclose.	7.39	1948-57† 1987-88†	10- 3-88 3-23-89 5-24-89 8- 7-89 10- 2-89	2.89 10.1 5.22 4.48 34.0
03473650 Nicks Creek	Middle Fork Holston River	Lat 36°51'52", long 81°26'09", Smyth County, at bridge on U.S. Highway 11, 3.5 mi north- east of Marion.	6.00	1988	5- 2-89 5- 6-89 6-17-89 7- 6-89	55.6 47.0 28.1 62.6
03473660 Bear Creek	Middle Fork Holston River	Lat 36°52'08", long 81°26'33", Smyth County, at bridge on State Highway 622, 3 mi north- east of Marion.	14.66	1988	5- 2-89 5- 6-89 6-17-89 7- 6-89	164 108 82.3 139
03473820 Staley Creek	Middle Fork Holston River	Lat 36°50'10", long 81°31'03", Smyth County, at bridge on Lee Street, in Marion.	14.74	1988	5- 2-89 5- 6-89 6-17-89 7- 6-89	68.6 87 22.6 132
03473900 Walker Creek	Middle Fork Holston River	Lat 36°50'06", long 81°35'51", Smyth County, at bridge on State Highway 645, 2.3 mi northeast of Seven Mile Ford.	15.50	1988	5- 2-89 5- 6-89 6-17-89 7- 6-89	74.3 111 158 33.1
03474000 Middle Fork Holston River	South Fork Holston River	Lat 36°48'26", long 81°37'20", Smyth County, at bridge on U.S. Highway 11, at Seven Mile Ford.	132	1942-81†, 1983-85, 1987-88†	10- 3-88 3-22-89 10- 2-89	41.4 328 835
03474450 Carlock Creek	Middle Fork Holston River	Lat 36°48'29", long 81°40'21", Smyth County, at bridge on State Highway 774, in Chilhowie.	7.25	1988	12-14-87 2- 3-88 4-19-88 6-27-88 8-17-88 5- 2-89 5- 6-89 6-17-89 7- 6-89	.79 11.8 7.62 .37 .21 41.0 48.3 69.6 20.1
03474720 Hutton Creek	Middle Fork Holston River	Lat 36°46'21", long 81°43'49", Smyth County, at Huff Airport Road, 2.2 mi southwest of Chilhowie.	10.97	1988	5- 2-89 5- 6-89 6-17-89 7- 6-89	26.0 29.7 41.8 33.2
03474900 Byers Creek	Middle Fork Holston River	Lat 36°44'22", long 81°47'57", Washington County, at bridge on State Highway 735, 4 mi south of Glade Spring.	15.2	1961-73d, 1988	5- 2-89 5- 6-89	25.3 29.5
03475000 Middle Fork Holston River	South Fork Holston River	Lat 36°42'47", long 81°49'08", Washington County, on left bank 48 ft downstream from bridge on State Highway 803, 4.1 mi southeast of Meadow- view.	211	1932-53†, 1976-88†	10- 3-88 11-17-88 1-13-89 2-21-89 4-14-89 5-25-89 8-14-89	78.6 93.6 504 572 244 169 119
03475602 Cedar Creek	Middle Fork Holston River	Lat 36°42'53", long 81°49'51", Washington County, at bridge on State Highway 706, 2.6 mi southeast of Cedarville.	7.15	1988	5- 2-89 6-17-89 7- 6-89	9.12 13.2 10.6

† Operated as a continuous-record gaging station.
d Measurement by Tennessee Valley Authority.

Samples are collected at partial-record, special study, and miscellaneous sites to give better areal coverage. The results of these samples are given herein.

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARD-NESS TOTAL (MG/L AS CaCO3)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg)
RAPPAHANNOCK RIVER BASIN												
01665550 MARSH RUN NEAR SOMERSET, VA (LAT 38 13 33N LONG 078 15 30W)												
JUL 1989 24...	1315	9.0	6	6.70	28.0	750	6.9	90	900	19	4.8	1.8
SEP 05...	1020	1.8	5	6.40	17.5	763	8.5	89	--	--	--	--
01665570 BLUE RUN AT BARBOURSVILLE, VA (LAT 38 10 01N LONG 078 16 33W)												
JUL 1989 27...	0830	4.7	9	5.80	21.0	--	8.6	--	--	--	--	--
01665580 BLUE RUN NEAR SOMERSET, VA (LAT 38 14 15N LONG 078 11 57W)												
JUL 1989 24...	1415	14	12	7.10	28.0	750	6.3	82	K500	42	11	3.5
SEP 05...	1220	2.7	12	7.00	19.0	763	8.4	90	--	--	--	--
01665600 POPLAR RUN NR MADISON MILLS, VA (LAT 38 15 53N LONG 078 09 25W)												
JUL 1989 24...	1630	0.03	6	6.60	29.0	750	6.6	87	K480	28	6.6	2.8
SEP 05...	1330	0.01	5	6.60	18.0	762	8.5	90	--	--	--	--
01667670 LONG BRANCH NR RACCOON FORD, VA (LAT 38 21 02N LONG 077 58 11W)												
JUL 1989 26...	1410	0.63	9	6.00	21.0	--	8.5	--	--	--	--	--
01667840 BLACK WALNUT RUN NR RHOADESVILLE, VA (LAT 38 18 22N LONG 077 52 56W)												
JUL 1989 26...	1100	2.4	4	6.60	23.0	--	7.8	--	--	--	--	--
01667850 MINE RUN AT BURR HILL, VA (LAT 38 20 36N LONG 077 51 33W)												
JUL 1989 25...	1825	10	5	7.70	25.0	765	6.6	80	600	18	4.1	1.9
SEP 05...	1527	3.0	5	7.70	18.5	765	7.7	82	--	--	--	--
01667860 MOUNTAIN RUN NR UNIONVILLE, VA (LAT 38 18 16N LONG 077 57 58W)												
JUL 1989 26...	1320	5.7	13	6.20	25.0	--	5.2	--	--	--	--	--
01667870 MOUNTAIN RUN NEAR BURR HILL, VA (LAT 38 21 13N LONG 077 53 38W)												
JUL 1989 25...	0940	15	12	--	24.0	765	7.0	83	420	52	16	2.9
SEP 06...	0950	3.8	12	6.20	18.5	760	7.9	85	--	--	--	--
01667880 RUSSELL RUN NEAR FLAT RUN, VA (LAT 38 22 10N LONG 077 47 58W)												
JUL 1989 24...	1645	2.1	4	7.20	25.0	765	7.9	95	150	14	2.8	1.7
SEP 05...	1426	0.53	4	6.40	19.0	765	8.9	96	--	--	--	--
01667890 FLAT RUN NEAR FLAT RUN, VA (LAT 38 21 11N LONG 077 45 13W)												
JUL 1989 24...	1500	2.9	5	6.20	32.0	765	6.8	93	280	19	4.3	1.9
SEP 05...	1311	0.15	10	7.40	22.0	765	9.6	109	--	--	--	--

RAPPAHANNOCK RIVER BASIN--Continued

[illegible]

ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD, SPECIAL STUDY, AND MISCELLANEOUS SITES

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHORUS, ORTHO, TOTAL (MG/L AS P)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD)	CADMIUM RECOV. FM BOT- TOM MA- TERIAL (UG/G AS CD)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	CHRO- MIUM, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	COPPER, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	IRON, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)
RAPPAHANNOCK RIVER BASIN--Continued												
01665550 MARSH RUN NEAR SOMERSET, VA (LAT 38 13 33N LONG 078 15 30W)												
JUL 1989 24...	0.040	0.010	<1	--	2	--	2	--	1100	350	--	2
SEP 05...	--	--	-	1	--	7	--	4	--	--	4900	--
01665570 BLUE RUN AT BARBOURSVILLE, VA (LAT 38 10 01N LONG 078 16 33W)												
JUL 1989 27...	--	--	-	--	--	--	--	--	--	--	--	--
01665580 BLUE RUN NEAR SOMERSET, VA (LAT 38 14 15N LONG 078 11 57W)												
JUL 1989 24...	0.040	0.020	<1	--	1	--	2	--	700	400	--	1
SEP 05...	--	--	-	1	--	8	--	3	--	--	8400	--
01665600 POPLAR RUN NR MADISON MILLS, VA (LAT 38 15 53N LONG 078 09 25W)												
JUL 1989 24...	0.050	0.010	<1	--	3	--	3	--	3600	500	--	3
SEP 05...	--	--	-	<1	--	20	--	20	--	--	20000	--
01667670 LONG BRANCH NR RACCOON FORD, VA (LAT 38 21 02N LONG 077 58 11W)												
JUL 1989 26...	--	--	-	--	--	--	--	--	--	--	--	--
01667840 BLACK WALNUT RUN NR RHOADESVILLE, VA (LAT 38 18 22N LONG 077 52 56W)												
JUL 1989 26...	--	--	-	--	--	--	--	--	--	--	--	--
01667850 MINE RUN AT BURR HILL, VA (LAT 38 20 36N LONG 077 51 33W)												
JUL 1989 25...	0.040	0.020	1	--	<1	--	5	--	1400	660	--	1
SEP 05...	--	--	-	<1	--	10	--	2	--	--	3200	--
01667860 MOUNTAIN RUN NR UNIONVILLE, VA (LAT 38 18 16N LONG 077 57 58W)												
JUL 1989 26...	--	--	-	--	--	--	--	--	--	--	--	--
01667870 MOUNTAIN RUN NEAR BURR HILL, VA (LAT 38 21 13N LONG 077 53 38W)												
JUL 1989 25...	0.030	0.020	<1	--	<1	--	3	--	810	390	--	1
SEP 06...	--	--	-	1	--	3	--	3	--	--	5300	--
01667880 RUSSELL RUN NEAR FLAT RUN, VA (LAT 38 22 10N LONG 077 47 58W)												
JUL 1989 24...	0.020	0.010	<1	--	<1	--	3	--	2000	700	--	1
SEP 05...	--	--	-	1	--	7	--	3	--	--	5000	--
01667890 FLAT RUN NEAR FLAT RUN, VA (LAT 38 21 11N LONG 077 45 13W)												
JUL 1989 24...	<0.010	<0.010	<1	--	<1	--	5	--	170	89	--	1
SEP 05...	--	--	-	1	--	8	--	20	--	--	10000	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	LEAD, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS PB)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MANGA- NESE, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	MERCURY RECOV. FM BOT- TOM MA- TERIAL (UG/G AS HG)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI)	NICKEL, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS NI)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	ZINC, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	PHENOLS TOTAL (UG/L)
RAPPAHANNOCK RIVER BASIN--Continued												
01665550 MARSH RUN NEAR SOMERSET, VA (LAT 38 13 33N LONG 078 15 30W)												
JUL 1989 24...	--	70	6	--	0.10	--	1	--	10	--	2.8	2
SEP 05...	<10	--	-	130	--	<0.01	--	<10	--	10	--	--
01665570 BLUE RUN AT BARBOURSVILLE, VA (LAT 38 10 01N LONG 078 16 33W)												
JUL 1989 27...	--	--	-	--	--	--	--	--	--	--	--	--
01665580 BLUE RUN NEAR SOMERSET, VA (LAT 38 14 15N LONG 078 11 57W)												
JUL 1989 24...	--	50	4	--	<0.10	--	<1	--	<10	--	2.8	3
SEP 05...	<10	--	-	320	--	0.02	--	<10	--	10	--	--
01665600 POPLAR RUN NR MADISON MILLS, VA (LAT 38 15 53N LONG 078 09 25W)												
JUL 1989 24...	--	200	4	--	0.10	--	2	--	10	--	3.0	4
SEP 05...	10	--	-	1200	--	0.02	--	<10	--	20	--	--
01667670 LONG BRANCH NR RACCOON FORD, VA (LAT 38 21 02N LONG 077 58 11W)												
JUL 1989 26...	--	--	-	--	--	--	--	--	--	--	--	--
01667840 BLACK WALNUT RUN NR RHOADESVILLE, VA (LAT 38 18 22N LONG 077 52 56W)												
JUL 1989 26...	--	--	-	--	--	--	--	--	--	--	--	--
01667850 MINE RUN AT BURR HILL, VA (LAT 38 20 36N LONG 077 51 33W)												
JUL 1989 25...	--	60	5	--	<0.10	--	2	--	<10	--	4.5	1
SEP 05...	<10	--	-	110	--	0.01	--	<10	--	<10	--	--
01667860 MOUNTAIN RUN NR UNIONVILLE, VA (LAT 38 18 16N LONG 077 57 58W)												
JUL 1989 26...	--	--	-	--	--	--	--	--	--	--	--	--
01667870 MOUNTAIN RUN NEAR BURR HILL, VA (LAT 38 21 13N LONG 077 53 38W)												
JUL 1989 25...	--	50	3	--	0.10	--	3	--	20	--	3.5	2
SEP 06...	<10	--	-	410	--	<0.01	--	<10	--	10	--	--
01667880 RUSSELL RUN NEAR FLAT RUN, VA (LAT 38 22 10N LONG 077 47 58W)												
JUL 1989 24...	--	90	7	--	<0.10	--	4	--	<10	--	4.3	2
SEP 05...	<10	--	-	340	--	0.02	--	<10	--	10	--	--
01667890 FLAT RUN NEAR FLAT RUN, VA (LAT 38 21 11N LONG 077 45 13W)												
JUL 1989 24...	--	50	3	--	0.50	--	1	--	20	--	5.6	4
SEP 05...	<10	--	-	600	--	0.04	--	<10	--	60	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
RAPPAHANNOCK RIVER BASIN--Continued												
01667910 WILDERNESS RUN AT WILDERNESS, VA (LAT 38 19 32N LONG 077 43 33W)												
JUL 1989 24...	1230	2.8	6	5.80	25.5	765	6.2	75	1200	20	4.4	2.2
SEP 05...	1115	0.86	6	6.80	18.0	765	6.4	67	--	--	--	--
YORK RIVER BASIN												
01670120 MOUNTAIN RUN AT RT 643 NEAR GORDONVILLE, VA (LAT 38 09 39N LONG 078 06 06W)												
JUL 1989 25...	0930	7.3	14	7.10	22.5	750	8.2	96	660	64	19	4.1
SEP 05...	1600	2.1	16	7.20	19.0	763	8.9	96	--	--	--	--
01670122 NEGRO RUN AT GORDONVILLE, VA (LAT 38 07 48N LONG 078 10 22W)												
JUL 1989 26...	1730	0.03	4	6.10	22.0	--	7.0	--	--	--	--	--
01670140 BEAVER CREEK NEAR DANIEL, VA (LAT 38 09 43N LONG 078 02 17W)												
JUL 1989 25...	1100	3.2	3	6.40	21.5	750	9.6	111	K2300	13	2.9	1.4
SEP 05...	1450	1.7	4	6.40	18.0	763	9.2	97	--	--	--	--
01670150 CHURCH RUN NEAR ORANGE, VA (LAT 38 13 31N LONG 078 04 16W)												
JUL 1989 26...	1611	2.9	14	6.50	30.0	--	6.5	--	--	--	--	--
01670160 TOMAHAWK CREEK NR ORANGE, VA (LAT 38 13 29N LONG 078 04 22W)												
JUL 1989 26...	1500	3.3	15	6.00	25.0	--	7.2	--	--	--	--	--
01670165 PAMUNKEY CREEK NEAR LAHORE, VA (LAT 38 11 36N LONG 077 59 05W)												
JUL 1989 25...	1520	13	10	--	25.0	763	7.5	91	170	39	10	3.3
SEP 06...	1150	5.4	9	7.40	19.5	763	9.1	99	--	--	--	--
01670170 CLEAR CREEK AT LAHORE, VA (LAT 38 12 07N LONG 077 58 51W)												
JUL 1989 25...	1335	4.3	4	--	25.5	763	7.1	87	820	14	3.4	1.3
SEP 06...	1305	1.1	5	7.10	19.0	762	9.4	101	--	--	--	--
01670180 PAMUNKEY CREEK AT LAHORE, VA (LAT 38 11 33N LONG 077 58 09W)												
JUL 1989 25...	1205	20	8	--	24.0	763	7.4	88	600	30	7.6	2.7
SEP 06...	1410	7.8	8	7.20	19.0	762	8.3	89	--	--	--	--
01670220 ROCKY RUN NEAR MINE RUN, VA (LAT 38 14 03N LONG 077 53 35W)												
JUL 1989 25...	--	0.60	6	6.70	23.0	--	5.8	--	--	--	--	--
01670230 TERRYS RUN NEAR TATUM, VA (LAT 38 11 13N LONG 077 55 39W)												
JUL 1989 25...	1330	4.1	7	6.90	24.0	750	7.4	89	K3600	26	5.1	3.1
SEP 06...	0930	4.1	7	6.60	19.0	764	7.4	80	--	--	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

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ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD, SPECIAL STUDY, AND MISCELLANEOUS SITES

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHORUS, ORTHO, TOTAL (MG/L AS P)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD)	CADMIUM RECOV. FM BOT- TOM MA- TERIAL (UG/G AS CD)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	CHRO- MIUM, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	COPPER, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS CU)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	IRON, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)
RAPPAHANNOCK RIVER BASIN--Continued												
01667910 WILDERNESS RUN AT WILDERNESS, VA (LAT 38 19 32N LONG 077 43 33W)												
JUL 1989 24...	0.100	0.080		--	<1	--	2	--	1600	900	--	2
SEP 05...	--	--	1	1	--	7	--	6	--	--	6900	--
YORK RIVER BASIN--Continued												
01670120 MOUNTAIN RUN AT RT 643 NEAR GORDONSVILLE, VA (LAT 38 09 39N LONG 078 06 06W)												
JUL 1989 25...	0.030	0.010	<1	--	<1	--	2	--	600	130	--	1
SEP 05...	--	--	-	1	--	7	--	6	--	--	11000	--
01670122 NEGRO RUN AT GORDONSVILLE, VA (LAT 38 07 48N LONG 078 10 22W)												
JUL 1989 26...	--	--	-	--	--	--	--	--	--	--	--	--
01670140 BEAVER CREEK NEAR DANIEL, VA (LAT 38 09 43N LONG 078 02 17W)												
JUL 1989 25...	0.030	0.010	<1	--	1	--	3	--	1500	1000	--	1
SEP 05...	--	--	-	<1	--	5	--	2	--	--	3800	--
01670150 CHURCH RUN NEAR ORANGE, VA (LAT 38 13 31N LONG 078 04 16W)												
JUL 1989 26...	--	--	-	--	--	--	--	--	--	--	--	--
01670160 TOMAHAWK CREEK NR ORANGE, VA (LAT 38 13 29N LONG 078 04 22W)												
JUL 1989 26...	--	--	-	--	--	--	--	--	--	--	--	--
01670165 PAMUNKEY CREEK NEAR LAHORE, VA (LAT 38 11 36N LONG 077 59 05W)												
JUL 1989 25...	0.040	0.040	<1	--	<1	--	6	--	920	330	--	2
SEP 06...	--	--	-	1	--	30	--	5	--	--	5200	--
01670170 CLEAR CREEK AT LAHORE, VA (LAT 38 12 07N LONG 077 58 51W)												
JUL 1989 25...	0.050	0.020	<1	--	<1	--	1	--	1200	500	--	1
SEP 06...	--	--	-	<1	--	2	--	2	--	--	1900	--
01670180 PAMUNKEY CREEK AT LAHORE, VA (LAT 38 11 33N LONG 077 58 09W)												
JUL 1989 25...	0.040	0.030	<1	--	1	--	2	--	1200	560	--	1
SEP 06...	--	--	-	<1	--	30	--	6	--	--	6000	--
01670220 ROCKY RUN NEAR MINE RUN, VA (LAT 38 14 03N LONG 077 53 35W)												
JUL 1989 25...	--	--	-	--	--	--	--	--	--	--	--	--
01670230 TERRY'S RUN NEAR TATUM, VA (LAT 38 11 13N LONG 077 55 39W)												
JUL 1989 25...	0.040	0.010	<1	--	2	--	4	--	1500	370	--	2
SEP 06...	--	--	-	1	--	50	--	6	--	--	11000	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	LEAD, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS PB)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MANGA- NESE, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	MERCURY RECOV. FM BOT- TOM MA- TERIAL (UG/G AS HG)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI)	NICKEL, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS NI)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	ZINC, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	PHENOLS TOTAL (UG/L)
RAPPAHANNOCK RIVER BASIN--Continued												
01667910 WILDERNESS RUN AT WILDERNESS, VA (LAT 38 19 32N LONG 077 43 33W)												
JUL 1989												
24...	--	170	14	--	<0.10	--	1	--	10	--	5.0	2
SEP												
05...	10	--	-	300	--	0.02	--	<10	--	10	--	--
YORK RIVER BASIN--Continued												
01670120 MOUNTAIN RUN AT RT 643 NEAR GORDONSVILLE, VA (LAT 38 09 39N LONG 078 06 06W)												
JUL 1989												
25...	--	50	3	--	<0.10	--	<1	--	<10	--	2.5	1
SEP												
05...	10	--	-	370	--	0.02	--	<10	--	20	--	--
01670122 NEGRO RUN AT GORDONSVILLE, VA (LAT 38 07 48N LONG 078 10 22W)												
JUL 1989												
26...	--	--	-	--	--	--	--	--	--	--	--	--
01670140 BEAVER CREEK NEAR DANIEL, VA (LAT 38 09 43N LONG 078 02 17W)												
JUL 1989												
25...	--	70	6	--	<0.10	--	1	--	<10	--	5.3	6
SEP												
05...	<10	--	-	100	--	0.02	--	<10	--	<10	--	--
01670150 CHURCH RUN NEAR ORANGE, VA (LAT 38 13 31N LONG 078 04 16W)												
JUL 1989												
26...	--	--	-	--	--	--	--	--	--	--	--	--
01670160 TOMAHAWK CREEK NR ORANGE, VA (LAT 38 13 29N LONG 078 04 22W)												
JUL 1989												
26...	--	--	-	--	--	--	--	--	--	--	--	--
01670165 PAMUNKEY CREEK NEAR LAHORE, VA (LAT 38 11 36N LONG 077 59 05W)												
JUL 1989												
25...	--	50	4	--	0.10	--	1	--	10	--	3.7	3
SEP												
06...	<10	--	-	320	--	<0.01	--	<10	--	<10	--	--
01670170 CLEAR CREEK AT LAHORE, VA (LAT 38 12 07N LONG 077 58 51W)												
JUL 1989												
25...	--	60	5	--	0.20	--	1	--	<10	--	5.1	3
SEP												
06...	<10	--	-	130	--	<0.01	--	<10	--	<10	--	--
01670180 PAMUNKEY CREEK AT LAHORE, VA (LAT 38 11 33N LONG 077 58 09W)												
JUL 1989												
25...	--	60	5	--	0.10	--	1	--	<10	--	4.1	5
SEP												
06...	<10	--	-	270	--	<0.01	--	<10	--	<10	--	--
01670220 ROCKY RUN NEAR MINE RUN, VA (LAT 38 14 03N LONG 077 53 35W)												
JUL 1989												
25...	--	--	-	--	--	--	--	--	--	--	--	--
01670230 TERRYS RUN NEAR TATUM, VA (LAT 38 11 13N LONG 077 55 39W)												
JUL 1989												
25...	--	60	5	--	<0.10	--	1	--	10	--	3.7	3
SEP												
06...	<10	--	-	180	--	0.01	--	<10	--	<10	--	--

ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD, SPECIAL STUDY, AND MISCELLANEOUS SITES
 WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)
YORK RIVER BASIN--Continued						
01670235	PLEASANT RUN NEAR TATUM, VA (LAT 38 10 38N LONG 077 54 23W)					
JUL 1989 25...	--	0.82	54	6.70	24.0	7.2
01670300	CONTRARY CREEK NEAR MINERAL, VA (LAT 38 03 53N LONG 077 52 45W)					
JUL 1989 26...	1300	1.2	714	3.80	33.0	7.0
01671500	BUNCH CREEK NEAR BOSWELLS TAVERN, VA (LAT 38 01 54N LONG 078 11 30W)					
JUL 1989 27...	1425	19	38	6.30	26.5	7.1

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	COLOR (PLAT- INUM- COBALT UNITS)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
JAMES RIVER BASIN											
02042270 CHICKAHOMINY RIVER AT RT 33 NR GLEN ALLEN, VA (LAT 37 41 10N LONG 077 32 35W)											
APR 1989											
04...	0845	14	95	6.40	13.5	747	110	9.1	89	5.3	1.4
SEP											
12...	0815	1.5	280	6.70	22.0	750	30	6.7	78	21	4.2
02042275 CHICKAHOMINY RIVER AT RT 625 NEAR GLEN ALLEN, VA (LAT 37 42 02N LONG 077 30 49W)											
APR 1989											
04...	1015	28	102	6.50	16.0	749	120	9.4	97	5.2	1.5
SEP											
12...	0830	2.4	490	7.10	24.0	750	23	6.3	76	44	4.2
02042284 STONY RUN AT RT 656 NEAR GREENWOOD, VA (LAT 37 41 05N LONG 077 26 58W)											
APR 1989											
04...	1200	16	101	6.50	15.0	750	120	10.0	101	5.3	1.7
SEP											
12...	0845	0.62	175	6.40	22.0	753	40	5.9	68	11	2.5
02042288 CHICKAHOMINY RIVER AT RT 627 NEAR RICHMOND, VA (LAT 37 36 41N LONG 077 24 24W)											
APR 1989											
04...	1430	42	140	6.80	19.0	749	110	7.8	86	7.1	1.8
SEP											
12...	0915	<0.05	185	6.50	24.5	753	60	2.3	28	11	2.5
02042426 UPHAM BROOK AT WILKINSON ROAD NR RICHMOND, VA (LAT 37 36 47N LONG 077 25 28W)											
APR 1989											
04...	1315	17	240	6.90	17.0	750	80	9.2	97	15	2.9
SEP											
12...	0900	0.37	255	7.00	24.0	754	30	3.9	47	16	3.3
02042433 BEAVERDAM CREEK AT RT 156 AT MECHANICSVILLE, VA (LAT 37 35 45N LONG 077 21 32W)											
APR 1989											
05...	0845	12	120	6.50	15.5	751	80	7.9	80	4.5	2.8
SEP											
12...	0800	20	170	6.60	25.0	767	55	--	--	3.9	2.1
02042435 CHICKAHOMINY RIV AT RT 615 NR HIGHLAND SPGS, VA (LAT 37 34 36N LONG 077 20 03W)											
APR 1989											
05...	1015	124	135	7.00	17.5	751	110	5.8	62	8.7	2.3
SEP											
12...	0930	7.1	190	7.10	25.0	767	60	--	--	8.3	2.6
02042440 CHICKAHOMINY RIVER AT RT 156 NR SEVEN PINES, VA (LAT 37 33 07N LONG 077 16 17W)											
APR 1989											
05...	1200	166	145	6.80	19.0	751	100	6.9	76	7.6	2.1
SEP											
12...	1045	12	165	7.20	25.0	767	60	--	--	7.7	2.4
02042443 CHICKAHOMINY RIV AT I64 NR WHITE OAK SWAMP, VA (LAT 37 31 03N LONG 077 12 34W)											
APR 1989											
05...	1400	217	120	6.80	18.5	751	110	7.4	81	6.8	2.0
SEP											
12...	1200	19	175	7.30	25.0	767	60	--	--	7.7	2.1
02042455 WHITE OAK SWAMP AT RT 156 AT ELKO, VA (LAT 37 28 05N LONG 077 12 32W)											
APR 1989											
05...	1530	37	60	6.80	18.5	751	140	8.1	88	4.2	0.86
SEP											
13...	0830	<0.05	72	6.20	23.0	755	140	2.2	26	7.4	0.87

ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD, SPECIAL STUDY, AND MISCELLANEOUS SITES

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)
JAMES RIVER BASIN--Continued											
02042270	CHICKAHOMINY RIVER AT RT 33 NR GLEN ALLEN, VA (LAT 37 41 10N LONG 077 32 35W)										
APR 1989											
04...	11	1.8	11	9.0	14	0.10	12	62	0.079	0.040	0.70
SEP											
12...	17	3.7	40	41	12	0.40	14	147	2.20	0.060	0.40
02042275	CHICKAHOMINY RIVER AT RT 625 NEAR GLEN ALLEN, VA (LAT 37 42 02N LONG 077 30 49W)										
APR 1989											
04...	12	2.4	13	10	13	0.10	11	66	0.561	0.030	0.50
SEP											
12...	34	18	55	78	31	0.20	11	298	10.1	0.020	1.3
02042284	STONY RUN AT RT 656 NEAR GREENWOOD, VA (LAT 37 41 05N LONG 077 26 58W)										
APR 1989											
04...	10	1.8	10	8.0	14	0.10	6.0	55	0.155	0.100	0.60
SEP											
12...	12	3.3	22	14	17	0.10	9.2	88	0.805	0.060	0.60
02042288	CHICKAHOMINY RIVER AT RT 627 NEAR RICHMOND, VA (LAT 37 36 41N LONG 077 24 24W)										
APR 1989											
04...	14	2.5	18	9.0	18	0.10	2.2	67	0.051	0.040	0.70
SEP											
12...	14	2.6	37	6.0	18	0.20	12	93	0.110	0.050	0.60
02042426	UPHAM BROOK AT WILKINSON ROAD NR RICHMOND, VA (LAT 37 36 47N LONG 077 25 28W)										
APR 1989											
04...	28	2.9	30	22	41	0.10	7.3	141	0.599	0.050	0.60
SEP											
12...	24	4.3	40	14	35	0.20	11	135	0.625	0.080	0.50
02042433	BEAVERDAM CREEK AT RT 156 AT MECHANICSVILLE, VA (LAT 37 35 45N LONG 077 21 32W)										
APR 1989											
05...	11	2.6	15	12	15	0.10	2.4	65	0.998	0.080	0.40
SEP											
12...	8.8	3.3	15	7.0	12	0.30	5.3	54	0.438	0.040	0.60
02042435	CHICKAHOMINY RIV AT RT 615 NR HIGHLAND SPGS, VA (LAT 37 34 36N LONG 077 20 03W)										
APR 1989											
05...	17	2.8	26	20	21	0.10	1.5	91	0.044	0.030	0.60
SEP											
12...	11	2.4	32	4.0	15	0.10	9.7	75	0.136	0.060	0.50
02042440	CHICKAHOMINY RIVER AT RT 156 NR SEVEN PINES, VA (LAT 37 33 07N LONG 077 16 17W)										
APR 1989											
05...	16	2.6	22	20	20	0.10	1.1	84	0.017	0.010	0.50
SEP											
12...	11	2.3	28	4.0	14	0.10	9.9	70	0.149	0.040	0.80
02042443	CHICKAHOMINY RIV AT I64 NR WHITE OAK SWAMP, VA (LAT 37 31 03N LONG 077 12 34W)										
APR 1989											
05...	16	2.4	18	20	19	0.10	1.4	80	0.016	0.020	0.60
SEP											
12...	10	2.0	27	4.0	13	0.10	10	67	0.178	0.030	0.50
02042455	WHITE OAK SWAMP AT RT 156 AT ELKO, VA (LAT 37 28 05N LONG 077 12 32W)										
APR 1989											
05...	5.5	1.3	7.0	6.1	8.7	0.10	2.9	35	0.050	0.030	0.50
SEP											
13...	4.5	0.40	20	<1.0	6.4	0.10	6.5	--	0.051	0.030	0.70

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)
JAMES RIVER BASIN--Continued										
02042270	CHICKAHOMINY RIVER AT RT 33 NR GLEN ALLEN, VA (LAT 37 41 10N LONG 077 32 35W)									
APR 1989										
04...	0.031	0.008	0.007	<1	1	2	<1	7	1700	610
SEP										
12...	0.026	0.008	0.006	<1	<1	<1	<1	1	1100	300
02042275	CHICKAHOMINY RIVER AT RT 625 NEAR GLEN ALLEN, VA (LAT 37 42 02N LONG 077 30 49W)									
APR 1989										
04...	0.069	0.008	0.008	<1	1	2	2	5	1800	770
SEP										
12...	0.028	0.010	0.003	<1	<1	<1	<1	3	310	130
02042284	STONY RUN AT RT 656 NEAR GREENWOOD, VA (LAT 37 41 05N LONG 077 26 58W)									
APR 1989										
04...	0.079	0.023	0.016	<1	1	2	<1	5	2100	660
SEP										
12...	0.052	0.057	0.025	<1	<1	<1	<1	3	2500	2100
02042288	CHICKAHOMINY RIVER AT RT 627 NEAR RICHMOND, VA (LAT 37 36 41N LONG 077 24 24W)									
APR 1989										
04...	0.057	0.014	0.012	<1	<1	2	<1	3	1400	1500
SEP										
12...	0.076	0.076	0.040	1	<1	<1	<1	2	2900	2300
02042426	UPHAM BROOK AT WILKINSON ROAD NR RICHMOND, VA (LAT 37 36 47N LONG 077 25 28W)									
APR 1989										
04...	0.067	0.019	0.017	2	<1	2	<1	6	1800	870
SEP										
12...	0.056	0.067	0.050	2	<1	<1	<1	3	1200	570
02042433	BEAVERDAM CREEK AT RT 156 AT MECHANICSVILLE, VA (LAT 37 35 45N LONG 077 21 32W)									
APR 1989										
05...	0.031	0.002	<0.001	<1	5	2	1	4	2100	610
SEP										
12...	0.057	0.020	0.009	1	<1	<1	<1	2	3000	440
02042435	CHICKAHOMINY RIV AT RT 615 NR HIGHLAND SPGS, VA (LAT 37 34 36N LONG 077 20 03W)									
APR 1989										
05...	0.081	0.028	0.018	1	1	1	1	3	1900	1100
SEP										
12...	0.067	0.039	0.027	<1	<1	<1	1	3	2000	790
02042440	CHICKAHOMINY RIVER AT RT 156 NR SEVEN PINES, VA (LAT 37 33 07N LONG 077 16 17W)									
APR 1989										
05...	0.077	0.022	0.017	1	<1	2	1	3	1600	800
SEP										
12...	0.063	0.050	0.033	<1	<1	<1	1	<1	1800	920
02042443	CHICKAHOMINY RIV AT I64 NR WHITE OAK SWAMP, VA (LAT 37 31 03N LONG 077 12 34W)									
APR 1989										
05...	0.069	0.026	0.018	1	<1	2	<1	2	1400	880
SEP										
12...	0.062	0.042	0.033	<1	<1	<1	<1	<1	1400	970
02042455	WHITE OAK SWAMP AT RT 156 AT ELKO, VA (LAT 37 28 05N LONG 077 12 32W)									
APR 1989										
05...	0.035	0.012	0.008	<1	<1	5	<1	11	2100	890
SEP										
13...	0.027	0.010	0.002	1	3	3	2	4	4400	1400

ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD, SPECIAL STUDY, AND MISCELLANEOUS SITES

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI)	SELE- NIUM, TOTAL (UG/L AS SE)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	SEDI- MENT, SUS- PENDE (MG/L)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
JAMES RIVER BASIN--Continued										
02042270	CHICKAHOMINY RIVER AT RT 33 NR GLEN ALLEN, VA (LAT 37 41 10N LONG 077 32 35W)									
APR 1989 04...	<5	130	130	<0.10	2	<1	20	11	9	100
SEP 12...	1	120	120	<0.10	<1	<1	<10	6.2	3	92
02042275	CHICKAHOMINY RIVER AT RT 625 NEAR GLEN ALLEN, VA (LAT 37 42 02N LONG 077 30 49W)									
APR 1989 04...	<5	120	110	<0.10	4	<1	20	11	8	90
SEP 12...	1	40	27	<0.10	2	<1	<10	7.0	2	93
02042284	STONY RUN AT RT 656 NEAR GREENWOOD, VA (LAT 37 41 05N LONG 077 26 58W)									
APR 1989 04...	--	110	89	<0.10	3	<1	60	11	21	92
SEP 12...	3	200	210	<0.10	3	<1	70	6.5	12	99
02042288	CHICKAHOMINY RIVER AT RT 627 NEAR RICHMOND, VA (LAT 37 36 41N LONG 077 24 24W)									
APR 1989 04...	<5	120	120	0.10	<1	<1	60	13	11	65
SEP 12...	1	1300	1400	<0.10	1	<1	<10	9.4	10	97
02042426	UPHAM BROOK AT WILKINSON ROAD NR RICHMOND, VA (LAT 37 36 47N LONG 077 25 28W)									
APR 1989 04...	<5	120	120	0.10	2	<1	30	7.4	12	64
SEP 12...	3	130	120	<0.10	2	<1	40	4.7	11	97
02042433	BEAVERDAM CREEK AT RT 156 AT MECHANICSVILLE, VA (LAT 37 35 45N LONG 077 21 32W)									
APR 1989 05...	<5	140	140	<0.10	5	<1	<10	4.8	8	92
SEP 12...	3	110	84	<0.10	1	<1	20	6.0	23	83
02042435	CHICKAHOMINY RIV AT RT 615 NR HIGHLAND SPGS, VA (LAT 37 34 36N LONG 077 20 03W)									
APR 1989 05...	<5	270	250	<0.10	6	<1	40	11	8	81
SEP 12...	2	820	790	<0.10	4	<1	20	6.7	7	98
02042440	CHICKAHOMINY RIVER AT RT 156 NR SEVEN PINES, VA (LAT 37 33 07N LONG 077 16 17W)									
APR 1989 05...	<5	170	160	<0.10	4	<1	110	12	7	67
SEP 12...	<1	290	290	<0.10	1	<1	10	6.6	3	89
02042443	CHICKAHOMINY RIV AT I64 NR WHITE OAK SWAMP, VA (LAT 37 31 03N LONG 077 12 34W)									
APR 1989 05...	<5	140	120	0.20	7	<1	30	14	8	61
SEP 12...	<1	150	130	<0.10	1	<1	10	7.1	2	81
02042455	WHITE OAK SWAMP AT RT 156 AT ELKO, VA (LAT 37 28 05N LONG 077 12 32W)									
APR 1989 05...	<5	50	43	<0.10	3	<1	20	12	8	83
SEP 13...	20	170	160	0.40	4	<1	<10	11	10	80

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	COLOR (PLAT- INUM- COBALT UNITS)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED SATUR- ATION	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
JAMES RIVER BASIN--Continued											
02042465	TOE INK SWAMP BELOW KENT LAKE DAM NR ROXBURY, VA (LAT 37 29 03N LONG 077 07 56W)										
APR 1989											
05...	0845	19	77	7.30	15.0	756	100	9.2	92	8.6	1.1
SEP											
13...	1000	2.1	75	7.10	26.0	755	55	6.9	86	9.3	1.0
02042470	CHICKAHOMINY RIVER AT RT 609 AT ROXBURY, VA (LAT 37 28 11N LONG 077 08 17W)										
APR 1989											
05...	1000	485	85	7.40	18.5	756	110	6.2	67	6.4	1.5
SEP											
13...	0930	<0.05	125	6.80	23.0	755	60	4.4	52	9.4	2.1
02042610	JONES RUN ABOVE C&O RR AT PROVIDENCE FORGE, VA (LAT 37 26 28N LONG 077 02 48W)										
APR 1989											
05...	1200	20	64	7.20	17.5	756	110	8.5	89	5.8	0.92
SEP											
13...	1100	6.0	69	6.90	25.0	757	65	6.0	73	8.7	0.95

DATE	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)
02042465	TOE INK SWAMP BELOW KENT LAKE DAM NR ROXBURY, VA (LAT 37 29 03N LONG 077 07 56W)										
APR 1989											
05...	5.2	1.5	19	11	9.1	<0.10	2.7	52	0.212	0.080	0.30
SEP											
13...	3.2	1.6	24	3.0	5.8	0.10	4.4	43	0.017	0.050	1.3
02042470	CHICKAHOMINY RIVER AT RT 609 AT ROXBURY, VA (LAT 37 28 11N LONG 077 08 17W)										
APR 1989											
05...	12	2.0	16	7.0	16	0.10	1.1	57	0.024	0.020	0.50
SEP											
13...	9.9	1.9	31	3.0	12	0.10	9.9	69	0.135	0.040	0.60
02042610	JONES RUN ABOVE C&O RR AT PROVIDENCE FORGE, VA (LAT 37 26 28N LONG 077 02 48W)										
APR 1989											
05...	3.8	1.1	14	4.3	6.5	<0.10	3.0	34	0.015	0.010	0.40
SEP											
13...	3.4	1.1	23	1.0	6.3	0.10	9.2	46	0.020	0.070	0.50

ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD, SPECIAL STUDY, AND MISCELLANEOUS SITES

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)
JAMES RIVER BASIN--Continued										
02042465	TOE INK SWAMP BELOW KENT LAKE DAM NR ROXBURY, VA (LAT 37 29 03N LONG 077 07 56W)									
APR 1989										
05...	0.055	0.014	0.007	1	1	2	<1	6	1600	350
SEP										
13...	0.022	0.009	<0.001	1	<1	<1	<1	3	900	360
02042470	CHICKAHOMINY RIVER AT RT 609 AT ROXBURY, VA (LAT 37 28 11N LONG 077 08 17W)									
APR 1989										
05...	0.083	0.016	0.010	1	1	2	<1	7	1700	530
SEP										
13...	0.059	0.046	0.029	<1	<1	<1	<1	2	1400	660
02042610	JONES RUN ABOVE C&O RR AT PROVIDENCE FORGE, VA (LAT 37 26 28N LONG 077 02 48W)									
APR 1989										
05...	0.058	0.027	0.017	1	<1	2	1	4	1700	460
SEP										
13...	0.066	0.043	0.018	<1	<1	<1	1	1	3200	1100

DATE	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI)	SELE- NIUM, TOTAL (UG/L AS SE)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	SEDI- MENT, SUS- PENDE (MG/L)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
02042465	TOE INK SWAMP BELOW KENT LAKE DAM NR ROXBURY, VA (LAT 37 29 03N LONG 077 07 56W)									
APR 1989										
05...	<5	60	42	0.10	2	<1	20	7.4	10	94
SEP										
13...	1	50	11	<0.10	1	<1	<10	9.6	11	89
02042470	CHICKAHOMINY RIVER AT RT 609 AT ROXBURY, VA (LAT 37 28 11N LONG 077 08 17W)									
APR 1989										
05...	<5	170	140	<0.10	2	<1	30	18	6	83
SEP										
13...	1	300	300	<0.10	2	<1	<10	7.5	5	78
02042610	JONES RUN ABOVE C&O RR AT PROVIDENCE FORGE, VA (LAT 37 26 28N LONG 077 02 48W)									
APR 1989										
05...	<5	90	77	<0.10	2	<1	<10	9.5	7	80
SEP										
13...	1	200	160	<0.10	<1	<1	<10	8.3	7	83

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
TENNESSEE RIVER BASIN											
03473500 M F HOLSTON RIVER AT GROSECLOSE, VA (LAT 36 53 19N LONG 081 20 51W)											
MAY 1989											
02...	0925	11	240	7.50	11.5	695	9.0	91	3.4	55000	>100000
06...	0830	19	170	7.30	10.0	690	9.0	88	3.1	25000	240000
JUN											
17...	0845	16	250	7.30	15.0	702	7.6	82	--	380000	1100000
JUL											
06...	1100	15	187	7.10	17.0	705	7.9	89	--	2400	21000
03473650 NICKS CREEK NEAR MARION, VA (LAT 36 51 52N LONG 081 26 09W)											
MAY 1989											
02...	1110	56	31	6.70	10.5	700	10.0	98	0.2	2700	1500
06...	0935	47	33	6.50	10.0	697	10.3	100	2.0	2400	1000
JUN											
17...	1045	28	39	6.80	15.0	707	9.6	103	--	1500	1800
JUL											
06...	1235	63	44	6.70	16.0	707	9.5	104	--	540	2600
03473660 BEAR CREEK NEAR MARION, VA (LAT 36 52 08N LONG 081 26 33W)											
MAY 1989											
02...	1315	164	34	6.70	12.0	700	9.9	100	0.6	730	1400
06...	1030	108	42	6.70	11.0	697	10.6	105	2.0	730	770
JUN											
17...	1220	82	52	6.60	16.0	707	9.4	103	--	1700	1800
JUL											
06...	1415	139	73	6.70	18.0	707	7.9	90	--	1900	2100
03473820 STALEY CREEK AT MARION, VA (LAT 36 50 10N LONG 081 31 03W)											
MAY 1989											
02...	1425	69	120	7.30	12.5	700	9.8	100	1.0	2000	2500
06...	1230	87	142	7.20	11.0	700	9.6	95	3.3	4300	28000
JUN											
17...	0845	23	220	7.60	14.5	712	8.6	90	--	21000	6100
JUL											
06...	0945	132	125	7.20	15.0	712	9.0	96	--	28000	8100
03473900 WALKER CREEK NEAR SEVEN MILE FORD, VA (LAT 36 50 06N LONG 081 35 51W)											
MAY 1989											
02...	1320	74	73	6.90	13.0	710	9.7	99	0.4	1600	2400
06...	1330	111	73	7.40	12.0	702	9.6	97	2.3	1900	4700
JUN											
17...	0945	158	85	7.20	14.5	715	8.9	93	--	2500	21000
JUL											
06...	1150	33	90	7.20	17.5	717	8.8	98	--	4200	31000
03474000 M F HOLSTON RIVER AT SEVEN MILE FORD, VA (LAT 36 48 26N LONG 081 37 20W)											
MAY 1989											
02...	1440	690	115	7.50	13.5	710	9.7	100	3.2	3900	K13000
06...	1330	670	140	7.20	12.0	705	9.6	96	3.3	K7600	22000
JUN											
17...	1340	613	150	7.20	18.0	715	9.0	101	--	K6800	6000
JUL											
06...	1600	795	185	7.40	19.5	714	9.1	106	--	32000	9500

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DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
TENNESSEE RIVER BASIN--Continued											
03474450 CARLOCK CREEK AT CHILHOWIE, VA (LAT 36 48 29N LONG 081 40 21W)											
MAY 1989											
02...	0755	41	100	6.90	12.0	709	8.8	88	2.1	K9600	33000
06...	0835	48	100	6.80	11.0	708	9.2	90	2.7	22000	9700
JUN											
17...	1100	70	122	7.30	15.5	717	8.4	90	--	K7800	8600
JUL											
06...	1300	20	240	7.40	20.0	718	8.2	96	--	5800	21000
03474720 HUTTON CREEK AT HUFF AIRPORT NEAR CHILHOWIE, VA (LAT 36 46 21N LONG 081 43 49W)											
MAY 1989											
02...	0900	26	350	7.60	12.0	709	8.8	88	3.5	25000	45000
06...	0925	30	340	7.40	11.5	708	9.2	91	3.6	K2500	26000
JUN											
17...	1155	42	380	7.60	16.5	718	8.8	96	--	26000	5400
JUL											
06...	1340	33	430	7.50	19.5	718	8.1	94	--	23000	9900
03474900 BYERS CREEK NEAR GLADE SPRING, VA (LAT 36 44 22N LONG 081 47 57W)											
MAY 1989											
02...	1210	25	400	8.20	12.0	712	9.4	94	2.2	3600	5100
06...	1225	29	400	7.70	12.0	709	9.0	90	3.2	K8600	8600
JUN											
17...	1430	27	440	7.80	17.0	719	9.2	101	--	K7500	2800
JUL											
06...	1550	25	440	7.80	18.5	717	8.2	93	--	32000	45000
03475000 M F HOLSTON RIVER NEAR MEADOWVIEW, VA (LAT 36 42 47N LONG 081 49 08W)											
MAY 1989											
02...	1115	889	260	7.80	15.0	715	9.5	101	7.0	K12000	38000
06...	1130	912	235	7.10	12.5	708	10.4	105	4.0	5600	8800
JUN											
17...	1340	1130	240	7.70	17.0	721	9.6	105	--	28000	94000
JUL											
06...	1515	1470	200	7.50	18.5	719	8.6	97	--	22000	25000
03475602 CEDAR CREEK NEAR CEDARVILLE, VA (LAT 36 42 53N LONG 081 49 51W)											
MAY 1989											
02...	1035	9.1	460	8.40	13.0	714	9.5	96	1.6	K16000	55000
06...	1100	9.1	460	8.00	13.0	710	10.0	102	2.9	2700	3000
JUN											
17...	1300	13	470	7.90	18.0	720	8.6	96	--	5200	4400
JUL											
06...	1430	11	460	7.80	20.5	720	8.2	97	--	25000	5300

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	CHLO- RIDE, DIS- SOLVED (MG/L)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L)	PHOS- PHOROUS TOTAL (MG/L)	PHOS- PHOROUS DIS- SOLVED (MG/L)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L)	CARBON, ORGANIC TOTAL (MG/L)	SEDI- MENT, SUS- PENDED
TENNESSEE RIVER BASIN--Continued										
03473500	M F HOLSTON RIVER AT GROSECLOSE, VA (LAT 36 53 19N LONG 081 20 51W)									
MAY 1989										
02...	3.8	144	0.480	0.370	1.0	0.180	0.180	0.140	6.8	36
06...	8.8	120	0.750	0.090	0.30	0.070	0.040	0.030	8.4	56
JUN										
17...	5.9	129	0.550	0.530	1.6	0.190	0.090	0.070	10	72
JUL										
06...	4.0	109	0.540	0.080	0.60	0.080	0.060	0.050	5.2	38
03473650	NICKS CREEK NEAR MARION, VA (LAT 36 51 52N LONG 081 26 09W)									
MAY 1989										
02...	0.80	15	0.150	0.040	<0.20	0.020	0.010	0.010	2.6	73
06...	0.90	19	0.190	0.020	<0.20	0.010	0.010	<0.010	2.0	16
JUN										
17...	1.0	20	0.120	0.020	0.40	<0.010	<0.010	<0.010	3.3	51
JUL										
06...	1.5	36	0.290	0.030	0.20	0.020	0.020	0.010	2.9	30
03473660	BEAR CREEK NEAR MARION, VA (LAT 36 52 08N LONG 081 26 33W)									
MAY 1989										
02...	1.0	28	0.150	0.040	<0.20	0.020	<0.010	<0.010	3.7	32
06...	0.80	26	<0.100	0.010	<0.20	<0.010	<0.010	<0.010	2.4	22
JUN										
17...	0.90	30	0.140	0.010	0.30	<0.010	<0.010	<0.010	2.6	13
JUL										
06...	1.5	48	0.350	0.040	0.70	0.020	0.010	0.010	5.4	18
03473820	STALEY CREEK AT MARION, VA (LAT 36 50 10N LONG 081 31 03W)									
MAY 1989										
02...	9.2	64	0.420	0.030	0.40	0.040	0.030	0.020	4.6	35
06...	12	75	0.510	0.270	0.50	0.250	0.220	0.190	6.9	95
JUN										
17...	14	112	0.640	0.030	<0.20	0.040	0.040	0.020	3.3	22
JUL										
06...	9.6	97	1.00	0.030	0.40	0.040	0.030	0.030	4.5	68
03473900	WALKER CREEK NEAR SEVEN MILE FORD, VA (LAT 36 50 06N LONG 081 35 51W)									
MAY 1989										
02...	2.2	47	0.200	0.020	0.50	0.020	0.030	0.010	2.9	32
06...	1.9	46	0.230	0.020	<0.20	0.020	<0.010	0.010	3.8	94
JUN										
17...	1.9	49	0.350	0.020	0.30	0.050	0.020	<0.010	3.9	51
JUL										
06...	3.8	70	0.670	0.020	0.30	0.030	0.020	0.020	4.4	33
03474000	M F HOLSTON RIVER AT SEVEN MILE FORD, VA (LAT 36 48 26N LONG 081 37 20W)									
MAY 1989										
02...	6.0	68	0.320	0.060	0.60	0.150	0.030	0.010	5.8	82
06...	6.3	80	0.430	0.050	<0.20	0.030	0.030	0.020	7.0	52
JUN										
17...	5.6	80	0.470	0.040	0.30	0.040	0.020	<0.010	4.8	47
JUL										
06...	7.1	106	0.950	0.050	0.80	0.040	0.030	0.030	5.8	66

ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD, SPECIAL STUDY, AND MISCELLANEOUS SITES

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	CHLO- RIDE, DIS- SOLVED (MG/L)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L)	PHOS- PHOROUS TOTAL (MG/L)	PHOS- PHOROUS DIS- SOLVED (MG/L)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L)	CARBON, ORGANIC TOTAL (MG/L)	SEDI- MENT, SUS- PENDE
TENNESSEE RIVER BASIN--Continued										
03474450	CARLOCK CREEK AT CHILHOWIE, VA (LAT 36 48 29N LONG 081 40 21W)									
MAY 1989										
02...	1.5	61	0.360	0.050	0.30	0.040	0.020	0.020	6.7	100
06...	1.6	60	0.360	0.030	<0.20	0.050	0.020	0.020	4.6	57
JUN										
17...	1.8	72	0.610	0.020	0.40	0.040	0.010	<0.010	4.0	53
JUL										
06...	3.5	140	1.10	0.030	0.30	0.040	0.020	0.020	4.2	29
03474720	HUTTON CREEK AT HUFF AIRPORT NEAR CHILHOWIE, VA (LAT 36 46 21N LONG 081 43 49W)									
MAY 1989										
02...	13	202	1.20	0.090	0.40	0.110	0.050	0.030	10	179
06...	13	196	1.30	0.070	0.20	0.080	0.060	0.040	6.1	137
JUN										
17...	12	202	1.70	0.050	0.30	0.050	0.040	0.050	6.4	93
JUL										
06...	18	255	2.00	0.050	0.70	0.070	0.040	0.040	5.9	84
03474900	BYERS CREEK NEAR GLADE SPRING, VA (LAT 36 44 22N LONG 081 47 57W)									
MAY 1989										
02...	11	242	1.60	0.050	0.30	0.070	0.050	0.030	5.1	71
06...	12	236	1.80	0.050	0.20	0.060	0.060	0.040	5.6	110
JUN										
17...	11	251	2.20	0.040	0.30	0.050	0.030	0.020	5.1	66
JUL										
03475000	M F HOLSTON RIVER NEAR MEADOWVIEW, VA (LAT 36 42 47N LONG 081 49 08W)									
MAY 1989										
02...	9.8	147	0.840	0.170	0.60	0.090	0.060	0.040	18	393
06...	3.1	101	0.510	0.110	0.40	0.100	0.060	0.050	6.2	139
JUN										
17...	7.7	132	1.00	0.100	0.30	0.090	0.040	0.040	12	229
JUL										
06...	6.6	122	1.10	0.050	0.30	0.070	0.050	0.040	13	217
03475602	CEDAR CREEK NEAR CEDARVILLE, VA (LAT 36 42 53N LONG 081 49 51W)									
MAY 1989										
02...	11	265	2.50	0.120	<0.20	0.080	0.060	0.050	5.1	64
06...	11	267	2.50	0.050	<0.20	0.070	0.060	0.060	4.5	73
JUN										
17...	10	260	2.80	0.040	0.60	0.050	0.030	0.040	5.5	98
JUL										
06...	12	295	3.30	0.080	0.80	0.100	0.060	0.060	8.2	101

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	TIME	PER- THANE TOTAL (UG/L)	METHO- MYL TOTAL (UG/L)	PROPHAM TOTAL (UG/L)	NAPH- THA- LENES, POLY- CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	LINDANE TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)
TENNESSEE RIVER BASIN--Continued									
03473500	M F HOLSTON RIVER AT GROSECLOSE, VA (LAT 36 53 19N LONG 081 20 51W)								
JUN 17...	0845	<0.1	<0.5	<0.5	<0.10	<0.001	<0.001	<0.1	<0.001
03474000	M F HOLSTON RIVER AT SEVEN MILE FORD, VA (LAT 36 48 26N LONG 081 37 20W)								
JUN 17...	1340	<0.1	<0.5	<0.5	<0.10	<0.001	0.001	<0.1	<0.001
03475000	M F HOLSTON RIVER NEAR MEADOWVIEW, VA (LAT 36 42 47N LONG 081 49 08W)								
JUN 17...	1340	<0.1	<0.5	<0.5	<0.10	<0.001	0.001	<0.1	<0.001

DATE	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI- ELDRIN TOTAL (UG/L)	ENDO- SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/L)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	METH- OXY- CHLOR, TOTAL (UG/L)
03473500	M F HOLSTON RIVER AT GROSECLOSE, VA (LAT 36 53 19N LONG 081 20 51W)								
JUN 17...	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.001	<0.001	<0.01
03474000	M F HOLSTON RIVER AT SEVEN MILE FORD, VA (LAT 36 48 26N LONG 081 37 20W)								
JUN 17...	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.001	<0.001	<0.01
03475000	M F HOLSTON RIVER NEAR MEADOWVIEW, VA (LAT 36 42 47N LONG 081 49 08W)								
JUN 17...	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.001	<0.001	<0.01

DATE	PCB, TOTAL (UG/L)	PICLO- RAM (TOR- DON) (AMDON) TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SEVIN, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	DICAMBA (MED- IBEN) (BAN- VEL D) TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)
03473500	M F HOLSTON RIVER AT GROSECLOSE, VA (LAT 36 53 19N LONG 081 20 51W)								
JUN 17...	<0.1	<0.01	<0.01	<0.01	<0.50	<0.01	<0.01	0.14	<0.01
03474000	M F HOLSTON RIVER AT SEVEN MILE FORD, VA (LAT 36 48 26N LONG 081 37 20W)								
JUN 17...	<0.1	<0.01	<0.01	<0.01	<0.50	<0.01	<0.01	0.05	<0.01
03475000	M F HOLSTON RIVER NEAR MEADOWVIEW, VA (LAT 36 42 47N LONG 081 49 08W)								
JUN 17...	<0.1	<0.01	<0.01	<0.01	<0.50	<0.01	<0.01	0.03	<0.01

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GROUND WATER AND GROUND-WATER-QUALITY RECORDS

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

<u>PRINTED OUTPUT</u>	<u>REMARK</u>
E	Estimated value
>	Actual value is known to be greater than the value shown.
<	Actual value is known to be less than the value shown
K	Results based on colony count outside the acceptance range (non-ideal colony count)
L	Biological organism count less than 0.5 percent (organism may be observed rather than counted)
D	Biological organism count equal to or greater than 15 percent (dominant)
&	Biological organism estimated as dominant

GROUND-WATER LEVELS

ACCOMACK COUNTY

372922076470101. Local number, 64H 5 SOW 102C.

LOCATION.--Lat 37°29'21", long 75°47'05", Hydrologic Unit 02080110, at entrance to Virginia Landing, 0.2 mi south from end of State Highway 605, 2.0 mi southeast of Willis Wharf, and 5.2 mi southwest of intersection of State Highways 605 and 182. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 306 ft, screened 296 to 306 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 6 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.3 ft above land-surface datum prior to Mar. 1, 1988; 1.1 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--May 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.70 ft below land-surface datum, June 6, 1984; lowest measured, 7.35 ft below land-surface datum, Nov. 1, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	2.86	JAN 05	3.42	MAR 01	3.32	APR 26	3.10	JUN 14	3.15	AUG 01	3.37
WATER YEAR 1988		HIGHEST	2.86	NOV 10, 1987	LOWEST	3.42	JAN 05, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	4.47	JAN 09	3.70	MAR 06	3.30	APR 18	3.30	JUN 20	3.00	AUG 16	2.80
NOV 14	3.90										
WATER YEAR 1989		HIGHEST	2.80	AUG 16, 1989	LOWEST	4.47	OCT 05, 1988				

372905075474002. Local number, 64H 6 SOW 102A.

LOCATION.--Lat 37°29'21", long 75°47'05", Hydrologic Unit 02080110, at entrance to Virginia Landing, 0.2 mi south from end of State Highway 605, 2.0 mi southeast of Willis Wharf, and 5.2 mi southwest of intersection of State Highways 605 and 182. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 154 ft, screened 144 to 154 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 6 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.7 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--May 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.33 ft below land-surface datum, Oct. 30, 1984; lowest measured, 9.63 ft below land-surface datum, Sept. 1, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	2.44	JAN 05	4.22	MAR 01	3.92	APR 26	3.50	JUN 14	3.10	AUG 01	3.55
WATER YEAR 1988		HIGHEST	2.44	NOV 10, 1987	LOWEST	4.22	JAN 05, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	5.22	JAN 09	4.10	MAR 06	3.60	APR 18	3.40	JUN 20	3.00	AUG 16	2.70
NOV 14	3.20										
WATER YEAR 1989		HIGHEST	2.70	AUG 16, 1989	LOWEST	5.22	OCT 05, 1988				

GROUND-WATER LEVELS

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ACCOMACK COUNTY--Continued

372905075474001. Local number, 64H 7 SOW 102B.

LOCATION.--Lat 37°29'21", long 75°47'05", Hydrologic Unit 02080110, at entrance to Virginia Landing, 0.2 mi south from end of State Highway 605, 2.0 mi southeast of Willis Wharf, and 5.2 mi southwest of intersection of State Highways 605 and 182. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 220 ft, screened 210 to 220 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 6 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.8 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--May 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.51 ft below land-surface datum, June 14, 1983; lowest measured, 8.76 ft below land-surface datum, Nov. 1, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	3.03	JAN 05	3.97	MAR 01	3.72	APR 26	3.50	JUN 14	3.33	AUG 01	3.70
WATER YEAR 1988		HIGHEST	3.03	NOV 10, 1987	LOWEST	3.97	JAN 05, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	4.73	JAN 09	3.90	MAR 06	3.60	APR 18	3.30	JUN 20	3.30	AUG 16	3.40
NOV 14	3.60										
WATER YEAR 1989		HIGHEST	3.30	APR 18, JUN 20, 1989	LOWEST	4.73	OCT 05, 1988				

373845075522501. Local number, 64K 7 SOW 106C.

LOCATION.--Lat 37°38'45", long 75°52'25", Hydrologic Unit 02080109, 100 ft north of State Highway 633, 0.3 mi northwest of intersection of State Highways 633 and 631, and 0.3 mi northwest of Hacksneck. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 176 ft, screened 166 to 176 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 3 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.73 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.36 ft below land-surface datum, Dec. 11, 1978; lowest measured, 2.36 ft below land-surface datum, July 16, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	2.09	JAN 06	1.57	MAR 01	1.19	APR 26	0.95	JUN 15	1.29	AUG 02	1.75
WATER YEAR 1988		HIGHEST	0.95	APR 26, 1988	LOWEST	2.09	NOV 10, 1987				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	1.72	JAN 10	1.47	MAR 07	1.07	APR 19	0.87	JUN 20	1.87	AUG 16	1.17
NOV 15	1.57										
WATER YEAR 1989		HIGHEST	0.87	APR 19, 1989	LOWEST	1.87	JUN 20, 1989				

GROUND-WATER LEVELS

ACCOMACK COUNTY--Continued

373845075522503. Local number, 64K 8 SOW 106B.

LOCATION.--Lat 37°38'45", long 75°52'25", Hydrologic Unit 02080109, 100 ft north of State Highway 633, 0.3 mi northwest of intersection of State Highways 633 and 631, and 0.3 mi northwest of Hacksneck. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 95 ft, screened 85 to 95 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 3 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.7 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.70 ft below land-surface datum, Apr. 21, 1983; lowest measured, 2.90 ft below land-surface datum, Sept. 14, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	2.65	JAN 06	1.45	MAR 01	1.27	APR 26	1.05	JUN 15	1.77	AUG 02	2.00
WATER YEAR 1988		HIGHEST	1.05	APR 26, 1988		LOWEST	2.65	NOV 10, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	2.15	JAN 10	1.50	MAR 07	1.00	APR 19	1.00	JUN 20	1.50	AUG 16	1.20
WATER YEAR 1989		HIGHEST	1.00	MAR 07, APR 19, 1989		LOWEST	2.15	OCT 05, 1988			

373845075522502. Local number, 64K 9 SOW 106A.

LOCATION.--Lat 37°38'45", long 75°52'25", Hydrologic Unit 02080109, 100 ft north of State Highway 633, 0.3 mi northwest of intersection of State Highways 633 and 631, and 0.3 mi northwest of Hacksneck. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 37 ft, screened 27 to 37 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 3 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.2 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.50 ft below land-surface datum, Mar. 7, 1989; lowest measured, 3.46 ft below land-surface datum, Sept. 14, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	3.05	JAN 06	1.20	MAR 01	1.18	APR 26	1.13	JUN 15	2.10	AUG 02	1.95
WATER YEAR 1988		HIGHEST	1.13	APR 26, 1988		LOWEST	3.05	NOV 10, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	1.95	JAN 10	1.30	MAR 07	0.50	APR 19	0.90	JUN 20	2.10	AUG 16	0.80
WATER YEAR 1989		HIGHEST	0.50	MAR 07, 1989		LOWEST	2.10	JUN 20, 1989			

GROUND-WATER LEVELS

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ACCOMACK COUNTY--Continued

373932075452701. Local number, 64K 10 SOW 108A.

LOCATION.--Lat 37°39'32", long 75°45'27", Hydrologic Unit 02080109, 200 ft east of State Highway 609, 0.2 mi southeast of intersection of State Highways 609 and 627, and 0.9 mi northwest of Melfa. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 50 ft, screened 40 to 50 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 47 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.22 ft above land-surface datum prior to Mar. 1, 1988; 0.75 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.98 ft below land-surface datum, Apr. 21, 1983; lowest measured, 15.06 ft below land-surface datum, Jan. 30, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	8.03	JAN 06	6.93	MAR 01	5.65	APR 26	5.58	JUN 15	6.17	AUG 02	6.85
WATER YEAR 1988		HIGHEST	5.58	APR 26, 1988	LOWEST	8.03	NOV 10, 1987				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	7.15	JAN 10	6.75	MAR 07	5.35	APR 19	4.35	JUN 20	6.15	AUG 16	3.85
NOV 15	6.65										
WATER YEAR 1989		HIGHEST	3.85	AUG 16, 1989	LOWEST	7.15	OCT 05, 1988				

373932075452702. Local number, 64K 11 SOW 108B.

LOCATION.--Lat 37°39'32", long 75°45'27", Hydrologic Unit 02080109, 200 ft east of State Highway 609, 0.2 mi southeast of intersection of State Highways 609 and 627, and 0.9 mi northwest of Melfa. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 180 ft, screened 170 to 180 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 47 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.03 ft below land-surface datum, Aug. 1, 1979; lowest measured, 16.24 ft below land-surface datum, Nov. 10, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	16.24	JAN 06	15.67	MAR 01	13.87	APR 26	13.40	JUN 15	14.90	AUG 02	15.02
WATER YEAR 1988		HIGHEST	13.40	APR 26, 1988	LOWEST	16.24	NOV 10, 1987				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	15.45	JAN 10	15.10	MAR 07	14.30	APR 19	12.40	JUN 20	13.80	AUG 16	12.70
NOV 15	15.20										
WATER YEAR 1989		HIGHEST	12.40	APR 19, 1989	LOWEST	15.45	OCT 05, 1988				

GROUND-WATER LEVELS

ACCOMACK COUNTY--Continued

373932075452703. Local number, 64K 12 SOW 108C.

LOCATION.--Lat 37°39'32", long 75°45'27", Hydrologic Unit 02080109, 200 ft east of State Highway 609, 0.2 mi southeast of intersection of State Highways 609 and 627, and 0.9 mi northwest of Melfa. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 284 ft, screened 274 to 284 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 47 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 14.50 ft below land-surface datum, Feb. 2, 1984; lowest measured, 26.73 ft below land-surface datum, Nov. 20, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	25.05	JAN 06	25.10	MAR 01	24.90	APR 26	24.65	JUN 15	24.78	AUG 02	25.05
WATER YEAR 1988		HIGHEST	24.65	APR 26, 1988	LOWEST	25.10	JAN 06, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	25.90	JAN 10	25.40	MAR 07	25.00	APR 19	24.40	JUN 20	24.60	AUG 16	24.10
NOV 15	25.33										
WATER YEAR 1989		HIGHEST	24.10	AUG 16, 1989	LOWEST	25.90	OCT 05, 1988				

374324075443201. Local number, 65K 2 SOW 058.

LOCATION.--Lat 37°43'24", long 75°44'32", Hydrologic Unit 02080110, 100 ft southeast of State Highway 658, 0.3 mi northeast of intersection of State Highways 658 and 653, and 0.9 mi north of Onancock. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 8 in. to 96.5 ft, diameter 6 in. from 96.5 to 187 ft, depth 187 ft, screened 97.3 to 107 ft, 116 to 126 ft, 135 to 145 ft, 162 to 182 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 2.1 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--December 1969 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.95 ft below land-surface datum, Feb. 8, 1972; lowest measured, 10.20 ft below land-surface datum, Aug. 2, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	9.49	JAN 06	9.02	MAR 01	7.88	APR 26	7.50	JUN 14	8.13	AUG 02	10.20
WATER YEAR 1988		HIGHEST	7.50	APR 26, 1988	LOWEST	10.20	AUG 02, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	9.85	JAN 10	9.40	MAR 07	8.70	APR 19	7.50	JUN 20	8.60	AUG 16	8.30
NOV 14	9.60										
WATER YEAR 1989		HIGHEST	7.50	APR 19, 1989	LOWEST	9.85	OCT 05, 1988				

GROUND-WATER LEVELS

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ACCOMACK COUNTY--Continued

374442075432501. Local number, 65K 23 SOW 109C.

LOCATION.--Lat 37°44'28", long 75°43'28", Hydrologic Unit 02080109, 50 ft north of State Highway 658, 0.1 mi northeast of intersection of State Highways 658 and 660, and 2.2 mi southeast of Deep Creek. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 290 ft, screened 280 to 290 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 13 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.3 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.36 ft below land-surface datum, Dec. 30, 1982; lowest measured, 16.65 ft below land-surface datum, Mar. 12, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	13.20	JAN 06	13.17	MAR 01	13.68	APR 26	12.93	JUN 14	12.52	AUG 02	12.75
WATER YEAR 1988		HIGHEST	12.52	JUN 14, 1988	LOWEST	13.68	MAR 01, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	13.20	JAN 10	13.40	MAR 07	13.30	APR 19	13.20	JUN 20	12.80	AUG 16	13.00
NOV 14	13.32										
WATER YEAR 1989		HIGHEST	12.80	JUN 20, 1989	LOWEST	13.40	JAN 10, 1989				

374442075432502. Local number, 65K 24 SOW 109A.

LOCATION.--Lat 37°44'42", long 75°43'25", Hydrologic Unit 02080109, 50 ft north of State Highway 658, 0.1 mi northeast of intersection of State Highways 658 and 660, and 2.2 mi southeast of Deep Creek. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 130 ft, screened 120 to 130 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 13 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.8 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.35 ft below land-surface datum, Apr. 21, 1983; lowest measured, 8.60 ft below land-surface datum, Oct. 5, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	8.28	JAN 06	7.77	MAR 01	5.95	APR 26	5.55	JUN 14	6.08	AUG 02	7.95
WATER YEAR 1988		HIGHEST	5.55	APR 26, 1988	LOWEST	8.28	NOV 10, 1987				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	8.60	JAN 10	7.70	MAR 07	6.60	APR 19	5.50	JUN 20	6.70	AUG 16	6.30
NOV 14	7.70										
WATER YEAR 1989		HIGHEST	5.50	APR 19, 1989	LOWEST	8.60	OCT 05, 1988				

GROUND-WATER LEVELS

ACCOMACK COUNTY--Continued

374442075432503. Local number, 65K 25 SOW 109B.

LOCATION.--Lat 37°44'42", long 75°43'25", Hydrologic Unit 02080109, 50 ft north of State Highway 658, 0.1 mi northeast of intersection of State Highways 658 and 660, and 2.2 mi southeast of Deep Creek. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 228 ft, screened 218 to 228 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 13 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.85 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.15 ft below land-surface datum, June 20, 1984; lowest measured, 13.30 ft below land-surface datum, Oct. 5, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	12.05	JAN 06	12.20	MAR 01	11.74	APR 26	11.25	JUN 14	11.20	AUG 02	12.50
WATER YEAR 1988		HIGHEST	11.20	JUN 14, 1988		LOWEST	12.50	AUG 02, 1988			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	13.30	JAN 10	12.55	MAR 07	11.95	APR 19	11.65	JUN 20	11.65	AUG 16	12.55
NOV 14	12.95										
WATER YEAR 1989		HIGHEST	11.65	APR 19, JUN 20, 1989		LOWEST	13.30	OCT 05, 1988			

374442075432504. Local number, 65K 26 SOW 109S.

LOCATION.--Lat 37°44'42", long 75°43'25", Hydrologic Unit 02080109, 50 ft north of State Highway 658, 0.1 mi northeast of intersection of State Highways 658 and 660, and 2.2 mi southeast of Deep Creek. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 25 ft, screened 15 to 25 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 13 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.37 ft above land-surface datum prior to Mar. 1, 1988; 0.5 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.48 ft below land-surface datum, June 12, 1979; lowest measured, 6.57 ft below land-surface datum, Oct. 31, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	6.07	JAN 06	2.94	MAR 01	2.72	APR 26	2.95	JUN 14	4.30	AUG 02	5.77
WATER YEAR 1988		HIGHEST	2.72	MAR 01, 1988		LOWEST	6.07	NOV 10, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	5.60	JAN 10	4.40	MAR 07	1.60	APR 19	2.10	JUN 20	4.00	AUG 16	1.60
NOV 14	4.70										
WATER YEAR 1989		HIGHEST	1.60	MAR 07, AUG 16, 1989		LOWEST	5.60	OCT 05, 1988			

ACCOMACK COUNTY--Continued

374425075400001. Local number, 65K 27 SOW 114A.

LOCATION.--Lat 37°44'25", long 75°40'00", Hydrologic Unit 02080101, 0.2 mi northwest of intersection of State Highway 662 and U.S. Highway 13, 0.6 mi northwest of State Highway 662, and 0.9 mi east of Greenbush. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 160 ft, screened 150 to 160 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 45 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 1.4 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1980 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 34.59 ft below land-surface datum, June 6, 1984; lowest measured, 49.98 ft below land-surface datum, Nov. 6, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	45.50	43.98	40.40	39.38	40.50	40.88	39.63	39.90	39.20	42.73	44.81	45.63
10	45.60	44.22	40.27	39.80	40.48	40.45	39.51	39.95	39.37	43.15	44.69	44.72
15	45.91	43.70	41.20	40.39	41.22	40.20	39.40	40.28	39.58	43.66	45.62	44.62
20	45.88	42.30	41.30	40.91	41.34	39.98	39.75	39.81	40.71	43.85	44.73	44.78
25	46.09	41.35	40.98	41.17	40.35	39.50	40.18	39.12	41.18	44.95	44.38	44.80
EOM	44.77	40.69	39.88	40.66	40.72	39.48	40.22	39.82	41.47	45.05	44.77	44.13

WATER YEAR 1988 HIGHEST 38.73 JUN 08, 1988 LOWEST 46.30 OCT 18, 1987

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	43.47	43.41	42.24	43.20	43.27	42.75	---	43.93	---	45.28	45.55	43.82
10	43.83	43.40	42.09	42.11	43.15	---	---	43.51	---	45.28	---	43.33
15	43.03	44.03	41.85	43.32	43.05	---	---	---	---	45.52	---	43.33
20	42.49	43.35	41.85	42.54	43.37	43.16	43.69	44.43	45.20	45.31	44.56	43.33
25	42.72	42.08	42.05	42.53	42.80	43.16	---	43.82	45.28	45.55	43.82	43.33
EOM	43.36	43.02	42.86	42.92	42.51	42.14	---	43.93	45.28	45.60	43.82	43.33

WATER YEAR 1989 HIGHEST 41.42 DEC 12, 18, 19, 1988 LOWEST 45.67 JUL 23, 24, 1989

374425075400002. Local number, 65K 28 SOW 114B.

LOCATION.--Lat 37°44'25", long 75°40'00", Hydrologic Unit 02080101, 0.2 mi northwest of intersection of State Highway 662 and U.S. Highway 13, 0.6 mi northwest of State Highway 662, and 0.9 mi east of Greenbush. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 230 ft, screened 220 to 230 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 45 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 1.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1980 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 49.40 ft below land-surface datum, June 6, 1987; lowest recorded, 75.95 ft below land-surface datum, Aug. 16, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	67.70	69.60	60.90	59.20	65.40	65.90	58.00	62.40	59.20	64.05	69.80	66.85
10	73.60	65.50	63.75	60.60	63.80	62.60	61.10	60.70	62.85	67.20	68.55	70.35
15	73.50	65.30	62.90	64.95	61.85	60.55	64.95	61.55	62.05	69.15	68.20	70.80
20	70.60	62.35	61.10	63.15	66.40	61.45	65.00	61.50	60.20	68.95	68.80	67.60
25	70.40	62.55	63.30	60.95	63.90	63.50	60.20	61.10	65.85	66.10	71.10	67.10
EOM	70.25	57.65	62.50	61.40	60.40	62.40	63.70	57.30	66.60	67.20	69.25	67.25

WATER YEAR 1988 HIGHEST 54.75 JAN 04, 1988 LOWEST 74.05 OCT 17, 1987

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	66.25	69.35	60.70	63.10	66.25	68.60	69.48	72.60	---	---	---	---
10	63.00	68.80	67.85	64.80	67.45	71.10	69.10	70.10	---	---	---	---
15	64.95	65.95	65.40	66.88	65.80	68.60	73.00	68.80	---	---	---	---
20	65.50	65.10	62.50	67.80	62.50	64.70	71.80	72.95	69.20	---	---	---
25	63.65	61.95	62.95	66.76	65.70	69.20	71.04	71.80	---	---	---	---
EOM	63.20	62.90	66.25	64.68	62.54	69.45	70.30	69.32	---	---	---	---

WATER YEAR 1989 HIGHEST 60.70 DEC 05, 1988 LOWEST 73.00 APR 15, 1989

GROUND-WATER LEVELS

ACCOMACK COUNTY--Continued

374425075400003. Local number, 65K 29 SOW 114C.

LOCATION.--Lat 37°44'25", long 75°40'00", Hydrologic Unit 02080101, 0.2 mi northwest of intersection of State Highway 662 and U.S. Highway 13, 0.6 mi northwest of State Highway 662, and 0.9 mi east of Greenbush. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 315 ft, screened 305 to 315 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 45 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 1.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board. Water level affected by local pumpage.

PERIOD OF RECORD.--February 1980 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 71.50 ft below land-surface datum, Feb. 24, 1986; lowest recorded, 101.75 ft below land-surface datum, Aug. 16, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	90.60	92.80	91.85	---	88.57	89.00	78.30	84.60	78.60	82.60	92.20	86.90
10	98.25	86.85	86.35	81.22	87.37	84.80	81.20	83.40	85.00	85.40	90.55	92.45
15	98.00	---	88.80	87.82	83.42	81.55	---	83.20	83.75	90.70	89.30	93.20
20	93.85	---	93.40	85.12	89.62	81.90	---	83.50	81.20	90.70	91.80	89.15
25	92.05	87.05	91.20	82.02	85.92	86.10	---	82.60	87.60	87.10	94.05	88.80
EOM	93.45	97.30	87.85	81.52	81.27	84.50	88.20	77.40	87.00	87.75	91.50	90.70

WATER YEAR 1988 HIGHEST 74.20 APR 05, 1988 LOWEST 98.70 OCT 16, 17, 1987

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	89.40	92.35	81.40	---	86.48	---	---	99.30	---	93.30	99.50	90.16
10	85.20	91.70	90.30	86.70	---	96.46	---	95.50	100.72	93.90	98.60	97.70
15	88.00	88.15	87.50	88.45	---	93.12	---	93.62	100.55	100.76	94.55	99.40
20	89.00	85.50	83.65	90.64	---	87.68	98.30	99.55	95.90	99.18	93.92	96.20
25	87.20	82.60	82.90	89.22	---	94.48	97.15	98.08	98.80	95.45	99.64	91.84
EOM	84.90	84.00	---	86.40	---	---	94.85	94.90	101.58	92.35	100.40	97.30

WATER YEAR 1989 HIGHEST 75.82 DEC 27, 1988 LOWEST 101.58 JUN 30, 1989

374425075400004. Local number, 65K 30 SOW 114S.

LOCATION.--Lat 37°44'25", long 75°40'00", Hydrologic Unit 02080101, 0.2 mi northwest of intersection of State Highway 662 and U.S. Highway 13, 0.6 mi northwest of State Highway 662, and 0.9 mi east of Greenbush. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 40 ft, screened 30 to 40 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 45 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum prior to Mar. 1, 1988; 1.5 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1980 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.97 ft below land-surface datum, Mar. 23, 1982; lowest measured, 20.10 ft below land-surface datum, Dec. 9, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	10.30	JAN 06	10.10	MAR 01	7.73	APR 26	7.60	JUN 14	8.04	AUG 02	9.00

WATER YEAR 1988 HIGHEST 7.60 APR 26, 1988 LOWEST 10.30 NOV 10, 1987

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	10.01	JAN 10	10.35	MAR 07	8.55	APR 19	5.40	JUN 20	7.70	AUG 16	4.00
NOV 15	10.05										

WATER YEAR 1989 HIGHEST 4.00 AUG 16, 1989 LOWEST 10.35 JAN 10, 1989

GROUND-WATER LEVELS

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ACCOMACK COUNTY--Continued

374320075380501. Local number, 66K 2 SOW 101C.

LOCATION.--Lat 37°43'19", long 75°36'54", Hydrologic Unit 02080110, 0.2 mi north of State Highway 662, 2.2 mi east of intersection of State Highway 662 and U.S. Highway 13 (Business), and 2.8 mi east of Accomac. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 292 ft, screened 282 to 292 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 10 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.4 ft above land-surface datum prior to Mar. 1, 1988; 0.6 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.57 ft below land-surface datum, Apr. 25, 1984; lowest measured, 17.30 ft below land-surface datum, Aug. 5, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	13.58	JAN 06	11.65	MAR 01	10.82	APR 25	10.30	JUN 14	10.12	AUG 02	11.65
WATER YEAR 1988		HIGHEST	10.12	JUN 14, 1988		LOWEST	13.58	NOV 10, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	11.85	JAN 10	11.00	MAR 07	11.00	APR 19	11.40	JUN 20	12.20	AUG 16	12.60
NOV 15	11.80										
WATER YEAR 1989		HIGHEST	11.00	JAN 10, MAR 07, 1989		LOWEST	12.60	AUG 16, 1989			

374320075365602. Local number, 66K 3 SOW 101B.

LOCATION.--Lat 37°43'20", long 75°38'05", Hydrologic Unit 02080110, 0.2 mi north of State Highway 662, 2.2 mi east of intersection of State Highway 662 and U.S. Highway 13 (Business), 2.8 mi east of Accomac. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 220 ft, screened 210 to 220 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 8 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.36 ft above land-surface datum prior to Mar. 1, 1988; 0.65 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.04 ft below land-surface datum, Apr. 25, 1984; lowest measured, 9.84 ft below land-surface datum, Aug. 5, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	7.58	JAN 06	6.84	MAR 01	6.05	APR 25	5.62	JUN 14	6.33	AUG 02	8.15
WATER YEAR 1988		HIGHEST	5.62	APR 25, 1988		LOWEST	8.15	AUG 02, 1988			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	7.25	JAN 10	6.65	MAR 07	6.60	APR 19	6.15	JUN 20	7.85	AUG 16	6.75
NOV 15	7.05										
WATER YEAR 1989		HIGHEST	6.15	APR 19, 1989		LOWEST	7.85	JUN 20, 1989			

GROUND-WATER LEVELS

ACCOMACK COUNTY--Continued

374320075365603. Local number, 66K 4 SOW 101A.

LOCATION.--Lat 37°43'20", long 75°36'56", Hydrologic Unit 02080110, 0.2 mi north of State Highway 662, 2.2 mi east of intersection of State Highway 662 and U.S. Highway 13 (Business), and 2.8 mi east of Accomac. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 152 ft, screened 142 to 152 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 10 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.4 ft above land-surface datum prior to Mar. 1, 1988; 0.65 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.99 ft below land-surface datum, Apr. 25, 1984; lowest measured, 9.93 ft below land-surface datum, Aug. 5, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	7.55	JAN 06	6.50	MAR 01	6.00	APR 25	5.55	JUN 14	6.41	AUG 02	8.20
WATER YEAR 1988		HIGHEST	5.55	APR 25, 1988	LOWEST	8.20	AUG 02, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	7.20	JAN 10	6.65	MAR 07	6.65	APR 19	6.05	JUN 20	8.10	AUG 16	6.70
NOV 15	7.05										
WATER YEAR 1989		HIGHEST	6.05	APR 19, 1989	LOWEST	8.10	JUN 20, 1989				

375225075321701. Local number, 66L 1 SOW 107C.

LOCATION.--Lat 37°52'25", long 75°32'17", Hydrologic Unit 02080110, 0.15 mi northwest of State Highway 679, 0.45 mi northeast of intersection of State Highways 679 and 790, and 0.7 mi west of Assawoman. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 305 ft, screened 295 to 305 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 6 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.4 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.21 ft below land-surface datum, Apr. 25, 1984; lowest measured, 7.35 ft below land-surface datum, Nov. 14, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	6.62	JAN 06	5.92	MAR 01	5.70	APR 26	4.90	JUN 13	5.04	AUG 02	6.10
WATER YEAR 1988		HIGHEST	4.90	APR 26, 1988	LOWEST	6.62	NOV 10, 1987				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	7.05	JAN 10	5.80	MAR 07	6.30	APR 19	5.50	JUN 19	6.00	AUG 16	5.20
NOV 14	7.35										
WATER YEAR 1989		HIGHEST	5.20	AUG 16, 1989	LOWEST	7.35	NOV 14, 1988				

GROUND-WATER LEVELS

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ACCOMACK COUNTY--Continued

375225075321702. Local number, 66L 2 SOW 107A.

LOCATION.--Lat 37°52'25", long 75°32'17", Hydrologic Unit 02080110, 0.15 mi northwest of State Highway 679, 0.45 mi northeast of intersection of State Highways 679 and 790, and 0.7 mi west of Assawoman. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 140 ft, screened 130 to 140 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 5 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.6 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.18 ft below land-surface datum, Mar. 10, 1978; lowest measured, 5.45 ft below land-surface datum, Oct. 5, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	4.72	JAN 06	5.42	MAR 01	3.20	APR 26	2.70	JUN 13	2.95	AUG 02	4.37
WATER YEAR 1988		HIGHEST	2.70	APR 26, 1988		LOWEST	5.42	JAN 06, 1988			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	5.45	JAN 10	4.70	MAR 07	4.50	APR 19	4.00	JUN 19	3.80	AUG 16	2.90
WATER YEAR 1989		HIGHEST	2.90	AUG 16, 1989		LOWEST	5.45	OCT 05, 1988			

375225075321703. Local number, 66L 3 SOW 107B.

LOCATION.--Lat 37°52'25", long 75°32'17", Hydrologic Unit 02080110, 0.15 mi northwest of State Highway 679, 0.45 mi northeast of intersection of State Highways 679 and 790, and 0.7 mi west of Assawoman. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 206 ft, screened 191 to 201 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 5 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.1 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.59 ft below land-surface datum, Feb. 1, 1980; lowest measured, 5.95 ft below land-surface datum, Nov. 14, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	4.80	JAN 06	3.50	MAR 01	3.77	APR 26	3.20	JUN 13	3.52	AUG 02	4.95
WATER YEAR 1988		HIGHEST	3.20	APR 26, 1988		LOWEST	4.95	AUG 02, 1988			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	5.85	JAN 10	5.15	MAR 07	4.90	APR 19	4.50	JUN 19	4.30	AUG 16	3.50
WATER YEAR 1989		HIGHEST	3.50	AUG 16, 1989		LOWEST	5.95	NOV 14, 1988			

GROUND-WATER LEVELS

ACCOMACK COUNTY--Continued

375723075344401. Local number, 66M 16 SOW 110A.

LOCATION.--Lat 37°57'23", long 75°34'44", Hydrologic Unit 02060009, 0.25 mi northeast of State Highway 693, 0.5 mi southeast of intersection of State Highways 693 and 706, and 2.3 mi northwest of Oak Hall. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 130 ft, screened 120 to 130 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 11 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.65 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.28 ft below land-surface datum Feb. 19, 1986; lowest measured, 12.23 ft below land-surface datum, Nov. 10, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	12.23	JAN 06	11.64	FEB 29	10.80	APR 26	9.95	JUN 14	10.52	AUG 02	11.25
WATER YEAR 1988		HIGHEST	9.95	APR 26, 1988	LOWEST	12.23	NOV 10, 1987				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	11.63	JAN 10	11.55	MAR 07	10.85	APR 19	9.85	JUN 19	10.55	AUG 08	10.35
NOV 15	11.65										
WATER YEAR 1989		HIGHEST	9.85	APR 19, 1989	LOWEST	11.65	NOV 15, 1988				

375723075344402. Local number, 66M 17 SOW 110B.

LOCATION.--Lat 37°57'23", long 75°34'44", Hydrologic Unit 02060009, 0.25 mi northeast of State Highway 693, 0.5 mi southeast of intersection of State Highways 693 and 706, and 2.3 mi northwest of Oak Hall. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 178 ft, screened 168 to 178 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 11 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.75 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.76 ft below land-surface datum, Apr. 1, 1980; lowest measured, 12.75 ft below land-surface datum, Jan. 6, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	12.50	JAN 06	12.75	FEB 29	11.30	APR 26	10.45	JUN 14	10.82	AUG 02	11.60
WATER YEAR 1988		HIGHEST	10.45	APR 26, 1988	LOWEST	12.75	JAN 06, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	11.70	JAN 10	11.85	MAR 07	10.85	APR 19	10.45	JUN 19	11.15	AUG 08	10.85
NOV 15	12.05										
WATER YEAR 1989		HIGHEST	10.45	APR 19, 1989	LOWEST	12.05	NOV 15, 1988				

GROUND-WATER LEVELS

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ACCOMACK COUNTY--Continued

375723075344403. Local number, 66M 18 SOW 110C.

LOCATION.--Lat 37°57'23", long 75°34'44", Hydrologic Unit 02060009, 0.25 mi northeast of State Highway 693, 0.5 mi southeast of intersection of State Highways 693 and 706, and 2.3 mi northwest of Oak Hall. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 240 ft, screened 230 to 240 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 11 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.65 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.43 ft below land-surface datum, Aug. 12, 1981; lowest measured, 13.35 ft below land-surface datum, Jan. 10, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	12.25	JAN 06	12.77	FEB 29	12.85	APR 26	12.60	JUN 14	12.65	AUG 02	12.55
WATER YEAR 1988		HIGHEST	12.25	NOV 10, 1987		LOWEST	12.85	FEB 29, 1988			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	12.95	JAN 10	13.35	MAR 07	13.05	APR 19	12.95	JUN 19	12.85	AUG 08	12.55
NOV 15	13.15										
WATER YEAR 1989		HIGHEST	12.55	AUG 08, 1989		LOWEST	13.35	JAN 10, 1989			

375723075344404. Local number, 66M 19 SOW 110S.

LOCATION.--Lat 37°57'23", long 75°34'44", Hydrologic Unit 02060009, 0.25 mi northeast of State Highway 693, 0.5 mi southeast of intersection of State Highways 693 and 706, and 2.3 mi northwest of Oak Hall. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 36 ft, screened 26 to 36 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 11 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.35 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.06 ft below land-surface datum Mar. 17, 1987; lowest measured, 11.34 ft below land-surface datum, Nov. 6, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	10.38	JAN 06	10.08	FEB 29	9.55	APR 26	9.35	JUN 14	9.75	AUG 02	9.55
WATER YEAR 1988		HIGHEST	9.35	APR 26, 1988		LOWEST	10.38	NOV 10, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	10.08	JAN 10	10.35	MAR 07	9.05	APR 19	8.15	JUN 19	8.95	AUG 08	8.55
NOV 15	10.25										
WATER YEAR 1989		HIGHEST	8.15	APR 19, 1989		LOWEST	10.35	JAN 10, 1989			

375610075361801. Local number. 66M 23 SOW 181A.

LOCATION.--Lat 37°56'10", long 75°36'18", Hydrologic Unit 02080109, 100 ft south of State Highway 703, 0.1 mi east of intersection of State Highways 701 and 703, and 2.7 mi northwest of Makemie Park. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diamter 4.5 in., depth 1,300 ft., screened 1,290 to 1,300 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 6 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--October 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.38 ft above land-surface datum, Jan. 26, 1988;
lowest measured, 1.38 ft above land-surface datum, Mar. 7, 1989.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 26	2.38	FEB 14	1.85	JUN 14	1.85	AUG 02	1.84

NOTE.--Flowing well, readings given are above land-surface datum.

WATER YEAR 1988 HIGHEST 2.38 JAN 26, 1988 LOWEST 1.84 AUG 02, 1988

[illegible]

NOTE.--Flowing well, readings given are above land-surface datum.

WATER YEAR 1989 HIGHEST 1.63 APR 19, 1989 LOWEST 1.38 MAR 07, 1989

375610075361802. Local number, 66M 24 SOW 181B.

LOCATION.--Lat 37°56'10", long 75°36'18", Hydrologic Unit 02080109, 100 ft south of State Highway 703, 0.1 mi east of intersection of State Highways 701 and 703, and 2.7 mi northwest of Makemie Park. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Miocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in., depth 508 ft, screened 498 to 508 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 6 ft above National Geodetic Ver

map. Measuring point: Top of casing, 0.85 ft above land-su

REMARKS.--Records provided by the Virginia Water

PERIOD OF RECORD.--October 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water-level measured, 0.25 ft below land-surface datum, Mar. 7, 1989; lowest measured, 1.20 ft below land-surface datum, June 19, 1989.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	1.00	JAN 26	0.78	FEB 29	1.00	APR 26	0.98	JUN 14	0.98	AUG 02	1.02

WATER YEAR 1988	HIGHEST 0.78	JAN 26, 1988	LOWEST 1.02	AUG 02, 1988
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[illegible]

WATER YEAR 1989	HIGHEST 0.25 MAR 07, 1989	LOWEST 1.20 JUN 19, 1989
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ACCOMACK COUNTY--Continued

375610075361803. Local number, 66M 25 SOW 181C.

LOCATION.--Lat 37°56'10", long 75°36'18", Hydrologic Unit 02080109, 100 ft south of State Highway 703, 0.1 mi east of intersection of State Highways 701 and 703, and 2.7 mi northwest of Makemie Park. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in., depth 340 ft, screened 330 to 340 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 6 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.95 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--October 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.45 ft below land-surface datum, Aug. 2, 1988, Aug. 8, 1989; lowest measured, 2.80 ft below land-surface datum, Jan. 10, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	2.72	JAN 26	2.53	FEB 29	2.53	APR 26	2.50	JUN 14	2.63	AUG 02	2.45
WATER YEAR 1988		HIGHEST	2.45	AUG 02, 1988		LOWEST	2.72	OCT 30, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	2.62	JAN 10	2.80	MAR 07	2.65	APR 19	2.65	JUN 19	2.70	AUG 08	2.45
NOV 15	2.75										
WATER YEAR 1989		HIGHEST	2.45	AUG 08, 1989		LOWEST	2.80	JAN 10, 1989			

375610075361804. Local number, 66M 26 SOW 181D.

LOCATION.--Lat 37°56'10", long 75°36'18", Hydrologic Unit 02080109, 100 ft south of State Highway 703, 0.1 mi east of intersection of State Highways 701 and 703, and 2.7 mi northwest of Makemie Park. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in., depth 230 ft, screened 220 to 230 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 6 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--October 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.30 ft below land-surface datum, Aug. 8, 1989; lowest measured, 3.60 ft below land-surface datum, Jan. 10, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	3.58	JAN 26	3.47	FEB 29	3.25	APR 26	2.78	JUN 14	2.70	AUG 02	2.67
WATER YEAR 1988		HIGHEST	2.67	AUG 02, 1988		LOWEST	3.58	OCT 30, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	3.30	JAN 10	3.60	MAR 07	2.90	APR 19	2.75	JUN 19	2.70	AUG 08	2.30
NOV 15	3.50										
WATER YEAR 1989		HIGHEST	2.30	AUG 08, 1989		LOWEST	3.60	JAN 10, 1989			

375610075361805. Local number, 66M 27 SOW 181E.

LOCATION.--Lat 37°56'10", long 75°36'18", Hydrologic Unit 02080109, 100 ft south of State Highway 703, 0.1 mi east of intersection of State Highways 701 and 703, and 2.7 mi northwest of Makemie Park. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 30 ft, screened 20 to 30 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 6 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.9 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--October 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.50 ft below land-surface datum, Aug. 8, 1989; lowest measured, 4.09 ft below land-surface datum, Oct. 29, 1987.

GROUND-WATER LEVELS

ACCOMACK COUNTY--Continued

375610075361805. Local number, 66M 27 SOW 181E--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 29	4.09	JAN 26	2.54	FEB 29	1.75	APR 26	2.09	JUN 14	3.37	AUG 02	2.52
WATER YEAR 1988		HIGHEST	1.75	FEB 29, 1988		LOWEST	4.09	OCT 29, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	3.90	JAN 10	3.25	MAR 07	1.15	APR 19	0.95	JUN 19	2.55	AUG 08	0.50
WATER YEAR 1989		HIGHEST	0.50	AUG 08, 1989		LOWEST	3.90	OCT 05, 1988			

375622075280101. Local number, 67M 2.

LOCATION.--Lat 37°56'23", long 75°28'02", Hydrologic Unit 02060010, well B31 Wallops Flight Center, 5.0 mi west of Chincoteague. Owner: National Aeronautics and Space Administration (formerly U.S. Naval Air Station, Wallops Island).

AQUIFER.--Columbia Group sand of Pleistocene age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 8 in., depth 60 ft, screen depth unknown.

INSTRUMENTATION.--Monthly measurement with chalked tape by NASA personnel.

DATUM.--Elevation of land-surface datum is 35 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.38 ft above land-surface datum.

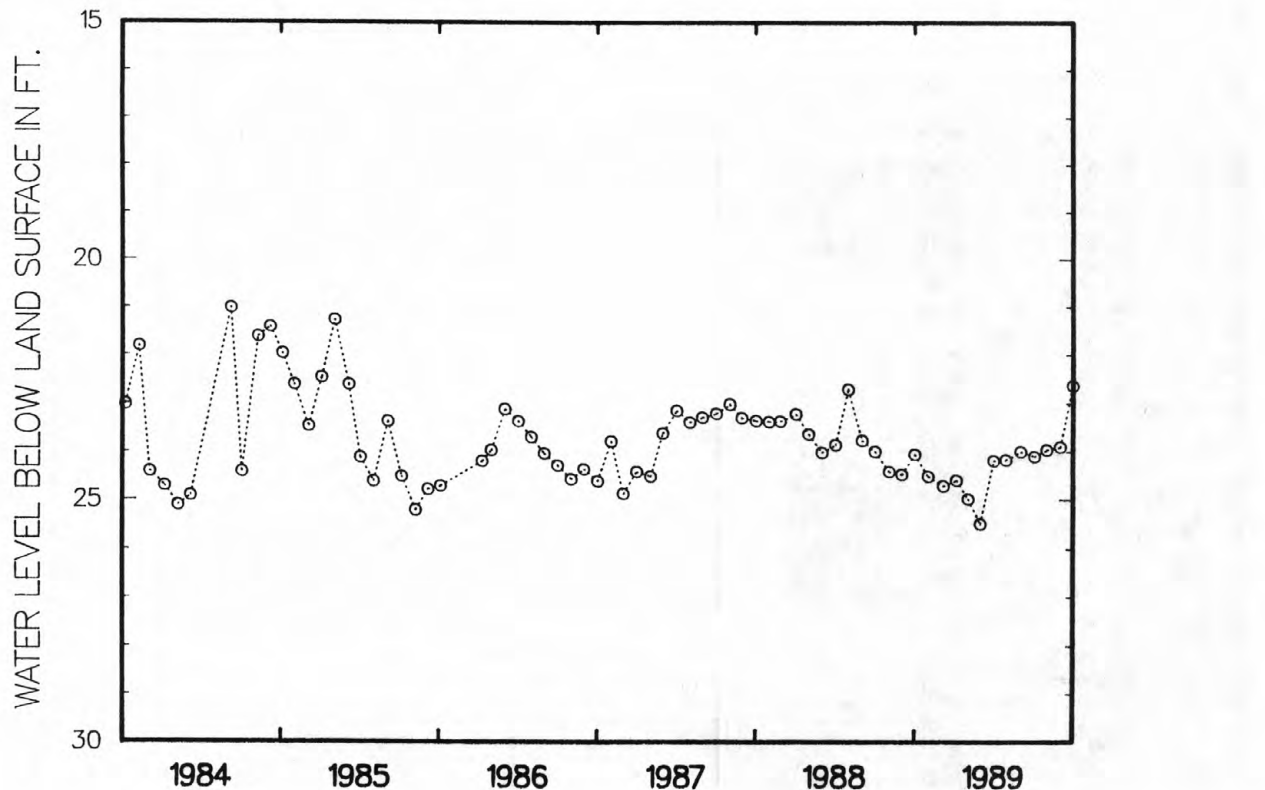
REMARKS.--Records provided by the National Aeronautics and Space Administration. Water levels for water years 1963 to 1974 should be 4.71 ft lower than previously published.

PERIOD OF RECORD.--May 1963 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.82 ft below land-surface datum, July 2, 1979; lowest measured, 27.02 ft below land-surface datum, Jan. 20, 1967.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 31	24.52	JAN 04	24.60	FEB 28	25.50	APR 28	24.17	JUL 03	24.10	AUG 31	23.90
DEC 05	24.72	31	24.99	MAR 31	24.19	JUN 01	24.00	31	23.96	SEP 29	22.64
WATER YEAR 1989		HIGHEST	22.64	SEP 29, 1989		LOWEST	25.50	FEB 28, 1989			



GROUND-WATER LEVELS

401

ACCOMACK COUNTY--Continued

375635075271501. Local number, 67M 10 SOW 115A.

LOCATION.--Lat 37°56'35", long 75°27'15", Hydrologic Unit 02060010, 200 ft east of State Highway 175, 2.4 mi east of Wattsville, and 2.5 mi northeast of intersection of State Highways 175 and 798. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 52 ft, screened 32 to 52 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 13 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.7 ft above land-surface datum prior to Feb. 28, 1988; 1.7 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March 1981 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

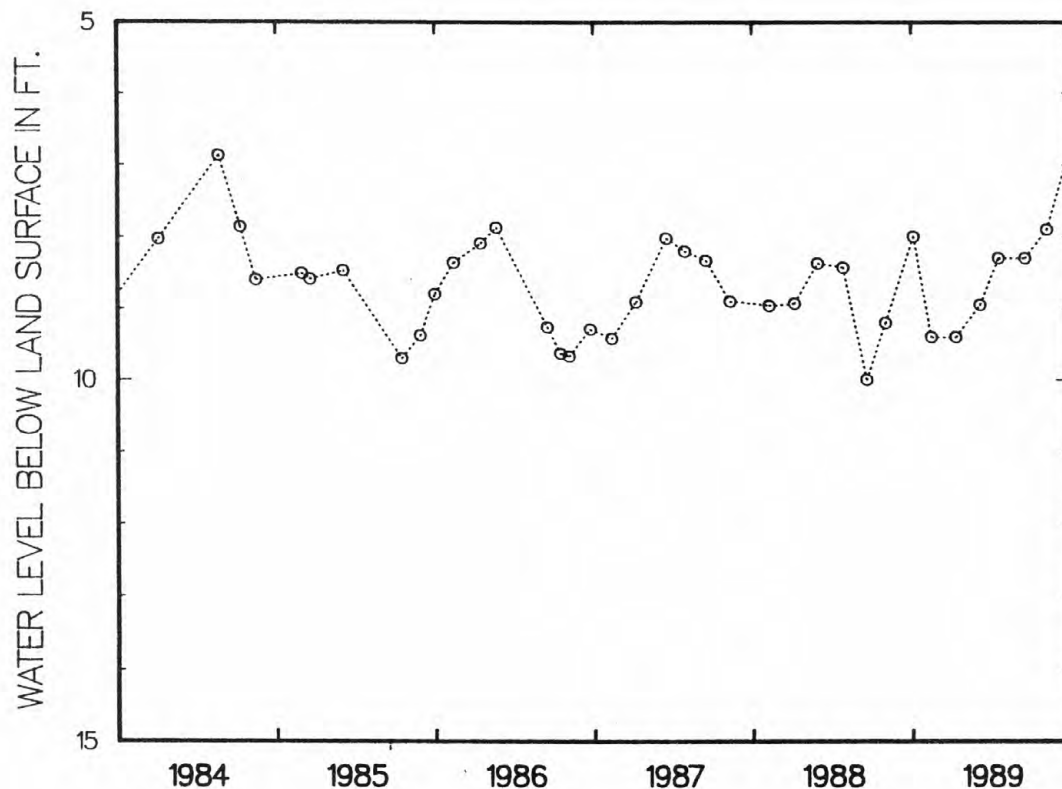
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.87 ft below land-surface datum, May 22, 1984; lowest measured, 10.00 ft below land-surface datum, Aug. 12, 1981, June 19, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	8.96	JAN 06	8.93	FEB 29	8.37	APR 26	8.43	JUN 19	10.00	AUG 02	9.20
WATER YEAR 1988		HIGHEST	8.37	FEB 29, 1988	LOWEST	10.00	JUN 19, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	8.00	JAN 10	9.40	MAR 07	8.95	APR 19	8.30	JUN 19	8.30	AUG 08	7.90
NOV 15	9.40										
WATER YEAR 1989		HIGHEST	7.90	AUG 08, 1989	LOWEST	9.40	NOV 15, 1988, JAN 10, 1989				



GROUND-WATER LEVELS

ACCOMACK COUNTY--Continued

375635075271502. Local number, 67M 11 SOW 115B.

LOCATION.--Lat 37°56'35", long 75°27'15", Hydrologic Unit 02060010, 200 ft east of State Highway 175, 2.4 mi east of Wattsville, and 2.5 mi northeast of intersection of State Highways 175 and 798. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 138 ft, screened 118 to 138 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 14 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.6 ft above land-surface datum prior to Feb. 29, 1988; 1.9 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March 1981 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

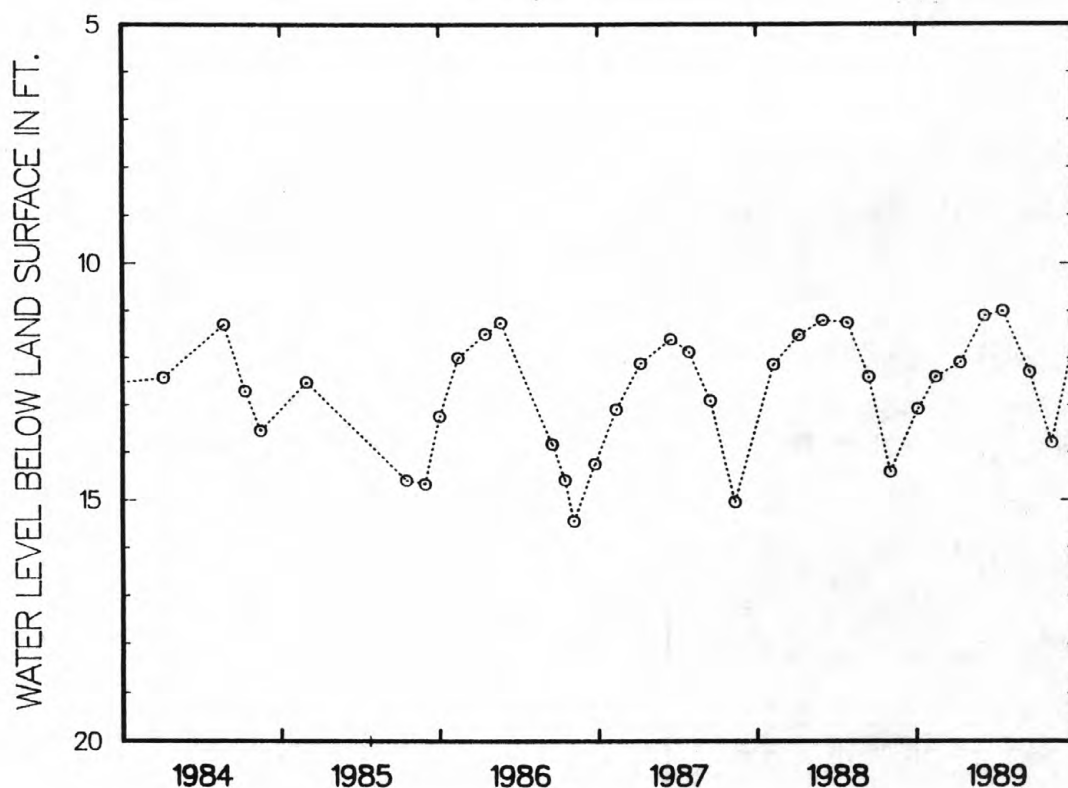
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.70 ft below land-surface datum, May 6, 1982; lowest measured, 15.45 ft below land-surface datum, Aug. 5, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	12.14	JAN 06	11.51	FEB 29	11.20	APR 26	11.25	JUN 14	12.40	AUG 02	14.42
WATER YEAR 1988		HIGHEST	11.20	FEB 29, 1988	LOWEST	14.42	AUG 02, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	13.08	JAN 10	12.10	MAR 07	11.10	APR 19	11.00	JUN 19	12.30	AUG 08	13.80
NOV 15	12.40										
WATER YEAR 1989		HIGHEST	11.00	APR 19, 1989	LOWEST	13.80	AUG 08, 1989				



ACCOMACK COUNTY--Continued

375635075271503. Local number, 67M 12 SOW 115C.

LOCATION.--Lat 37°56'35", long 75°27'15", Hydrologic Unit 02060010, 200 ft east of State Highway 175, 2.4 mi east of Wattsville, and 2.5 mi northeast of intersection of State Highways 175 and 798. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 222 ft, screened 202 to 222 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 13 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 2.35 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March 1981 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 11.64 ft below land-surface datum, Mar. 17, 1989; lowest recorded, 51.40 ft below land-surface datum, Aug. 17, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

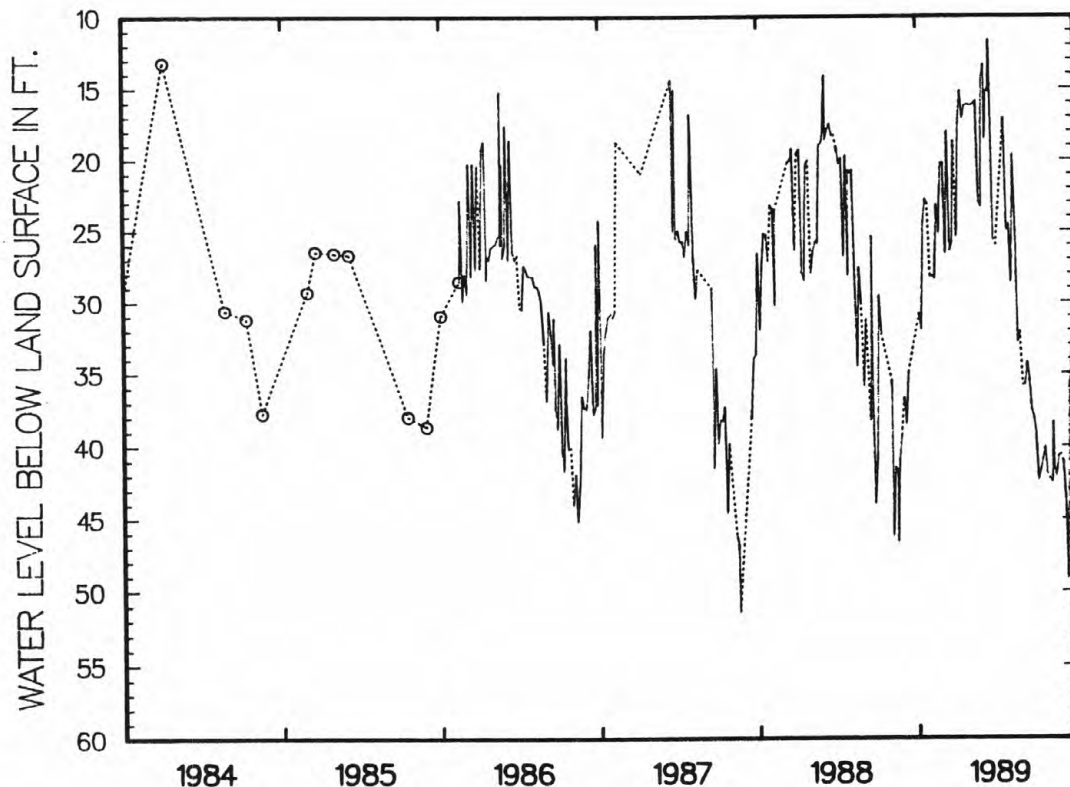
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	31.99	23.49	---	19.30	26.40	18.65	20.30	20.70	31.23	29.50	46.22	38.50
10	27.80	23.53	20.19	28.00	25.75	17.81	19.90	28.23	---	32.25	41.44	34.95
15	25.15	---	20.07	28.49	25.91	17.50	26.84	34.58	38.23	---	41.74	---
20	25.29	---	19.24	20.40	18.90	18.32	19.68	27.55	36.40	---	40.98	---
25	27.15	---	26.38	20.06	18.81	18.28	28.18	30.08	43.97	---	39.26	---
EOM	23.24	---	19.60	27.97	18.00	19.22	20.94	35.88	40.80	---	36.68	---

WATER YEAR 1988 HIGHEST 14.10 MAR 04, 1988 LOWEST 46.59 AUG 16, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	30.85	28.19	26.63	17.49	16.23	13.38	---	28.67	35.79	42.37	42.52	43.61
10	31.98	28.39	18.04	15.24	16.11	15.18	---	19.67	34.30	41.65	41.55	49.20
15	24.40	23.19	26.47	17.14	15.94	15.28	---	24.60	35.49	40.88	42.09	35.97
20	22.84	25.20	25.83	16.26	23.05	15.54	17.13	32.90	37.52	40.09	40.68	33.69
25	23.10	20.24	18.70	16.19	23.37	25.62	25.04	32.13	38.10	41.85	40.57	---
EOM	28.24	20.26	25.44	16.25	14.20	26.05	24.58	35.84	39.18	42.29	41.15	---

WATER YEAR 1989 HIGHEST 11.64 MAR 17, 1989 LOWEST 49.20 SEP 10, 1989



GROUND-WATER LEVELS

ACCOMACK COUNTY--Continued

375635075271504. Local number, 67M 13 SOW 115D.

LOCATION.--Lat 37°56'35", long 75°27'15", Hydrologic Unit 02060010, 50 ft east of State Highway 175, 2.4 mi east of Wattsville, and 2.6 mi northeast of intersection of State Highways 175 and 798. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of the Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 249 ft, screened 229 to 249 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 16 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.8 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March 1981 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 15.72 ft below land-surface datum, Mar. 6, 1989; lowest recorded, 52.52 ft below land-surface datum, Aug. 17, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

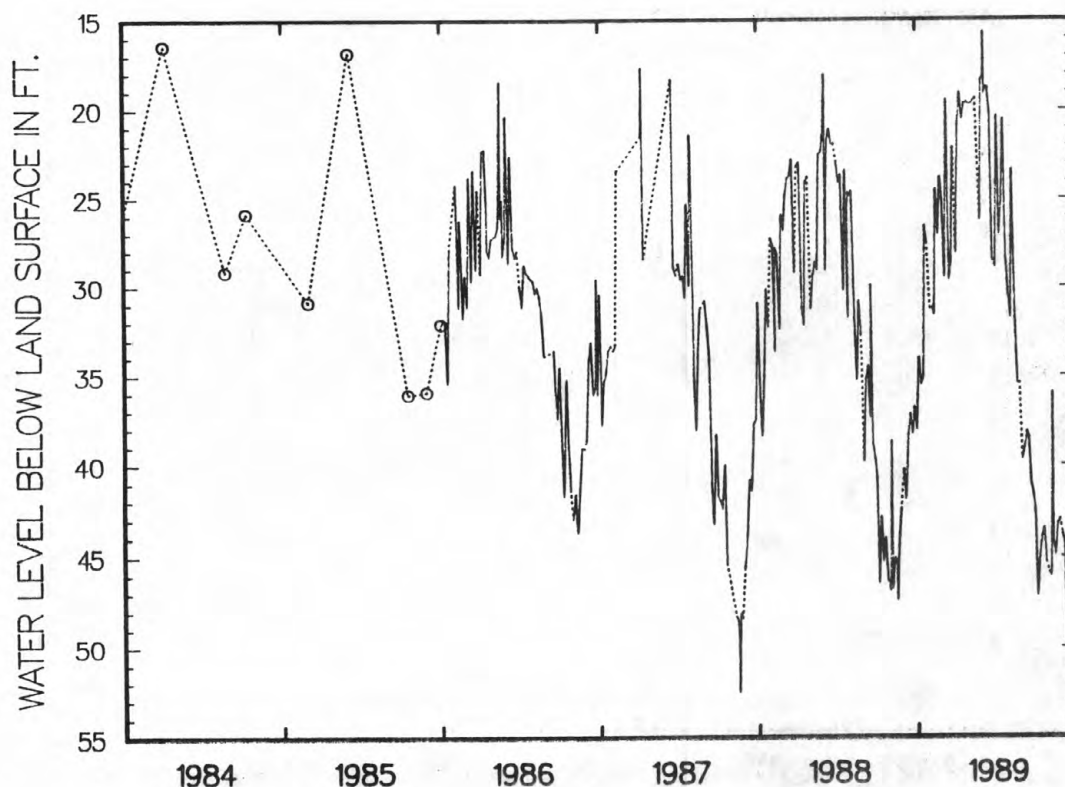
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	35.72	27.67	24.78	23.00	29.36	29.15	24.14	24.60	35.16	46.48	46.80	41.90
10	38.44	27.77	23.87	31.16	28.62	21.70	23.68	31.80	34.48	42.84	45.10	38.42
15	35.04	28.15	23.74	32.20	29.10	21.12	30.29	35.33	37.44	45.34	45.33	37.20
20	30.15	32.47	22.80	24.07	22.49	21.94	23.40	30.82	38.89	44.01	44.49	38.33
25	32.35	25.90	29.25	23.80	22.42	21.95	31.80	32.73	39.62	46.34	42.50	36.82
EOM	27.28	26.85	23.20	31.28	21.53	22.93	24.90	39.84	40.79	46.86	40.28	38.08

WATER YEAR 1988 HIGHEST 18.05 MAR 04, 1988 LOWEST 47.40 AUG 16, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	34.00	31.20	29.53	20.87	19.71	18.25	20.40	31.78	39.12	47.20	46.10	44.30
10	35.59	31.62	19.48	19.08	19.55	18.77	27.12	23.38	38.18	45.10	44.28	49.60
15	35.19	24.50	29.66	20.59	19.42	18.85	25.30	31.78	38.55	43.98	44.96	38.62
20	26.56	27.10	28.65	19.69	---	20.20	20.58	35.54	41.10	43.50	43.27	36.21
25	27.55	23.78	22.15	19.64	26.27	28.50	28.26	35.46	41.62	45.32	43.00	37.54
EOM	31.28	25.10	28.12	19.75	18.33	28.93	30.48	39.73	42.58	45.90	43.84	34.02

WATER YEAR 1989 HIGHEST 15.72 MAR 06, 1989 LOWEST 49.60 SEP 10, 1989



GROUND-WATER LEVELS

405

ACCOMACK COUNTY--Continued

375617075273701. Local number, 67M 14 SOW 115E.

LOCATION.--Lat 37°56'17", long 75°27'37", Hydrologic Unit 02060010, 100 ft west of State Highway 175, inside fence of NASA Wallops Flight Center, 2.1 mi northeast of intersection of State Highways 175 and 798, and 2.1 mi east of Wattsville. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 280 ft, screened 260 to 280 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 26 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 1.3 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--October 1981 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.45 ft below land-surface datum, June 9, 1982; lowest recorded, 42.45 ft below land-surface datum, Aug. 17, 18, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

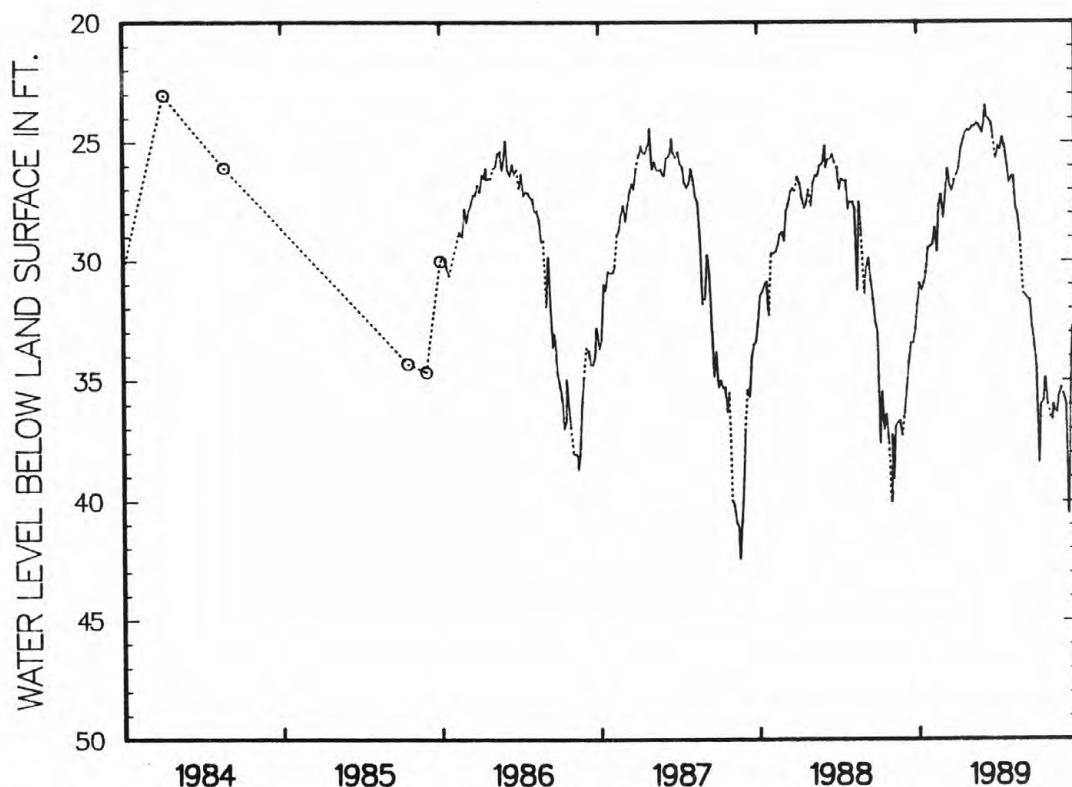
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	31.47	29.70	27.91	26.77	26.71	26.10	27.03	27.52	30.27	37.65	39.12	35.27
10	31.28	29.62	27.59	27.33	26.39	25.72	26.53	27.85	29.90	35.48	36.89	34.29
15	31.00	29.37	27.11	27.82	26.46	25.70	26.63	31.29	30.87	37.10	36.75	33.47
20	30.88	28.88	26.93	27.61	25.98	25.52	26.63	27.52	31.62	36.41	36.68	33.49
25	32.32	28.78	27.08	27.00	25.93	25.85	27.88	28.92	32.64	37.62	37.32	32.88
EOM	29.69	29.18	26.48	27.73	25.71	26.05	27.53	31.43	33.11	40.04	36.39	31.88

WATER YEAR 1988 HIGHEST 25.15 MAR 04, 1988 LOWEST 40.04 JUL 31, AUG 01, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	30.94	29.35	27.22	26.10	24.36	23.98	25.20	26.48	31.49	38.45	36.65	36.02
10	31.28	28.60	26.13	25.28	24.38	23.97	25.33	26.45	31.62	35.98	36.25	40.56
15	30.95	29.65	26.85	24.95	24.22	24.07	24.80	27.80	31.68	35.88	36.35	36.03
20	30.50	27.61	27.08	24.60	24.33	24.22	25.14	28.15	32.77	34.92	35.64	32.90
25	29.47	27.23	26.66	24.51	24.52	24.83	25.86	29.14	33.50	35.99	35.31	32.39
EOM	29.40	28.23	26.38	24.56	24.65	25.70	26.74	31.38	34.36	36.50	35.65	31.07

WATER YEAR 1989 HIGHEST 23.50 MAR 07, 1989 LOWEST 40.56 SEP 10, 11, 1989



GROUND-WATER LEVELS

ALBEMARLE COUNTY

380333078264801. Local number, 43N 1 SOW 028.

LOCATION.--Lat 38°03'33", long 78°26'48", Hydrologic Unit 02080204, at Key West Subdivision, 1.1 mi east of Charlottesville. Owner: Key West Development Corporation.

AQUIFER.--Lynchburg Formation of Precambrian age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in., depth 409 ft, cased to 52 ft, open hole 52 to 409 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 345 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.2 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1967 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 8.65 ft below land-surface datum, May 3, 1984; lowest recorded, 22.10 ft below land-surface datum, Nov. 30, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	17.50	17.73	17.81	17.71	17.27	16.50	16.15	16.00	15.70	15.41	15.50	15.64
10	17.52	17.67	17.86	17.60	17.22	15.70	16.28	13.94	14.22	15.73	15.67	15.68
15	17.60	17.83	17.71	17.52	17.10	15.77	16.41	14.29	14.46	15.83	15.64	15.70
20	17.71	17.93	18.00	17.11	16.75	16.00	16.33	14.82	14.80	15.67	15.61	15.62
25	17.70	17.73	17.90	17.09	16.48	15.75	16.34	15.24	15.00	15.43	15.59	15.55
EOM	17.80	17.52	17.80	16.98	16.40	15.76	16.48	15.52	15.18	14.49	15.55	15.35

WATER YEAR 1989 HIGHEST 13.80 MAY 11, 12, 1989 LOWEST 18.02 DEC 23, 1988

AMELIA COUNTY

372709077585801. Local number, 47H 1 SOW 166.

LOCATION.--Lat 37°27'09", long 77°58'58", Hydrologic Unit 02080207, 800 ft north of State Highway 616, 0.95 mi west of intersection of State Highways 616 and 609, and 2.3 mi east of Lodore. Owner: R. K. Anderson.

AQUIFER.--Saprolite of the Wissahickon Schist.

WELL CHARACTERISTICS.--Dug unused water well, diameter 48 in., depth 44 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 340 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, at land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--May 1983 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 34.86 ft below land-surface datum, July 30, 1984; lowest measured, 37.42 ft below land-surface datum, Jan. 5, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 13	36.51	MAR 08	36.20	MAY 03	35.85	JUN 21	35.90	AUG 09	36.78	SEP 15	36.75
JAN 19	36.68										

WATER YEAR 1988 HIGHEST 35.85 MAY 03, 1988 LOWEST 36.78 AUG 09, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	36.86	JAN 05	37.42	APR 24	37.30	JUN 19	36.70	AUG 07	36.43		

WATER YEAR 1989 HIGHEST 36.43 AUG 07, 1989 LOWEST 37.42 JAN 05, 1989

GROUND-WATER LEVELS

407

APPOMATTOX COUNTY

372133078493701. Local number, 40G 1 SOW 012.

LOCATION.--Lat 37°21'33", long 78°49'37", Hydrologic Unit 02080207, 0.45 mi east of State Highway 131, 300 ft north of U.S. Highway 460 in the town of Appomattox. Owner: Town of Appomattox.

AQUIFER.--Metamorphic rock of uncertain age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 8 in., depth 288 ft, cased to 40 ft, open hole 40 to 288 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 860 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--May 1949, October 1967 to current year. Unpublished record available in May 1949 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 34.78 ft below land-surface datum, June 13, 1973; lowest recorded, 58.21 ft below land-surface datum, Nov. 17, 18, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	52.01	52.19	52.65	53.05	53.82	53.79	53.33	52.45	51.31	50.29	49.20	48.99
10	51.91	52.30	52.77	53.25	53.87	53.74	53.20	52.12	51.21	49.99	49.29	48.86
15	52.11	52.36	52.95	53.20	53.86	53.75	53.00	51.92	51.01	49.88	49.12	48.90
20	52.17	52.40	52.97	53.43	53.71	53.68	52.90	51.88	50.78	49.60	48.97	48.94
25	52.19	52.55	52.95	53.53	53.81	53.53	52.78	51.68	50.70	49.47	48.98	48.80
DOM	52.26	52.53	52.90	53.66	53.88	53.29	52.56	51.43	50.64	49.22	49.00	48.60

WATER YEAR 1989 HIGHEST 48.36 SEP 29, 1989 LOWEST 53.91 FEB 09, 1989

372514078394301. Local number, 41H 2.

LOCATION.--Lat 37°25'14", long 78°39'43", Hydrologic Unit 02080207, 1.0 mi south of intersection of State Highway 636 on the east side of State Highway 640, 2.8 mi southeast of Sliders. Owner: U.S. Geological Survey.

AQUIFER.--Candler Formation of Paleozoic age.

WELL CHARACTERISTICS.--Augered observation water well, diameter 3 in. to 68 ft, diameter 1.25 in. from 68 to 73 ft, depth 73 ft, screened 68 to 73 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 640 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum.

PERIOD OF RECORD.--March 1971 to current year. Unpublished records available prior to October 1977 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 32.99 ft below land-surface datum, May 20, 1973; lowest measured, 49.41 ft below land-surface datum, Mar. 30, 1971.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	46.09	JAN 12	47.29	APR 18	47.00	JUN 12	45.30	JUL 18	44.55	AUG 18	44.18
NOV 22	46.65	MAR 08	47.73								

WATER YEAR 1989 HIGHEST 44.18 AUG. 18, 1989 LOWEST 47.73 MAR 08, 1989

ARLINGTON COUNTY

385346077073701. Local number, 53V 1.

LOCATION.--Lat 38°53'46", long 77°07'37", Hydrologic Unit 02070010, at Langston School, 4854 Lee Highway in Arlington. Owner: Arlington County School Board.

AQUIFER.--Brandywine Formation of Pleistocene age and Bryn Mawr (?) gravel of Pliocene (?) age, overlying the Sykesville Formation of Precambrian age.

WELL CHARACTERISTICS.--Dug unused water well, diameter 24 in., depth 35 ft, terracotta casing.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 410 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Inner flange of manhole, at land-surface datum.

PERIOD OF RECORD.--October 1931 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.74 ft below land-surface datum, Apr. 20, 1935; lowest measured, 34.81 ft below land-surface datum, Dec. 5, 1931.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 28	28.87	MAR 29	26.50	JUN 27	21.31	JUL 26	21.70	AUG 28	23.70	SEP 28	24.43
JAN 30	28.70	MAY 25	22.44								

WATER YEAR 1989 HIGHEST 21.31 JUN 27, 1989 LOWEST 28.87 NOV 28, 1988

GROUND-WATER LEVELS

ARLINGTON COUNTY--Continued

385253077042301. Local number, 54V 3.

LOCATION.--Lat 38°52'53", long 77°04'23", Hydrologic Unit 02070010, at Arlington National Cemetery in Arlington.

Owner: NPS National Capitol Parks.

AQUIFER.--Terrace gravels of Holocene age and sand of early Cretaceous age.

WELL CHARACTERISTICS.--Dug unused water well, diameter 48 in., depth 50 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 205 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of brick and stone casing, 3.0 ft above land-surface datum.

PERIOD OF RECORD.--January 1958 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 40.34 ft below land-surface datum, June 26, 1978; lowest measured, 45.28 ft below land-surface datum, Nov. 28, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 28	45.28	MAY 25	44.34	JUN 27	42.62	JUL 26	42.25	AUG 28	42.15	SEP 28	42.50
MAR 29	44.24										

WATER YEAR 1989 HIGHEST 42.15 AUG 28, 1989 LOWEST 45.28 NOV 28, 1988

AUGUSTA COUNTY

382523078535501. Local number, 38P 1 SOW 070.

LOCATION.--Lat 38°07'48", long 79°04'07", Hydrologic Unit 02070005, 100 ft east of State Highway 613, 0.5 mi south of intersection of State Highway 613 and U.S. Highway 11, and 0.9 mi south of Dogwood Hill. Owner: Augusta County Water Authority.

AQUIFER.--Beekmantown Group of early Ordovician age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 8 in. to 30 ft, diameter 6 in. from 30 to 97 ft, depth 250 ft, open hole from 97 to 250 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 1,490 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--December 1973 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 11.70 ft below land-surface datum, Apr. 25, 1987; lowest measured, 27.79 ft below land-surface datum, Oct. 20, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	20.20	20.86	20.57	20.49	20.38	20.82	21.22	21.54	21.17	21.78	21.53	21.70
10	20.18	20.91	20.70	20.69	20.45	20.94	21.20	21.40	21.30	21.86	21.63	21.80
15	20.40	20.82	20.72	20.80	20.55	21.04	21.24	21.52	21.40	21.70	21.75	21.91
20	20.58	20.77	20.67	20.77	20.22	21.10	21.29	21.00	21.51	21.72	21.87	21.97
25	20.70	20.85	20.76	20.28	20.60	21.19	21.35	21.14	21.56	21.11	21.84	22.01
EOM	20.78	20.40	20.18	20.46	20.72	21.16	21.40	21.10	21.68	21.34	21.70	22.00

WATER YEAR 1988 HIGHEST 19.95 JAN 20, 1988 LOWEST 22.02 SEP 24, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	22.05	22.27	22.14	22.33	22.13	21.70	20.60	18.10	19.08	19.56	20.00	19.70
10	22.11	22.17	22.20	22.38	22.20	20.53	---	15.90	18.48	19.68	20.26	19.88
15	22.18	22.23	22.27	22.40	22.22	20.79	---	16.91	18.93	19.65	19.99	19.84
20	22.23	22.21	22.35	21.89	21.80	20.92	20.82	17.70	19.15	19.69	20.04	19.17
25	22.22	21.93	22.34	22.07	21.58	20.10	20.95	18.27	19.30	19.89	19.18	18.66
EOM	22.30	21.97	22.24	22.10	21.60	20.42	20.56	18.78	19.39	19.90	19.35	18.69

WATER YEAR 1989 HIGHEST 15.80 MAY 06, 07, 10, 1989 LOWEST 22.40 JAN 14, 15, 1989

GROUND-WATER LEVELS

409

BUCHANAN COUNTY

370443082022301. Local number, 14E 40.

LOCATION.--Lat 37°04'43", long 82°02'23", Hydrologic Unit 05070202, 50 ft south of the intersection of State Highways 622 and 620, at Grissom School. Owner: U.S. Geological Survey.

AQUIFER.--Jawbone coalbed of Norton Formation of Pennsylvanian age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in., depth 60 ft, cased to 14 ft, open hole 14 to 60 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 1,820 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.8 ft above land-surface datum.

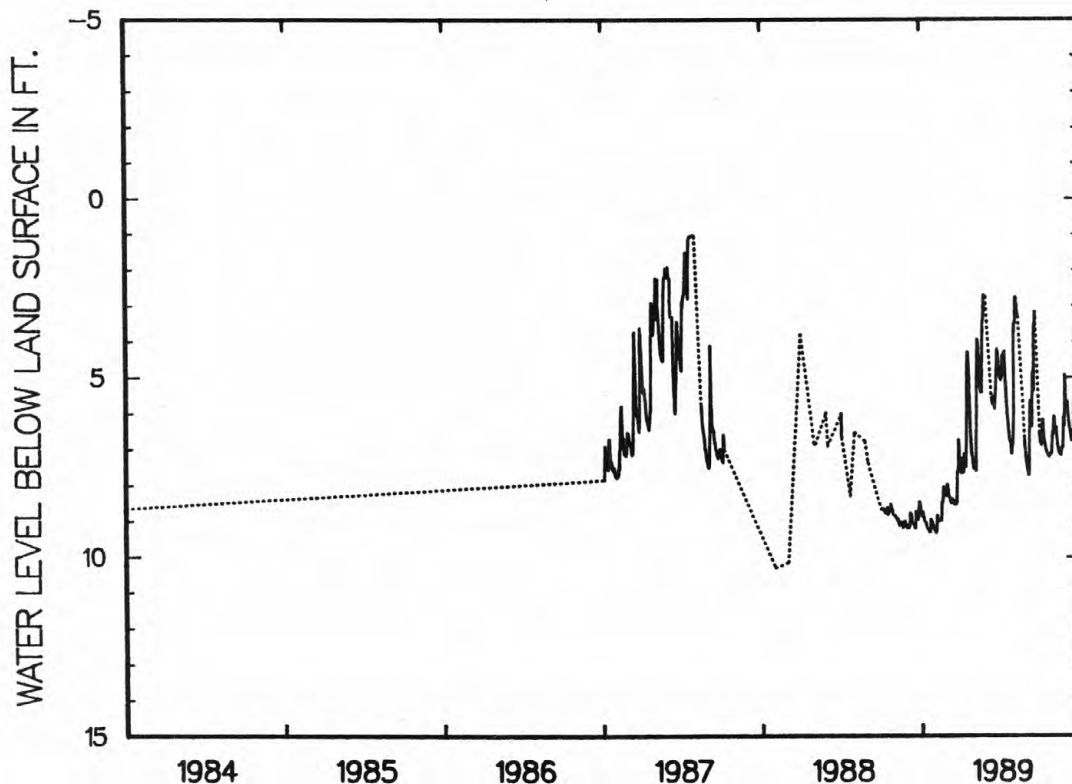
PERIOD OF RECORD.--August 1982 to September 1983, October 1986 to current year. Unpublished records available prior to October 1986 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 0.99 ft below land-surface datum, Apr. 30, 1987; lowest measured, 11.49 ft below land-surface datum, Oct. 6, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	8.86	9.24	8.41	7.67	4.80	---	4.41	3.48	7.74	6.69	6.50	6.33
10	9.04	8.93	8.38	7.40	4.71	5.59	4.29	3.28	6.06	6.73	6.92	6.75
15	9.24	9.00	8.47	4.31	5.37	5.65	5.78	---	5.26	7.05	7.14	6.51
20	9.34	8.14	8.52	6.11	3.34	5.38	6.54	---	3.18	7.24	6.96	6.04
25	9.05	8.29	6.73	7.20	2.78	4.31	6.84	---	---	7.15	6.36	3.29
EOM	9.26	8.09	7.67	7.39	---	5.09	6.58	7.46	6.67	6.40	5.66	4.08

WATER YEAR 1989 HIGHEST 2.53 FEB 22, 1989 LOWEST 9.36 NOV 02, 1988



BUCKINGHAM COUNTY

372541078392101. Local number, 41H 1.

LOCATION.--Lat 37°25'41", long 78°39'21", Hydrologic Unit 02080207, 200 ft east of State Highway 640, 2.6 mi southeast of Sliders. Owner: U.S. Geological Survey.

AQUIFER.--Candler Formation of Paleozoic age.

WELL CHARACTERISTICS.--Augered observation water well, diameter 3 in. to 83 ft, diameter 1.25 in. from 83 to 88 ft, depth 88 ft, screened 83 to 88 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 660 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.2 ft above land-surface datum.

PERIOD OF RECORD.--March 1971 to current year. Unpublished records available prior to October 1977 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 30.95 ft below land-surface datum, May 20, 1973; lowest measured, 50.81 ft below land-surface datum, Mar. 8, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	50.30	JAN 12	50.70	APR 18	49.75	JUN 12	47.46	JUL 18	46.40	AUG 18	46.30
NOV 22	50.08	MAR 8	50.81								

WATER YEAR 1989 HIGHEST 46.30 AUG 18, 1989 LOWEST 50.81 MAR 08, 1989

372608078404601. Local number, 41H 3.

LOCATION.--Lat 37°26'08", long 78°40'46", Hydrologic Unit 02080207, 0.85 mi west of Ranger Headquarters on south side of dirt road off State Highway 636, 1.5 mi south of Sliders. Owner: U.S. Geological Survey.

AQUIFER.--Candler Formation of Paleozoic age.

WELL CHARACTERISTICS.--Augered observation water well, diameter 3 in. to 49 ft, diameter 1.25 in. from 49 to 54 ft, depth 54 ft, screened 49 to 54 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 683.8 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 1.3 ft above land-surface datum.

REMARKS.--Prior to Oct. 1, 1981, well was reported as being located in Appomattox County.

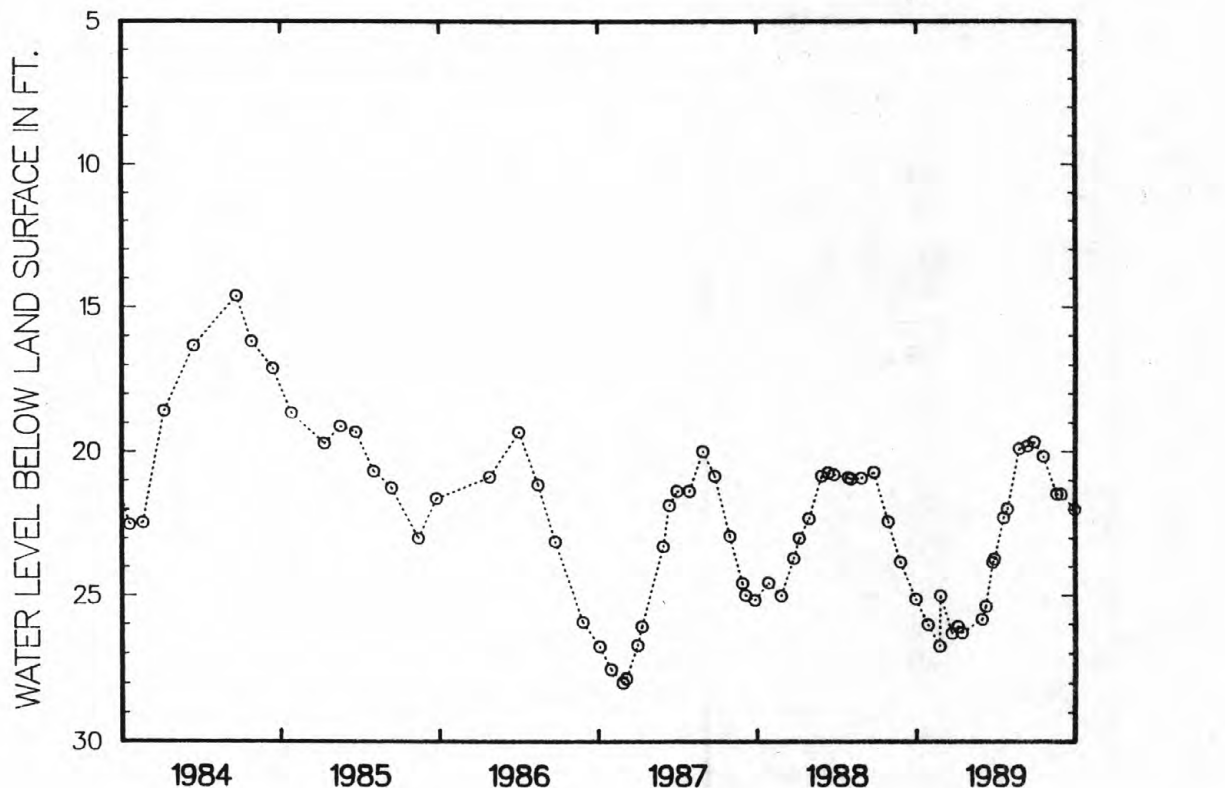
PERIOD OF RECORD.--March 1971 to current year. Unpublished records available prior to October 1977 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 7.31 ft below land-surface datum, Apr. 12, 1973; lowest measured, 28.30 ft below land-surface datum, Oct. 17, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	26.02	DEC 20	26.32	FEB 27	25.84	MAR 28	23.73	MAY 24	19.90	AUG 28	21.47
NOV 22	26.76	JAN 03	26.09	MAR 08	25.38	APR 18	22.29	JUN 27	19.67	SEP 28	22.00
24	25.02	12	26.30	24	23.85	27	21.98	JUL 18	20.17		

WATER YEAR 1989 HIGHEST 19.67 JUN 27, 1989 LOWEST 26.76 NOV 22, 1988



GROUND-WATER LEVELS

411

BUCKINGHAM COUNTY--Continued

372519078374001. Local number, 41H 4.

LOCATION.--Lat 37°25'19", long 78°37'40", Hydrologic Unit 02080207, 0.65 mi northeast of Holiday Creek, 0.85 mi southeast of State Highway 636 off State Highway 614, and 4.0 mi southeast of Sliders. Owner: U.S. Geological Survey.

AQUIFER.--Candler Formation of Paleozoic age.

WELL CHARACTERISTICS.--Augered observation water well, diameter 3 in. to 72 ft, diameter 1.25 in. from 72 to 77 ft, depth 77 ft, screened 72 to 77 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 647 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.4 ft above land-surface datum.

PERIOD OF RECORD.--March 1971 to current year. Unpublished records available prior to October 1977 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 28.45 ft below land-surface datum, May 1, 1980; lowest measured, 48.13 ft below land-surface datum, Mar. 30, 1971.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	42.50	JAN 12	42.73	MAR 08	41.48	APR 18	39.58	JUN 12	37.16	JUL 18	36.95
NOV 22	42.95										

WATER YEAR 1989 HIGHEST 36.95 JUL 18, 1989 LOWEST 42.95 NOV 22, 1988

CHARLES CITY COUNTY

372014077073001. Local number, 53G 7.

LOCATION.--Lat 37°20'14", long 77°07'30", Hydrologic Unit 02080206, 0.25 mi north of State Highway 5, 2.35 mi east of the intersection of State Highways 5 and 603, and 3.2 mi west of Charles City Courthouse. Owner: Archer H. Ruffin.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 314 ft, screened 280 to 305 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Oct. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 50 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

PERIOD OF RECORD.--December 1971, December 1974, October 1983 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 61.48 ft below land-surface datum, Dec. 3, 1971; lowest measured, 78.34 ft below land-surface datum, Sept. 19, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 18	77.93

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 14	71.99	MAR 21	77.71	JUN 21	74.27	SEP 19	78.34

WATER YEAR 1989 HIGHEST 71.99 DEC 14, 1988 LOWEST 78.34 SEP 19, 1989

GROUND-WATER LEVELS

CHARLES CITY COUNTY--Continued

371951077092001. Local number, 53G 14.

LOCATION.--Lat 37°19'51", long 77°09'20", Hydrologic Unit 02080206, 0.25 mi south of State Highway 5, 0.6 mi east of the intersection of State Highways 5 and 609, and 4.7 mi west of Charles City Courthouse. Owner: Evelyn Association.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 321 ft, screened 311 to 321 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 70 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

PERIOD OF RECORD.--December 1984 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 82.00 ft below land-surface datum, Feb. 11, 1987; lowest measured, 90.28 ft below land-surface datum, June 21, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 18	88.22

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 14	89.95	MAR 21	89.26	JUN 21	90.28	SEP 19	90.14

WATER YEAR 1989 HIGHEST 89.26 MAR 21, 1989 LOWEST 90.28 JUN 21, 1989

371956077055203. Local number, 54G 11 SOW 066.

LOCATION.--Lat 37°19'56", long 77°05'52", Hydrologic Unit 02080206, 0.6 mi east of Bowens Store on State Highway 5, 1.6 mi west of Charles City. Owner: Virginia Water Control Board.

AQUIFER.--Sand and gravel of undifferentiated Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 6 in., depth 540 ft, screened 290 to 310 ft, 404 to 424 ft, 486 to 496 ft, 510 to 530 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 54 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 2.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--May 1973 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 50.07 ft below land-surface datum, May 1, 1973; lowest measured, 66.30 ft below land-surface datum, Oct. 14, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	66.30	JAN 13	66.10	MAR 01	65.90	MAY 01	65.70	JUN 14	66.00	AUG 03	66.20
NOV 23	66.20										

WATER YEAR 1989 HIGHEST 65.70 MAY 01, 1989 LOWEST 66.30 OCT 14, 1988

371956076055101. Local number, 54G 13 SOW 067.

LOCATION.--Lat 37°19'56", long 77°05'51", Hydrologic Unit 02080206, 0.6 mi east of Bowens Store on State Highway 5, 1.6 mi southwest of Charles City. Owner: Virginia Water Control Board.

AQUIFER.--Sand and gravel of undifferentiated Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 227 ft, screened 222 to 227 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 35 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.4 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1973 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 44.63 ft below land-surface datum, June 7, 1973; lowest measured, 60.10 ft below land-surface datum, Oct. 14, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	60.10	JAN 13	59.80	MAR 01	59.70	MAY 01	59.50	JUN 14	59.80	AUG 03	60.00
NOV 23	60.00										

WATER YEAR 1989 HIGHEST 59.50 MAY 01, 1989 LOWEST 60.10 OCT 14, 1988

GROUND-WATER LEVELS

413

CITY OF CHESAPEAKE

364852076252201. Local number, 59C 29 SOW 163A.

LOCATION.--Lat 36°48'52", long 76°25'22", Hydrologic Unit 02080208, 0.7 mi southeast of intersection of State Highways 191 and 337 in Chesapeake. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 35 ft, screened 25 to 35 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.9 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--November 1981 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.70 ft below land-surface datum, Mar. 14, 1989; lowest measured, 10.00 ft below land-surface datum, Nov. 18, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	8.80	JAN 17	6.50	MAR 14	2.70	APR 25	3.75	JUN 22	6.30	AUG 10	7.50
NOV 22	7.90										

WATER YEAR 1989 HIGHEST 2.70 MAR 14, 1989 LOWEST 8.80 OCT 18, 1988

364852076252202. Local number, 59C 30 SOW 163B.

LOCATION.--Lat 36°48'52", long 76°25'22", Hydrologic Unit 02080208, 0.7 mi southeast of intersection of State Highways 191 and 337 in Chesapeake. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 948 ft, screened 938 to 948 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.8 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--November 1981 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 67.06 ft below land-surface datum, May 25, 1983; lowest measured, 78.72 ft below land-surface datum, Jan. 12, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	78.30	JAN 17	78.20	MAR 14	77.70	APR 25	77.70	JUN 22	77.80	AUG 10	78.10
NOV 22	78.15										

WATER YEAR 1989 HIGHEST 77.70 MAR 14, APR 25, 1989 LOWEST 78.30 OCT 18, 1988

364852076252203. Local number, 59C 31 SOW 163C.

LOCATION.--Lat 36°48'52", long 76°25'22", Hydrologic Unit 02080208, 0.7 mi southeast of intersection of State Highways 191 and 337 in Chesapeake. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 631 ft, screened 621 to 631 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.2 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--November 1981 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 67.13 ft below land-surface datum, Feb. 23, 1983; lowest measured, 79.15 ft below land-surface datum, Jan. 12, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	78.90	JAN 17	78.50	MAR 14	78.20	APR 25	77.95	JUN 22	78.30	AUG 10	78.60
NOV 22	78.50										

WATER YEAR 1989 HIGHEST 77.95 APR 25, 1989 LOWEST 78.90 OCT 18, 1988

GROUND-WATER LEVELS

CITY OF CHESAPEAKE--Continued

364621076273201. Local number, 59C 36.

LOCATION.--Lat 36°46'21", long 76°27'32", Hydrologic Unit 02080208, 2.5 mi southwest of the intersection of U.S. Highways 13, 58, 460, and Interstate Highways 264 and 64 near Bowers Hills in the city of Chesapeake.

Owner: City of Chesapeake.

AQUIFER.--Sands of middle and late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 880 ft, screened 602 to 607 ft, 659 to 664 ft, 706 to 716 ft, 800 to 805 ft, 854 to 859 ft.

INSTRUMENTATION.--Occasional measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 22 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.2 ft above land-surface datum.

PERIOD OF RECORD.--August 1986 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 85.46 ft below land-surface datum, Aug. 20, 25, 1986; lowest measured, 89.62 ft below land-surface datum, Mar. 7, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

	DATE	WATER LEVEL	DATE	WATER LEVEL
	NOV 04	87.92	MAR 07	89.62
WATER YEAR 1988	HIGHEST	87.92	NOV 04, 1987	LOWEST 89.62 MAR 07, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
	MAR 29	87.92	JUN 19	88.04	SEP 18	88.10
WATER YEAR 1989	HIGHEST	87.92	MAR 29, 1989	LOWEST	88.10	SEP 18, 1989

363836076201701. Local number, 60B 3 SOW 090A.

LOCATION.--Lat 36°38'36", long 76°20'17", Hydrologic Unit 03010205, 0.15 mi north of intersection of Benefit and West Roads, 1.5 mi north of Cornland. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 855 ft, screened 824 to 834 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 16 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--July 1978 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 52.61 ft below land-surface datum, Sept. 19, 1979; lowest recorded, 70.16 ft below land-surface datum, Feb. 17, 18, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	70.07	69.91	69.99	70.00	70.07	69.86	69.87	69.89	69.96	69.97	70.03	70.02
10	70.09	70.02	69.96	70.02	70.07	69.87	69.87	69.83	69.89	69.92	70.10	70.02
15	70.10	70.04	69.96	69.95	70.07	69.78	69.90	69.88	69.93	69.92	69.84	70.05
20	70.08	69.99	70.01	69.94	69.97	69.91	69.88	69.94	70.00	69.87	69.77	69.96
25	70.06	69.95	70.01	70.03	69.88	69.77	69.89	69.89	69.92	70.03	69.80	70.04
EOM	70.11	69.99	70.02	69.96	69.84	69.78	69.90	70.03	69.95	70.05	69.90	70.02

WATER YEAR 1989 HIGHEST 69.67 APR 07, 1989 LOWEST 70.16 FEB 17, 18, 1989

363836076201702. Local number, 60B 4 SOW 090B.

LOCATION.--Lat 36°38'36", long 76°20'17", Hydrologic Unit 03010205, 0.15 mi north of intersection of Benefit and West Roads, 1.5 mi north of Cornland. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous-early Paleocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 556 ft, screened 525 to 535 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 16 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.05 ft above land-surface datum prior to Mar. 2, 1988; 1.2 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1978 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.20 ft above land-surface datum, Feb. 1, 1978; lowest measured, 3.35 ft below land-surface datum, Oct. 17, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	3.35	DEC 19	3.32	MAR 13	3.00	APR 25	3.10	JUN 21	3.32	AUG 17	3.10
NOV 16	3.20	JAN 11	3.30								
WATER YEAR 1989	HIGHEST	3.00	MAR 13, 1989	LOWEST	3.35	OCT 17, 1988					

CITY OF CHESAPEAKE--Continued

364615076182101. Local number, 60C 41 SOW 164.

LOCATION.--Lat 36°46'15", long 76°18'21", Hydrologic Unit 02080208, 50 ft north of entrance road to Virginia Power powerplant, 500 ft south of Military Highway in Chesapeake. Owner: Virginia Power.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in. to 400 ft, diameter 4 in. from 400 to 928 ft, depth 928 ft, screened 770 to 780 ft, 875 to 885 ft, 918 to 928 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 10 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.6 ft above land-surface datum prior to July 15, 1987; 1.5 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1982 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 55.22 ft below land-surface datum, Mar. 15, 1983; lowest recorded, 66.19 ft below land-surface datum, Sept. 15, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	---	64.27	64.73	65.01	65.09	64.80	64.66	64.75	65.20	65.44	65.56
10	---	---	64.30	64.70	65.10	64.71	64.73	64.62	64.70	65.16	65.43	65.68
15	---	---	64.37	64.98	65.20	65.00	64.85	64.65	64.83	65.18	65.58	65.73
20	---	64.25	64.58	64.82	64.89	65.02	64.68	64.50	64.86	65.29	65.43	65.75
25	---	64.52	64.60	64.71	64.90	65.02	64.66	64.56	64.90	65.27	65.57	65.82
EOM	---	64.10	64.63	65.11	64.91	64.89	64.67	64.65	64.91	65.41	65.65	65.91

WATER YEAR 1988 HIGHEST 63.63 NOV 30, 1987 LOWEST 65.91 SEP 30, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	65.76	65.60	65.80	65.93	---	---	65.75	65.77	65.85	65.89	65.93	65.95
10	65.85	65.79	65.77	66.08	---	---	65.66	65.41	65.70	65.89	66.07	65.99
15	65.94	65.80	65.86	65.80	---	65.68	65.65	65.63	65.73	65.89	65.82	66.19
20	65.89	65.75	66.13	---	---	65.76	65.68	65.70	65.90	65.88	65.88	66.00
25	65.79	65.76	66.01	---	---	65.62	65.68	65.70	65.88	66.00	65.83	66.10
EOM	65.80	65.72	65.93	---	---	65.47	65.73	65.90	65.92	66.04	66.00	66.09

WATER YEAR 1989 HIGHEST 65.05 NOV 24, 1988 LOWEST 66.19 SEP 15, 1989

363502076091201. Local number, 61A 3 SOW 132.

LOCATION.--Lat 36°35'02", long 76°09'12", Hydrologic Unit 03010205, 250 ft south of Indian Creek Road, 0.2 mi southeast of entrance to Northwest River Park, and 3.0 mi southeast of Saint Brides. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 1.5 in., depth 36 ft, screened 28 to 36 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 10 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.7 ft above land-surface datum prior to Mar. 2, 1988; 0.15 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--May 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.95 ft below land-surface datum, Jan. 24, 1980; lowest measured, 9.87 ft below land-surface datum, Sept. 26, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	9.55	JAN 13	7.60	MAR 02	5.25	APR 27	3.33	JUN 21	3.90	AUG 03	7.90
WATER YEAR 1988		HIGHEST	3.33	APR 27, 1988	LOWEST		9.55	NOV 18, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	9.75	JAN 11	8.45	MAR 13	3.30	APR 25	3.25	JUN 21	7.75	AUG 17	6.35
NOV 16	9.65										
WATER YEAR 1989		HIGHEST	3.25	APR 25, 1989	LOWEST		9.75	OCT 17, 1988			

GROUND-WATER LEVELS

CITY OF CHESAPEAKE--Continued

364227076074701. Local number, 61B 2 SOW 091A.

LOCATION.--Lat 36°42'27", long 76°07'47", Hydrologic Unit 03010205, 300 ft south of Lockheed Avenue, 0.7 mi east of intersection of State Highway 165 and Lockheed Avenue, and 3.8 mi east of Fentress. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 97 ft, screened 92 to 97 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.05 ft above land-surface datum prior to Jan. 11, 1989; 0.75 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--November 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.01 ft below land-surface datum, Oct. 16, 1979; lowest measured, 10.30 ft below land-surface datum, Sept. 18, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
	NOV 19	9.45	JAN 13	7.42	MAR 15	7.15
WATER YEAR 1988	HIGHEST	7.15	MAR 15, 1988	LOWEST	9.45	NOV 19, 1987

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 11	8.35	MAR 13	6.85	APR 20	6.55	JUN 21	7.85	AUG 10	9.05
WATER YEAR 1989	HIGHEST	6.55	APR 20, 1989	LOWEST	9.05	AUG 10, 1989			

364227076074702. Local number, 61B 5 SOW 091B.

LOCATION.--Lat 36°42'27", long 76°07'47", Hydrologic Unit 03010205, 300 ft south of Lockheed Avenue, 0.7 mi east of intersection of State Highway 165 and Lockheed Avenue, and 3.8 mi east of Fentress. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 1,060 ft, screened 1,040 to 1,060 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--May 1979 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 27.83 ft below land-surface datum, Aug. 28, 1980; lowest measured, 51.90 ft below land-surface datum, Aug. 10, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	50.02	JAN 13	50.02	MAR 15	50.30	MAY 10	50.48	JUN 21	50.66	AUG 03	51.09
WATER YEAR 1988	HIGHEST	50.02	NOV 19, 1987, JAN 13, 1988	LOWEST	51.09	AUG 03, 1988					

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	51.40	JAN 11	51.40	MAR 13	51.40	APR 20	51.60	JUN 21	51.80	AUG 10	51.90
NOV 16	51.40										
WATER YEAR 1989	HIGHEST	51.40	OCT 17, NOV 16, 1988, JAN 11, MAR 13, 1989	LOWEST	51.90	AUG 10, 1989					

GROUND-WATER LEVELS

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CITY OF CHESAPEAKE--Continued

364227076074703. Local number, 61B 6 SOW 091C.

LOCATION.--Lat 36°42'27", long 76°07'47", Hydrologic Unit 03010205, 300 ft south of Lockheed Avenue, 0.7 mi east of intersection of State Highway 165 and Lockheed Avenue, and 3.8 mi east of Fentress. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 780 ft, screened 760 to 780 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 7.0 ft above land-surface datum prior to Jan. 11, 1989; 1.2 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--May 1979 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.37 ft above land-surface datum, July 26, 1979; lowest measured, 2.45 ft above land-surface datum, Aug. 10, 1989.

WATER LEVEL, IN FEET ABOVE LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	3.01	JAN 13	3.16	MAR 15	3.26	MAY 10	3.26	JUN 21	3.02	AUG 03	2.90

NOTE.--Flowing well, readings given are above land-surface datum.

WATER YEAR 1988 HIGHEST 3.26 MAR 15, MAY 10, 1988 LOWEST 2.90 AUG 03, 1988

WATER LEVEL, IN FEET ABOVE LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	2.60	JAN 11	2.63	MAR 13	2.85	APR 20	2.66	JUN 21	2.54	AUG 10	2.45
NOV 16	2.60										

NOTE.--Flowing well, readings given are above land-surface datum.

WATER YEAR 1989 HIGHEST 2.85 MAR 13, 1989 LOWEST 2.45 AUG 10, 1989

364227076074704. Local number, 61B 7 SOW 091D.

LOCATION.--Lat 36°42'27", long 76°07'47", Hydrologic Unit 03010205, 300 ft south of Lockheed Avenue, 0.7 mi east of intersection of State Highway 165 and Lockheed Avenue, and 3.8 mi east of Fentress. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 22 ft, screened 17 to 22 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--May 1979 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.35 ft below land-surface datum, Mar. 13, 1989; lowest measured, 6.22 ft below land-surface datum, Sept. 18, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
	NOV 19	5.55	JAN 13	1.14	MAR 15	2.26

WATER YEAR 1988 HIGHEST 1.14 JAN 13, 1988 LOWEST 5.55 NOV 19, 1987

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	5.60	JAN 11	2.00	MAR 13	0.35	APR 20	1.70	JUN 21	3.50	AUG 10	3.80
NOV 16	3.60										

WATER YEAR 1989 HIGHEST 0.35 MAR 13, 1989 LOWEST 5.60 OCT 17, 1988

GROUND-WATER LEVELS

CITY OF CHESAPEAKE--Continued

364231076140801. Local number, 61B 8 SOW 134.

LOCATION.--Lat 36°42'31", long 76°14'08", Hydrologic Unit 03010205, at Great Bridge Junior High School, in Great Bridge. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 8 in., depth 100 ft, screened 84 to 94 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 20 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.8 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--January 1979 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.80 ft below land-surface datum, Apr. 25, 1989; lowest measured, 16.07 ft below land-surface datum, Sept. 18, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	7.70	JAN 13	5.58	MAR 15	5.21	APR 27	5.05	JUN 21	6.40	AUG 03	8.08
WATER YEAR 1988		HIGHEST	5.05	APR 27, 1988	LOWEST	8.08	AUG 03, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	8.60	JAN 11	8.40	MAR 13	5.40	APR 25	4.80	JUN 21	6.10	AUG 10	6.60
NOV 16	8.30										
WATER YEAR 1989		HIGHEST	4.80	APR 25, 1989	LOWEST	8.60	OCT 17, 1988				

364227076074706. Local number, 61B 12 SOW 091E.

LOCATION.--Lat 36°42'27", long 76°07'47", Hydrologic Unit 03010205, 300 ft south of Lockheed Avenue, 0.7 mi east of intersection of State Highway 165 and Lockheed Avenue, and 3.8 mi east of Fentress. Owner: Virginia Water Control Board.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in. to 1,630 ft, diameter 2 in. from 1,630 to 1,830 ft, depth 1,830 ft, screened 1,820 to 1,830 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.4 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March to September 1989.

EXTREMES FOR PERIOD MARCH TO SEPTEMBER 1989.--Highest water level measured, 41.50 ft below land-surface datum, June 21, 1989; lowest measured, 63.00 ft below land-surface datum, Mar. 13, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, MARCH TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 13	63.00	APR 20	45.00	JUN 21	41.50	AUG 10	41.80
PERIOD MARCH TO SEPTEMBER 1989		HIGHEST	41.50	JUN 21, 1989	LOWEST	63.00	MAR 13, 1989

364227076074707. Local number, 61B 13 SOW 091F.

LOCATION.--Lat 36°42'27", long 76°07'47", Hydrologic Unit 03010205, 300 ft south of Lockheed Avenue, 0.7 mi east of intersection of State Highway 165 and Lockheed Avenue, and 3.8 mi east of Fentress. Owner: Virginia Water Control Board.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in. to 1,270 ft, diameter 2 in. from 1,270 to 1,390 ft, depth 1,390 ft, screened 1,370 to 1,380 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.1 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March to September 1989.

EXTREMES FOR PERIOD MARCH TO SEPTEMBER 1989.--Highest water level measured, 49.00 ft below land-surface datum, Aug. 10, 1989; lowest measured, 55.95 ft below land-surface datum, Mar. 22, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, MARCH TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 07	55.12	MAR 13	52.30	MAR 22	55.95	APR 20	54.10	JUN 21	55.50	AUG 10	49.00
PERIOD MARCH TO SEPTEMBER 1989		HIGHEST	49.00	AUG 10, 1989	LOWEST	55.95	MAR 22, 1989				

GROUND-WATER LEVELS

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CITY OF CHESAPEAKE--Continued

364227076074708. Local number, 61B 14 SOW 091G.

LOCATION.--Lat 36°42'27", long 76°07'47", Hydrologic Unit 03010205, 300 ft south of Lockheed Avenue, 0.7 mi east of intersection of State Highway 165 and Lockheed Avenue, and 3.8 mi east of Fentress. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in. to 987 ft, diameter 2 in. from 987 to 1,110 ft, depth 1,110 ft, screened 1,090 to 1,100 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.9 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March to September 1989.

EXTREMES FOR PERIOD MARCH TO SEPTEMBER 1989.--Highest water level measured, 51.30 ft below land-surface datum, Mar. 22, 1989; lowest measured, 52.60 ft below land-surface datum, Mar. 13, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, MARCH TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 07	51.32	MAR 13	52.60	MAR 22	51.30	APR 20	51.40	JUN 21	51.60	AUG 10	51.70
PERIOD MARCH TO SEPTEMBER 1989				HIGHEST	51.30	MAR 22, 1989	LOWEST	52.60	MAR 13, 1989		

364227076074709. Local number, 61B 15 SOW 091H.

LOCATION.--Lat 36°42'27", long 76°07'47", Hydrologic Unit 03010205, 300 ft south of Lockheed Avenue, 0.7 mi east of intersection of State Highway 165 and Lockheed Avenue, and 3.8 mi east of Fentress. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in. to 700 ft, diameter 2 in. from 674 to 790 ft, depth 790 ft, screened 759 to 769 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.1 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March to September 1989.

EXTREMES FOR PERIOD MARCH TO SEPTEMBER 1989.--Highest Water level measured, 3.75 ft above land-surface datum, Apr. 20, 1989; lowest measured, 3.40 ft above land-surface datum, Aug. 10, 1989.

WATER LEVEL, IN FEET ABOVE LAND-SURFACE DATUM, MARCH TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 13	3.70	APR 20	3.75	JUN 21	3.65	AUG 10	3.40

NOTE.--Flowing well, readings given are above land-surface datum.

PERIOD MARCH TO SEPTEMBER 1989 HIGHEST 3.75 APR 20, 1989 LOWEST 3.40 AUG 10, 1989

364227076074710. Local number, 61B 16 SOW 091J.

LOCATION.--Lat 36°42'27", long 76°07'47", Hydrologic Unit 03010205, 300 ft south of Lockheed Avenue, 0.7 mi east of intersection of State Highway 165 and Lockheed Avenue, and 3.8 mi east of Fentress. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in. to 602 ft, diameter 2 in. from 586 to 690 ft, depth 690 ft, screened 670 to 680 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.1 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March to September 1989.

EXTREMES FOR PERIOD MARCH TO SEPTEMBER 1989.--Highest water level measured, 3.31 ft above land-surface datum, Mar. 23, 1989; lowest measured, 3.00 ft above land-surface datum, Aug. 10, 1989.

WATER LEVEL, IN FEET ABOVE LAND-SURFACE DATUM, MARCH TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 13	3.31	APR 20	3.30	JUN 21	3.14	AUG 10	3.00

NOTE.--Flowing well, readings given are above land-surface datum.

PERIOD MARCH TO SEPTEMBER 1989 HIGHEST 3.31 MAR 13, 1989 LOWEST 3.00 AUG 10, 1989

GROUND-WATER LEVELS

CITY OF CHESAPEAKE--Continued

364227076074711. Local number, 61B 17 SOW 091K.

LOCATION.--Lat 36°42'27", long 76°07'47", Hydrologic Unit 03010205, 300 ft south of Lockheed Avenue, 0.7 mi east of intersection of State Highway 165 and Lockheed Avenue, and 3.8 mi east of Fentress. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in. to 78 ft, diameter 2 in. from 78 to 108 ft, depth 108 ft, screened 88 to 98 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.3 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March to September 1989.

EXTREMES FOR PERIOD MARCH TO SEPTEMBER 1989.--Highest water level measured, 5.70 ft below land-surface datum, Apr. 20, 1989; lowest measured, 7.50 ft below land-surface datum, Aug. 10, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, MARCH TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 13	5.90	APR 20	5.70	JUN 21	6.90	AUG 10	7.50

PERIOD MARCH TO SEPTEMBER 1989 HIGHEST 5.70 APR 20, 1989 LOWEST 7.50 AUG 10, 1989

364227076074712. Local number, 61B 18 SOW 091L.

LOCATION.--Lat 36°42'27", long 76°07'47", Hydrologic Unit 03010205, 300 ft south of Lockheed Avenue, 0.7 mi east of intersection of State Highway 165 and Lockheed Avenue, and 3.8 mi east of Fentress. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in. to 37 ft, diameter 2 in. from 37 to 67 ft, depth 67 ft, screened 57 to 67 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.3 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March to September 1989.

EXTREMES FOR PERIOD MARCH TO SEPTEMBER 1989.--Highest water level measured, 5.40 ft below land-surface datum, Mar. 13, Apr. 20, 1989; lowest measured, 6.90 ft below land-surface datum, June 21, Aug. 10, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, MARCH TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 13	5.40	APR 20	5.40	JUN 21	6.90	AUG 10	6.90

PERIOD MARCH TO SEPTEMBER 1989 HIGHEST 5.40 MAR 13, APR 20, 1989 LOWEST 6.90 JUN 21, AUG 10, 1989

364227076074713. Local number, 61B 19 SOW 091M.

LOCATION.--Lat 36°42'27", long 76°07'47", Hydrologic Unit 03010205, 300 ft south of Lockheed Avenue, 0.7 mi east of intersection of State Highway 165 and Lockheed Avenue, and 3.8 mi east of Fentress. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in., depth 20 ft, screened 10 to 20 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.1 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March to September 1989.

EXTREMES FOR PERIOD MARCH TO SEPTEMBER 1989.--Highest water level measured, 1.70 ft below land-surface datum, Mar. 13, 1989; lowest measured, 4.00 ft below land-surface datum, June 21, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, MARCH TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 13	1.70	APR 20	2.20	JUN 21	4.00	AUG 10	3.80

PERIOD MARCH TO SEPTEMBER 1989 HIGHEST 1.70 MAR 13, 1989 LOWEST 4.00 JUN 21, 1989

CHESTERFIELD COUNTY

372519077264701. Local number, 51H 92.

LOCATION.--Lat 37°25'19", long 77°26'47", Hydrologic Unit 02080206, 500 ft north of Alcott Road at Bensley, 0.3 mi southwest of the intersection of U.S. Highways 1 and 301 (Jefferson Davis Highway) and Alcott Road.
 Owner: U.S. Geological Survey.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 3 in., depth 53 ft, screened 51 to 53 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch. Prior to Oct. 1, 1985, monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 102.31 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 1.5 ft above land-surface datum.

PERIOD OF RECORD.--April 1985 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 8.95 ft below land-surface datum, June 14, 1989; lowest measured, 14.35 ft below land-surface datum, Aug. 16, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
 LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	11.65	12.30	11.30	10.78	10.27	10.21	10.12	10.62	11.17	11.91	11.64	11.85
10	11.80	12.39	11.28	10.70	10.24	10.13	10.07	10.73	11.45	11.93	11.82	11.96
15	11.84	12.11	11.03	10.78	10.03	10.17	10.05	11.01	11.69	12.04	11.77	11.92
20	11.91	11.93	10.86	10.54	9.87	10.25	10.11	11.15	11.48	12.19	11.82	11.94
25	12.15	12.11	10.86	10.39	10.03	10.32	10.18	10.91	11.54	11.84	11.58	12.14
EOM	12.33	11.71	10.90	10.39	10.06	10.25	10.45	11.02	11.80	11.44	11.84	12.33

WATER YEAR 1988 HIGHEST 9.83 FEB 19, 20, 1988 LOWEST 12.39 NOV 06-10, 1987

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
 LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	12.33	11.93	10.99	11.41	11.29	10.21	9.38	-	9.93	10.77	10.83	10.97
10	12.27	11.66	11.01	11.39	11.04	10.05	9.27	-	9.87	10.79	11.13	11.08
15	12.39	11.77	11.08	11.05	10.91	9.82	9.19	-	9.92	10.99	11.08	11.26
20	12.54	11.28	11.22	10.89	10.84	9.87	9.10	-	10.01	10.66	10.45	11.36
25	12.37	11.12	11.36	11.01	10.45	9.59	9.07	-	10.17	10.83	10.39	11.38
EOM	12.52	11.07	11.45	11.03	10.29	9.37	9.18	-	10.52	10.70	10.68	10.90

WATER YEAR 1989 HIGHEST 8.95 JUN 14, 1989 LOWEST 12.55 OCT 21, 1988

372519077264702. Local number, 51H 93.

LOCATION.--Lat 37°25'19", long 77°26'47", Hydrologic Unit 02080206, 500 ft north of Alcott Road at Bensley and 0.3 mi southwest of the intersection of U.S. Highways 1 and 301 (Jefferson Davis Highway) and Alcott Road.
 Owner: U.S. Geological Survey.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 3 in., depth 38 ft, screened 36 to 38 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch. Prior to Oct. 1, 1985, monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 102.40 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 1.9 ft above land-surface datum.

PERIOD OF RECORD.--April 1985 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 8.94 ft below land-surface datum, May 16, 1989; lowest measured, 14.65 ft below land-surface datum, Aug. 16, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
 LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	11.66	12.70	11.32	10.79	10.28	10.24	10.13	10.61	11.15	11.92	11.66	11.87
10	11.81	12.79	11.29	10.71	10.25	10.14	10.08	10.73	11.49	11.94	11.84	11.98
15	11.85	12.53	11.04	10.79	10.05	10.18	10.05	10.99	11.73	12.05	11.80	11.93
20	11.91	12.34	10.88	10.56	9.87	10.26	10.11	11.14	11.52	12.20	11.83	11.95
25	12.56	12.11	10.87	10.41	10.03	10.34	10.19	10.90	11.57	11.88	11.60	12.15
EOM	12.73	11.70	10.92	10.40	10.08	10.27	10.47	11.00	11.86	11.48	11.85	12.35

WATER YEAR 1988 HIGHEST 9.84 FEB 19, 20, 1988 LOWEST 12.80 NOV 07, 1987

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
 LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	12.34	11.95	11.04	11.46	11.34	10.26	9.43	9.23	9.90	10.75	10.84	10.97
10	12.28	11.69	11.05	11.43	11.08	10.11	9.33	9.00	9.85	10.77	11.15	11.10
15	12.41	11.78	11.12	11.10	10.95	9.87	9.24	9.02	9.91	10.98	11.11	11.29
20	12.55	11.33	11.26	10.93	10.89	9.92	9.15	9.06	9.98	10.66	10.49	11.38
25	12.38	11.17	11.41	11.05	10.52	9.64	9.11	9.20	10.15	10.82	10.43	11.41
EOM	12.52	11.12	11.49	11.08	10.36	9.43	9.23	9.62	10.51	10.73	10.70	10.91

WATER YEAR 1989 HIGHEST 8.94 MAY 16, 1989 LOWEST 12.55 OCT 20, 21, 1988

GROUND-WATER LEVELS

CHESTERFIELD COUNTY--Continued

372519077264703. Local number, 51H 94.

LOCATION.--Lat 37°25'19", long 77°26'47", Hydrologic Unit 02080206, 500 ft north of Alcott Road, 0.3 mi southwest of the intersection of U.S. Highways 1 and 301 in Bensley. Owner: U.S. Geological Survey.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 3 in., depth 26 ft, screened 24 to 26 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch. Prior to Oct. 1, 1985, monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 102.04 ft above National Geodetic Vertical Datum of 1929.

Measuring point: Top of casing, 2.2 ft above land-surface datum.

PERIOD OF RECORD.--April 1985 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 8.82 ft below land-surface datum, May 16, 1989; lowest measured, 15.19 ft below land-surface datum, Aug. 16, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	11.50	12.13	11.16	10.65	10.15	10.11	10.03	10.50	11.04	11.83	11.57	11.78
10	11.65	12.22	11.15	10.57	10.13	10.03	9.97	10.61	11.39	11.86	11.75	11.89
15	11.70	11.96	10.91	10.65	9.93	10.07	9.95	10.89	11.68	11.95	11.71	11.85
20	11.77	11.79	10.74	10.41	9.76	10.15	10.01	11.03	11.43	12.11	11.74	11.88
25	11.99	11.96	10.74	10.27	9.92	10.22	10.09	10.79	11.47	11.78	11.51	12.06
EOM	12.16	11.57	10.78	10.27	9.96	10.16	10.35	10.90	11.81	11.37	11.77	12.26

WATER YEAR 1988 HIGHEST 9.72 FEB 20, 1988 LOWEST 12.30 NOV 24, 1987

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	12.25	11.88	10.97	11.27	11.17	10.11	9.31	9.13	9.84	10.64	10.73	10.88
10	12.19	11.61	10.97	11.25	10.94	9.96	9.20	8.90	9.78	10.67	11.07	10.99
15	12.32	11.72	11.04	10.96	10.81	9.73	9.13	8.92	9.86	10.88	10.99	11.17
20	12.46	11.25	11.17	10.77	10.74	9.78	9.04	8.96	9.93	10.55	10.39	11.27
25	12.29	11.08	11.31	10.90	10.35	9.49	9.00	9.10	10.09	10.71	10.31	11.28
EOM	12.44	11.03	11.31	10.93	10.20	9.30	9.11	9.49	10.40	10.61	10.60	10.82

WATER YEAR 1989 HIGHEST 8.82 MAY 16, 1989 LOWEST 12.46 OCT 20, 21, 1988

372519077264704. Local number, 51H 95.

LOCATION.--Lat 37°25'19", long 77°26'47", Hydrologic Unit 02080206, 500 ft north of Alcott Road at Bensley and 0.3 mi southwest of the intersection of U.S. Highways 1 and 301 (Jefferson Davis Highway) and Alcott Road. Owner: U.S. Geological Survey.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 3 in., depth 4.7 ft, screened 2.7 to 4.7 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch. Prior to Oct. 1, 1985, monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 102.23 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 1.9 ft above land-surface datum.

PERIOD OF RECORD.--April 1985 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 0.07 ft above land-surface datum, Mar. 31, 1989; lowest recorded, 4.38 ft below land-surface datum, Aug. 8-19, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	2.57	2.71	.96	.64	.52	2.00	.66	2.76	2.14	3.45	3.12	2.73
10	2.12	2.79	1.56	1.31	1.30	.49	1.02	2.63	3.09	1.42	3.10	.82
15	2.72	.78	.79	.99	.62	1.42	1.77	3.09	3.50	2.82	2.96	2.59
20	2.92	1.27	1.09	.43	.89	1.64	1.43	2.05	.77	3.44	.82	2.98
25	3.27	1.91	1.56	.83	1.52	1.96	2.32	1.59	2.83	1.09	2.31	3.32
EOM	2.73	.43	.85	1.20	1.82	1.18	2.72	2.88	2.73	2.38	1.75	3.43

WATER YEAR 1988 HIGHEST 0.27 OCT 07, 1987 LOWEST 3.73 JUL 09, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	1.64	.87	1.67	1.93	1.05	.60	1.10	---	3.10	3.80	3.05	3.53
10	2.63	1.20	1.27	1.67	.98	.73	.67	---	1.44	3.25	3.45	3.72
15	2.96	1.86	1.95	.56	1.72	.61	1.50	---	1.28	2.48	2.63	3.87
20	3.14	.59	2.12	1.55	.92	.89	1.44	---	2.35	2.31	.99	3.52
25	1.86	1.53	1.87	2.09	.56	.43	2.17	---	2.82	1.58	2.47	2.58
EOM	2.46	.63	2.22	2.26	.63	.30	2.41	---	3.83	2.41	3.21	2.02

WATER YEAR 1989 HIGHEST -0.07* MAR 31, 1989 LOWEST 3.87 SEP 15, 16, 1989

* Water level above land-surface datum.

CLARKE COUNTY

390348078035501. Local number, 46W175.

LOCATION.--Lat 39°03'48", long 78°03'55", Hydrologic Unit 02070007, 1.5 mi east of the intersection of U.S. Highway 17/50 and U.S. Highway 340 at Blandy Experimental Farm. Owner: University of Virginia.

AQUIFER.--Conococheague limestone of middle Cambrian age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in., depth 80.4 ft, cased to 24 ft, open hole 24 to 80.4 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 600 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.7 ft above land-surface datum.

PERIOD OF RECORD.--July 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 33.53 ft below land-surface datum, May 28, 1988; lowest recorded, 43.13 ft below land-surface datum, Feb. 21, 1989.

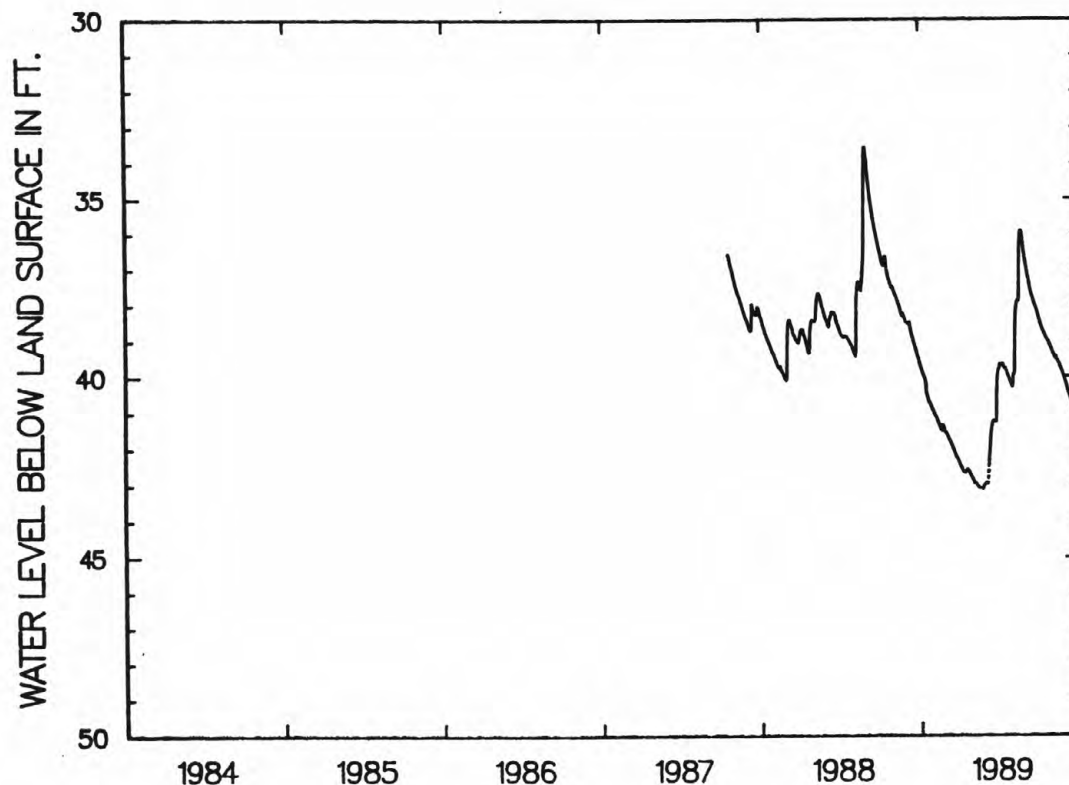
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	39.96	41.08	41.73	42.59	42.95	42.97	39.68	39.93	37.17	38.56	39.48	40.44
10	40.15	41.22	41.86	42.63	43.05	41.92	39.70	38.05	37.51	38.74	39.53	40.63
15	40.48	41.36	42.01	42.60	43.09	41.26	39.78	37.91	37.78	38.89	39.64	40.82
20	40.69	---	42.17	42.63	43.12	41.24	39.98	35.97	37.97	38.99	39.80	40.95
25	40.81	---	42.29	42.76	42.99	40.47	40.13	36.18	38.15	39.13	39.98	41.07
EOM	40.96	41.60	42.46	42.89	42.95	39.76	40.30	36.78	38.38	39.31	40.21	41.21

WATER YEAR 1989

HIGHEST 35.91 MAY 21, 1989

LOWEST 43.13 FEB 21, 1989



CITY OF COLONIAL HEIGHTS

371644077244601. Local number, 51G 1.

LOCATION.--Lat 37°16'44", long 77°24'46", Hydrologic Unit 02080207, 200 ft west of U.S. Highways 1 and 301, 0.50 mi south of the intersection of State Highway 144 and U.S. Highway 1 and 301 in Colonial Heights. Owner: Dean Whittington.

AQUIFER.--Petersburg granite of late Paleozoic age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in., depth 100 ft, cased to 50 ft, open hole 50 to 100 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 57.30 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 1.0 ft above land-surface datum.

PERIOD OF RECORD.--October 1939 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.73 ft below land-surface datum, Jan. 26, 1978; lowest measured, 19.26 ft below land-surface datum, Dec. 3, 1963.

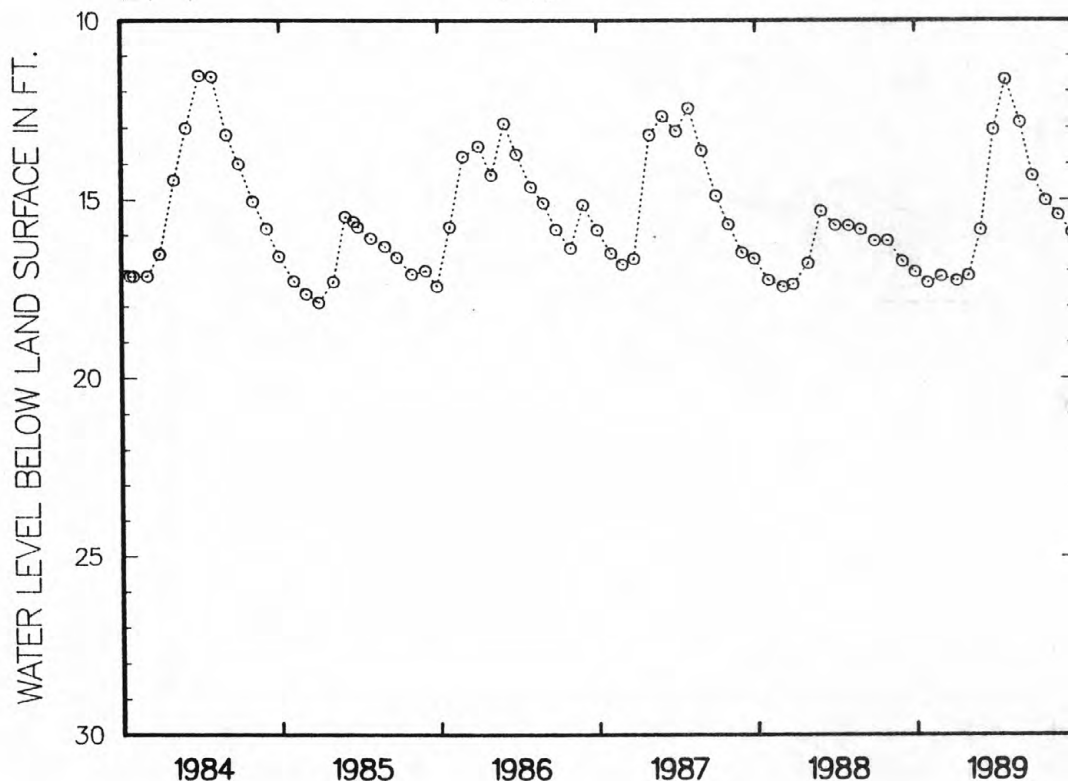
GROUND-WATER LEVELS

CITY OF COLONIAL HEIGHTS--Continued

371644077244601. Local number, 51G 1--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	17.34	JAN 03	17.29	FEB 27	15.86	APR 27	11.67	JUN 27	14.33	AUG 25	15.43
NOV 28	17.16	30	17.14	MAR 30	13.06	MAY 30	12.86	JUL 27	15.02	SEP 25	15.94
WATER YEAR 1989		HIGHEST	11.67	APR 27, 1989	LOWEST	17.34	OCT 28, 1988				



FAIRFAX COUNTY

384518077163501. Local number, 52U 4.

LOCATION.--Lat 38°45'18", long 77°16'35", Hydrologic Unit 02070010, 200 ft east of intersection of State Highways 641 and 643 in Springfield. Owner: Sydenstricker Church.

AQUIFER.--Granite of undetermined age.

WELL CHARACTERISTICS.--Dug unused water well, diameter 24 in., depth 28 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 340 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Hole in cement platform, 0.67 ft above land-surface datum.

PERIOD OF RECORD.--May 1957 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.54 ft below land-surface datum, Apr. 30, 1973; lowest measured, 28.85 ft below land-surface datum, Jan. 30, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	27.19	DEC 27	27.14	FEB 28	27.41	APR 27	26.01	JUN 27	23.65	AUG 28	24.10
NOV 28	24.03	JAN 30	28.85	MAR 30	26.75	MAY 25	24.38	JUL 26	23.44	SEP 28	24.78
WATER YEAR 1989		HIGHEST	23.44	JUL 26, 1989	LOWEST	28.85	JAN 30, 1989				

GROUND-WATER LEVELS

425

FAIRFAX COUNTY--Continued

385638077220101. Local number, 52V 2.

LOCATION.--Lat 38°56'58", long 77°22'01", Hydrologic Unit 02070008, at U.S. Geological Survey National Center in Reston. Owner: U.S. Geological Survey.

AQUIFER.--Manassas Sandstone of Triassic age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 8 in., depth 205 ft, cased to 35 ft, open hole 35 to 205 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 390 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

PERIOD OF RECORD.--October 1976 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 6.47 ft below land-surface datum, Mar. 30, 1984; lowest recorded, 18.19 ft below land-surface datum, Oct. 25, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	17.03	16.75	15.95	15.80	14.82	13.09	---	---	11.77	12.72	13.80	15.28
10	17.24	16.66	16.01	15.45	14.61	11.96	---	---	11.29	12.99	14.18	15.43
15	17.42	16.61	16.01	14.81	14.56	12.00	---	---	11.67	13.31	14.29	15.62
20	17.52	16.32	16.14	14.53	14.14	12.30	---	8.42	11.92	13.35	14.56	15.63
25	17.40	16.22	15.96	14.82	13.10	10.43	---	---	11.80	13.51	14.65	15.65
EOM	17.40	15.85	15.80	14.70	13.02	10.18	---	10.92	12.48	13.77	15.02	15.58

WATER YEAR 1989 HIGHEST 8.38 MAY 16, 1989 LOWEST 17.52 OCT 20, 1988

CITY OF FRANKLIN

364033076562603. Local number, 55B 66 SOW 145C.

LOCATION.--Lat 36°40'33", long 76°56'26", Hydrologic Unit 03010202, at P. D. Camp Community College in Franklin. Owner: U.S. Geological Survey.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 360 ft, screened 350 to 360 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, bimonthly measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 34 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.58 ft above land-surface datum.

REMARKS.--Water levels affected by local pumpage.

PERIOD OF RECORD.--November 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 175.39 ft below land-surface datum, Dec. 27, 1984; lowest measured, 198.41 ft below land-surface datum, Mar. 16, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 08	189.82	DEC 12	189.92	MAR 16	198.41	JUN 22	191.44	SEP 20	188.68

WATER YEAR 1989 HIGHEST 188.68 SEP 20, 1989 LOWEST 198.41 MAR 16, 1989

364033076562604. Local number, 55B 67 SOW 145D.

LOCATION.--Lat 36°40'33", long 76°56'26", Hydrologic Unit 03010202, at P. D. Camp Community College in Franklin. Owner: U.S. Geological Survey.

AQUIFER.--Sand of Paleocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 140 ft, screened 130 to 140 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, bimonthly measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 34 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.15 ft above land-surface datum.

REMARKS.--Water level affected by local pumpage.

PERIOD OF RECORD.--November 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 29.51 ft below land-surface datum, Mar. 19, 1985; lowest measured, 32.20 ft below land-surface datum, Sept. 30, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 08	32.09	DEC 12	32.05	MAR 16	31.54	JUN 22	31.53	SEP 20	31.73

WATER YEAR 1989 HIGHEST 31.53 JUN 22, 1989 LOWEST 32.09 NOV 08, 1988

GROUND-WATER LEVELS

CITY OF FRANKLIN--Continued

364033076562605. Local number, 55B 68 SOW 145E.

LOCATION.--Lat 36°40'33", long 76°56'26", Hydrologic Unit 03010202, at P. D. Camp Community College in Franklin.

Owner: Virginia Water Control Board.

AQUIFER.--Sand of Miocene-Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 98 ft, screen depth unknown.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, bimonthly measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 34 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.8 ft above land-surface datum prior to Feb. 24, 1988; 1.5 ft thereafter.

PERIOD OF RECORD.--November 1984 to March 1989 (discontinued). Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.10 ft below land-surface datum, Nov. 1, 1984; lowest measured, 29.88 ft below land-surface datum, Mar. 16, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, OCTOBER 1988 TO MARCH 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 08	29.54	DEC 12	29.65	MAR 16	29.88
PERIOD OCTOBER 1988 TO MARCH 1989		HIGHEST 29.54 NOV 08, 1988		LOWEST 29.88 MAR 16, 1989	

GLOUCESTER COUNTY

372331076312602. Local number, 58H 6 SOW 168A.

LOCATION.--Lat 37°23'31", long 76°31'26", Hydrologic Unit 02080102, at entrance to Gloucester County landfill, 0.3 mi east of U.S. Highway 17, and 1.4 mi south of Gloucester. Owner: Virginia Water Control Board.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 1,300 ft, screened 1,290 to 1,300 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 75 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--August 1982 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 125.26 ft below land-surface datum, Feb. 14, 1983; lowest measured, 136.45 ft below land-surface datum, Aug. 2, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	133.85	JAN 20	133.97	MAR 07	134.25	MAY 06	134.29	JUN 22	134.70	AUG 24	135.05
WATER YEAR 1988		HIGHEST 133.85 NOV 20, 1987		LOWEST 135.05 AUG 24, 1988							

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	135.50	JAN 19	135.70	MAR 16	135.74	APR 27	135.75	JUN 28	136.10	AUG 02	136.45
NOV 30	135.50	MAR 02	135.80								
WATER YEAR 1989		HIGHEST 135.50 OCT 13, NOV 30, 1988		LOWEST 136.45 AUG 02, 1989							

GROUND-WATER LEVELS

427

GLOUCESTER COUNTY--Continued

372331076312603. Local Number 58H 7 SOW 168B.

LOCATION.--Lat 37°23'31", long 76°31'26", Hydrologic Unit 02080102, at entrance to Gloucester County landfill, 0.3 mi east of U.S. Highway 17, and 1.4 mi south of Gloucester. Owner: Virginia Water Control Board.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in. to 186 ft, diameter 2 in. from 186 to 960 ft, depth 960 ft, screened 950 to 960 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 75 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1985 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 33.55 ft below land-surface datum, Nov. 20, 1985; lowest measured, 56.90 ft below land-surface datum, Aug. 2, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	50.99	JAN 20	51.19	MAR 07	51.55	MAY 06	51.70	JUN 22	51.72	AUG 24	51.65
WATER YEAR 1988		HIGHEST	50.99	NOV 20, 1987		LOWEST	51.72	JUN 22, 1988			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	51.60	JAN 19	51.60	MAR 02	51.50	APR 27	51.20	JUN 28	55.00	AUG 02	56.90
NOV 30	51.60										
WATER YEAR 1989		HIGHEST	51.20	APR 27, 1989		LOWEST	56.90	AUG 02, 1989			

372331076312604. Local number, 58H 8 SOW 168C.

LOCATION.--Lat 37°23'31", long 76°31'26", Hydrologic Unit 02080102, at entrance to Gloucester County landfill, 0.3 mi east of U.S. Highway 17, and 1.4 mi south of Gloucester. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 40 ft, screened 30 to 40 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 75 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1985 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.05 ft below land-surface datum, Apr. 27, 1989; lowest measured, 21.81 ft below land-surface datum, Sept. 23, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	21.30	JAN 20	21.52	MAR 07	21.01	MAY 06	21.10	JUN 22	20.82	AUG 24	21.45
WATER YEAR 1988		HIGHEST	20.82	JUN 22, 1988		LOWEST	21.52	JAN 20, 1988			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	21.70	JAN 19	21.80	MAR 02	21.10	APR 27	17.05	JUN 28	18.30	AUG 02	19.10
NOV 30	21.70										
WATER YEAR 1989		HIGHEST	17.05	APR 27, 1989		LOWEST	21.80	JAN 19, 1989			

GROUND-WATER LEVELS

HALIFAX COUNTY

364550078562301. Local number, 39C 1 SOW 011.

LOCATION.--Lat 36°45'50", long 78°56'23", Hydrologic Unit 03010105, 0.6 mi west of intersection of U.S. Highways 501 and 360, in the town of Halifax. Owner: Town of Halifax.

AQUIFER.--Granite and gneiss of uncertain age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 8 in., depth 302 ft, cased to 52 ft, open hole 52 to 302 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 380 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.28 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

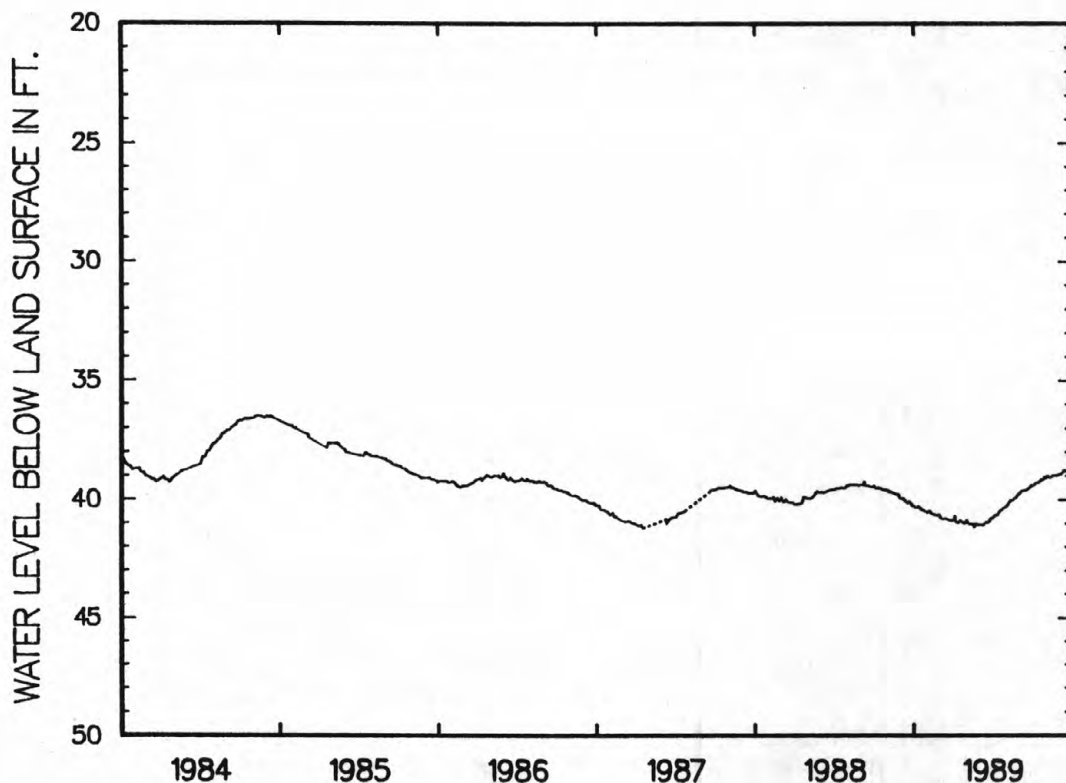
PERIOD OF RECORD.--October 1968 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 36.28 ft below land-surface datum, June 8, 1980; lowest recorded, 45.09 ft below land-surface datum, Dec. 30, 1968.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	40.35	40.46	40.83	40.95	41.05	41.05	40.65	40.20	39.66	39.35	39.02	38.91
10	40.29	40.61	40.78	40.99	41.04	41.03	40.65	40.04	39.62	39.30	39.09	38.78
15	40.38	40.64	40.83	40.87	41.05	40.94	40.50	40.02	39.62	39.27	38.99	38.77
20	40.45	40.63	40.87	40.96	41.02	40.97	40.46	39.95	39.55	39.16	38.97	38.78
25	40.48	40.68	40.90	41.02	41.08	40.81	40.33	39.85	39.48	39.16	38.98	38.83
EOM	40.56	40.76	40.85	40.95	41.08	40.75	40.30	39.76	39.45	39.10	38.94	38.73

WATER YEAR 1989 HIGHEST 38.63 SEP 22, 1989 LOWEST 41.20 FEB 16, 1989



HANOVER COUNTY

375316077274701. Local number, 51M 11.

LOCATION.--Lat 37°53'16", long 77°27'47", Hydrologic Unit 02080106, 900 ft east of U.S. Highway 1 on a private dirt road at the North Anna River and 9.9 mi north of Ashland on U.S. Highway 1. Owner: Weyerhaeuser Inc.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 8 in., depth 175 ft, cased to 40 ft, open hole 40 to 175 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 70 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, at land-surface datum.

PERIOD OF RECORD.--January 1984 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.77 ft below land-surface datum, Apr. 2, 1984; lowest measured, 20.58 ft below land-surface datum, July 15, 1985.

HANOVER COUNTY--Continued

375316077274701. Local number, 51M 11--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 17	18.73

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 14	20.42	MAR 22	17.98	JUN 23	18.38	SEP 27	18.83

WATER YEAR 1989	HIGHEST	17.98	MAR 22, 1989	LOWEST	20.42	DEC 14, 1988
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373507077171201. Local number, 52J 10.

LOCATION.--Lat 37°35'07", long 77°17'12", Hydrologic Unit 02080206, 150 ft north of State Highway 156 at the Cold Harbor Visitor Center, 1.0 mi southwest of the intersection of State Highways 156 and 619, and 4.9 mi east of Mechanicsville. Owner: U.S. National Park Service.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 6 in., depth 270 ft, screened 255 to 270 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 172 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.55 ft above land-surface datum.

PERIOD OF RECORD.--December 1972, October 1983 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 165.75 ft below land-surface datum, Dec. 1, 1972; lowest measured, 189.84 ft below land-surface datum, Dec. 14, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 11	187.58

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 14	189.84	MAR 21	183.29	JUN 22	179.61	SEP 26	187.43

WATER YEAR 1989	HIGHEST	179.61	JUN 22, 1989	LOWEST	189.84	DEC 14, 1988
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374720077300501. Local number, 52K 3.

LOCATION.--Lat 37°40'05", long 77°17'54", Hydrologic Unit 02080106, 200 ft west of State Highway 615, 0.65 mi southwest of Studley, and 1.95 mi northwest of the intersection of State Highways 615 and 627. Owner: Sydnor Hydrodynamics.

AQUIFER.--Sand of middle and early Cretaceous age.

WELL CHARACTERISTICS.--Drilled public supply water well, diameter 6 in., depth 426 ft, screened 355 to 365 ft, 392 to 422 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 163 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.76 ft above land-surface datum.

REMARKS.--Water levels affected by pumpage.

PERIOD OF RECORD.--May 1970, November 1973, December 1974, January 1984 to March 1986, March 1988 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 142.50 ft below land-surface datum, May 21, 1970; lowest measured, 182.46 ft below land-surface datum, Mar. 21, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 18	173.42

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 14	179.42	MAR 21	182.46	JUN 22	176.56	SEP 26	177.94

WATER YEAR 1989	HIGHEST	176.56	JUN 22, 1989	LOWEST	182.46	MAR 21, 1989
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GROUND-WATER LEVELS

HANOVER COUNTY--Continued

373738077082801. Local number, 53K 16.

LOCATION.--Lat 37°37'38", long 77°08'28", Hydrologic Unit 02080106, 1,000 ft northeast of the intersection of State Highways 606 and 629 at Eastern View Farm, 0.6 mi southeast of Glimps Corner, 4.7 mi east of Old Church, and 5.95 mi east of the intersection of U.S. Highway 360 and State Highway 606. Owner: John Maples.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 4 in., depth 366 ft, screen depth unknown.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 100 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 5.3 ft below land-surface datum.

PERIOD OF RECORD.--January 1984 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 131.52 ft below land-surface datum, Jan. 25, 1984; lowest measured, 138.70 ft below land-surface datum, Dec. 15, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 17	136.98

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 15	138.70	MAR 22	133.12	JUN 23	132.68	SEP 27	135.92
WATER YEAR 1989		HIGHEST	132.68	JUN 23, 1989	LOWEST	138.70	DEC 15, 1988

373737077083201. Local number, 53K 19 SOW 080.

LOCATION.--Lat 37°37'37", long 77°08'32", Hydrologic Unit 02080106, 500 ft northeast of State Highway 606, 0.15 mi west of intersection of State Highways 606 and 629, and 4.6 mi east of Old Church. Owner: Virginia Water Control Board.

AQUIFER.--Yorktown-Eastover aquifer of Miocene-Pliocene age.

WELL CHARACTERISTICS.--Dug unused water well, diameter 30 in., depth 35 ft, cased to 35 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 130 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.85 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--January 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.05 ft below land-surface datum, Jan. 25, 1978; lowest measured, 22.85 ft below land-surface datum, Aug. 3, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 13	21.66	MAR 04	17.70	MAY 10	18.22	JUN 14	16.55	JUL 29	22.25	SEP 21	21.25
JAN 12	20.97										
WATER YEAR 1988		HIGHEST	16.55	JUN 14, 1988	LOWEST	22.25	JUL 29, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 15	20.99	FEB 27	16.58	APR 17	11.92	JUN 12	14.62	AUG 01	17.04	SEP 25	18.78
JAN 10	20.88										
WATER YEAR 1989		HIGHEST	11.92	APR 17, 1989	LOWEST	20.99	NOV 15, 1988				

HENRICO COUNTY

373607077331401. Local number, 50J 1 SOW 023.

LOCATION.--Lat 37°36'07", long 77°33'14", Hydrologic Unit 02080205, 200 ft north of Three Chop Road, 1.0 mi south-east of intersection of Three Chop Road and Parham Road in Richmond. Owner: E. L. Gilman.

AQUIFER.--Petersburg Granite of Mississippian age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 10 in., depth 300 ft, cased to 68 ft, open hole 68 to 300 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 275 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.88 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--May 1969 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.48 ft below land-surface datum, June 5, 1970; lowest measured, 10.43 ft below land-surface datum, Jan. 5, 1971.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 11	7.07	MAR 08	4.17	APR 28	3.92	JUN 16	5.41	AUG 05	6.27	SEP 21	7.95
JAN 15	5.14										

WATER YEAR 1988 HIGHEST 3.92 APR 28, 1988 LOWEST 7.95 SEP 21, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 29	7.10	JAN 05	7.22	FEB 27	3.82	MAY 02	3.67	JUN 15	4.40	AUG 01	4.22

WATER YEAR 1989 HIGHEST 3.67 MAY 02, 1989 LOWEST 7.22 JAN 05, 1989

372920077241001. Local number, 51H132 SOW 081.

LOCATION.--Lat 37°29'20", long 77°24'10", Hydrologic Unit 02080206, 100 ft west of State Highway 5, 2.0 mi northwest of intersection of State Highway 5 and Laburnum Avenue, and 5.3 mi southwest of Sandston. Owner: Moses.

AQUIFER.--Columbia aquifer of Quaternary age.

WELL CHARACTERISTICS.--Dug unused water well, diameter 30 in., depth 40 ft, cased to 40 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 160 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.3 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 28.79 ft below land-surface datum, June 16, 1980; lowest measured, 35.23 ft below land-surface datum, Sept. 24, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 11	33.30	JAN 14	33.97	MAR 03	33.30	APR 28	33.18	JUN 16	33.49	AUG 11	33.72

WATER YEAR 1988 HIGHEST 33.18 APR 28, 1988 LOWEST 33.97 JAN 14, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	34.10	JAN 05	34.53	MAY 02	33.40	JUN 15	32.80	JUL 31	32.60	SEP 26	32.70
NOV 23	34.30	FEB 27	34.60								

WATER YEAR 1989 HIGHEST 32.60 JUL 31, 1989 LOWEST 34.60 FEB 27, 1989

373428077233001. Local number, 51J 13.

LOCATION.--Lat 37°34'28", long 77°23'30", Hydrologic Unit 02080206, 1,600 ft east of the intersection of U.S. Highway 360 (Mechanicsville Turnpike) and Laburnum Avenue and 500 ft south of Laburnum Avenue at water tower. Owner: Henrico County.

AQUIFER.--Middle Potomac aquifer of Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 8 in. 275 ft, diameter 6 in. from 275 to 307 ft, depth 307 ft, screened 167 to 186 ft, 213 to 226 ft, 248 to 258 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 168 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.7 ft above land-surface datum.

PERIOD OF RECORD.--January 1988 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 190.85 ft below land-surface datum, Apr. 7, 1988; lowest recorded, 193.04 ft below land-surface datum, Sept. 28, 1989.

GROUND-WATER LEVELS

HENRICO COUNTY--Continued

373428077233001. Local number, 51J 13--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	192.04	191.73	192.25	192.23	192.44	192.37	192.23	---	---	---	---	192.92
10	192.01	192.03	192.17	192.49	192.53	192.55	192.41	---	---	---	192.74	192.65
15	192.11	192.13	192.19	192.37	192.48	192.20	192.47	---	192.33	---	192.66	192.69
20	192.07	192.15	192.29	192.22	192.49	192.58	---	192.45	192.54	---	192.68	192.76
25	191.77	192.09	192.27	192.53	192.33	192.38	---	---	192.46	192.70	192.67	192.92
EOM	192.19	192.14	192.24	192.12	192.21	191.99	---	192.55	192.58	---	192.71	192.89

WATER YEAR 1989 HIGHEST 191.34 NOV 5, 1988 LOWEST 193.04 SEP 28, 1989

373817077282501. Local number, 51K 4 SOW 137.

LOCATION.--Lat 37°38'17", long 77°28'25", Hydrologic Unit 02080206, 50 ft east of entrance to J. Sargeant Reynolds Community College, 0.9 mi west of intersection of Parham Road and U.S. Highway 1, and 0.9 mi west of Yellow Tavern. Owner: Virginia Water Control Board.

AQUIFER.--Petersburg Granite of Mississippian age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 6 in., depth 280 ft, cased to 35 ft, open hole 35 to 280 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 180 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum prior to Sept. 9, 1980; 1.5 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1980 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.37 ft below land-surface datum, Apr. 7, 1987; lowest measured, 12.12 ft below land-surface datum, Oct. 6, 1981, Aug. 22, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 11	11.40	FEB 29	7.10	APR 28	6.92	JUN 13	8.60	AUG 05	10.55	SEP 21	11.99
JAN 15	9.98										

WATER YEAR 1988 HIGHEST 6.92 APR 28, 1988 LOWEST 11.99 SEP 21, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 29	10.30	JAN 05	10.88	FEB 27	8.25	MAY 01	6.60	JUN 15	8.50	AUG 01	8.30

WATER YEAR 1989 HIGHEST 6.60 MAY 01, 1989 LOWEST 10.88 JAN 05, 1989

372936077211101. Local number, 52H 3 SOW 136.

LOCATION.--Lat 37°29'36", long 77°21'11", Hydrologic Unit 02080206, 100 ft west of Laburnum Avenue, 0.9 mi north of intersection of Laburnum Avenue and Darbytown Road, and 2.4 mi southwest of Sandston. Owner: Nabisco Incorporated.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in., depth 209 ft, screened 149 to 159 ft, 199 to 209 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 150 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--December 1974 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 131.42 ft below land-surface datum, Dec. 2, 1974; lowest measured, 139.95 ft below land-surface datum, July 31, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 11	138.80	JAN 14	139.70	MAR 03	139.17	APR 28	138.92	JUN 16	139.33	AUG 11	139.52

WATER YEAR 1988 HIGHEST 138.80 NOV 11, 1987 LOWEST 139.70 JAN 14, 1988

GROUND-WATER LEVELS

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HENRICO COUNTY--Continued

372936077211101. Local number, 52H 3 SOW 136--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	139.90	JAN 05	139.90	MAY 02	139.40	JUN 15	139.80	JUL 31	139.95	SEP 26	139.90
NOV 23	139.80	FEB 27	139.60								
WATER YEAR 1989		HIGHEST	139.40	MAY 02, 1989		LOWEST	139.95	JUL 31, 1989			

373301077194001. Local number, 52J 1.

LOCATION.--Lat 37°33'01", long 77°19'40", Hydrologic Unit 02080206, at the intersection of Daisy and Vine Streets, at water tower in Highland Springs. Owner: Henrico County.

AQUIFER.--Middle Potomac aquifer of Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 10 in. to 212 ft, diameter 6 in. from 212 to 306 ft, depth 306 ft, screened 212 to 306 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 172 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

PERIOD OF RECORD.--January 1988 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 197.64 ft below land-surface datum, Jan. 25, 26, 1988; lowest recorded, 202.44 ft below land-surface datum, Sept. 4, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	200.67	200.99	201.25	201.12	201.13	201.26	201.03	201.09	201.49	201.94	202.21	202.43
10	200.82	201.22	201.35	201.05	201.41	201.43	201.16	200.98	201.34	201.91	202.32	202.25
15	200.92	201.43	201.77	201.05	201.57	201.37	201.21	201.07	201.49	201.97	202.23	202.25
20	200.89	201.40	201.85	201.11	201.58	201.46	201.10	201.10	201.63	201.77	202.21	202.19
25	200.86	201.43	201.71	201.34	201.38	201.55	201.12	201.13	201.61	202.21	202.30	202.18
EOM	201.12	201.24	201.51	201.18	201.34	201.04	201.16	201.38	201.92	202.32	202.34	202.09
WATER YEAR 1989		HIGHEST	200.60	OCT 04, 1988		LOWEST	202.44	SEP 04, 1989				

373125077185001. Local number, 52J 34.

LOCATION.--Lat 37°31'25", long 77°18'50", Hydrologic Unit 02080206, 300 ft north of the intersection of U.S. Highway 60 (Williamsburg Road) and Finley Drive and 200 ft east of Finley Drive. Owner: Henrico County.

AQUIFER.--Lower Potomac aquifer of Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 10 in. to 165 ft, diameter 8 in. from 165 to 272 ft, depth 272 ft, screened 222 to 265 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 162 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.9 ft above land-surface datum.

REMARKS.--Water-level affected by local pumpage.

PERIOD OF RECORD.--January 1988 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 187.76 ft below land-surface datum, Apr. 7, 1988; lowest recorded, 191.04 ft below land-surface datum, Sept. 28, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	189.68	189.30	189.86	189.57	190.00	189.89	189.75	190.01	190.02	190.30	190.26	190.87
10	189.59	189.58	189.41	189.91	190.02	190.12	189.93	189.52	190.06	190.30	190.71	190.43
15	189.74	189.73	189.67	189.75	189.95	189.73	189.89	189.73	190.05	190.40	190.55	190.57
20	189.72	189.72	189.76	189.68	189.89	190.16	189.92	189.90	190.20	190.24	190.62	190.69
25	189.45	189.73	189.68	190.01	189.83	189.81	189.79	189.83	190.13	190.67	190.63	190.92
EOM	189.88	189.77	189.52	189.65	189.74	189.48	189.95	190.12	190.37	190.47	190.72	190.85
WATER YEAR 1989		HIGHEST	188.92	NOV 05, 1988		LOWEST	191.04	SEP 28, 1989				

373117077210201. Local number, 52J 35.

LOCATION.--Lat 37°31'17", long 77°21'02", Hydrologic Unit 02080206, 400 ft east of the intersection of South Laburnum Avenue and Finley Street, on Finley Street. Owner: Henrico County.

AQUIFER.--Lower Potomac aquifer of Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in., depth 265 ft, screened 220 to 260 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 160 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

REMARKS.--Water-level affected by local pumpage.

PERIOD OF RECORD.--January 1988 to current year.

EXTREMES FOR PERIOD CURRENT YEAR.--Highest water level recorded, 191.24 ft below land-surface datum, Jan. 20, 1988; lowest recorded, 206.53 ft below land-surface datum, Aug. 11, 1989.

HENRICO COUNTY--Continued

373117077210201. Local number, 52J 35--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	203.87	205.64	202.97	199.38	200.90	200.27	---	203.87	201.30	200.11	205.16	202.43
10	198.93	205.30	205.96	201.14	204.79	203.68	---	203.52	203.35	201.71	206.12	201.66
15	202.52	203.56	205.03	199.03	204.04	202.36	204.15	201.61	203.49	204.44	205.16	206.06
20	204.84	200.82	204.60	202.26	200.20	199.23	204.16	203.85	202.43	205.42	202.57	205.26
25	203.93	198.47	199.55	202.22	201.41	---	202.79	204.85	201.07	204.93	205.56	202.62
EOM	202.43	202.04	193.19	202.33	200.21	---	200.02	202.37	204.35	204.36	205.69	205.93

WATER YEAR 1989	HIGHEST	192.78	DEC 31, 1988	LOWEST	206.53	AUG 11, 1989
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372555077153001. Local number, 53H 2.

LOCATION.--Lat 37°25'55", long 77°15'30", Hydrologic Unit 02080206, 0.7 mi south of the intersection of State Highways 600 (Charles City Road) and 156 (Willis Church Road) at the Glendale National Cemetery, 5.0 mi southwest of the city of Richmond. Owner: Department of Veterans Affairs.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 6 in., depth 232 ft, screen depth unknown.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 128 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.95 ft below land-surface datum.

PERIOD OF RECORD.--January 1943, November 1973, October 1983 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 128.00 ft below land-surface datum, Jan. 1, 1943;
lowest measured, 152.57 ft below land-surface datum, Sept. 19, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 17	151.22

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 14	148.16	MAR 22	152.32	JUN 22	152.15	SEP 19	152.57

WATER YEAR 1989	HIGHEST	148.16	DEC 14, 1988	LOWEST	152.57	SEP 19, 1989
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372900077130001. Local number, 53H 4 SOW 072.

LOCATION.--Lat 37°29'11", long 77°14'07", Hydrologic Unit 02080206, 1.3 mi southeast of end of State Highway 345, 1.6 mi northwest of Elko. Owner: Virginia Water Control Board.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 10 in. to 208 ft, diameter 8 in. from 208 to 292 ft, diameter 6 in. from 292 to 395 ft, depth 395 ft, screened 208 to 213 ft, 240 to 262 ft, 266 to 268 ft, 281 to 287 ft, 303 to 309 ft, 363 to 384 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 130 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.8 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March 1950 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 107.00 ft below land-surface datum, Mar. 27, 1950; lowest measured, 145.70 ft below land-surface datum, July 31, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 11	143.00	JAN 15	142.90	MAR 03	142.95	APR 28	143.15	JUN 16	143.32	AUG 11	144.60

WATER YEAR 1988	HIGHEST	142.90	JAN 15, 1988	LOWEST	144.60	AUG 11, 1988
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WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	144.60	JAN 05	144.42	MAY 01	144.30	JUN 14	144.70	JUL 31	145.70	SEP 26	145.60

WATER YEAR 1989	HIGHEST	144.30	MAY 01, 1989	LOWEST	145.70	JUL 31, 1989
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GROUND-WATER LEVELS

435

CITY OF HOPEWELL

371801077164201. Local number, 52G 1.

LOCATION.--Lat 37°18'01", long 77°16'42", Hydrologic Unit 02080206, 0.2 mi north of intersection of State Highways 156 and 10 in Hopewell. Owner: Virginia American Water Corporation.

AQUIFER.--Sand of lower Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in., depth 300 ft, screen depth unknown.

INSTRUMENTATION.--Weekly measurement with chalked tape by observer.

DATUM.--Elevation of land-surface datum is 50.26 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 0.34 ft above land-surface datum.

REMARKS.--Water level affected by pumpage.

PERIOD OF RECORD.--May 1939 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.56 ft below land-surface datum, Sept. 7, 1979; lowest measured, 56.95 ft below land-surface datum, Aug. 14, 1943.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 07	35.54	DEC 09	35.42	FEB 10	35.31	APR 14	34.58	JUN 16	35.06	AUG 11	35.09
14	35.57	16	35.36	17	35.06	21	34.57	23	35.21	18	35.03
21	35.59	23	35.38	24	35.08	28	34.64	30	35.18	25	34.97
28	35.58	30	35.41	MAR 03	35.01	MAY 05	34.65	JUL 06	35.35	SEP 01	34.94
NOV 04	35.54	JAN 06	35.40	10	34.65	12	34.77	07	35.35	08	34.86
11	35.51	13	35.39	17	34.26	19	34.88	14	35.41	15	34.98
18	35.49	20	35.41	24	34.64	26	34.85	21	35.32	22	34.96
25	35.46	27	35.39	31	34.54	JUN 02	34.94	28	35.24	29	34.99
DEC 02	35.41	FEB 03	35.36	APR 07	34.50	09	35.01	AUG 04	35.21		

WATER YEAR 1989 HIGHEST 34.26 MAR 17, 1989 LOWEST 35.59 OCT 21, 1988

371727077160401. Local number, 52G 15 SOW 142A.

LOCATION.--Lat 37°17'27", long 77°16'04", Hydrologic Unit 02080206, 0.2 mi south of State Highway 10, 0.8 mi east of State Highway 156 in Hopewell. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 100 ft, screened 84 to 94 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 45 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.7 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March 1985 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 34.67 ft below land-surface datum, Feb. 24, 1986; lowest measured, 35.60 ft below land-surface datum, Jan. 17, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	35.53	JAN 17	35.60	MAR 15	35.35	APR 24	35.35	JUN 12	35.30	AUG 09	35.35
NOV 21	35.52										

WATER YEAR 1989 HIGHEST 35.30 JUN 12, 1989 LOWEST 35.60 JAN 17, 1989

371727077160402. Local number, 52G 16 SOW 142B.

LOCATION.--Lat 37°17'27", long 77°16'04", Hydrologic Unit 02080206, 0.2 mi south of State Highway 10, 0.8 mi east of State Highway 156 in Hopewell. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 164 ft, screened 154 to 164 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 45 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March 1985 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 34.93 ft below land-surface datum, Feb. 24, 1986; lowest measured, 35.95 ft below land-surface datum, Mar. 8, 1988, Jan. 17, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	35.85	JAN 17	35.95	MAR 15	35.50	APR 24	35.80	JUN 12	35.60	AUG 09	35.80
NOV 21	35.82										

WATER YEAR 1989 HIGHEST 35.50 MAR 15, 1989 LOWEST 35.95 JAN 17, 1989

GROUND-WATER LEVELS

ISLE OF WIGHT COUNTY

364059076544901. Local number, 55B 16.

LOCATION.--Lat 36°40'59", long 76°54'49", Hydrologic Unit 03010202, off U.S. Highways 258 and 58, 200 ft west of the intersection of U.S. Highways 258 and 58 and Lynn Road, 0.3 mi east of Franklin. Owner: Union Camp Corporation.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 6 in., depth 305 ft, screened 285 to 305 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch. Prior to May 27, 1988, continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 25 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.45 ft above land-surface datum.

PERIOD OF RECORD.--June 1960 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 99.00 ft below land-surface datum, Dec. 27, 1960; lowest recorded, 206.21 ft below land-surface datum, June 24, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	196.38	196.55	195.28	197.57	196.28	196.25	196.94	197.43	199.11	197.78	197.36	195.45
10	196.65	196.62	196.26	197.50	197.20	196.25	196.29	198.63	201.05	---	197.29	190.86
15	196.17	195.61	196.38	196.53	197.52	195.97	197.30	197.31	199.43	---	196.09	193.83
20	196.19	195.37	197.80	196.23	197.80	195.84	196.65	197.46	198.82	---	196.09	194.92
25	195.55	195.61	198.58	196.48	196.76	196.01	196.56	198.02	197.20	---	195.96	195.42
EOM	196.22	195.44	197.72	196.11	196.17	197.50	196.46	198.50	197.26	198.36	195.90	196.33

WATER YEAR 1989 HIGHEST 189.91 SEP 08, 1989 LOWEST 201.05 JUN 09, 10, 1989

364143076535701. Local number, 55B 25.

LOCATION.--Lat 36°41'43", long 76°53'57", Hydrologic Unit 03010202, at Rose Municipal Airport, 0.3 mi west of U.S. Highways 258 and 58, and 1.5 mi northeast of Franklin. Owner: City of Franklin.

AQUIFER.--Sand of Paleocene age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 8 in., depth 167.8 ft, screened 155 to 161 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, semiannual measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 36 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, at land-surface datum.

PERIOD OF RECORD.--November 1942, August 1968, November 1972 to December 1978, January 1978 to current year.

Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.00 ft below land-surface datum, Nov. 27, 1942; lowest measured, 48.46 ft below land-surface datum, Nov. 3, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
	DEC 13	48.07	MAR 16	47.77	JUN 22	48.18	SEP 19	48.23

WATER YEAR 1989 HIGHEST 47.77 MAR 16, 1989 LOWEST 48.23 SEP 19, 1989

364125076544801. Local number, 55B 36.

LOCATION.--Lat 36°41'25", long 76°54'48", Hydrologic Unit 03010202, on Lynn Road, 0.45 mi north of intersection with U.S. Highways 258 and 58, and 0.7 mi northeast of Franklin. Owner: Union Camp Corporation.

AQUIFER.--Sand of lower Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 860 ft, screened 720 to 725 ft, 800 to 805 ft, 855 to 860 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 37 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 4.56 ft above land-surface datum.

REMARKS.--Water level affected by local pumpage.

PERIOD OF RECORD.--March 1969 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 156.65 ft below land-surface datum, Dec. 27, 1969; lowest measured, 219.29 ft below land-surface datum, May 18, 1978.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	192.60	193.13	193.06	194.14	194.57	---	193.66	---	195.16	195.47	194.90	194.38
10	192.73	193.18	193.02	194.40	194.35	---	193.67	---	195.42	195.40	194.90	193.40
15	192.84	193.24	193.03	194.65	194.06	---	194.07	---	195.69	195.18	194.77	192.10
20	192.95	193.24	193.12	194.85	193.93	---	194.27	---	195.72	195.04	194.62	191.93
25	193.04	193.23	193.52	195.08	193.75	---	194.44	---	195.87	194.92	194.43	195.04
EOM	193.11	193.11	193.89	194.78	193.64	193.57	---	194.98	195.67	194.89	194.40	194.88

WATER YEAR 1989 HIGHEST 191.93 SEP 19-22, 1989 LOWEST 195.87 JUN 25, 1989

GROUND-WATER LEVELS

437

ISLE OF WIGHT COUNTY--Continued

364141076530701. Local number, 55B 43.

LOCATION.--Lat 36°41'46", long 76°53'07", Hydrologic Unit 03010202, off U.S. Highway 58, 2.1 mi east of Franklin.

Owner: Ray A. Tillet.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 315 ft, screened 305 to 315 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, annual measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 30 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of well housing, 3.9 ft above land-surface datum.

PERIOD OF RECORD.--August 1970 to December 1975, January 1978 to current year. Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 145.47 ft below land-surface datum, Aug. 12, 1974; lowest measured, 186.11 ft below land-surface datum, Mar. 8, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 13	183.04	MAR 16	182.97	JUN 22	185.49	SEP 19	181.88
WATER YEAR 1989		HIGHEST	181.88	SEP 19, 1989	LOWEST	185.49	JUNE 22, 1989

364425076532701. Local number, 55B 45 SOW 033.

LOCATION.--Lat 36°44'25", long 76°53'27", Hydrologic Unit 03010202, 0.8 mi west of intersection of State Highway 611 and U.S. Highway 258, 4.2 mi northeast of Franklin. Owner: R. J. Goodrich.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 348 ft, screened 338 to 348 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 37 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 2.2 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board. Water level affected by local pumpage.

PERIOD OF RECORD.--December 1970 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 130.06 ft below land-surface datum, Aug. 15, 1974; lowest measured, 175.60 ft below land-surface datum, June 12, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	172.93	DEC 13	173.10	MAR 14	171.70	APR 24	172.30	JUN 12	175.60
NOV 21	172.45	JAN 17	172.60					AUG 09	174.90
WATER YEAR 1989		HIGHEST	171.70	MAR 14, 1989	LOWEST	175.60	JUN 12, 1989		

364101076544802. Local number, 55B 60.

LOCATION.--Lat 36°41'01", long 76°54'48", Hydrologic Unit 03010202, 200 ft northwest of intersection of U.S. Highways 58 and 258 and Lynn Road, 0.3 mi east of Franklin. Owner: Virginia Water Control Board.

AQUIFER.--Sand of lower Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in. to 830 ft, diameter 3 in. from 830 to 860 ft, depth 860 ft, screened 830 to 840 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 25 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum.

PERIOD OF RECORD.--May 1979 to September 1983, October 1986 to March 1989 (discontinued). Unpublished records available prior to October 1986 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 168.90 ft below land-surface datum, Sept. 19, 1979; lowest measured, 184.39 ft below land-surface datum, Mar. 22, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, OCTOBER 1988 TO MARCH 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	178.47	NOV 28	177.15	DEC 20	176.70	JAN 25	176.68	FEB 27	176.17
								MAR 29	176.15
PERIOD OCTOBER 1988 TO MARCH 1989		HIGHEST	176.15	MAR 29, 1989	LOWEST	178.47	OCT 25, 1988		

GROUND-WATER LEVELS

ISLE OF WIGHT COUNTY--Continued

364101076544803. Local number, 55B 62 SOW 96B.

LOCATION.--Lat 36°41'01", long 76°54'48", Hydrologic Unit 03010202, 200 ft northwest of intersection of U.S. Highways 58 and 258 and Lynn Road, 0.3 mi east of Franklin. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 3 in., depth 30.77 ft, screened 25 to 30 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 27 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.15 ft above land-surface datum.

PERIOD OF RECORD.--May 1979, October 1980 to September 1981, October 1982 to September 1983, October 1984 to current year. Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 9.46 ft below land-surface datum, Apr. 8, 9, Aug. 19, 1989; lowest measured, 15.38 ft below land-surface datum, Oct. 17, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	11.16	11.08	11.06	11.16	11.12	10.31	9.87	9.97	10.29	10.39	10.53	10.16
10	11.21	11.08	11.07	11.14	11.03	10.06	9.54	10.05	10.35	10.44	10.62	10.20
15	11.33	11.09	11.11	10.99	11.06	9.99	9.73	10.13	10.36	10.21	10.19	10.34
20	11.33	11.05	11.15	11.07	10.99	9.99	9.83	10.19	10.32	10.22	9.52	10.31
25	11.28	11.04	11.14	11.11	10.75	9.86	9.97	10.15	10.29	10.36	9.79	10.37
EOM	11.31	10.99	11.16	11.10	10.58	9.75	9.96	10.29	10.31	10.46	9.98	10.31

WATER YEAR 1989 HIGHEST 9.46 APR 08, 09, AUG 19, 1989 LOWEST 11.35 OCT 01-03, 1988

365300076380001. Local number, 56B 5.

LOCATION.--Lat 36°42'41", long 76°49'33", Hydrologic Unit 03010202, 0.05 mi south of U.S. Highway 58 in Carrsville. Owner: John Rose.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 6 in., depth 372 ft, screened 352 to 372 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, semiannual measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 72 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.1 ft above land-surface datum.

PERIOD OF RECORD.--August 1970 to December 1975, January 1978 to current year. Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 163.00 ft below land-surface datum, Aug. 26, 1970; lowest measured, 193.99 ft below land-surface datum, June 20, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
	DEC 13	192.43	MAR 21	192.63	JUN 20	193.99	SEP 19	192.32

WATER YEAR 1989 HIGHEST 192.32 SEP 19, 1989 LOWEST 193.99 JUN 20, 1989

365305076380001. Local number, 56C 1.

LOCATION.--Lat 36°50'06", long 76°50'03", Hydrologic Unit 03010202, 0.13 mi west of State Highway 614, 2.2 mi south of Zuni. Owner: Zuni Presbyterian Training Center.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 8 in., depth 434 ft, screened 418 to 434 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, semiannual measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 75 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of pump base, 1.7 ft above land-surface datum.

REMARKS.--Water levels affected by pumpage.

PERIOD OF RECORD.--August 1970 to December 1975, January 1978 to current year. Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 125.02 ft below land-surface datum, Aug. 27, 1970; lowest measured, 161.99 ft below land-surface datum, June 16, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

	DATE	LEVEL	DATE	LEVEL	DATE	LEVEL	DATE	LEVEL
	DEC 14	158.96	MAR 21	158.90	JUN 20	159.29	SEP 19	159.33

WATER YEAR 1989 HIGHEST 158.90 MAR 21, 1989 LOWEST 159.33 SEP 19, 1989

GROUND-WATER LEVELS

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ISLE OF WIGHT COUNTY--Continued

364814076440701. Local number, 57C 25 SOW 149A.

LOCATION.--Lat 36°48'14", long 76°44'07", Hydrologic Unit 02080208, at Windsor Community Center in Windsor.

Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 26 ft, screened 16 to 26 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 70 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.2 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March 1985 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.27 ft above land-surface datum, Feb. 23, 1987; lowest measured, 3.29 ft below land-surface datum, July 22, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	1.90	JAN 17	0.60	MAR 15	*0.15	APR 24	0.60	JUN 12	1.70	AUG 09	2.40
NOV 21	1.10										

WATER YEAR 1989 HIGHEST *0.15 MAR 15, 1989 LOWEST 2.40 AUG 09, 1989

* Water level above land-surface datum.

364814076440702. Local number, 57C 26 SOW 149B.

LOCATION.--Lat 36°48'14", long 76°44'07", Hydrologic Unit 02080208, at Windsor Community Center in Windsor.

Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 380 ft, screened 370 to 380 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 70 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.2 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March 1985 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 144.42 ft below land-surface datum, Feb. 25, 1986; lowest measured, 158.20 ft below land-surface datum, Jan. 11, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	151.45	JAN 17	151.40	MAR 15	151.10	APR 24	150.80	JUN 12	151.00	AUG 09	151.20
NOV 21	151.30										

WATER YEAR 1989 HIGHEST 150.80 APR 24, 1989 LOWEST 151.45 OCT 11, 1988

364814076440704. Local number, 57C 28 SOW 149D.

LOCATION.--Lat 36°48'14", long 76°44'07", Hydrologic Unit 02080208, at Windsor Community Center in Windsor.

Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 807 ft, screened 797 to 807 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 70 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.4 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March 1985 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 142.80 ft below land-surface datum, Feb. 25, 1986; lowest measured, 155.67 ft below land-surface datum, Jan. 12, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	149.50	JAN 17	149.50	MAR 15	149.10	APR 24	149.05	JUN 12	149.00	AUG 09	149.30
NOV 21	149.40										

WATER YEAR 1989 HIGHEST 149.00 JUN 12, 1989 LOWEST 149.50 OCT 11, 1988, JAN 17, 1989

GROUND-WATER LEVELS

ISLE OF WIGHT COUNTY--Continued

365751076433501. Local number, 57D 21 SOW 143A.

LOCATION.--Lat 36°57'51", long 76°43'35", Hydrologic Unit 03010202, 50 ft west of State Highway 652, 0.5 mi south of State Highway 682, and 1.8 mi southwest of Magnet. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 650 ft, screened 640 to 650 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 73 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1980 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 122.60 ft below land-surface datum, Aug. 27, 1980; lowest measured, 139.95 ft below land-surface datum, Jan. 11, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	139.05	JAN 17	138.80	MAR 15	138.30	APR 24	138.20	JUN 12	138.20	AUG 09	138.90
NOV 21	139.00										

WATER YEAR 1989 HIGHEST 138.20 APR 24, JUN 12, 1989 LOWEST 139.05 OCT 11, 1988

365751076433502. Local number, 57D 22 SOW 143B.

LOCATION.--Lat 36°57'51", long 76°43'35", Hydrologic Unit 03010202, 50 ft west of State Highway 652, 0.5 mi south of State Highway 682, and 1.8 mi southwest of Magnet. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well; diameter 4 in., depth 350 ft, screened 340 to 350 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 73 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1980 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 125.10 ft below land-surface datum, Apr. 24, May 29, 1980; lowest measured, 140.25 ft below land-surface datum, Mar. 16, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	139.30	JAN 17	139.10	MAR 15	138.60	APR 24	138.45	JUN 12	138.40	AUG 09	139.20
NOV 21	139.25										

WATER YEAR 1989 HIGHEST 138.40 JUN 12, 1989 LOWEST 139.30 OCT 11, 1988

365751076433503. Local number, 57D 23 SOW 143C.

LOCATION.--Lat 36°57'51", long 76°43'35", Hydrologic Unit 03010202, 50 ft west of State Highway 652, 0.5 mi south of State Highway 682, and 1.8 mi southwest of Magnet. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 18 ft, screened 8 to 18 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 73 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1980 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.29 ft below land-surface datum, Feb. 23, 1987; lowest measured, 8.70 ft below land-surface datum, Aug. 11, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	6.98	JAN 17	5.00	MAR 15	3.30	APR 24	4.30	JUN 12	5.20	AUG 09	7.30
NOV 21	6.15										

WATER YEAR 1989 HIGHEST 3.30 MAR 15, 1989 LOWEST 7.30 AUG 09, 1989

GROUND-WATER LEVELS

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ISLE OF WIGHT COUNTY--Continued

370236076425901. Local number, 57E 10 SOW 144B.

LOCATION.--Lat 37°02'36", long 76°42'59", Hydrologic Unit 02080206, 0.5 mi east of State Highway 627, 1.0 mi north of State Highway 621, and 2.5 mi southwest of Rushmere. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 440 ft, screened 430 to 440 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 85 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1980 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 139.90 ft below land-surface datum, Apr. 24, July 24, 1980; lowest measured, 154.65 ft below land-surface datum, Oct. 11, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	154.65	JAN 17	154.00	MAR 15	152.50	APR 24	153.30	JUN 12	153.40	AUG 09	154.60
NOV 21	154.50										
WATER YEAR 1989		HIGHEST	152.50	MAR 15, 1989		LOWEST	154.65	OCT 11, 1988			

370253076431201. Local number, 57E 14 SOW 144A.

LOCATION.--Lat 37°02'53", long 76°43'12", Hydrologic Unit 02080208, 0.5 mi east of State Highway 627, 1.0 mi north of State Highway 621, and 2.5 mi southwest of Rushmere. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well; diameter 4 in. to 590 ft, diameter 3 in. from 590 to 600 ft, depth 600 ft, screened 590 to 600 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 86 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1980 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 139.49 ft below land-surface datum, Apr. 24, 1980; lowest measured, 154.20 ft below land-surface datum, Oct. 11, 1988, Aug. 9, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	154.20	JAN 17	153.70	MAR 15	152.10	APR 24	152.90	JUN 12	152.90	AUG 09	154.20
NOV 21	154.10										
WATER YEAR 1989		HIGHEST	152.10	MAR 15, 1989		LOWEST	154.20	OCT 11, 1988, AUG 09, 1989			

370253076431202. Local number, 57E 15 SOW 144C.

LOCATION.--Lat 37°02'53", long 76°43'12", Hydrologic Unit 02080208, 0.5 mi east of State Highway 627, 1.0 mi north of State Highway 621, and 2.5 mi southwest of Rushmere. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 20 ft, screened 10 to 20 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 86 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1980 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.90 ft below land-surface datum, Feb. 25, 1987; lowest measured, 13.73 ft below land-surface datum, Nov. 16, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	10.20	JAN 17	4.35	MAR 15	1.90	APR 24	2.10	JUN 12	3.80	AUG 09	9.40
NOV 21	9.50										
WATER YEAR 1989		HIGHEST	1.90	MAR 15, 1989		LOWEST	10.20	OCT 11, 1988			

GROUND-WATER LEVELS

JAMES CITY COUNTY

372546076532901. Local number, 55H 20.

LOCATION.--Lat 37°25'46", long 76°53'29", Hydrologic Unit 02080206, 700 ft east of the pumping station at Diascund Creek Reservoir, 100 ft north of State Highway 603, 0.6 mi northwest of the intersection of U.S. Highway 60 and State Highway 603 in James City County. Owner: City of Newport News.

AQUIFER.--Potomac aquifer of Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 12 in. to 300 ft, diameter 6 in. from 300 to 735 ft, depth 735 ft, screened 515 to 540 ft, 600 to 620 ft, 630 to 655 ft, 665 to 685 ft, 720 to 730 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 28 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.6 ft above land-surface datum.

REMARKS.--Water levels for the period May to September 1988 should be 100.00 ft higher than previously published.

PERIOD OF RECORD.--May 1988 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 90.99 ft below land-surface datum, June 4, 1988; lowest recorded, 92.99 ft below land-surface datum, Sept. 25, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	92.26	92.17	92.44	92.64	92.76	92.55	92.46	92.51	92.65	92.69	92.64	92.89
10	92.28	92.37	92.43	92.74	92.76	92.57	92.53	92.37	92.56	92.65	92.79	92.83
15	92.44	92.40	92.50	92.65	92.77	92.44	92.47	92.46	92.58	92.65	92.70	92.91
20	92.43	92.34	92.59	92.66	92.71	92.63	92.52	92.53	92.68	92.57	92.62	92.90
25	92.32	92.39	92.63	92.77	92.54	92.36	92.48	92.52	92.59	92.72	92.68	92.99
EOM	92.48	92.37	92.65	92.64	92.52	92.22	92.51	92.66	92.72	92.68	92.77	92.90

WATER YEAR 1989 HIGHEST 92.00 NOV 5, 1988 LOWEST 92.99 SEP 25, 1989

371311076463601. Local number, 56F 1 SOW 018.

LOCATION.--Lat 37°13'11", long 76°46'36", Hydrologic Unit 02080206, 1,100 ft southwest of Colonial Parkway, 0.5 mi west of State Highway 682, and 0.6 mi north of Jamestown. Owner: U.S. Department of Interior, Colonial National Historical Park.

AQUIFER.--Sand of upper Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 4 in., depth 346 ft, screened 336 to 346 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 10 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top edge of recorder shelf, 3.15 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--May 1969 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 43.29 ft below land-surface datum, May 8, 1969; lowest measured, 81.65 ft below land-surface datum, Oct. 19, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	81.65	JAN 13	79.85	MAR 01	79.15	APR 26	79.00	JUN 26	79.95	AUG 03	80.35
NOV 29	80.75										

WATER YEAR 1989 HIGHEST 79.00 APR 26, 1989 LOWEST 81.65 OCT 19, 1988

371810076473001. Local number, 56G 8.

LOCATION.--Lat 37°20'08", long 76°47'32", Hydrologic Unit 02080206, 0.55 mi east of the intersection of State Highways 611 and 614 on State Highway 611, 2.1 mi west of Lightfoot. Owner: Peninsula Boy Scout Council.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 490 ft, screened 480 to 490 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 143 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.85 ft above land-surface datum.

PERIOD OF RECORD.--November 1965, September 1978, January 1984 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 160.00 ft below land-surface datum, November 1965; lowest measured, 211.28 ft below land-surface datum, Sept. 19, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 18	202.21

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 13	203.13	MAR 21	204.72	JUN 20	206.89	SEP 19	211.28
WATER YEAR 1989	HIGHEST 203.13 DEC 13, 1988	LOWEST 211.28 SEP 19, 1989					

GROUND-WATER LEVELS

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JAMES CITY COUNTY--Continued

372028076452401. Local number, 56G 38.

LOCATION.--Lat 37°20'24", long 76°45'24", Hydrologic Unit 02080206, 200 ft southwest of U.S. Highway 60 in Lightfoot, 550 ft northwest of the intersection of U.S. Highway 60 and State Highway 646. Owner: Chesapeake and Potomac Telephone Company.

AQUIFER.--Sand of Eocene to Miocene age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 300 ft, screened 262 to 300 ft.

INSTRUMENTATION.--Occasional measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 122 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.53 ft below land-surface datum.

PERIOD OF RECORD.--February to September 1978, February 1984 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 137.61 ft below land-surface datum, Feb. 9, 1978; lowest measured, 166.45 ft below land-surface datum, July 27, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 14	161.92

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

	DATE	WATER LEVEL	DATE	WATER LEVEL		
	DEC 13	164.16	SEP 27	166.21		
WATER YEAR 1989	HIGHEST	164.16	DEC 13, 1988	LOWEST	166.21	SEP 27, 1989

372145076493201. Local number, 56G 57.

LOCATION.--Lat 37°21'45", long 76°49'32", Hydrologic Unit 02080206, 1.75 mi south of the intersection of U.S. Highway 60 and State Highway 631 (Church Lane), off a dirt road at the end of State Highway 631, and 0.10 mi north of the pump station at Little Creek Reservoir. Owner: City of Newport News.

AQUIFER.--Middle Potomac aquifer of Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 12 in. to 300 ft, diameter 6 in. from 300 to 695 ft, depth 695 ft, screened 530 to 540 ft, 558 to 598 ft, 604 to 624 ft, 660 to 690 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 84 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 4.3 ft above land-surface datum.

PERIOD OF RECORD.--May 1988 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 155.79 ft below land-surface datum, May 25, 1988; lowest recorded, 157.66 ft below land-surface datum, Feb. 17, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	157.11	157.12	157.35	157.34	157.54	157.23	157.13	157.14	157.29	157.34	157.32	157.52
10	---	157.19	157.27	157.42	157.48	157.20	157.11	157.09	157.23	157.35	157.49	157.45
15	---	157.25	---	157.30	157.51	157.13	157.16	157.10	157.30	157.34	157.39	157.51
20	157.23	157.26	157.35	157.33	157.45	157.25	157.12	157.21	157.33	157.26	157.21	157.51
25	157.13	157.27	157.36	157.48	157.26	157.11	---	---	157.26	157.40	157.29	157.54
EOM	157.34	157.26	157.34	157.40	157.20	156.97	157.14	157.31	157.34	157.38	157.41	157.51

WATER YEAR 1989 HIGHEST 156.89 MAR. 31, 1989 LOWEST 157.66 FEB 17, 1989

371820076473001. Local number, 56H 7.

LOCATION.--Lat 37°23'55", long 76°45'28", Hydrologic Unit 02080107, 0.2 mi northeast of Croaker, 1.5 mi northeast of the intersection of State Highways 168 and 607 at the Virginia Department of Transportation garage.

Owner: Virginia Department of Transportation.

AQUIFER.--Sand of Eocene to Miocene age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 325 ft, screened 305 to 325 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 101 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.2 ft above land-surface datum.

REMARKS.--Water levels affected by local pumpage.

PERIOD OF RECORD.--August 1976, October 1983 to September 1989 (discontinued). Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 120.90 ft below land-surface datum, Aug. 20, 1976; lowest measured, 142.05 ft below land-surface datum, Sept. 20, 1989.

GROUND-WATER LEVELS

JAMES CITY COUNTY--Continued

371820076473001. Local number, 56H 7--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 08	137.92

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 12	135.05	MAR 20	136.11	JUN 21	133.60	SEP 20	142.05

WATER YEAR 1989 HIGHEST 133.60 JUN 21, 1989 LOWEST 142.05 SEP 20, 1989

372314076480401. Local number, 56H 22 SOW 135A.

LOCATION.--Lat 37°23'14", long 76°48'04", Hydrologic Unit 02080107, 100 ft south of State Highway 754, 0.2 mi east of intersection of State Highway 754 and U.S. Highway 60, and 0.5 mi north of Toano. Owner: James City Service Authority.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 2 in., depth 645 ft, screened 625 to 645 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 105 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.50 ft above land-surface datum prior to Mar. 3, 1988; at land-surface datum prior to Mar. 1, 1989; 0.50 ft below land surface datum thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March 1979 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 154.85 ft below land-surface datum, Apr. 5, 1979; lowest measured, 172.19 ft below land-surface datum, Sept. 18, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	169.16	MAR 03	170.10	MAR 14	171.49	MAY 11	170.10	JUN 23	170.38	AUG 25	170.95
JAN 19	169.55										

WATER YEAR 1988 HIGHEST 169.16 NOV 20, 1987 LOWEST 171.49 MAR 14, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	171.45	DEC 13	171.53	MAR 01	171.90	MAY 01	171.70	JUN 26	171.70	SEP 18	172.19
NOV 17	171.40	JAN 13	171.60	20	171.98	JUN 20	172.01	AUG 03	171.90		

WATER YEAR 1989 HIGHEST 171.40 NOV 17, 1988 LOWEST 172.19 SEP 18, 1989

372506076511701. Local number, 56H 25 SOW 177A.

LOCATION.--Lat 37°25'06", long 76°51'17", Hydrologic Unit 02080206, 3.15 mi west of the intersection of U.S. Highway 60 and State Highway 168, 0.7 mi north of the intersection of State Highways 168 and 601, and on the northwest side of State Highway 601 in James City County. Owner: Virginia Water Control Board.

AQUIFER.--Lower Potomac aquifer of Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 4 in., depth 929 ft, screened 888 to 908 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to June 28, 1988, digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 103 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.15 ft above land-surface datum.

PERIOD OF RECORD.--April 1985 to current year. Unpublished records available prior to October 1986 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 158.21 ft below land-surface datum, Mar. 19, 20, 1986; lowest measured, 167.21 ft below land-surface datum, Sept. 21, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24	166.81	DEC 20	167.14	MAR 31	166.89	JUN 29	167.02	SEP 21	167.21

WATER YEAR 1989 HIGHEST 166.81 OCT 24, 1988 LOWEST 167.21 SEP 21, 1989

JAMES CITY COUNTY--Continued

372506076511702. Local number, 56H 26 SOW 177B.

LOCATION.--Lat 37°25'06", long 76°51'17", Hydrologic Unit 02080206, 3.15 mi west of the intersection of U.S. Highway 60 and State Highway 168, 0.7 mi north of the intersection of State Highways 168 and 601, and on the northwest side of State Highway 601 in James City County. Owner: Virginia Water Control Board.

AQUIFER.--Middle Potomac aquifer of Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 4 in., depth 581 ft, screened 550 to 560 ft.

INSTRUMENTATION.--Quarterly measurements with chalked tape by USGS personnel. Prior to Oct. 1, 1988, digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 103 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.15 ft above land-surface datum.

PERIOD OF RECORD.--April 1985 to current year. Unpublished records prior to October 1986 and fragmentary periods of continuous record for water year 1989 available in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 157.61 ft below land-surface datum, June 1, 2, 1985; lowest measured, 166.30 ft below land-surface datum, Sept. 21, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24	165.91	DEC 20	166.25	MAR 31	165.95	JUN 29	166.13	SEP 21	166.30

WATER YEAR 1989 HIGHEST 165.91 OCT 24, 1988 LOWEST 166.30 SEP 21, 1989

372506076511703. Local number, 56H 27 SOW 177C.

LOCATION.--Lat 37°25'06", long 76°51'17", Hydrologic Unit 02080206, 3.15 mi west of the intersection of U.S. Highway 60 and State Highway 168, 0.7 mi north of the intersection of State Highways 168 and 601, and on the northwest side of State Highway 601 in James City County. Owner: Virginia Water Control Board.

AQUIFER.--Upper Potomac aquifer of Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 401 ft, screened 370 to 380 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 103 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.95 ft above land-surface datum.

PERIOD OF RECORD.--April 1985 to current year. Unpublished records available prior to October 1986 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 153.47 ft below land-surface datum, June 1, 2, 1985; lowest recorded, 160.72 ft below land-surface datum, Sept. 24, 25, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	160.23	---	---	160.44	160.46	160.21	160.04	160.02	160.24	160.37	160.41	160.63
10	160.24	---	---	160.46	160.42	160.14	160.03	159.95	160.22	160.36	160.57	160.62
15	160.34	---	---	160.40	160.42	160.06	160.08	160.00	160.27	160.38	160.50	160.69
20	160.38	---	---	160.38	160.34	160.18	160.07	160.06	160.31	160.30	160.36	160.66
25	160.31	---	160.48	160.47	160.20	160.01	160.07	160.09	160.20	160.43	160.43	160.72
EOM	160.45	---	160.46	160.39	160.17	159.95	160.10	160.23	160.34	160.45	160.53	160.66

WATER YEAR 1989 HIGHEST 159.86 MAR 03, APR 07, MAY 02, 1989 LOWEST 160.72 SEP 24, 25, 1989

372506076511704. Local number, 56H 28 SOW 177D.

LOCATION.--Lat 37°25'06", long 76°51'17", Hydrologic Unit 02080206, 3.15 mi west of the intersection of U.S. Highway 60 and State Highway 168, 0.7 mi north of the intersection of State Highways 168 and 601, and on the northwest side of State Highway 601 in James City County. Owner: Virginia Water Control Board.

AQUIFER.--Aquia aquifer of Tertiary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 321 ft, screened 290 to 300 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 193 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.9 ft above land-surface datum.

PERIOD OF RECORD.--April 1985 to current year. Unpublished records available prior to October 1986 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 153.20 ft below land-surface datum, May 31, 1985; lowest recorded, 160.22 ft below land-surface datum, Sept. 13, 14, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	159.73	159.74	159.93	159.97	160.02	---	159.57	159.58	---	159.87	159.91	160.16
10	159.77	159.89	159.90	160.01	159.97	---	159.57	159.46	---	159.88	160.09	160.14
15	159.84	159.91	---	159.89	159.96	---	159.59	159.56	---	159.90	160.01	160.21
20	159.89	159.90	---	159.91	---	---	159.61	159.62	---	159.84	159.88	---
25	159.82	159.91	159.98	160.01	---	---	159.60	159.64	---	159.93	159.93	---
EOM	159.96	159.89	159.97	159.92	---	---	159.65	159.77	159.84	159.95	160.04	---

WATER YEAR 1989 HIGHEST 159.37 MAR 31, 1989 LOWEST 160.22 SEP 13, 14, 1989

GROUND-WATER LEVELS

JAMES CITY COUNTY--Continued

372506076511705. Local number, 56H 29 SOW 177E.

LOCATION.--Lat 37°25'06", long 76°51'17", Hydrologic Unit 02080206, 3.15 mi west of intersection of U.S. Highway 60 and State Highway 168, 0.7 mi north of intersection of State Highways 168 and 601, and on the northwest side of State Highway 601 in James City County. Owner: Virginia Water Control Board.

AQUIFER.--Chickahominy-Piney Point aquifer of Tertiary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 235 ft, screened 204 to 214 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 103 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.8 ft above land-surface datum.

PERIOD OF RECORD.--April 1985 to current year. Unpublished records available prior to October 1986 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 111.96 ft below land-surface datum, Feb. 27, 1986; lowest recorded, 120.34 ft below land-surface datum, Sept. 18, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	119.00	118.85	118.74	118.81	118.56	118.20	117.93	118.06	118.71	119.24	119.62	120.23
10	119.00	118.97	118.67	118.79	118.49	118.14	117.91	117.93	119.16	119.22	119.93	120.25
15	119.06	118.94	118.73	118.58	118.52	118.02	117.89	117.96	119.09	119.23	119.91	120.28
20	119.10	118.84	---	118.61	118.42	118.11	117.94	118.07	119.03	119.11	119.86	120.29
25	119.04	118.81	118.84	118.65	118.29	117.97	118.08	118.23	118.94	119.28	119.89	---
EOM	119.13	118.74	118.84	118.55	118.23	117.87	118.22	118.58	119.08	119.45	120.02	---

WATER YEAR 1989 HIGHEST 117.72 APR 04, 1989 LOWEST 120.34 SEP 18, 1989

372506076511706. Local number, 56H 30 SOW 177F.

LOCATION.--Lat 37°25'06", long 76°51'17", Hydrologic Unit 02080206, 3.15 mi west of intersection of U.S. Highway 60 and State Highway 168, 0.7 mi north of intersection of State Highways 168 and 601, and on the northwest side of State Highway 601 in James City County. Owner: Virginia Water Control Board.

AQUIFER.--Yorktown-Eastover aquifer of Tertiary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 60 ft, screened 50 to 60 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 103 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.9 ft above land-surface datum.

PERIOD OF RECORD.--April 1985 to current year. Unpublished records available prior to October 1986 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 17.25 ft below land-surface datum, June 8, 9, 12, 13, 1987; lowest recorded, 23.83 ft below land-surface datum, Feb. 16, 17, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	22.27	22.61	23.01	23.39	23.71	23.70	22.85	21.19	20.05	19.93	19.93	19.76
10	22.31	22.72	23.06	23.44	23.74	23.61	22.54	20.80	20.03	19.95	20.07	19.69
15	22.40	22.79	23.14	23.43	23.79	23.56	22.25	20.57	20.01	20.01	19.99	19.72
20	22.48	22.82	23.21	23.52	23.82	23.57	21.98	20.37	20.02	19.92	19.82	19.74
25	22.53	22.90	23.27	23.60	23.74	23.33	21.74	20.22	19.93	19.98	19.76	---
EOM	22.62	22.95	23.32	23.65	23.73	23.05	21.54	20.11	19.99	19.97	19.77	---

WATER YEAR 1989 HIGHEST 19.67 AUG 30, 1989 LOWEST 23.83 FEB 16, 17, 1989

372314076480402. Local number, 56H 31 SOW 135B.

LOCATION.--Lat 37°23'14", long 76°48'04", Hydrologic Unit 02080107, 100 ft south of State Highway 754, 0.2 mi east of intersection of State Highway 754 and U.S. Highway 60, and 0.5 mi north of Toano. Owner: James City Service Authority.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 4 in., depth 30 ft, screened 20 to 30 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 95 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.3 ft above land-surface datum prior to Mar 3, 1988; at land-surface datum prior to Mar. 1, 1989; 0.2 ft below land-surface datum thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--August 1979 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 16.28 ft below land-surface datum, June 8, 1984; lowest measured, 23.80 ft below land-surface datum, Mar. 1, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	20.10	JAN 19	21.00	MAR 03	20.80	MAY 11	20.90	JUN 23	20.55	AUG 25	21.22
WATER YEAR 1988		HIGHEST 20.10	NOV 20, 1987		LOWEST 21.22	AUG 25, 1988					

JAMES CITY COUNTY--Continued

372314076480402. Local number, 56H 31 SOW 135B--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	22.10	NOV 17	23.10	JAN 13	23.30	MAR 01	23.80	JUN 26	19.30	AUG 03	19.70
WATER YEAR 1989		HIGHEST	19.30	JUN 26, 1989	LOWEST	23.80	MAR 01, 1989				

372315076415001. Local number 57H 14 SOW 095.

LOCATION.--Lat 37°23'15", long 76°41'50", Hydrologic Unit 02080107, 500 ft north of State Highway 606, 0.8 mi east of intersection of State Highway 606 and 646, and 3.3 mi east of Croaker. Owner: Virginia Water Control Board.

AQUIFER.--Yorktown-Eastover aquifer of Miocene-Pliocene age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 4 in., depth 123 ft, screened 118 to 123 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 95 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum prior to Mar. 3, 1988; 1.4 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 45.00 ft below land-surface datum, Sept. 21, 1978; lowest measured, 54.42 ft below land-surface datum, Nov. 9, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	52.46	MAR 03	52.32	MAR 08	52.32	MAY 11	52.48	JUN 23	52.57	AUG 25	52.72
JAN 19	52.05										
WATER YEAR 1988		HIGHEST	52.05	JAN 19, 1988	LOWEST	52.72	AUG 25, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	52.80	DEC 12	52.99	MAR 01	53.20	MAY 01	53.00	JUN 27	53.40	SEP 20	53.33
NOV 29	52.80	JAN 13	52.90	20	53.27	JUN 21	53.46	AUG 03	53.50		
WATER YEAR 1989		HIGHEST	52.80	OCT 19, NOV 29, 1988		LOWEST	53.50	AUG 03, 1989			

KING AND QUEEN COUNTY

374328077012801. Local number, 54K 6 SOW 064.

LOCATION.--Lat 37°43'28", long 77°01'28", Hydrologic Unit 02080105, 100 ft west of State Highway 629, 0.2 mi southeast of Walkerton, and 0.25 mi south of intersection of State Highways 629 and 634. Owner: C. L. Walker.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in. to 66 ft, diameter 4 in. from 66 to 390 ft, depth 390 ft, screened 341 to 372 ft, 376 to 387 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 5 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.17 ft above land-surface datum prior to Nov. 18, 1985; 1.3 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--August 1972 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.82 ft below land-surface datum, Aug. 1, 1972; lowest measured, 31.90 ft below land-surface datum, June 12, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 13	29.89	MAR 04	29.41	MAY 10	29.67	JUN 14	30.44	JUL 29	31.29	SEP 21	31.40
JAN 12	30.25										
WATER YEAR 1988		HIGHEST	29.41	MAR 04, 1988	LOWEST	31.40	SEP 21, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 15	31.68	FEB 27	31.28	APR 17	31.05	JUN 12	31.90	AUG 01	31.29	SEP 25	31.45
JAN 10	31.20										
WATER YEAR 1989		HIGHEST	31.05	APR 17, 1989	LOWEST	31.90	JUN 12, 1989				

GROUND-WATER LEVELS

KING AND QUEEN COUNTY--Continued

373126076454101. Local number, 56J 11 SOW 073.

LOCATION.--Lat 37°31'26", long 76°45'41", Hydrologic Unit 02080105, at West Point Airport, 1.7 mi southeast of West Point. Owner: Chesapeake Corporation.

AQUIFER.--Sand and gravel of undifferentiated Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in., depth 1,254 ft, screened 1,233 to 1,248 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, bimonthly measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.6 ft above land-surface datum.

PERIOD OF RECORD.--November 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 73.08 ft below land-surface datum, Apr. 25, 1975; lowest measured, 103.39 ft below land-surface datum, Dec. 15, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
	DEC 15	103.39	MAR 17	103.26	JUN 21	101.15	SEP 20	101.38
WATER YEAR 1989	HIGHEST	101.15	JUN 21, 1989		LOWEST	103.39	DEC 15, 1988	

373008076425601. Local number, 57J 3 SOW 074.

LOCATION.--Lat 37°30'08", long 76°42'56", Hydrologic Unit 02080107, off State Highway 606, 0.4 mi northeast of intersection of State Highways 606 and 605, and 2.8 mi south of Shacklefords. Owner: Chesapeake Corporation.

AQUIFER.--Sand of undifferentiated Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in. to 200 ft, diameter 4 in. from 200 to 760 ft, depth 760 ft, screened 741 to 756 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, bimonthly measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 51 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.20 ft above land-surface datum.

PERIOD OF RECORD.--November 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 109.90 ft below land-surface datum, Jan. 26, 1975; lowest measured, 132.88 ft below land-surface datum, June 27, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
	DEC 15	132.35	MAR 17	132.83	JUN 27	132.88	SEP 20	132.48
WATER YEAR 1989	HIGHEST	132.35	DEC 15, 1988		LOWEST	132.88	JUN 27, 1989	

KING WILLIAM COUNTY

373955077000501. Local number, 53K 9.

LOCATION.--Lat 37°41'18", long 77°10'43", Hydrologic Unit 02080106, 250 ft east of the intersection of U.S. Highways 360 and 60, 0.3 mi northeast of the Pamunkey River on U.S. Highway 360, and 2.0 mi southwest of Manquin. Owner: G. O. Townsend.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 3 in., depth 290 ft, screen depth unknown.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 60 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.01 ft above land-surface datum.

PERIOD OF RECORD.--August 1972, December 1975, January 1984 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 44.54 ft below land-surface datum, Aug. 17, 1972; lowest measured, 64.83 ft below land-surface datum, Sept. 20, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 17	62.85

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
	DEC 15	54.56	MAR 21	56.88	JUN 20	54.58	SEP 20	64.83
WATER YEAR 1989	HIGHEST	54.56	DEC 15, 1988		LOWEST	64.83	SEP 20, 1989	

KING WILLIAM COUNTY--Continued

373226076481201. Local number, 56J 2.

LOCATION.--Lat 37°32'26", long 76°48'12", Hydrologic Unit 02080106, 0.1 mi west of State Highway 30, 0.3 mi north of State Highway 33, and in West Point. Owner: Chesapeake Corporation.

AQUIFER.--Sand of undifferentiated Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused withdrawal water well, diameter 18 in. to 300 ft, diameter 8 in. from 300 to 600 ft, depth 600 ft, screened 390 to 400 ft, 550 to 570 ft, 580 to 600 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, bimonthly measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 25 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum.

REMARKS.--Water levels affected by local pumpage.

PERIOD OF RECORD.--November 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 141.48 ft below land-surface datum, Feb. 15, 1983; lowest measured, 174.36 ft below land-surface datum, May 25, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
	DEC 15	172.56	MAR 17	169.84	JUN 21	174.22	SEP 19	169.51
WATER YEAR 1989	HIGHEST	169.51	SEP 19, 1989		LOWEST	174.22	JUN 21, 1989	

373459076510201. Local number, 56J 10.

LOCATION.--Lat 37°34'59", long 76°51'02", Hydrologic Unit 02080105, 100 ft northeast of State Highway 30 at the Virginia State Police office, 4.2 mi west of the intersection of State Highways 30 and 33 in West Point. Owner: Virginia Department of State Police.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 437 ft, screened 417 to 437 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 101 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.2 ft below land-surface datum.

PERIOD OF RECORD.--December 1972, December 1974, October 1983 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 176.00 ft below land-surface datum, Dec. 8, 1972; lowest measured, 197.63 ft below land-surface datum, June 23, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 17	194.97

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
	DEC 15	195.67	MAR 22	196.72	JUN 23	197.63	SEP 27	196.24
WATER YEAR 1989	HIGHEST	195.67	DEC 15, 1988		LOWEST	197.63	JUN 23, 1989	

373206076481201. Local number, 56J 18.

LOCATION.--Lat 37°32'06", long 76°48'12", Hydrologic Unit 02080106, near State Highway 33 at Chesapeake Corporation, in brick pump house at northeast corner of 13th and A Streets in West Point. Owner: Chesapeake Corporation.

AQUIFER.--Sand and clay of Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused withdrawal water well, diameter 18 in. to 180 ft, diameter 8 in. from 165 to 446 ft, depth 446 ft, screened 210 to 240 ft, 380 to 390 ft, 405 to 445 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, bimonthly measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 5 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.45 ft above land-surface datum.

REMARKS.--Water levels affected by local pumpage.

PERIOD OF RECORD.--March 1977 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 111.68 ft below land-surface datum, Dec. 29, 1978; lowest measured, 173.08 ft below land-surface datum, Feb. 23, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
	DEC 15	167.47	MAR 17	165.18	JUN 21	166.94	SEP 19	164.72
WATER YEAR 1989	HIGHEST	164.72	SEP 19, 1989		LOWEST	167.47	DEC 15, 1988	

GROUND-WATER LEVELS

LANCASTER COUNTY

374249076230101. Local number, 59K 1 SOW 015.

LOCATION.--Lat 37°42'49", long 76°23'01", Hydrologic Unit 02080104, at Lancaster County High School in Kilmarnock.

Owner: Lancaster County Public Schools.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 4 in. to 163 ft., diameter 2 in. from 163 to 716 ft, depth 716 ft, screened 706 to 716 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 85 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, at land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--October 1967 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 95.89 ft below land-surface datum, Feb. 20, 1968; lowest measured, 122.57 ft below land-surface datum, Aug. 24, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	121.58	JAN 19	121.10	MAR 02	120.20	APR 27	120.50	JUN 28	120.70	AUG 02	121.80
NOV 30	121.30										

WATER YEAR 1989	HIGHEST	120.20	MAR 02, 1989	LOWEST	121.80	AUG 02, 1989
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LOUDOUN COUNTY

391542077423801. Local number, 49Y 1 SOW 022.

LOCATION.--Lat 39°15'42", long 77°42'38", Hydrologic Unit 02070008, 4.2 mi southeast of Harpers Ferry. Owner:

American Telephone and Telegraph Company.

AQUIFER.--Bedrock of Precambrian or Cambrian age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6.5 in., depth 516 ft, cased to 45 ft, open hole 45 to 516 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 1,100 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, at land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--August 1969 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 48.00 ft below land-surface datum, June 22, 1972; lowest measured, 61.70 ft below land-surface datum, Sept. 27, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 16	60.56	MAR 01	60.05	APR 20	59.10	JUN 20	59.23	AUG 01	59.00	SEP 27	60.34
JAN 05	60.69										

WATER YEAR 1989	HIGHEST	59.00	AUG 01, 1989	LOWEST	60.69	JAN 05, 1989
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390623077314201. Local number, 50W 4C.

LOCATION.--Lat 39°06'23", long 77°31'42", Hydrologic Unit 02070008, under water tower 500 ft east of State Highway 7, 0.75 mi east of Leesburg. Owner: Town of Leesburg.

AQUIFER.--Slightly metamorphosed Balls Bluff Formation of Triassic age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in., depth 535 ft, cased to 6 ft, open hole 6 to 535 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 400 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

PERIOD OF RECORD.--October 1977 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 33.74 ft below land-surface datum, June 28, 1989; lowest measured, 49.06 ft below land-surface datum, Nov. 27, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

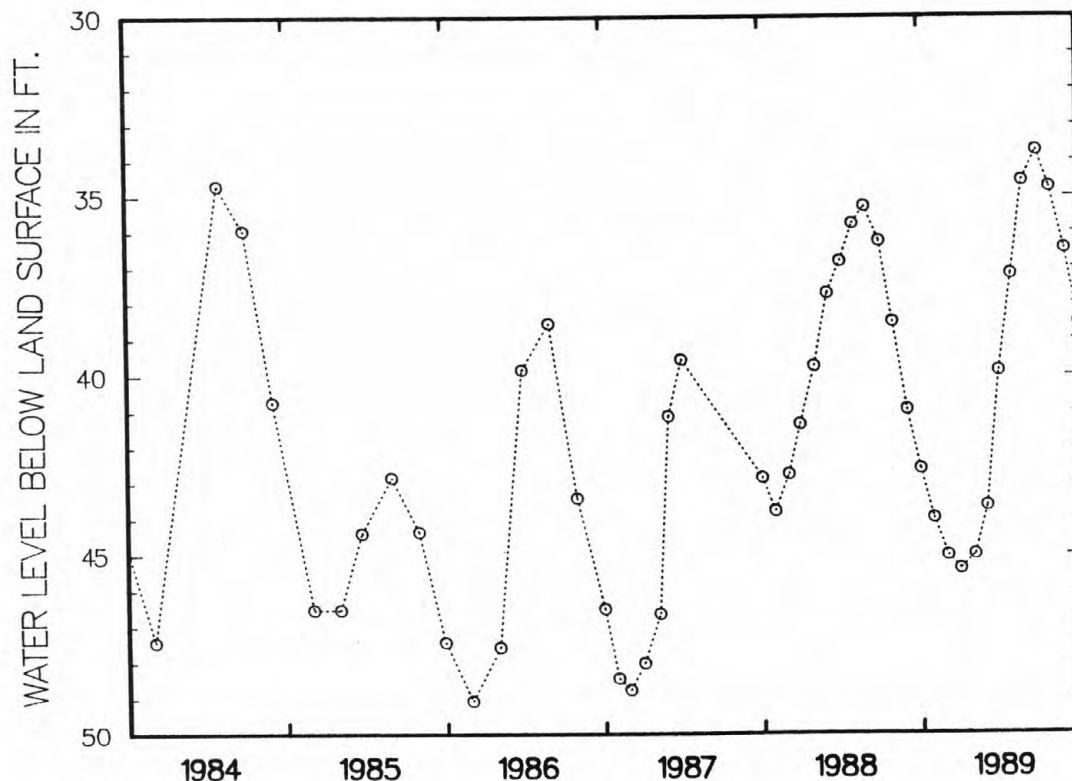
DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 29	43.99	DEC 28	45.43	MAR 01	43.66	APR 28	37.20	JUN 28	33.74	AUG 29	36.48
NOV 29	45.05	JAN 31	45.02	30	39.89	MAY 26	34.58	JUL 27	34.76	SEP 29	38.55

WATER YEAR 1989	HIGHEST	33.74	JUN 28, 1989	LOWEST	45.43	DEC 28, 1988
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GROUND-WATER LEVELS
LOUDOUN COUNTY-Continued

451

390623077314201. Local number, 50W 4C--Continued



LOUISA COUNTY

380217078133701. Local number, 45N 1.

LOCATION.--Lat 38°02'17", long 78°13'43", Hydrologic Unit 02080106, off State Highway 640 on Tyler property, 0.9 mi southeast of Thelma, and 3 mi southwest of Boswells Tavern. Owner: Tyler.

AQUIFER.--Wissahickon Formation of late Precambrian (?) age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 6 in., depth 56 ft, length of casing unknown.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 500 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.95 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--July 1952 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 11.97 ft below land-surface datum, Apr. 30, 1973; lowest measured, 35.17 ft below land-surface datum, Dec. 2, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	29.06	30.00	30.55	30.31	29.47	28.55	25.92	24.60	22.10	20.89	17.50	19.20
10	29.16	30.19	30.49	30.31	29.38	28.10	25.68	23.76	21.55	20.28	17.67	19.44
15	29.36	30.30	30.40	30.25	29.28	27.57	25.38	23.42	21.27	20.10	17.67	19.80
20	29.56	30.39	30.44	30.03	29.16	27.30	25.17	23.04	21.10	19.10	18.00	19.57
25	29.70	30.50	30.60	29.80	28.95	26.70	24.91	22.57	20.89	18.84	18.40	19.58
EOM	29.86	30.66	30.49	29.53	28.77	26.22	24.82	22.29	20.92	17.93	18.85	19.10

WATER YEAR 1989 HIGHEST 17.46 AUG 06, 07, 1989 LOWEST 30.66 NOV 29, 30, 1988

GROUND-WATER LEVELS

LOUISA COUNTY--Continued

380043078111301. Local number, 45N 4.

LOCATION.--Lat 38°00'45", long 78°11'14", Hydrologic Unit 02080106, 0.25 mi east of U.S. Highway 15, 4.1 mi south of Boswells Tavern. Owner: Virginia Department of Correction.

AQUIFER.--Metamorphosed sedimentary and volcanic rocks of unknown age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in., depth 200 ft, cased to 42 ft, open hole 42 to 200 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 415 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.3 ft above land-surface datum.

PERIOD OF RECORD.--February 1977 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.40 ft below land-surface datum, Apr. 28, 1980; lowest measured, 14.43 ft below land-surface datum, Aug. 26, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	13.99	DEC 28	12.25	FEB 27	12.25	APR 27	10.70	JUN 28	9.98	AUG 28	11.21
WATER YEAR 1989		HIGHEST	9.98	JUN 28, 1989	LOWEST	13.99	OCT 28, 1988				

380131078001001. Local number, 46N 1 SOW 056.

LOCATION.--Lat 38°01'31", long 78°00'10", Hydrologic Unit 02080106, 200 ft northeast of intersection of State Highway 208 and U.S. Highway 33 in Louisa. Owner: Town of Louisa.

AQUIFER.--Metamorphosed sedimentary and volcanic rocks of unknown age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in., depth 132 ft, length of casing unknown.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 455 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.6 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 26.27 ft below land-surface datum, May 18, 1973; lowest measured, 34.78 ft below land-surface datum, Dec. 8, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	30.98	JAN 09	31.60	FEB 27	31.74	APR 12	30.66	JUN 15	29.20	AUG 03	28.25
WATER YEAR 1989		HIGHEST	28.25	AUG 03, 1989	LOWEST	31.74	FEB 27, 1989				

MIDDLESEX COUNTY

373809076342501. Local number, 58K 1 SOW 031.

LOCATION.--Lat 37°38'09", long 76°34'25", Hydrologic Unit 02080104, 500 ft southeast of intersection of State Highways 227 and 602 in Urbanna. Owner: Town of Urbanna.

AQUIFER.--Sand of undifferentiated Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in., depth 552 ft, screen depth unknown.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 20 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--May 1970 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 44.33 ft below land-surface datum, May 16, 1970; lowest measured, 63.12 ft below land-surface datum, July 16, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	59.80	JAN 19	59.30	MAR 02	59.25	APR 27	58.90	JUN 28	59.10	AUG 02	59.50
NOV 30	59.70										
WATER YEAR 1989		HIGHEST	58.90	APR 27, 1989	LOWEST	59.80	OCT 13, 1988				

MONTGOMERY COUNTY

370812080261901. Local number, 27F 2 SOW 019.

LOCATION.--Lat 37°08'12", long 80°26'19", Hydrologic Unit 05050001, off entrance road to Round Meadow Country Club, 400 ft north of State Highway 661, and 0.5 mi west of Christiansburg. Owner: Town of Christiansburg.

AQUIFER.--Beekmantown Formation of early Ordovician age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 10 in., depth 450 ft, length of casing unknown.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 1,970 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft below land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board. Lowest recorded water level, 7.39 ft, is a result of the Mexico earthquake of Sept. 19, 1985, but is not shown as the minimum of record since it is an earthquake-induced measurement.

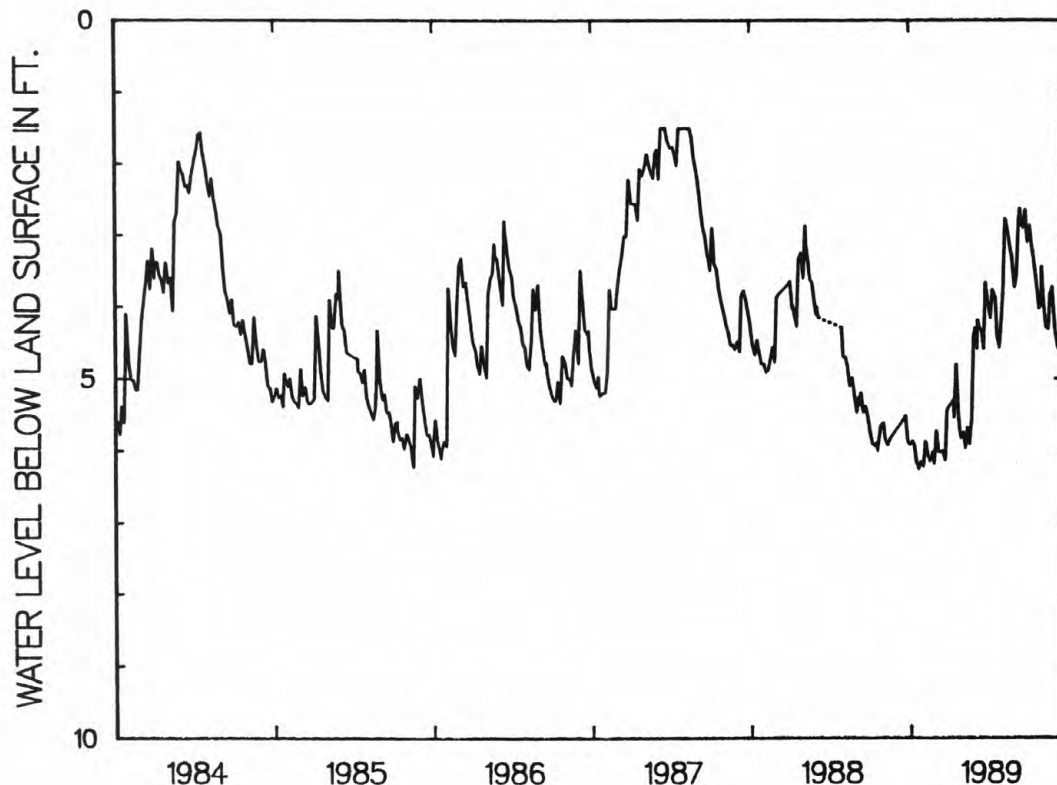
PERIOD OF RECORD.--July 1953, April 1969 to current year. Unpublished record available July 1953 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 1.50 ft below land-surface datum, several days in 1983, 1984, 1987, 1989, water flowing over top of casing; lowest recorded, 7.30 ft below land-surface datum, Dec. 5, 1969.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	5.87	5.88	6.02	---	5.97	4.60	4.18	3.76	3.55	2.87	3.98	4.57
10	5.93	6.07	6.02	5.55	5.68	4.30	3.77	2.77	2.80	3.18	4.30	4.64
15	6.16	6.15	6.00	4.80	5.92	4.34	3.86	2.95	2.85	3.42	4.32	4.22
20	6.26	6.08	6.14	5.52	5.56	4.60	4.44	3.15	2.91	3.66	3.83	2.37
25	6.15	6.18	5.43	5.84	4.40	3.67	4.58	3.34	2.65	4.04	3.73	1.56
EOM	6.22	5.73	---	5.75	4.30	4.00	4.20	3.74	3.12	3.96	4.35	1.50

WATER YEAR 1989 HIGHEST 1.50 SEP 22-30, 1989 LOWEST 6.26 OCT 20, 1988



NELSON COUNTY

374224078555601. Local number, 39K 1 SOW 006.

LOCATION.--Lat 37°42'24", long 78°55'56", Hydrologic Unit 02080203, 700 ft southeast of intersection of State Highway 655 and U.S. Highway 29 in Colleen. Owner: P. D. Payne.

AQUIFER.--Lovingston (or Marshall?) Formation of Precambrian age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in., depth 275 ft, length of casing unknown.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 770 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.94 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--October 1967 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 27.08 ft below land-surface datum, June 29, 1973; lowest recorded, 35.66 ft below land-surface datum, Mar. 7, 1969.

GROUND-WATER LEVELS
NELSON COUNTY--Continued

374224078555601. Local number, 39K 1 SOW 006--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	
NOV 18	34.20	MAR 13	34.80	APR 11	34.51	JUN 15	31.14	AUG 04	31.12	SEP 29	30.47	
JAN 12	34.66											
WATER YEAR 1989		HIGHEST	30.47	SEP 29, 1989	LOWEST	34.80	MAR 13, 1989					

NEW KENT COUNTY

373111077104601. Local number, 53J 6.

LOCATION.--Lat 37°31'11", long 77°10'46", Hydrologic Unit 02080206, 0.18 mi south of State Highway 249 in Brookwood Manor Subdivision, 0.7 mi northeast of the intersection of Interstate Highway 64 and State Highway 249, and 2.95 mi southwest of Quinton. Owner: Thomas M. Brooks.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 6 in., depth 305 ft, screened 285 to 305 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 115 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.3 ft above land-surface datum.

PERIOD OF RECORD.--November 1983 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 129.91 ft below land-surface datum, Feb. 3, 1984; lowest measured, 140.95 ft below land-surface datum, Mar. 17, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 17	140.95

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 14	139.55	MAR 21	139.55	JUN 22	136.80	SEP 20	138.59
WATER YEAR 1989		HIGHEST	136.80	JUN 22, 1989	LOWEST	139.55	DEC 14, 1988, MAR 21, 1989

372619077021602. Local number, 54H 15.

LOCATION.--Lat 37°26'19", long 77°02'16", Hydrologic Unit 02080206, 0.45 mi southeast of the intersection of U.S. Highway 60 and State Highway 155 at Providence Forge Presbyterian Church in Providence Forge. Owner: Providence Forge Presbyterian Church.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled recharge water well, diameter 4 in., depth 283 ft, screened 263 to 283 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 30 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.9 ft above land-surface datum.

PERIOD OF RECORD.--December 1984 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 53.20 ft below land-surface datum, Dec. 13, 1988; lowest measured, 76.67 ft below land-surface datum, Sept. 20, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 17	56.75

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 13	53.20	MAR 21	61.23	JUN 21	76.42	SEP 20	76.67
WATER YEAR 1989		HIGHEST	53.20	DEC 13, 1988	LOWEST	76.67	SEP 20, 1989

NEW KENT COUNTY--Continued

373421077012501. Local number, 54J 3.

LOCATION.--Lat 37°34'00", long 77°01'25", Hydrologic Unit 02080106, 0.8 mi northwest of the intersection of State Highway 608 and a private dirt road, 2.6 mi northwest of the intersection of State Highways 249 and 608, and 4.8 mi southeast of Tunstall. Owner: U.S. Department of the Navy.

AQUIFER.--Sand of Eocene to Miocene age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 125 ft, screen depth unknown.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 25 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.2 ft above land-surface datum.

PERIOD OF RECORD.--November 1983 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 16.23 ft below land-surface datum, Mar. 30, 1984; lowest measured, 17.86 ft below land-surface datum, Dec. 13, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 17	17.45

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 13	17.86	MAR 22	17.47	JUN 23	16.95	SEP 27	17.02

WATER YEAR 1989 HIGHEST 16.95 JUN 23, 1989 LOWEST 17.86 DEC 13, 1988

372428076561501. Local number, 55H 1 SOW 017.

LOCATION.--Lat 37°24'28", long 76°56'15", Hydrologic Unit 02080206, at city of Newport News pump station, 500 ft upstream from Walkers Dam, and 0.6 mi southeast of Walkers. Owner: City of Newport News.

AQUIFER.--Sand of undifferentiated Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in. to 145 ft, diameter 4 in. from 145 to 630 ft, depth 630 ft, screened 252 to 257 ft, 339 to 344 ft, 439 to 444 ft, 615 to 625 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 10 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 1.7 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March 1969 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 30.24 ft below land-surface datum, Apr. 10, 1969; lowest measured, 61.80 ft below land-surface datum, Aug. 3, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	61.60	JAN 13	61.50	MAR 01	61.40	MAY 01	61.30	JUN 14	61.40	AUG 03	61.80
NOV 23	61.40										

WATER YEAR 1989 HIGHEST 61.30 MAY 01, 1989 LOWEST 61.80 AUG 03, 1989

372539076593401. Local number, 55H 3.

LOCATION.--Lat 37°25'39", long 76°59'36", Hydrologic Unit 02080206, 0.2 mi southwest of U.S. Highway 60, 2.8 mi east of Providence Forge. Owner: Virginia Department of Forestry.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 4 in., depth 326 ft, screened 278 to 303 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 31 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft below land-surface datum.

PERIOD OF RECORD.--December 1972, December 1974, October 1983 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 46.90 ft below land-surface datum, Dec. 3, 1974; lowest measured, 86.89 ft below land-surface datum, July 31, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 17	76.60

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 13	79.11	MAR 22	79.28	JUN 23	79.38	SEP 27	78.27

WATER YEAR 1989 HIGHEST 78.27 SEP 27, 1989 LOWEST 79.38 JUN 23, 1989

GROUND-WATER LEVELS

NEW KENT COUNTY--Continued

373024076542201. Local number, 55J 6.
 LOCATION.--Lat 37°30'24", long 76°54'22", Hydrologic Unit 02080106, 0.25 mi north of State Highway 249, 4.3 mi east of New Kent Courthouse. Owner: Chad Brunskole.
 AQUIFER.--Sand of Paleocene age.
 WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 275 ft, screened 265 to 275 ft.
 INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurement with chalked tape.
 DATUM.--Elevation of land-surface datum is 110 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.38 ft above land-surface datum.
 PERIOD OF RECORD.--December 1972, April 1984 to March 1986, March 1988 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.
 EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 114.10 ft below land-surface datum, Dec. 7, 1972; lowest measured, 124.98 ft below land-surface datum, Dec. 14, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 18	120.93

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 14	124.98	MAR 17	123.18	JUN 22	123.01	SEP 19	121.98
WATER YEAR 1989		HIGHEST	121.98	SEP 19, 1989	LOWEST	124.98	DEC 14, 1988

CITY OF NEWPORT NEWS

370645076350301. Local number, 58E 3.
 LOCATION.--Lat 37°06'45", long 76°35'03", Hydrologic Unit 02080206, 4.45 mi southwest of the intersection of U.S. Highway 60 and Washington Boulevard off Mulberry Island Road at rifle range on Fort Eustis, 5.5 mi southwest of Lee Hall in the city of Newport News. Owner: U.S. Department of the Army.
 AQUIFER.--Sand of late Cretaceous age.
 WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 12 in. to 158 ft, diameter 4 in. from 140 to 470 ft, depth 470 ft, screened 455 to 470 ft.
 INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurement with chalked tape.
 DATUM.--Elevation of land-surface datum is 10 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum.
 PERIOD OF RECORD.--December 1983 to July 1985, February 1987 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.
 EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 78.15 ft below land-surface datum, Mar. 18, 1985; lowest measured, 93.00 ft below land-surface datum, Dec. 8, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 14	88.62

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 12	81.92	MAR 20	84.43	JUN 20	91.78	SEP 18	92.93
WATER YEAR 1989		HIGHEST	81.92	DEC 12, 1988	LOWEST	92.93	SEP 18, 1989

371027076335601. Local number, 58F 1 SOW 002.
 LOCATION.--Lat 37°10'27", long 76°33'56", Hydrologic Unit 02080206, on shore of Lee Hall Reservoir, 0.15 mi north of intersection of State Highway 105 and U.S. Highway 60, and 0.65 mi northeast of Fort Eustis in Newport News. Owner: City of Newport News.
 AQUIFER.--Sand and gravel of undifferentiated Cretaceous age.
 WELL CHARACTERISTICS.--Drilled unused water well, diameter 10 in. to 431.3 ft, diameter 8 in. from 431.3 to 443 ft, diameter 6 in. from 443 to 497 ft, depth 497 ft, screened 476 to 493 ft.
 INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.
 DATUM.--Elevation of land-surface datum is 20 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 2.3 ft above land-surface datum.
 REMARKS.--Records provided by the Virginia Water Control Board.
 PERIOD OF RECORD.--January 1968 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.
 EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 54.76 ft below land-surface datum, May 10, 1969; lowest measured, 97.10 ft below land-surface datum, Aug. 24, Oct. 13, 1988, Aug. 2, 1989.

CITY OF NEWPORT NEWS--Continued

371027076335601. Local number, 58F 1 SOW 002--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	97.10	JAN 19	95.80	MAR 02	93.60	APR 26	92.80	JUN 27	88.00	AUG 02	97.10
NOV 17	95.50										
WATER YEAR 1989		HIGHEST 88.00 JUN 27, 1989		LOWEST 97.10 OCT 13, 1988, AUG 02, 1989							

371208076341101. Local number, 58F 50 SOW 171A.

LOCATION.--Lat 37°12'08", long 76°34'11", Hydrologic Unit 02080206, 0.4 mi south of the intersection of State Highways 143 and 238 and 150 ft north of State Highway 143 in the city of Newport News. Owner: Virginia Water Control Board.

AQUIFER.--Lower Potomac aquifer of Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 1,236 ft, screened 1,205 to 1,215 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 55 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

PERIOD OF RECORD.--July 1984 to current year. Unpublished records available prior to October 1986 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 117.05 ft below land-surface datum, Mar. 20, 1985; lowest recorded, 124.94 ft below land-surface datum, Sept. 26, 28-30, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	124.54	124.57	124.56	124.26	124.11	123.82	123.54	123.44	123.59	123.75	124.33	124.67
10	124.60	124.60	124.49	124.27	124.06	123.80	123.48	123.40	123.60	123.88	124.41	124.69
15	124.65	124.63	124.45	124.21	124.03	123.64	123.56	123.47	123.68	123.89	124.41	124.83
20	124.71	124.64	124.47	124.10	124.04	123.69	123.46	123.55	123.73	123.90	124.45	124.87
25	124.56	124.57	124.35	124.15	123.84	123.55	123.45	123.34	123.75	124.19	124.33	124.93
EOM	124.75	124.53	124.38	124.06	123.76	123.49	123.39	123.55	123.87	124.33	124.48	124.94
WATER YEAR 1989		HIGHEST 123.28 MAY 24, 25, 1989		LOWEST 124.94 SEP 26, 28-30, 1989								

371208076341102. Local number, 58F 51 SOW 171B.

LOCATION.--Lat 37°12'08", long 76°34'11", Hydrologic Unit 02080206, 0.4 mi south of the intersection of State Highways 143 and 238 and 150 ft north of State Highway 143 in the city of Newport News. Owner: Virginia Water Control Board.

AQUIFER.--Lower Potomac aquifer of Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 851 ft, screened 820 to 830 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 55 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

PERIOD OF RECORD.--July 1984 to current year. Unpublished records available prior to October 1986 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 126.35 ft below land-surface datum, Mar. 23-25, 1985; lowest recorded, 136.10 ft below land-surface datum, Aug. 4, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	134.72	133.60	132.83	132.35	131.74	---	---	132.33	134.32	135.61	135.63
10	---	134.65	133.40	132.73	132.27	131.51	---	---	132.76	134.70	135.50	135.63
15	---	134.42	133.22	132.52	132.33	131.24	---	---	133.06	135.02	135.32	135.69
20	---	134.16	133.15	132.46	132.15	---	---	131.25	133.39	135.19	135.28	135.51
25	135.27	133.98	133.05	132.48	131.86	---	---	131.39	133.68	135.62	135.28	135.46
EOM	135.14	133.76	132.95	132.30	131.76	---	---	131.94	134.02	135.83	135.43	135.28
WATER YEAR 1989		HIGHEST 131.18 MAR 18, 1989		LOWEST 135.83 JUL 30, 31, 1989								

371208076341103. Local number, 58F 52 SOW 171C.

LOCATION.--Lat 37°12'08", long 76°34'11", Hydrologic Unit 02080206, 0.4 mi south of the intersection of State Highways 143 and 238 and 150 ft north of State Highway 143 in the city of Newport News. Owner: Virginia Water Control Board.

AQUIFER.--Upper Potomac aquifer of Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 537 ft, screened 527 to 537 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 55 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

PERIOD OF RECORD.--June 1984 to current year. Unpublished records available prior to October 1986 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 128.12 ft below land-surface datum, Mar. 23, 1985; lowest recorded, 139.28 ft below land-surface datum, Sept. 16, 1988.

GROUND-WATER LEVELS

CITY OF NEWPORT NEWS--Continued

371208076341103. Local number, 58F 52 SOW 171C--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	138.74	137.15	135.68	135.00	134.66	134.17	133.65	133.31	134.81	136.96	138.16	138.09
10	138.49	136.97	135.46	134.92	134.64	133.95	133.58	133.21	135.23	137.35	138.00	138.08
15	138.35	136.69	135.29	134.74	134.72	133.70	133.59	133.20	135.66	137.78	137.85	138.15
20	137.90	136.36	135.21	134.67	134.54	133.79	133.54	133.34	135.95	137.98	137.81	137.95
25	137.78	136.13	135.13	134.71	134.24	133.62	133.44	133.57	136.27	138.33	137.82	137.96
EOM	137.58	135.87	135.10	134.56	134.17	133.55	133.32	134.26	136.61	138.56	137.92	137.62

WATER YEAR 1989 HIGHEST 133.15 MAY 16, 1989 LOWEST 139.00 OCT 01, 1988

371208076341104. Local number, 58F 53 SOW 171D.

LOCATION.--Lat 37°12'08", long 76°34'11", Hydrologic Unit 02080206, 0.4 mi south of the intersection of State Highways 143 and 238 and 150 ft north of State Highway 143 in the city of Newport News. Owner: Virginia Water Control Board.

AQUIFER.--Chickahominy-Piney Point aquifer of Tertiary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 343 ft, screened 333 to 343 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 55 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

PERIOD OF RECORD.--July 1984 to current year. Unpublished records available prior to October 1986 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 55.18 ft below land-surface datum, Feb. 2, 1985; lowest recorded, 58.86 ft below land-surface datum; Sept. 27, 28, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	58.42	58.39	58.50	---	---	---	---	---	---	---	---	---
10	58.45	58.49	58.46	---	---	---	---	---	---	---	---	---
15	58.53	58.50	58.48	---	---	---	---	---	58.43	---	---	---
20	58.55	58.45	58.52	---	---	---	---	58.21	58.42	---	---	---
25	58.47	58.46	58.51	---	---	---	---	58.22	58.39	---	---	---
EOM	58.58	58.47	58.59	---	---	---	---	58.35	---	---	---	---

WATER YEAR 1989 HIGHEST 57.96 MAR 31, 1989 LOWEST 58.86 SEP 27, 28, 1989

371208076341105. Local number, 58F 54 SOW 171E.

LOCATION.--Lat 37°12'08", long 76°34'11", Hydrologic Unit 02080206, 0.4 mi south of the intersection of State Highways 143 and 238 and 150 ft north of State Highway 143 in the city of Newport News. Owner: Virginia Water Control Board.

AQUIFER.--Yorktown-Eastover aquifer of Tertiary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 88 ft, screened 78 to 88 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 55 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

PERIOD OF RECORD.--June 1984 to current year. Unpublished records available prior to October 1986 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 23.03 ft below land-surface datum, May 24, 25, 1989; lowest recorded, 26.59 ft below land-surface datum, Nov. 23, 24, 30, Dec. 3, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	25.40	25.62	25.71	25.80	25.78	25.29	24.29	23.29	23.12	23.58	24.12	24.34
10	25.46	25.68	25.68	25.80	25.75	25.16	24.03	23.13	23.18	23.68	24.18	24.37
15	25.58	25.70	25.73	25.75	25.74	25.05	23.85	23.08	23.29	23.77	24.14	24.45
20	25.66	25.66	25.76	25.75	25.61	24.89	23.63	23.08	23.30	23.79	24.11	24.41
25	25.64	25.67	25.75	25.79	25.43	24.63	23.53	23.04	23.33	23.94	24.11	24.47
EOM	25.74	25.66	25.78	25.75	25.38	24.43	23.40	23.11	23.47	24.01	24.23	24.45

WATER YEAR 1989 HIGHEST 23.03 MAY 24, 25, 1989 LOWEST 25.82 JAN 11, 12, 1989

371208076341106. Local number, 58F 55 SOW 171F.

LOCATION.--Lat 37°12'08", long 76°34'11", Hydrologic Unit 02080206, 0.4 mi south of the intersection of State Highways 143 and 238 and 150 ft north of State Highway 143 in the city of Newport News. Owner: Virginia Water Control Board.

AQUIFER.--Columbia aquifer of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 60 ft, screened 50 to 60 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 55 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.9 ft above land-surface datum.

PERIOD OF RECORD.--June 1984 to current year. Unpublished records available prior to October 1986 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 23.30 ft below land-surface datum, Apr. 18, 19, 1989; lowest recorded, 28.10 ft below land-surface datum, Dec. 10, 11, 22-24, 1986.

CITY OF NEWPORT NEWS--Continued

371208076341106. Local number, 58F 55 SOW 171F--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	27.39	27.73	27.78	27.90	27.88	26.57	24.71	23.62	24.41	25.21	25.97	26.34
10	27.47	27.75	27.79	27.90	27.82	26.14	23.69	23.51	24.58	25.34	26.07	26.42
15	27.57	27.76	27.82	27.83	27.78	25.96	23.52	23.64	24.75	25.48	26.09	26.50
20	27.64	27.75	27.83	27.81	27.77	25.76	23.36	23.83	24.84	25.54	26.13	26.53
25	27.70	27.77	27.85	27.80	27.23	25.04	23.50	24.01	24.95	25.69	26.16	26.61
EOM	27.76	27.77	27.88	27.84	27.16	24.80	23.67	24.24	25.08	25.84	26.25	26.62

WATER YEAR 1989 HIGHEST 23.30 APR 18, 1989 LOWEST 27.91 JAN 09, 1989

CITY OF NORFOLK

365223076122101. Local number, 61C 1.

LOCATION.--Lat 36°52'23", long 76°12'21", Hydrologic Unit 02080108, at Moores Bridge Filter Plant, 0.3 mi east of intersection of State Highway 165 and U.S. Highway 13 in Norfolk. Owner: City of Norfolk.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 6 in., depth 970 ft, screened 900 to 960 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, bimonthly measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 10.80 ft above National Geodetic Vertical Datum of 1929. Measuring point: Inner edge of manhole at land-surface datum. Prior to Oct. 29, 1987, measuring point at top of casing, 3.15 ft above land-surface datum.

REMARKS.--Water level affected by pumping and recharge operations in nearby wells May 18, 1971, to Nov. 5, 1973.

PERIOD OF RECORD.--January 1968 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.70 ft below land-surface datum, Feb. 17, 1968; lowest measured, 59.43 ft below land-surface datum, Sept. 25, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	58.94	DEC 19	58.98	MAR 29	58.91	JUN 27	59.24	SEP 25	59.43

WATER YEAR 1989 HIGHEST 58.91 MAR 29, 1989 LOWEST 59.43 SEP 25, 1989

365221076121302. Local number, 61C 2.

LOCATION.--Lat 36°52'21", long 76°12'15", Hydrologic Unit 02080108, at Moores Bridge Filter Plant, 0.3 mi east of intersection of State Highway 165 and U.S. Highway 13 in Norfolk. Owner: U.S. Geological Survey.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 1,000 ft, screened 900 to 990 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, bimonthly measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 13.47 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 4.3 ft above land-surface datum.

PERIOD OF RECORD.--October 1968 to February 1984, October 1985 to current year. Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.8 ft below land-surface datum, Oct. 8, 1968; lowest measured, 61.44 ft below land-surface datum, Sept. 25, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	60.00	DEC 19	61.08	MAR 29	60.99	JUN 27	61.27	SEP 25	61.44

WATER YEAR 1989 HIGHEST 60.00 OCT 27, 1988 LOWEST 61.44 SEP 25, 1989

365221076121303. Local number, 61C 3.

LOCATION.--Lat 36°52'21", long 76°12'15", Hydrologic Unit 02080108, at Moores Bridge Filter Plant, 0.3 mi east of intersection of State Highway 165 and U.S. Highway 13 in Norfolk. Owner: U.S. Geological Survey.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 991 ft, screened 900 to 980.7 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, bimonthly measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 7 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.22 ft above land-surface datum.

PERIOD OF RECORD.--February 1969 to current year. Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 14.30 ft below land-surface datum, Feb. 19, 1969; lowest measured, 56.55 ft below land-surface datum, Sept. 25, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	55.98	DEC 19	56.08	MAR 29	56.04	JUN 27	56.35	SEP 25	56.55

WATER YEAR 1989 HIGHEST 55.98 OCT 27, 1988 LOWEST 56.55 SEP 25, 1989

GROUND-WATER LEVELS

NORTHAMPTON COUNTY

371543076003401. Local number, 62G 15 SOW 121.

LOCATION.--Lat 37°15'43", long 76°00'34", Hydrologic Unit 02080110, 100 ft southwest of State Highway 642, 0.5 mi south of intersection of State Highways 642 and 184, and 0.7 mi southeast of Cape Charles. Owner: Brown and Root Corporation.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 190 ft, screened 180 to 190 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 12 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 1.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--November 1980 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.27 ft below land-surface datum, Nov. 1, 1983; lowest recorded, 14.31 ft below land-surface datum, Jan. 16, 17, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	12.85	12.43	12.34	11.65	12.09	11.93	---	11.06	10.85	11.45	12.35	12.19
10	12.98	12.28	12.47	11.57	12.32	11.65	---	10.92	10.79	11.64	12.39	12.03
15	12.86	12.14	12.43	11.73	12.30	11.55	---	10.93	10.80	11.75	12.66	12.00
20	12.72	12.09	12.44	11.68	12.16	11.55	---	10.76	10.83	11.99	12.60	12.02
25	12.72	12.23	12.12	11.78	12.20	---	11.40	10.71	11.03	12.12	12.36	11.99
EOM	12.76	11.84	11.88	11.92	12.17	---	11.45	10.95	11.02	12.23	12.22	12.05

WATER YEAR 1988 HIGHEST 10.70 MAY 24, 25, JUN 07-09, 1988 LOWEST 12.98 OCT 10, 1987

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	11.67	11.95	12.35	11.79	12.45	11.47	10.61	10.36	11.16	10.65	11.07	10.95
10	11.73	11.99	12.50	11.95	12.25	11.09	10.50	10.37	11.20	10.57	11.11	10.56
15	11.97	12.18	12.58	12.30	12.30	10.89	10.45	10.62	11.20	10.67	10.95	10.42
20	11.98	12.27	12.73	12.28	11.97	11.01	10.41	10.88	11.00	10.45	10.83	10.07
25	11.93	12.34	12.42	12.35	11.74	10.68	10.40	10.87	10.73	10.57	10.74	10.06
EOM	12.15	12.29	12.13	12.36	11.70	10.58	10.45	11.04	10.65	10.67	10.88	10.04

WATER YEAR 1989 HIGHEST 9.97 SEP 26, 1989 LOWEST 12.73 DEC 20, 1988

371307075583501. Local number, 63F 15 SOW 105A.

LOCATION.--Lat 37°13'07", 75°58'35", Hydrologic Unit 02080109, 50 ft south of State Highway 644, 0.3 mi west of intersection of State Highway 644 and U.S. Highway 13, and 1.3 mi north of Cheapside. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 130 ft, screened 120 to 130 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 31.97 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of recorder shelf, 1.1 ft above land-surface datum prior to July 21, 1987; 1.4 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.44 ft below land-surface datum, Apr. 12, 1982; lowest recorded, 24.62 ft below land-surface datum, June 15, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	19.29	19.47	19.42	19.30	18.93	18.85	18.90	18.75	20.20	19.58	19.60	20.15
10	19.39	19.49	19.42	19.20	19.00	18.76	18.71	18.76	22.30	19.46	19.59	19.45
15	19.37	19.48	19.43	19.33	18.95	18.79	18.62	18.79	24.62	19.73	19.60	19.39
20	19.35	19.40	19.43	19.10	18.80	18.79	18.70	21.84	19.74	19.72	19.60	19.40
25	19.40	19.50	19.45	19.04	18.89	18.90	18.73	19.23	19.50	19.71	19.92	19.42
EOM	19.49	19.27	19.42	19.08	18.80	18.90	18.80	22.40	19.38	19.56	20.70	19.42

WATER YEAR 1988 HIGHEST 18.58 APR 13, 1988 LOWEST 24.62 JUN 15, 1988

NORTHAMPTON COUNTY--Continued

371307075583501. Local number, 63F 15 SOW 105A--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	19.43	19.57	19.60	19.63	19.57	18.94	17.72	17.56	19.03	18.40	18.45	18.74
10	19.49	19.60	19.54	19.58	19.70	18.57	17.60	17.58	18.25	18.50	18.52	18.98
15	19.60	19.63	19.54	19.53	19.59	18.40	17.60	17.65	18.28	18.44	18.29	18.48
20	19.55	19.60	19.60	19.55	19.46	18.35	17.54	17.74	18.27	18.39	18.12	18.19
25	19.52	19.60	19.60	19.58	19.28	18.00	17.55	18.80	18.13	18.43	18.50	18.21
EOM	19.63	19.62	19.63	19.56	19.21	17.78	17.54	23.03	18.21	18.40	19.38	18.17

WATER YEAR 1989 HIGHEST 17.40 APR 15, 1989 LOWEST 23.09 JUN 01, 1989

371307075583502. Local number, 63F 16 SOW 105C.

LOCATION.--Lat 37°13'07", long 75°58'35", Hydrologic Unit 02080109, 50 ft south of State Highway 644, 0.3 mi west of intersection of State Highway 644 and U.S. Highway 13, and 1.3 mi north of Cheapside. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 285 ft, screened 275 to 285 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 31.16 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 0.1 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 23.91 ft below land-surface datum, Jan. 9, 1979; lowest measured, 29.58 ft below land-surface datum, May 23, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	25.68	JAN 05	25.39	FEB 29	25.52	APR 25	25.45	JUN 13	25.50	AUG 01	25.68
WATER YEAR 1988		HIGHEST	25.39	JAN 05, 1988		LOWEST	25.68	NOV 09, 1987, AUG 01, 1988			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 04	25.70	JAN 09	25.70	MAR 06	25.40	APR 18	25.10	JUN 19	25.20	AUG 15	25.10
NOV 14	25.70										
WATER YEAR 1989		HIGHEST	25.10	APR 18, AUG 15, 1989		LOWEST	25.70	OCT 04, NOV 14, 1988, JAN 09, 1989			

371307075583503. Local number, 63F 17 SOW 105B.

LOCATION.--Lat 37°13'07", long 75°58'35", Hydrologic Unit 02080109, 50 ft south of State Highway 644, 0.3 mi west of intersection of State Highway 644 and U.S. Highway 13, and 1.3 mi north of Cheapside. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 196 ft, screened 186 to 196 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 31.50 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 0.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.78 ft below land-surface datum, Apr. 25, 1984; lowest measured, 21.68 ft below land-surface datum, Feb. 11, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	19.28	JAN 05	19.00	FEB 29	18.60	APR 25	18.55	JUN 13	21.45	AUG 01	19.32
WATER YEAR 1988		HIGHEST	18.55	APR 25, 1988		LOWEST	21.45	JUN 13, 1988			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 04	19.15	JAN 09	19.35	MAR 06	18.60	APR 18	17.20	JUN 19	18.00	AUG 15	18.10
NOV 14	19.60										
WATER YEAR 1989		HIGHEST	17.20	APR 18, 1989		LOWEST	19.60	NOV 14, 1988			

GROUND-WATER LEVELS

NORTHAMPTON COUNTY--Continued

371145075565901. Local number, 63F 25.

LOCATION.--Lat 37°11'45", long 75°56'59", Hydrologic Unit 02080110, 0.4 mi east of State Highway 600 and 0.9 mi northeast of the intersection of State Highways 600 and 646 at Townsend along Walls Landing Creek.

Owner: U.S. Geological Survey.

AQUIFER.--Sand of Holocene age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 2 in., depth 7 ft, screened 4 to 7 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch. Prior to Nov. 13, 1987, bimonthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 12.38 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.2 ft above land-surface datum.

PERIOD OF RECORD.--September 1987 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 0.03 ft below land-surface datum, Apr. 15, 1989; lowest recorded, 1.90 ft below land-surface datum, Aug. 17, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	---	.99	.77	.71	.88	.91	.74	1.07	1.67	1.72	.97
10	---	---	1.02	.78	.83	.80	.78	.97	1.17	1.62	1.57	1.04
15	---	1.05	.97	.88	.76	.84	.81	1.03	1.47	1.78	1.74	1.46
20	---	1.04	.97	.86	.78	.81	.80	.99	1.34	1.70	1.14	1.55
25	---	1.09	.98	.81	.84	.90	.96	.97	1.55	1.85	1.54	1.32
EOM	---	.77	.91	.85	.86	.90	.96	1.21	1.51	1.80	1.16	1.57

WATER YEAR 1988 HIGHEST 0.51 APR 04, 1988 LOWEST 1.90 AUG 17, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	1.32	1.04	1.00	1.02	1.00	.71	.51	.63	1.02	1.21	1.49	1.27
10	1.53	1.10	.92	.92	.96	.69	.45	.65	.92	1.31	1.31	1.31
15	1.57	1.09	1.00	.86	1.02	.67	.53	.79	1.03	.92	.87	1.11
20	1.34	1.00	1.02	.98	.92	.64	.51	.90	1.10	1.07	.81	.73
25	1.27	1.03	1.04	1.00	.76	.25	.60	1.02	.98	1.32	1.07	.95
EOM	1.30	.87	1.05	1.03	.59	.33	.53	1.08	1.06	1.28	1.22	.94

WATER YEAR 1989 HIGHEST 0.03 APR 15, 1989 LOWEST 1.61 OCT 01, 1988

371121075565001. Local number, 63F 29.

LOCATION.--Lat 37°11'21", long 75°56'50", Hydrologic Unit 02080110, 0.15 mi from the end of a private dirt road, 0.5 mi southeast of the intersection of State Highway 600 and a private dirt road, 0.5 mi northeast of the intersection of State Highway 600 and 646, and 0.7 mi northeast of Townsend. Owner: U.S. Geological Survey.

AQUIFER.--Sand of Holocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 9.5 ft, screened 6.5 to 9.5 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch. Prior to Dec. 8, 1988, bimonthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 13.19 ft above National Geodetic Vertical Datum of 1929.

Measuring point: Top of casing, 2.8 ft above land-surface datum.

PERIOD OF RECORD.--September 1987 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 0.76 ft below land-surface datum, Aug. 18, 1989; lowest measured, 5.26 ft below land-surface datum, Sept. 29, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 16	2.72	APR 26	1.74	JUN 06	2.82	JUN 22	3.65	JUL 19	3.62	SEP 02	4.09
MAR 15	1.72										

WATER YEAR 1988 HIGHEST 1.72 MAR 15, 1988 LOWEST 4.09 SEP 02, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, OCTOBER TO DECEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	4.62	NOV 04	3.71

NORTHAMPTON COUNTY--Continued

371121075565001. Local number, 63F 29--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, DECEMBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	---	---	3.74	3.68	---	---	1.80	3.52	3.58	4.21	3.71
10	---	---	3.64	3.52	3.13	---	---	2.02	3.06	3.71	4.23	3.91
15	---	---	3.75	2.65	3.42	---	---	2.33	3.33	3.18	2.24	3.75
20	---	---	3.83	3.23	3.27	---	---	2.72	3.45	2.93	1.79	1.71
25	---	---	3.88	3.50	---	---	1.99	3.03	3.05	3.59	2.83	2.45
EOM	---	---	3.92	3.64	---	---	1.72	3.42	3.29	3.94	3.42	2.64

WATER YEAR 1989 HIGHEST 0.76 AUG 18, 1989 LOWEST 4.32 AUG 09, 1989

371128075572101. Local number, 63F 30.

LOCATION.--Lat 37°11'28", long 75°57'21", Hydrologic Unit 02080110, 50 ft east of intersection of State Highway 600 and a private dirt road, 0.5 mi northeast of intersection of State Highways 600 and 646, and 0.75 mi northeast of Townsend. Owner: U.S. Geological Survey.

AQUIFER.--Sand of Holocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 15 ft, screened 12 to 15 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch. Prior to Dec. 8, 1988, bimonthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 28.97 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.55 ft above land-surface datum.

PERIOD OF RECORD.--September 1987 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 7.74 ft below land-surface datum, Apr. 24-28, 1989; lowest recorded, 11.81 ft below land-surface datum, Sept. 2, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 16	11.09	APR 25	9.93	JUN 06	10.03	JUN 22	10.17	JUL 19	10.41	SEP 02	11.81
MAR 15	9.77										

WATER YEAR 1988 HIGHEST 9.77 MAR 15, 1988 LOWEST 11.81 SEP 02, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, OCTOBER TO DECEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	11.14	NOV 04	11.25	DEC 08	11.42

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, DECEMBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	---	---	11.47	11.30	10.21	8.22	7.91	8.52	8.90	9.22	8.97
10	---	---	11.47	11.47	11.24	9.83	8.12	8.02	8.58	8.96	9.28	9.06
15	---	---	11.47	11.47	11.20	9.57	7.99	8.12	8.63	9.03	9.29	9.16
20	---	---	11.47	11.46	11.18	9.30	7.82	8.22	8.70	9.07	9.23	9.19
25	---	---	11.47	11.43	11.01	8.95	7.74	8.31	8.75	9.12	9.03	9.25
EOM	---	---	11.47	11.35	10.84	8.40	7.81	8.43	8.83	9.18	8.95	9.26

WATER YEAR 1989 HIGHEST 7.74 APR 24-28, 1989 LOWEST 11.48 DEC 12, 13, 1988

371136075580201. Local number, 63F 31.

LOCATION.--Lat 37°11'36", long 75°58'02", Hydrologic Unit 02080110, 200 ft southeast of the intersection of U.S. Highway 13 and a private dirt road, 0.5 mi north of the intersection of U.S. Highway 13 and State Highway 646, and 0.6 mi northwest of Townsend. Owner: U.S. Geological Survey.

AQUIFER.--Sand of Holocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 12 ft, screened 9 to 12 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch. Prior to Jan. 22, 1988, bimonthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 31.79 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.8 ft above land-surface datum.

PERIOD OF RECORD.--September 1987 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 5.42 ft below land-surface datum, Apr. 19, 1989; lowest recorded, 9.12 ft below land-surface datum, Jan. 10-14, Feb. 18-21, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, OCTOBER 1987 TO JANUARY 1988

DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 17	8.69	JAN 22	8.03

GROUND-WATER LEVELS

NORTHAMPTON COUNTY--Continued

371136075580201. Local number, 63F 31--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, JANUARY TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	---	---	---	7.99	7.81	7.86	7.68	7.82	8.20	8.62	8.63
10	---	---	---	---	7.95	7.80	7.78	7.66	7.90	8.26	8.66	8.53
15	---	---	---	---	7.91	7.80	7.70	7.69	7.96	8.33	8.69	8.50
20	---	---	---	---	7.84	7.83	7.64	7.75	8.01	8.42	---	8.54
25	---	---	---	8.03	7.79	7.84	7.63	7.68	8.08	8.49	---	8.64
EOM	---	---	---	8.01	7.78	7.85	7.63	7.76	8.13	8.57	8.70	8.72

WATER YEAR 1988 HIGHEST 7.63 APR 21-30, MAY 01, 1988 LOWEST 8.79 AUG 29, 30, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	8.76	8.89	8.90	9.09	9.06	8.07	6.19	5.79	6.57	6.83	6.99	6.77
10	8.80	8.93	8.91	9.12	9.07	7.86	5.92	5.88	6.68	6.89	7.10	6.90
15	8.84	8.96	8.98	9.11	9.10	7.71	5.86	5.99	6.76	6.93	6.85	7.03
20	8.87	8.97	9.01	8.99	9.12	7.42	5.44	6.11	6.85	6.61	6.49	6.92
25	8.89	9.01	9.04	8.97	8.64	6.99	5.62	6.24	6.67	6.73	6.38	6.85
EOM	8.92	8.97	9.07	9.00	8.52	6.46	5.79	6.42	6.75	6.90	6.61	6.85

WATER YEAR 1989 HIGHEST 5.42 APR 19, 1989 LOWEST 9.12 JAN 10-14, FEB 18-21, 1989

371136075574801. Local number, 63F 32.

LOCATION.--Lat 37°11'36", long 75°57'48", Hydrologic Unit 02080110, 0.3 mi southeast of intersection of U.S. Highway 13 and a private dirt road, 0.5 mi north of intersection of U.S. Highway 13 and State Highway 646, and 0.6 mi northwest of Townsend. Owner: U.S. Geological Survey.

AQUIFER.--Sand of Holocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 12 ft, screened 9 to 12 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch. Prior to Apr. 6, 1988, bimonthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 28.95 ft above National Geodetic Vertical Datum of 1929.

Measuring point: Top of casing, 2.4 ft above land-surface datum.

PERIOD OF RECORD.--September 1987 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 3.54 ft below land-surface datum, Apr. 16, 1989; lowest recorded, 7.80 ft below land-surface datum, Jan. 11, 12, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, OCTOBER 1987 TO APRIL 1988

DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 17	6.80	APR 06	6.50

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, APRIL TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	---	---	---	---	---	---	6.47	6.57	6.86	7.05	6.97
10	---	---	---	---	---	---	6.45	6.47	6.65	6.89	7.09	6.81
15	---	---	---	---	---	---	6.39	6.47	6.70	6.94	7.08	6.83
20	---	---	---	---	---	---	6.38	6.50	6.73	6.99	7.14	6.93
25	---	---	---	---	---	---	6.42	6.46	6.76	7.04	7.11	7.02
EOM	---	---	---	---	---	---	6.43	6.51	6.80	7.06	6.91	---

WATER YEAR 1988 HIGHEST 6.38 APR 18-24, 1988 LOWEST 7.17 AUG 29, 30, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	7.41	7.37	7.75	7.69	6.63	4.53	4.46	5.21	5.32	5.52	5.17
10	---	7.42	7.43	7.79	7.72	6.34	4.24	4.61	5.23	5.40	5.59	5.30
15	---	7.46	7.59	7.69	7.73	6.22	4.41	4.72	5.29	5.45	5.00	5.42
20	7.36	7.45	7.66	7.67	7.74	5.75	4.09	4.89	5.35	5.20	4.45	4.92
25	7.36	7.49	7.70	7.63	7.26	4.27	4.31	5.00	5.12	5.30	4.75	5.09
EOM	7.41	7.26	7.73	7.66	7.13	4.29	4.48	5.14	5.22	5.44	5.00	5.17

WATER YEAR 1989 HIGHEST 3.54 APR 16, 1989 LOWEST 7.80 JAN 11, 12, 1989

GROUND-WATER LEVELS

465

NORTHAMPTON COUNTY--Continued

371145075580301. Local number, 63F 33.

LOCATION.--Lat 37°11'45", long 75°58'03", Hydrologic Unit 02080110, 100 ft east of U.S. Highway 13, 0.6 mi north of the intersection of U.S. Highway 13 and State Highway 646, and 0.9 mi northwest of Townsend. Owner: U.S. Geological Survey.

AQUIFER.--Sand of Holocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 13 ft, screened 10 to 13 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by USGS personnel. Prior to Jan. 22, 1988, occasional measurement with chalked tape; Jan. 22, 1988, to Aug. 15, 1989, digital recorder--60-minute punch and bimonthly measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 29.03 ft above National Geodetic Vertical Datum of 1929.

Measuring point: Top of casing 2.3 ft above land-surface datum.

PERIOD OF RECORD.--September 1987 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.09 ft below land-surface datum, Apr. 24, 1989; lowest recorded, 7.16 ft below land-surface datum, July 28, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 17	6.04	MAR 16	4.53	JUN 06	4.45	JUN 23	5.35	JUL 18	6.09	SEP 01	5.91
JAN 22	5.04	APR 25	4.24								

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	---	---	---	4.74	4.66	---	---	---	6.51	6.43	5.42
10	---	---	---	---	4.79	4.49	---	---	4.56	6.74	6.30	---
15	---	---	---	---	4.61	4.47	---	---	5.22	6.20	6.23	---
20	---	---	---	---	4.53	---	---	---	5.17	6.73	6.91	---
25	---	---	---	5.02	4.58	---	---	---	6.10	6.66	6.54	---
EOM	---	---	---	4.95	4.59	---	---	---	6.12	6.85	5.88	---

WATER YEAR 1988 HIGHEST 4.23 MAR 07, 1988 LOWEST 7.16 JUL 28, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	6.00	DEC 12	5.83	FEB 13	5.82	APR 24	2.09	JUN 29	3.80	AUG 23	3.35
NOV 04	5.77	JAN 23	5.76	MAR 27	2.10	MAY 18	2.85				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	---	---	---	---	---	---	---	5.26	4.20	4.58	---
10	---	---	---	---	---	---	---	---	4.44	4.32	5.35	---
15	---	---	---	---	---	---	---	---	4.34	4.20	---	---
20	---	---	---	---	---	---	---	3.03	4.35	3.83	---	---
25	---	---	---	---	---	---	---	3.76	3.90	4.14	---	---
EOM	---	---	---	---	---	---	---	5.19	3.97	4.39	---	---

WATER YEAR 1989 HIGHEST 2.09 APR 24, 1989 LOWEST 6.00 OCT 19, 1988

GROUND-WATER LEVELS

NORTHAMPTON COUNTY--Continued

371307075583601. Local number, 63F 34.

LOCATION.--Lat 37°13'07", long 75°58'36", Hydrologic Unit 02080109, 50 ft south of State Highway 644, 0.35 mi west of intersection of U.S. Highway 13 and State Highway 644, and 1.55 mi northwest of Capeville. Owner: U.S. Geological Survey.

AQUIFER.--Sand of Holocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 13 ft, screened 10 to 13 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by USGS personnel. Prior to Jan. 22, 1988, bimonthly measurement with chalked tape; Jan. 22, 1988, to Aug 15, 1989, digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 31.15 ft above National Geodetic Vertical Datum of 1929.

Measuring point: Top of casing 1.85 ft above land-surface datum.

PERIOD OF RECORD.--September 1987 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 5.95 ft below land-surface datum, May 2, 3, 1989; lowest recorded, 9.08 ft below land-surface datum, Feb. 4, 5, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, OCTOBER 1987 TO JANUARY 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	8.14	DEC 17	8.37	JAN 05	8.13	JAN 21	8.09

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, JANUARY TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	---	---	---	8.00	7.77	7.83	7.65	7.93	8.20	8.64	8.16
10	---	---	---	---	7.98	7.75	7.57	7.67	8.00	8.22	8.61	8.12
15	---	---	---	---	7.91	7.74	7.56	7.73	8.07	8.29	8.70	8.19
20	---	---	---	---	7.84	7.71	7.56	7.76	7.59	8.39	8.72	8.25
25	---	---	---	8.09	7.82	7.75	7.59	7.81	7.98	8.46	8.62	8.31
EOM	---	---	---	8.07	7.80	7.79	7.63	7.90	8.10	8.54	8.16	8.39

WATER YEAR 1988 HIGHEST 7.06 JUN 18, 1988 LOWEST 8.77 AUG 19, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, OCTOBER 1988 TO AUGUST 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	8.42	8.64	8.88	9.03	9.08	8.10	6.48	6.01	6.88	6.97	7.00	---
10	8.51	8.75	8.90	9.03	9.02	7.83	6.27	6.06	6.67	6.94	7.03	---
15	8.59	8.81	8.95	8.94	9.07	7.67	6.25	6.14	6.87	6.78	---	---
20	8.66	8.82	8.95	9.01	9.06	7.36	6.05	6.29	6.78	6.87	---	---
25	8.67	8.87	8.97	9.07	8.61	6.86	6.03	6.76	6.72	6.94	---	---
EOM	8.75	8.78	9.01	9.07	8.48	6.56	6.03	6.91	6.84	6.97	---	---

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, AUGUST TO SEPTEMBER 1989

DATE	WATER LEVEL
AUG 23	6.51

WATER YEAR 1989 HIGHEST 5.95 MAY 2, 3, 1989 LOWEST 9.08 FEB 4, 5, 1989

GROUND-WATER LEVELS

467

NORTHAMPTON COUNTY--Continued

371301075584401. Local number, 63F 35.

LOCATION.--Lat 37°13'01", long 75°58'44", Hydrologic Unit 02080109, 0.1 mi south of intersection of State Highway 644 and a private dirt road, 0.45 mi west of intersection of U.S. Highway 13 and State Highway 644, and 1.5 mi northwest of Capeville. Owner: U.S. Geological Survey

AQUIFER.--Sand of Holocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 13 ft, screened 10 to 13 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by USGS personnel. Prior to Jan. 22, 1988, bimonthly measurement with chalked tape; Jan. 22 to Dec. 8, 1988, digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 29.50 ft above National Geodetic Vertical Datum of 1929.

Measuring point: Top of casing 1.7 ft above land-surface datum.

PERIOD OF RECORD.--September 1987 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.93 ft below land-surface datum, May 18, 1989; lowest recorded, 8.74 ft below land-surface datum, Aug. 6, 7, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, OCTOBER 1987 TO JANUARY 1988

DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 17	7.15	JAN 21	6.85

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, JANUARY TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	---	---	---	6.74	6.51	6.68	6.56	6.87	7.37	8.53	6.99
10	---	---	---	---	6.70	6.48	6.49	6.56	7.11	7.61	8.52	6.98
15	---	---	---	---	6.64	6.50	6.48	6.68	7.62	7.51	8.30	6.99
20	---	---	---	---	6.57	6.50	6.48	7.18	7.71	7.60	8.18	7.06
25	---	---	---	6.83	6.54	6.50	6.52	7.17	7.50	7.60	7.97	7.13
EOM	---	---	---	6.81	6.53	6.50	6.52	6.92	7.39	7.58	7.07	7.22

WATER YEAR 1988 HIGHEST 6.47 MAR 10-15, 1988 LOWEST 8.74 AUG 6, 7, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, OCTOBER TO DECEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	7.27	7.54	7.70	---	---	---	---	---	---	---	---	---
10	7.36	7.62	---	---	---	---	---	---	---	---	---	---
15	7.46	7.67	---	---	---	---	---	---	---	---	---	---
20	7.47	7.68	---	---	---	---	---	---	---	---	---	---
25	7.50	7.72	---	---	---	---	---	---	---	---	---	---
EOM	7.59	7.68	---	---	---	---	---	---	---	---	---	---

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, DECEMBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 08	7.74	JAN 23	7.83	MAR 28	5.33	MAY 18	4.93	JUN 29	5.64	AUG 23	5.40

WATER YEAR 1989 HIGHEST 4.93 MAY 18, 1989 LOWEST 7.83 JAN 23, 1989

GROUND-WATER LEVELS

NORTHAMPTON COUNTY--Continued

371125075570205. Local number, 63F 49.

LOCATION.--Lat 37°11'25", long 75°57'02", Hydrologic Unit 02080110, 0.35 mi southeast of the intersection of State Highway 600 and a private dirt road, 0.5 mi northeast of the intersection of State Highways 600 and 646, and 0.6 mi northeast of Townsend. Owner: U.S. Geological Survey.

AQUIFER.--Sand of Holocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 17 ft, screened 14 to 17 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 27.35 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.8 ft above land-surface datum.

PERIOD OF RECORD.--June 1988 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 9.41 ft below land-surface datum, Apr. 19-22, 1989; lowest recorded, 13.05 ft below land-surface datum, Nov. 28, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, JUNE TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	---	---	---	---	---	---	---	---	11.66	12.19	12.70
10	---	---	---	---	---	---	---	---	11.33	11.72	12.27	12.73
15	---	---	---	---	---	---	---	---	11.40	11.81	12.35	12.75
20	---	---	---	---	---	---	---	---	11.45	11.91	12.44	12.78
25	---	---	---	---	---	---	---	---	11.52	12.00	12.51	12.81
EOM	---	---	---	---	---	---	---	---	11.57	12.10	12.59	12.84

PERIOD JUNE TO SEPTEMBER 1988 HIGHEST 11.30 JUN 07-09, 1988 LOWEST 12.84 SEPT 30, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	12.87	13.04	12.93	12.81	12.56	11.33	9.62	9.89	10.54	10.97	11.24	10.99
10	12.90	13.04	12.89	12.82	12.52	11.03	9.61	9.98	10.64	11.03	11.31	11.09
15	12.94	13.04	12.86	12.82	12.49	10.79	9.54	10.09	10.72	11.09	11.32	11.19
20	12.97	13.04	12.84	12.79	12.46	10.56	9.41	10.19	10.81	11.10	11.13	11.16
25	12.99	13.04	12.83	12.71	12.29	10.22	9.56	10.29	10.85	11.14	10.92	11.09
EOM	13.02	13.01	12.81	12.60	12.00	9.67	9.78	10.43	10.91	11.19	10.89	11.02

WATER YEAR 1989 HIGHEST 9.41 APR 19-22, 1989 LOWEST 13.05 NOV 28, 1988

371709075560801. Local number, 63G 15 SOW 104C.

LOCATION.--Lat 37°17'09", long 75°56'08", Hydrologic Unit 02080110, 50 ft north of State Highway 639, 0.1 mi east of intersection of State Highways 639 and 600, and 0.7 mi west of Oyster. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 310 ft, screened 300 to 310 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 28 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 1.24 ft above land-surface datum prior to Nov. 10, 1986; 1.75 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.38 ft below land-surface datum, Apr. 10, 1979; lowest measured, 27.96 ft below land-surface datum, Oct. 8, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	23.99	24.52	23.77	22.64	22.04	21.80	21.38	20.61	20.60	22.21	22.98	22.33
10	24.20	24.71	23.66	22.22	22.02	21.62	21.18	20.60	20.80	22.31	23.00	22.26
15	24.25	24.70	23.66	22.09	21.90	21.62	21.10	20.59	21.01	22.54	22.91	22.26
20	24.29	24.53	23.68	21.95	21.78	21.51	20.91	20.53	21.30	22.82	22.73	22.30
25	24.38	24.50	23.50	21.98	21.80	21.56	20.80	20.53	21.60	23.00	22.61	22.36
EOM	24.50	24.00	23.14	22.12	21.80	21.47	20.71	20.88	21.79	22.99	22.48	22.46

WATER YEAR 1988 HIGHEST 20.39 JUN 04, 1988 LOWEST 24.71 NOV 10, 1987

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	22.62	23.00	---	21.44	21.05	20.34	19.93	19.60	19.55	19.33	19.32	19.15
10	22.72	23.06	---	21.25	21.01	20.13	19.71	19.42	19.50	19.15	19.34	19.08
15	22.86	22.93	---	21.07	21.03	19.96	19.71	19.49	19.50	19.14	19.20	19.10
20	23.03	22.80	---	21.02	20.84	19.94	19.63	19.48	19.45	19.07	19.05	18.97
25	23.07	22.70	---	21.11	20.54	19.83	19.60	19.50	19.36	19.16	19.10	19.07
EOM	23.21	22.51	---	21.03	20.42	19.81	19.60	19.66	19.37	19.27	19.11	19.01

WATER YEAR 1989 HIGHEST 18.84 SEP 19, 1989 LOWEST 23.21 OCT 31, 1988

GROUND-WATER LEVELS

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NORTHAMPTON COUNTY--Continued

371709075560802. Local number, 63G 16 SOW 104B.

LOCATION.--Lat 37°17'09", 75°56'08", Hydrologic Unit 02080110, 50 ft north of State Highway 639, 0.1 mi east of intersection of State Highways 639 and 600, and 0.7 mi west of Oyster. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 240 ft, screened 230 to 240 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 28 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.4 ft above land-surface datum prior to Feb. 29, 1988; 0.9 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.93 ft below land-surface datum, May 25, 1983; lowest measured, 23.47 ft below land-surface datum, Oct. 8, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	21.39	JAN 05	19.12	FEB 29	18.89	APR 25	18.00	JUN 13	18.68	AUG 01	19.90
WATER YEAR 1988		HIGHEST	18.00	APR 25, 1988		LOWEST	21.39	NOV 09, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	19.50	JAN 09	18.30	MAR 06	16.00	APR 18	17.00	JUN 19	17.10	AUG 15	17.00
NOV 14	19.82										
WATER YEAR 1989		HIGHEST	16.00	MAR 06, 1989		LOWEST	19.82	NOV 14, 1988			

371709075560803. Local number, 63G 17 SOW 104A.

LOCATION.--Lat 37°17'09", long 75°56'08", Hydrologic Unit 02080110, 50 ft north of State Highway 639, 0.1 mi east of intersection of State Highways 639 and 600, and 0.7 mi west of Oyster. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 140 ft, screened 130 to 140 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 28 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.05 ft above land-surface datum prior to Feb. 29, 1988; 0.5 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 14.45 ft below land-surface datum, Apr. 13, 1978; lowest measured, 21.79 ft below land-surface datum, Oct. 8, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	19.92	JAN 05	18.07	FEB 29	17.10	APR 25	16.40	JUN 13	17.48	AUG 01	18.20
WATER YEAR 1988		HIGHEST	16.40	APR 25, 1988		LOWEST	19.92	NOV 09, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	17.70	JAN 09	16.80	MAR 06	15.00	APR 18	15.20	JUN 19	15.60	AUG 15	15.40
NOV 14	18.10										
WATER YEAR 1989		HIGHEST	15.00	MAR 06, 1989		LOWEST	18.10	NOV 14, 1988			

GROUND-WATER LEVELS
NORTHAMPTON COUNTY--Continued

371735075572601. Local number, 63G 20 SOW 075.

LOCATION.--Lat 37°17'35", long 75°57'26", Hydrologic Unit 02080101, at Kane Miller Corporation plant 0.4 mi north of State Highway 639, 0.7 mi northwest of intersection of State Highways 639 and 637, and 0.9 mi east of Cheriton. Owner: Kane Miller Corporation.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 20 in. to 56 ft, diameter 10 in. from 56 to 240 ft, depth 240 ft, screened 56 to 61 ft, 95 to 100 ft, 160 to 165 ft, 188 to 193 ft, 210 to 215 ft, 235 to 240 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 35 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 2.6 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--November 1974 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 22.97 ft below land-surface datum, Mar. 15, 1976; lowest recorded, 85.57 ft below land-surface datum, Aug. 5, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	36.34	38.98	33.90	28.50	30.64	28.67	27.30	25.55	28.31	36.98	33.77	30.22
10	38.70	38.12	34.37	27.68	30.11	28.04	27.18	25.50	29.79	35.84	33.02	31.65
15	38.60	36.52	33.98	28.49	29.62	27.66	26.53	25.33	29.90	37.60	30.97	31.40
20	38.00	36.16	33.22	30.40	29.17	27.88	25.98	27.42	29.80	36.84	31.30	30.74
25	38.82	33.60	31.60	29.67	29.70	27.30	25.66	27.30	33.55	34.15	31.52	32.51
EOM	39.16	32.50	29.57	30.46	29.09	28.04	25.52	27.90	34.50	33.85	31.93	34.88

WATER YEAR 1988 HIGHEST 25.18 MAY 16, 1988 LOWEST 39.38 NOV 07, 1987

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	35.14	34.59	30.36	27.83	27.57	25.39	24.51	23.42	23.98	24.20	24.37	23.77
10	33.42	33.74	31.95	26.92	26.35	25.12	24.12	23.67	24.01	23.90	24.33	23.78
15	36.92	32.76	29.29	26.75	26.00	24.87	23.98	23.73	23.98	24.09	24.02	23.79
20	37.13	31.87	28.70	27.63	25.68	25.52	23.70	23.51	24.06	23.90	23.60	23.67
25	36.19	31.79	29.00	27.15	25.93	26.16	23.62	23.62	23.92	24.04	23.42	23.67
EOM	34.45	30.84	28.30	26.25	25.64	24.84	23.57	24.13	23.99	24.33	23.80	23.61

WATER YEAR 1989 HIGHEST 23.34 MAY 06, 1989 LOWEST 37.58 OCT 22, 1988

371709075560804. Local number, 63G 21 SOW 104S.

LOCATION.--Lat 37°17'09", long 75°56'08", Hydrologic Unit 02080110, 50 ft north of State Highway 639, 0.1 mi east of intersection of State Highways 639 and 600, and 0.7 mi west of Oyster. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 36 ft, screened 26 to 36 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 28 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.4 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.25 ft below land-surface datum, Nov. 23, 1979; lowest measured, 16.35 ft below land-surface datum, Nov. 15, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	15.14	JAN 05	14.25	FEB 29	14.10	APR 25	14.05	JUN 13	14.38	AUG 01	14.80
WATER YEAR 1988		HIGHEST	14.05	APR 25, 1988	LOWEST	15.14	NOV 09, 1987				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	14.60	JAN 09	14.45	MAR 06	13.90	APR 18	13.20	JUN 19	13.90	AUG 15	13.30
NOV 14	14.55										
WATER YEAR 1989		HIGHEST	13.20	APR 18, 1989	LOWEST	14.60	OCT 05, 1988				

NORTHAMPTON COUNTY--Continued

371653075584801. Local number, 63G 22 SOW 111A.

LOCATION.--Lat 37°16'53", long 75°58'48", Hydrologic Unit 02080109, 50 ft west of U.S. Highway 13, 0.4 mi north of intersection of U.S. Highway 13 and State Highway 641, and 0.7 mi southwest of Cheriton. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 150 ft, screened 140 to 150 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, at land-surface datum prior to Apr. 27, 1987; 1.60 ft prior to Feb. 29, 1988; 1.1 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1979 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.80 ft below land-surface datum, Feb. 2, 1984; lowest measured, 14.51 ft below land-surface datum, Feb. 17, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	13.27	JAN 05	12.56	FEB 29	11.67	APR 25	11.20	JUN 15	11.17	AUG 02	12.46
WATER YEAR 1988		HIGHEST	11.17	JUN 15, 1988	LOWEST	13.27	NOV 09, 1987				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	12.32	JAN 09	12.15	MAR 06	11.00	APR 18	10.00	JUN 19	11.10	AUG 15	10.40
NOV 14	12.75										
WATER YEAR 1989		HIGHEST	10.00	APR 18, 1989	LOWEST	12.75	NOV 14, 1988				

371653075584802. Local number, 63G 23 SOW 111B.

LOCATION.--Lat 37°16'53", long 75°58'48", Hydrologic Unit 02080109, 50 ft west of U.S. Highway 13, 0.4 mi north of intersection of U.S. Highway 13 and State Highway 641, and 0.7 mi southwest of Cheriton. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 280 ft, screened 270 to 280 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 1.42 ft above land-surface datum prior to July 20, 1987; 1.56 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1979 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.01 ft below land-surface datum, Dec. 30, 1982; lowest measured, 22.47 ft below land-surface datum, Sept. 15, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	18.63	19.12	17.64	16.07	15.82	15.32	14.66	13.59	14.30	16.50	17.80	16.76
10	18.83	19.80	17.63	15.65	15.80	15.00	14.41	13.48	14.42	16.86	17.70	16.66
15	18.88	19.09	17.56	15.80	15.78	14.82	14.29	13.53	14.66	17.52	17.59	16.76
20	18.90	18.82	17.68	15.94	15.50	14.83	14.07	13.60	14.83	17.78	17.15	16.79
25	19.19	18.40	17.28	15.98	15.50	14.86	13.97	13.80	15.55	17.92	16.96	16.94
EOM	19.28	17.69	16.61	16.18	15.44	14.60	13.70	13.97	15.80	17.70	16.87	17.20
WATER YEAR 1988		HIGHEST	13.37	MAY 07, 1988	LOWEST	19.80	NOV 10, 1987					

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	17.10	17.60	16.48	15.18	14.47	13.51	13.00	12.50	13.38	13.10	13.34	13.20
10	17.35	17.38	16.56	14.95	14.32	13.26	12.86	12.41	13.08	13.11	13.30	13.03
15	17.73	17.25	16.25	14.78	14.20	13.12	12.83	12.50	13.03	13.21	13.12	12.97
20	17.86	17.06	15.86	14.69	13.90	13.20	12.76	12.48	13.03	13.09	13.04	12.74
25	17.80	16.83	15.74	14.68	13.76	13.27	12.75	12.48	12.91	13.32	13.02	12.78
EOM	18.02	16.39	15.49	14.40	13.71	13.15	12.67	13.25	13.04	13.40	13.13	12.65
WATER YEAR 1989		HIGHEST	12.31	MAY 11, 1989	LOWEST	18.04	OCT 30, 1988					

GROUND-WATER LEVELS

NORTHAMPTON COUNTY--Continued

371653075584803. Local number, 63G 24 SOW 111C.

LOCATION.--Lat 37°16'53", long 75°58'48", Hydrologic Unit 02080109, 50 ft west of U.S. Highway 13, 0.4 mi north of intersection of U.S. Highway 13 and State Highway 641, and 0.7 mi southwest of Cheriton. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 330 ft, screened 320 to 330 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.67 ft above land-surface datum prior to Feb. 28, 1988; 1.95 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1979 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.01 ft below land-surface datum, Feb. 17, 1981; lowest measured, 22.71 ft below land-surface datum, Sept. 15, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	19.85	JAN 05	16.43	FEB 28	15.67	APR 25	13.95	JUN 15	14.95	AUG 02	17.95
WATER YEAR 1988		HIGHEST	13.95	APR 25, 1988	LOWEST	19.85	NOV 09, 1987				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	17.40	JAN 09	15.22	MAR 06	13.75	APR 18	13.05	JUN 19	13.35	AUG 15	13.35
NOV 14	17.20										
WATER YEAR 1989		HIGHEST	13.05	APR 18, 1989	LOWEST	17.40	OCT 05, 1988				

371653075584804. Local number, 63G 25 SOW 111S.

LOCATION.--Lat 37°16'53", long 75°58'48", Hydrologic Unit 02080109, 50 ft west of U.S. Highway 13, 0.4 mi north of intersection of U.S. Highway 13 and State Highway 641, and 0.7 mi southwest of Cheriton. Owner: Virginia Water Control Board.

AQUIFER.--Sand of the Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 1.5 in., depth 70 ft, screened 60 to 70 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.64 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1979 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.96 ft below land-surface datum, Apr. 18, 1989; lowest measured, 10.82 ft below land-surface datum, Nov. 11, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	10.56	JAN 05	10.01	FEB 29	9.36	APR 25	9.26	JUN 15	9.76	AUG 02	10.21
WATER YEAR 1988		HIGHEST	9.26	APR 25, 1988	LOWEST	10.56	NOV 09, 1987				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	10.01	JAN 09	10.06	MAR 06	8.46	APR 18	7.96	JUN 19	9.16	AUG 15	8.46
NOV 14	10.03										
WATER YEAR 1989		HIGHEST	7.96	APR 18, 1989	LOWEST	10.06	JAN 09, 1989				

GROUND-WATER LEVELS

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NORTHAMPTON COUNTY--Continued

371726075572801. Local number, 63G 26 SOW 160.

LOCATION.--Lat 37°17'26", long 75°57'28", Hydrologic Unit 02080110, at Kane Miller Corporation plant, 0.4 mi north of State Highway 639, 0.7 mi northwest of intersection of State Highways 639 and 637, and 0.8 mi east of Cheriton.
 Owner: Kane Miller Corporation..

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 2 in., depth 320 ft, screened 310 to 320 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 34 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--May 1979 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 24.99 ft below land-surface datum, July 23, 1980; lowest measured, 74.90 ft below land-surface datum, Oct. 16, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	57.99	JAN 05	35.17	FEB 29	35.20	APR 25	31.55	JUN 13	47.25	AUG 01	53.75
WATER YEAR 1988		HIGHEST	31.55	APR 25, 1988		LOWEST	57.99	NOV 09, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	58.40	JAN 09	32.55	MAR 06	27.50	APR 18	29.70	JUN 19	30.20	AUG 15	30.20
NOV 14	51.97										
WATER YEAR 1989		HIGHEST	27.50	MAR 06, 1989		LOWEST	58.40	OCT 05, 1988			

371710075552201. Local number, 63G 27 SOW 161.

LOCATION.--Lat 37°17'10", long 75°55'22", Hydrologic Unit 02080110, 15 ft south of State Highway 639, 100 ft southeast of intersection of State Highways 639 and 1801, and at town of Oyster. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 185 ft, screened 175 to 185 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 5.5 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.8 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board. Water level affected by local pumpage.

PERIOD OF RECORD.--March 1980 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.45 ft below land-surface datum, Dec. 5, 1980; lowest measured, 70.91 ft below land-surface datum, Dec. 18, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	62.40	JAN 05	21.25	FEB 29	34.28	APR 25	28.79	JUN 13	34.79	AUG 01	44.50
WATER YEAR 1988		HIGHEST	21.25	JAN 05, 1988		LOWEST	62.40	NOV 09, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	19.95	JAN 09	23.70	MAR 06	20.90	APR 18	62.55	JUN 19	23.60	AUG 15	43.00
NOV 14	28.60										
WATER YEAR 1989		HIGHEST	19.95	OCT 05, 1988		LOWEST	62.55	APR 18, 1989			

GROUND-WATER LEVELS

NORTHAMPTON COUNTY--Continued

372705075555901. Local number, 63H 4 SOW 103C.

LOCATION.--Lat 37°27'06", long 75°55'59", Hydrologic Unit 02080109, 0.2 mi north of State Highway 619, 0.5 mi northwest of intersection of State Highways 619 and 622, and 0.5 mi northwest of Bridgetown. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 235 ft, screened 225 to 235 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 17 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.8 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.15 ft below land-surface datum, May 1, 1979; lowest measured, 12.56 ft below land-surface datum, Nov. 11, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	12.52	JAN 06	12.20	MAR 01	12.30	APR 25	11.85	JUN 14	11.97	AUG 02	12.10
WATER YEAR 1988		HIGHEST	11.85	APR 25, 1988		LOWEST	12.52	NOV 09, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 06	12.20	JAN 09	12.10	MAR 07	10.60	APR 19	11.70	JUN 20	11.80	AUG 15	11.30
NOV 15	12.15										
WATER YEAR 1989		HIGHEST	10.60	MAR 07, 1989		LOWEST	12.20	OCT 06, 1988			

372705075555902. Local number, 63H 5 SOW 103B.

LOCATION.--Lat 37°27'05", long 75°55'59", Hydrologic Unit 02080109, 0.2 mi north of State Highway 619, 0.5 mi northwest of intersection of State Highways 619 and 622, and 0.5 mi northwest of Bridgetown. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 132 ft, screened 122 to 132 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 17 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.25 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.90 ft below land-surface datum, Feb. 1, 1979; lowest measured, 12.00 ft below land-surface datum, Jan. 9, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	11.45	JAN 06	11.55	MAR 01	10.77	APR 25	10.55	JUN 14	10.82	AUG 02	11.25
WATER YEAR 1988		HIGHEST	10.55	APR 25, 1988		LOWEST	11.55	JAN 06, 1988			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 06	11.65	JAN 09	12.00	MAR 07	11.35	APR 19	9.85	JUN 20	10.45	AUG 15	8.85
NOV 15	11.75										
WATER YEAR 1989		HIGHEST	8.85	AUG 15, 1989		LOWEST	12.00	JAN 09, 1989			

GROUND-WATER LEVELS

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NORTHAMPTON COUNTY--Continued

372705075555903. Local number, 63H 6 SOW 103A.

LOCATION.--Lat 37°27'05", long 75°55'59", Hydrologic Unit 02080109, 0.2 mi north of State Highway 619, 0.5 mi northwest of intersection of State Highways 619 and 622, and 0.5 mi northwest of Bridgetown. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 37 ft, screened 27 to 37 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 17 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.2 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.94 ft below land-surface datum, Aug. 2, 1979; lowest measured, 9.93 ft below land-surface datum, Jan. 9, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	8.77	JAN 06	8.88	MAR 01	7.90	APR 25	7.78	JUN 14	8.28	AUG 02	9.15
WATER YEAR 1988		HIGHEST	7.78	APR 25, 1988	LOWEST	9.15	AUG 02, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 06	9.35	JAN 09	9.93	MAR 07	8.70	APR 19	6.80	JUN 20	7.70	AUG 15	3.60
WATER YEAR 1989		HIGHEST	3.60	AUG 15, 1989	LOWEST	9.93	JAN 09, 1989				

373230075541001. Local number, 63J 1 SOW 113A.

LOCATION.--Lat 37°32'16", long 75°54'07", Hydrologic Unit 02080109, 0.15 mi north of State Highway 183, 0.4 mi east of intersection of State Highways 183 and 611, and 1.3 mi west of Wardtown. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 120 ft, screened 110 to 120 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 22 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1980 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.79 ft below land-surface datum, Apr. 21, 1983; lowest measured, 28.00 ft below land-surface datum, July 15, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	21.27	JAN 06	20.23	MAR 01	19.78	APR 25	19.32	JUN 14	21.75	AUG 02	22.18
WATER YEAR 1988		HIGHEST	19.32	APR 25, 1988	LOWEST	22.18	AUG 02, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 06	20.80	JAN 09	20.00	MAR 07	19.60	APR 19	18.90	JUN 20	20.90	AUG 16	19.70
WATER YEAR 1989		HIGHEST	18.90	APR 19, 1989	LOWEST	20.90	JUN 20, 1989				

GROUND-WATER LEVELS

NORTHAMPTON COUNTY--Continued

373230075541002. Local number, 63J 2 SOW 113B.

LOCATION.--Lat 37°32'16", long 75°54'07", Hydrologic Unit 02080109, 0.15 mi north of State Highway 183, 0.40 mi east of intersection of State Highways 183 and 611, and 1.3 mi west of Wardtown. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 225 ft, screened 215 to 225 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 22 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.3 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1980 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.20 ft below land-surface datum, Apr. 21, 1983; lowest measured, 24.52 ft below land-surface datum, Aug. 4, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	21.57	JAN 06	20.58	MAR 01	20.38	APR 25	19.88	JUN 14	20.43	AUG 02	22.18
WATER YEAR 1988		HIGHEST	19.88	APR 25, 1988		LOWEST	22.18	AUG 02, 1988			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 06	21.32	JAN 09	19.50	MAR 07	19.90	APR 19	19.50	JUN 20	20.20	AUG 16	20.40
NOV 15	20.75										
WATER YEAR 1989		HIGHEST	19.50	JAN 09, APR 19, 1989		LOWEST	21.32	OCT 06, 1988			

373230075541003. Local number, 63J 3 SOW 113C.

LOCATION.--Lat 37°32'16", long 75°54'07", Hydrologic Unit 02080109, 0.15 mi north of State Highway 183, 0.4 mi east of intersection of State Highways 183 and 611, and 1.3 mi west of Wardtown. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 290 ft, screened 280 to 290 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 22 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.44 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1980 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.51 ft below land-surface datum, Aug. 18, 1983; lowest measured, 24.84 ft below land-surface datum, Aug. 4, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	22.91	JAN 06	22.05	MAR 01	21.68	APR 25	21.21	JUN 14	21.64	AUG 02	23.13
WATER YEAR 1988		HIGHEST	21.21	APR 25, 1988		LOWEST	23.13	AUG 02, 1988			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 06	22.61	JAN 09	21.86	MAR 07	21.36	APR 19	20.96	JUN 20	21.56	AUG 16	21.66
NOV 15	22.11										
WATER YEAR 1989		HIGHEST	20.96	APR 19, 1989		LOWEST	22.61	OCT 06, 1988			

NORTHAMPTON COUNTY--Continued

73059075484501. Local number, 64J 9 SOW 112A.

LOCATION.--Lat 37°30'59", long 75°48'45", Hydrologic Unit 02080109, 100 ft northeast of State Highway 660, 0.3 mi southeast of intersection of State Highways 660 and 600, and 0.3 mi west of Willis Wharf. Owner: Virginia Water Control Board.

QUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 135 ft, screened 125 to 135 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 30 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, at land-surface datum prior to Feb. 29, 1988; 0.7 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--July 1979 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.25 ft below land-surface datum, Oct. 29, 1981; lowest measured, 33.57 ft below land-surface datum, July 18, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	26.08	JAN 05	25.08	FEB 29	27.70	APR 26	28.00	JUN 14	27.83	AUG 02	27.70
WATER YEAR 1988		HIGHEST	25.08	JAN 05, 1988	LOWEST	28.00	APR 26, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	29.13	JAN 10	26.00	MAR 06	24.30	APR 18	24.80	JUN 20	25.30	AUG 15	25.20
NOV 14	26.10										
WATER YEAR 1989		HIGHEST	24.30	MAR 06, 1989	LOWEST	29.13	OCT 05, 1988				

73059075484502. Local number, 64J 10 SOW 112B.

LOCATION.--Lat 37°30'59", long 75°48'45", Hydrologic Unit 02080109, 100 ft northeast of State Highway 660, 0.3 mi southeast of intersection of State Highways 660 and 600, and 0.3 mi west of Willis Wharf. Owner: Virginia Water Control Board.

QUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 210 ft, screened 200 to 210 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 30 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 1.5 ft above land-surface datum prior to Aug. 12, 1987; 1.6 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--July 1979 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 21.02 ft below land-surface datum, Mar. 22, 1987; lowest measured, 31.29 ft below land-surface datum, Oct. 1, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	24.46	25.57	25.53	24.54	25.84	25.62	26.25	25.97	24.95	25.38	26.87	26.97
10	25.69	25.15	25.63	23.73	26.00	25.85	25.00	24.95	25.93	26.72	26.87	27.40
15	24.75	25.25	25.65	25.48	25.65	26.53	24.88	24.59	26.20	26.61	26.00	27.18
20	24.62	25.69	25.22	25.73	25.97	26.24	25.03	25.10	25.41	26.83	26.68	26.42
25	25.22	26.06	26.08	26.37	26.32	25.48	25.80	25.35	26.12	25.78	27.27	26.56
FROM	25.48	24.43	25.72	25.60	25.99	25.90	26.56	24.75	26.17	26.00	27.75	27.47
WATER YEAR 1988		HIGHEST	23.65	JAN 11, 1988	LOWEST	27.81	SEP 01, 1988					

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	27.04	23.77	25.00	25.31	24.94	24.34	24.35	24.94	24.00	25.07	25.39	23.70
10	26.36	24.52	25.49	25.20	25.51	23.23	23.57	24.60	24.53	25.11	25.62	23.56
15	27.18	25.35	25.16	25.05	25.29	23.96	23.97	23.97	24.85	25.55	24.76	24.95
20	26.93	25.54	25.43	25.59	24.21	24.18	24.56	24.50	25.09	25.05	24.64	24.36
25	25.55	24.96	24.34	25.17	24.03	24.32	24.72	24.37	24.30	25.22	24.96	23.56
FROM	24.24	24.74	25.36	25.19	23.81	24.54	24.87	24.37	25.23	24.90	24.72	24.63
WATER YEAR 1989		HIGHEST	22.66	MAR 13, 1989	LOWEST	27.56	OCT 1, 1988					

GROUND-WATER LEVELS

NORTHAMPTON COUNTY--Continued

373059075484503. Local number, 64J 11 SOW 112C.

LOCATION.--Lat 37°30'59", long 75°48'45", Hydrologic Unit 02080109, 100 ft northeast of State Highway 660, 0.3 mi southeast of intersection of State Highways 660 and 600, and 0.3 mi west of Willis Wharf. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 313 ft, screened 303 to 313 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 30 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.4 ft above land-surface datum prior to Apr. 27, 1987; 0.65 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--July 1979 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.78 ft below land-surface datum, Mar. 29, 1984; lowest measured, 35.70 ft below land-surface datum, Dec. 5, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	23.97	JAN 05	23.37	FEB 29	23.60	APR 26	23.28	JUN 14	23.38	AUG 02	23.85
WATER YEAR 1988		HIGHEST	23.28	APR 26, 1988		LOWEST	23.97	NOV 10, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	24.69	JAN 10	23.65	MAR 06	23.00	APR 18	22.75	JUN 20	22.95	AUG 15	23.45
NOV 14	23.83										
WATER YEAR 1989		HIGHEST	22.75	APR 18, 1989		LOWEST	24.69	OCT 05, 1988			

373046075482501. Local number, 64J 13 SOW 120.

LOCATION.--Lat 37°30'46", long 75°48'25", Hydrologic Unit 02080110, at American Original Corporation plant, 10 ft east of State Highway 603, 0.1 mi northeast of intersection of State Highways 603 and 660, and 0.3 mi south of Willis Wharf. Owner: American Original Corporation.

AQUIFER.--Sand and shell of Pliocene age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 8 in., depth 105 ft, screened 95 to 105 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 7 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 0.7 ft above land-surface datum prior to Aug. 11, 1987; 1.5 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board. Water level affected by local pumpage.

PERIOD OF RECORD.--August 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 0.24 ft below land-surface datum, Jan. 2, 1987; lowest measured, 17.90 ft below land-surface datum, Dec. 1, 1979.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	6.90	9.85	9.55	---	10.51	9.98	9.92	8.59	5.80	8.31	10.20	10.71
10	9.40	8.46	9.80	4.22	9.80	10.76	4.87	9.22	10.10	8.45	10.48	8.20
15	7.48	8.53	10.30	8.50	8.88	9.88	8.93	5.36	10.88	9.30	8.82	9.90
20	8.00	9.90	8.03	10.29	9.93	9.51	9.00	6.86	9.46	11.00	6.87	9.35
25	8.31	10.32	8.20	11.14	10.41	11.60	10.79	9.15	8.05	8.99	10.82	7.26
EOM	8.61	5.44	---	12.00	8.00	10.81	10.72	6.29	10.47	6.20	11.80	10.48
WATER YEAR 1988		HIGHEST	2.73	JAN 10, 1988		LOWEST	12.55	APR 29, 1988				

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	8.90	3.59	7.60	9.42	5.50	5.87	8.53	9.62	7.42	9.22	6.37	3.84
10	8.01	7.23	8.95	8.75	9.17	4.17	6.63	9.09	4.99	8.22	9.50	3.72
15	9.42	8.15	8.88	5.09	8.87	8.73	7.22	8.14	8.42	8.11	8.20	9.16
20	10.01	6.90	9.71	9.42	7.42	7.99	8.56	6.10	9.55	8.22	5.47	8.42
25	5.62	5.93	4.35	8.75	4.08	5.30	8.89	7.73	4.34	8.72	8.23	7.62
EOM	4.53	6.12	9.06	8.70	4.70	8.26	5.46	8.38	8.68	8.27	7.82	8.82
WATER YEAR 1989		HIGHEST	1.58	MAR 10, 1989		LOWEST	10.92	OCT 01, 1988				

GROUND-WATER LEVELS

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ORANGE COUNTY

381002078094201. Local number, 45P 1 SOW 030.

LOCATION.--Lat 38°10'02", long 78°09'42", Hydrologic Unit 02080106, off U.S. Highway 15, 2.3 mi north of Gordonsville. Owner: M. L. Johnson.

AQUIFER.--Phyllite of Evinston Group of Cambrian or Precambrian age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 6 in., depth 98 ft, length of casing unknown.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 480 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.4 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1965 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 11.83 ft below land-surface datum, Apr. 10, 1973; lowest recorded, 35.90 ft below land-surface datum, Jan. 31, 1966.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	31.36	32.80	32.70	33.20	28.83	25.88	22.50	21.22	21.53	22.09	22.10	25.20
10	31.50	33.19	32.88	33.10	28.60	24.30	21.40	18.68	20.28	21.60	22.91	25.32
15	31.84	33.33	33.10	32.11	28.33	23.38	21.32	18.29	20.84	22.17	23.17	25.85
20	32.12	33.43	33.30	29.60	27.47	23.65	21.91	18.68	21.54	21.27	23.62	26.20
25	32.36	33.64	33.40	28.91	26.36	22.22	22.20	19.60	20.89	21.80	24.21	26.65
EOM	32.68	32.89	33.14	28.53	25.90	21.90	22.87	20.82	21.69	22.13	24.62	26.08

WATER YEAR 1989 HIGHEST 17.97 MAY 12, 1989 LOWEST 33.66 NOV 26, 1988

PATRICK COUNTY

364732080070301. Local number, 30C 1 SOW 010.

LOCATION.--Lat 36°47'32", long 80°07'03", Hydrologic Unit 03010103, 300 ft west of State Highway 623, 1.0 mi northeast of intersection of State Highways 623 and 57, and 6.2 mi west of Philpott. Owner: Commonwealth of Virginia.

AQUIFER.--Lynchburg Group of late Proterozoic age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6.25 in., depth 250 ft, cased to 9 ft, open hole 9 to 250 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 1,060 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--May 1966 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.04 ft below land-surface datum, Apr. 4, 1973; lowest measured, 23.15 ft below land-surface datum, Jan. 10, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	18.33	MAR 02	15.90	APR 27	14.52	JUN 15	17.20	AUG 03	18.84	SEP 27	20.66
JAN 11	17.80										

WATER YEAR 1988 HIGHEST 14.52 APR 27, 1988 LOWEST 20.66 SEP 27, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 22	22.20	MAR 07	17.72	APR 18	19.80	JUN 13	16.35	AUG 01	13.40	SEP 26	6.74
JAN 10	23.15										

WATER YEAR 1989 HIGHEST 6.74 SEP 26, 1989 LOWEST 23.15 JAN 10, 1989

GROUND-WATER LEVELS

CITY OF PORTSMOUTH

364823076181501. Local number, 60C 27.

LOCATION.--Lat 36°48'23", long 76°18'15", Hydrologic Unit 02080208, 100 ft east of State Highway 239 (Victory Boulevard), 0.1 mi south of the intersection of State Highway 239 (Victory Boulevard) and State Highway 337 (Elem Avenue) in the city of Portsmouth. Owner: U.S. Department of the Navy.

AQUIFER.--Sands of Eocene to Miocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 908 ft, screened 903 to 908 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1989, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 18 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.5 ft above land-surface datum.

PERIOD OF RECORD.--June 1985 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 63.65 ft below land-surface datum, June 19, 1985; lowest measured, 70.53 ft below land-surface datum, Sept. 25, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

	DATE	WATER LEVEL	DATE	WATER LEVEL
	NOV 04	68.61	MAR 07	66.71
WATER YEAR 1988	HIGHEST	66.71	MAR 07, 1988	LOWEST 68.61 NOV 04, 1987

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
	MAR 29	70.05	JUN 27	70.20	SEP 25	70.53
WATER YEAR 1989	HIGHEST	70.05	MAR 29, 1989	LOWEST	70.53	SEP 25, 1989

365313076215101. Local number, 60D 2.

LOCATION.--Lat 36°53'13", long 76°21'51", Hydrologic Unit 02080208, 1.1 mi east of the main gate of the U.S. Naval Supply Center on Main Street in Building 285, 2.0 mi northwest of West Norfolk in the city of Portsmouth, and 2.25 mi north of the intersection of U.S. Highway 17 and Cedar Lane (Craney Island Road). Owner: U.S. Department of the Navy.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 8 in. to 170 ft, diameter 4 in. from 170 to 565 ft, depth 565 ft, screened 545 to 565 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 12 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.6 ft above land-surface datum.

PERIOD OF RECORD.--January 1984 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.01 ft below land-surface datum, Sept. 18, 1985; lowest measured, 5.05 ft below land-surface datum, Dec. 19, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

	DATE	WATER LEVEL	DATE	WATER LEVEL
	NOV 04	4.86	MAR 09	4.78
WATER YEAR 1988	HIGHEST	4.78	MAR 09, 1988	LOWEST 4.86 NOV 04, 1987

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
	DEC 19	5.05	MAR 29	4.76	JUN 27	5.02	SEP 26	4.94
WATER YEAR 1989	HIGHEST	4.76	MAR 29, 1989	LOWEST	5.05	DEC 19, 1988		

GROUND-WATER LEVELS

481

PRINCE GEORGE COUNTY

371315077171901. Local number, 52F 1 SOW 038.

LOCATION.--Lat 37°13'15", long 77°17'19", Hydrologic Unit 03010202, 0.1 mi north of State Highway 106 in Prince George. Owner: Prince George County.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 4 in., depth 180 ft, cased to 170 ft, open hole 170 to 180 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 132 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 3.4 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--December 1970 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 69.32 ft below land-surface datum, Feb. 4, 1980; lowest measured, 77.89 ft below land-surface datum, Sept. 20, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 15	77.83	JAN 04	77.62	FEB 28	77.20	APR 25	76.75	JUN 20	76.50	AUG 08	76.73
WATER YEAR 1989		HIGHEST	76.50	JUN 20, 1989	LOWEST	77.83	NOV 15, 1988				

PRINCE WILLIAM COUNTY

384931077420301. Local number, 49U 1.

LOCATION.--Lat 38°49'30", long 77°42'08", Hydrologic Unit 02070010, 500 ft north of State Highway 55, 0.8 mi east of Thoroughfare Gap, and 3.7 mi west of Haymarket. Owner: Virginia Department of Transportation.

AQUIFER.--Shale and sandstone of Newark Group of Triassic age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 7 in., depth 345 ft, cased to 20 ft, open hole 20 to 345 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 383 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

PERIOD OF RECORD.--October 1968 to current year. Unpublished records available prior to May 1969 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 2.59 ft below land-surface datum, Mar. 19, 1975; lowest measured, 10.33 ft below land-surface datum, Oct. 14, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	10.33	JAN 04	8.27	APR 13	4.70	JUL 07	6.73	AUG 29	8.16	SEP 29	8.53
NOV 16	8.81	MAR 17	5.10	JUN 02	6.84						
WATER YEAR 1989		HIGHEST	4.70	APR 13, 1989	LOWEST	10.33	OCT 14, 1988				

385607077381101. Local number, 49V 1.

LOCATION.--Lat 38°56'07", long 77°38'11", Hydrologic Unit 02070010, near intersection of State Highways 600 and 615, 2.8 mi south of Aldie. Owner: J. H. Hutchison.

AQUIFER.--Shale and sandstone of Newark Group of Triassic age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 7 in., depth 165 ft, cased to 10 ft, open hole 10 to 165 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 420 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum. Readings from 1979 to 1981 should be 0.7 ft lower than previously published.

PERIOD OF RECORD.--November 1968 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 6.85 ft below land-surface datum, Oct. 12, 1979; lowest recorded, 12.28 ft below land-surface datum, July 12, 13, 1970.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	11.13	10.94	10.44	10.41	9.29	8.58	8.03	8.02	9.23	9.22	9.70	11.14
10	11.26	10.92	10.50	10.15	9.21	8.03	7.97	7.18	8.25	8.29	9.99	11.31
15	11.58	10.94	10.61	9.11	9.28	8.03	8.26	7.52	8.35	8.93	9.99	11.19
20	11.63	-	10.72	9.03	8.81	8.69	8.25	7.39	8.40	9.09	10.14	11.01
25	11.07	-	10.65	9.28	8.25	7.86	8.59	8.02	8.33	9.46	10.39	11.03
EOM	11.22	-	10.63	9.28	8.37	7.81	9.01	8.68	8.97	9.65	10.83	10.56
WATER YEAR 1989		HIGHEST	6.96	MAY 05, 1989	LOWEST	11.63	OCT 20, 1988					

GROUND-WATER LEVELS

PRINCE WILLIAM COUNTY--Continued

383423077245901. Local number, 51S 7.

LOCATION.--Lat 38°34'23", long 77°24'59", Hydrologic Unit 02070011, in Prince William Forest Park, 700 ft north of State Highway 619, 0.7 mi southeast of Belfair Crossroads, and 4.6 mi south of Independent Hill. Owner: National Park Service.

AQUIFER.--Wissahickon Formation of Paleozoic age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 6 in., depth 490 ft, cased to 50 ft, open hole 50 to 490 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 295 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

PERIOD OF RECORD.--September 1973 to November 1975, December 1977 to current year. Unpublished records available prior to December 1975 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.14 ft below land-surface datum, Apr. 20, 1983; lowest recorded, 12.95 ft below land-surface datum, Nov. 16, 17, 1988.

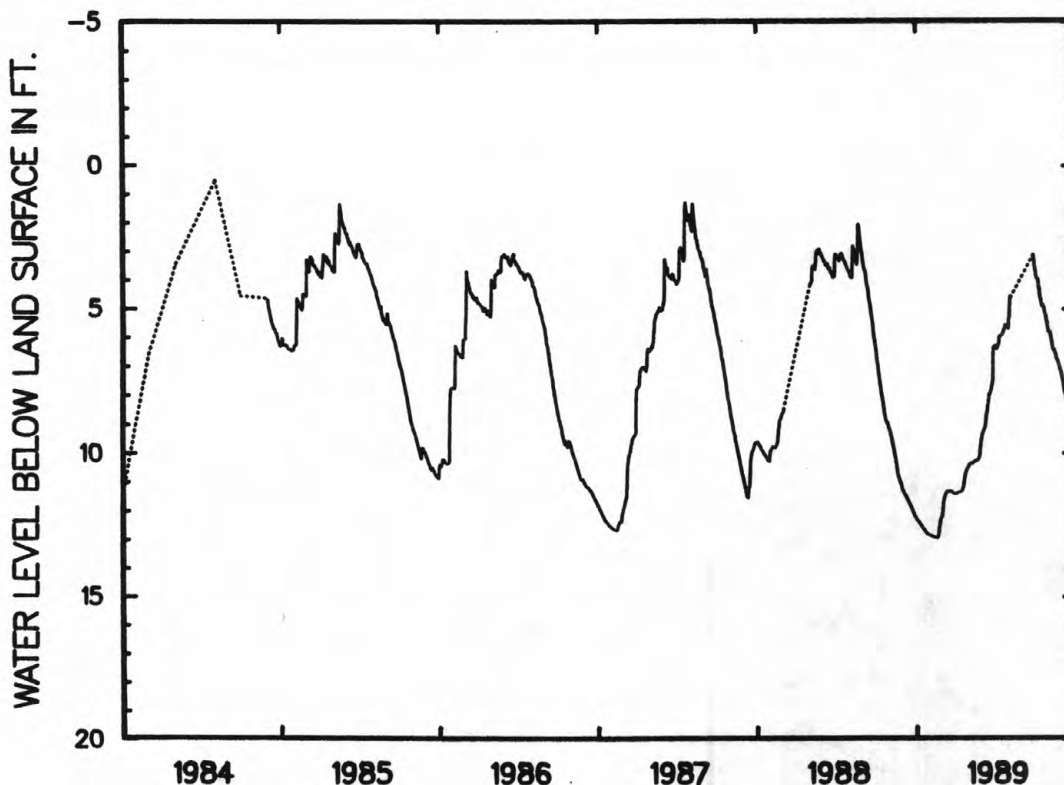
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	12.43	12.91	11.40	11.37	10.36	9.11	6.31	---	---	3.96	6.10	7.93
10	12.53	12.93	11.34	11.33	10.30	8.56	5.95	---	---	4.41	6.44	8.29
15	12.65	12.94	11.34	11.12	10.25	7.97	5.89	---	---	4.93	6.59	8.47
20	12.77	12.71	11.38	10.68	10.14	7.82	5.68	---	---	4.97	6.86	8.36
25	12.83	12.24	11.43	10.50	9.52	6.34	5.59	---	---	5.43	7.14	8.49
EOM	12.88	11.75	11.39	10.37	9.31	6.34	5.32	---	3.65	5.83	7.50	7.51

WATER YEAR 1989

HIGHEST 2.99 JUN 26, 1989

LOWEST 12.95 NOV 16, 17, 1988



383830077135502. Local number, 53T 2 SOW 029.

LOCATION.--Lat 38°38'30", long 77°13'55", Hydrologic Unit 02070010, at United States Army Woodbridge Research Facility, 1.5 mi southeast of Woodbridge. Owner: United States Army.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in., depth 162 ft, screened 130 to 156 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 5 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March 1970 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.60 ft below land-surface datum, Apr. 4, 1973; lowest measured, 10.35 ft below land-surface datum, Oct. 12, 1977.

PRINCE WILLIAM COUNTY--Continued

383830077135502. Local number, 53T 2 SOW 029--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 09	3.08	MAR 01	2.35	APR 26	2.50	JUN 15	2.61	AUG 01	2.74	SEP 20	2.78
WATER YEAR 1988		HIGHEST	2.35	MAR 01, 1988		LOWEST	3.08	NOV 09, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 15	3.04	FEB 28	2.82	APR 18	2.49	JUN 19	2.20	JUL 31	2.13	SEP 26	2.32
JAN 04	2.95										
WATER YEAR 1989		HIGHEST	2.13	JUL 31, 1989		LOWEST	3.04	NOV 15, 1988			

PULASKI COUNTY

370254080374401. Local number, 25E 1 SOW 009.

LOCATION.--Lat 37°02'54", long 80°37'44", Hydrologic Unit 05050001, 300 ft east of State Highway 100, 0.3 mi south of intersection of State Highways 700 and 682, and 1.1 mi south of Dublin. Owner: Commonwealth of Virginia.

AQUIFER.--Elbrook Formation of middle to late Cambrian age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in. depth 318 ft, cased to 56 ft, open hole 56 to 318 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 1,880 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, at land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--October 1969 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.15 ft below land-surface datum, Apr. 30, 1975; lowest measured, 27.25 ft below land-surface datum, Dec. 13, 1976.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	24.84	MAR 02	23.80	APR 27	23.30	JUN 06	23.09	AUG 03	22.66	SEP 27	23.40
JAN 06	23.47										
WATER YEAR 1988		HIGHEST	22.66	AUG 03, 1988		LOWEST	24.84	NOV 10, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 22	23.05	MAR 06	23.90	APR 18	22.80	JUN 13	23.02	AUG 01	22.65	SEP 26	22.10
JAN 09	22.80										
WATER YEAR 1989		HIGHEST	22.10	SEP 26, 1989		LOWEST	23.90	MAR 06, 1989			

370516080411501. Local number, 25E 2 SOW 059.

LOCATION.--Lat 37°05'16", long 80°41'15", Hydrologic Unit 05050001, 400 ft east of State Highway 100, 0.5 mi south of Dublin. Owner: Town of Dublin.

AQUIFER.--Conococheague Formation of late Cambrian age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 4 in., depth 370 ft, length of casing unknown.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 2,170 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, at land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 60.00 ft below land-surface datum, Mar. 18, 1973; lowest measured, 82.50 ft below land-surface datum, Oct. 5, 1982.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 22	78.55	MAR 06	78.01	APR 18	78.05	JUN 13	75.10	AUG 01	77.06	SEP 26	72.52
JAN 09	78.50										
WATER YEAR 1989		HIGHEST	72.52	SEP 26, 1989		LOWEST	78.55	NOV 22, 1988			

GROUND-WATER LEVELS

CITY OF ROANOKE

371653079552101. Local number, 31G 1 SOW 008.

LOCATION.--Lat 37°16'53", long 79°55'21", Hydrologic Unit 03010101, 700 ft south of intersection of 10th Street and Orange Avenue in Roanoke. Owner: Nelson-Roanoke Corporation.

AQUIFER.--Rome Formation of Cambrian age. Prior to 1974, reported as Elbrook Formation.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in., depth 48 ft, length of casing unknown.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 930 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.9 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--August 1966 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.36 ft below land-surface datum, Feb. 13, 1986; lowest measured, 23.15 ft below land-surface datum, May 23, 1977.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 21	18.96	MAR 06	18.71	APR 17	19.15	JUN 12	18.04	JUL 31	18.04	SEP 25	17.96
JAN 09	18.26										

WATER YEAR 1989 HIGHEST 17.96 SEP 25, 1989 LOWEST 19.15 APR 17, 1989

ROCKBRIDGE COUNTY

373758079271601. Local number, 35K 1 SOW 063.

LOCATION.--Lat 37°37'58", long 79°27'16", Hydrologic Unit 02080202, 0.35 mi northwest of intersection of State Highways 684 and 130 in Glasgow. Owner: Town of Glasgow.

AQUIFER.--Rome Formation of Cambrian age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in., depth 695 ft, cased to 101 ft, open hole from 101 to 695 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 745 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

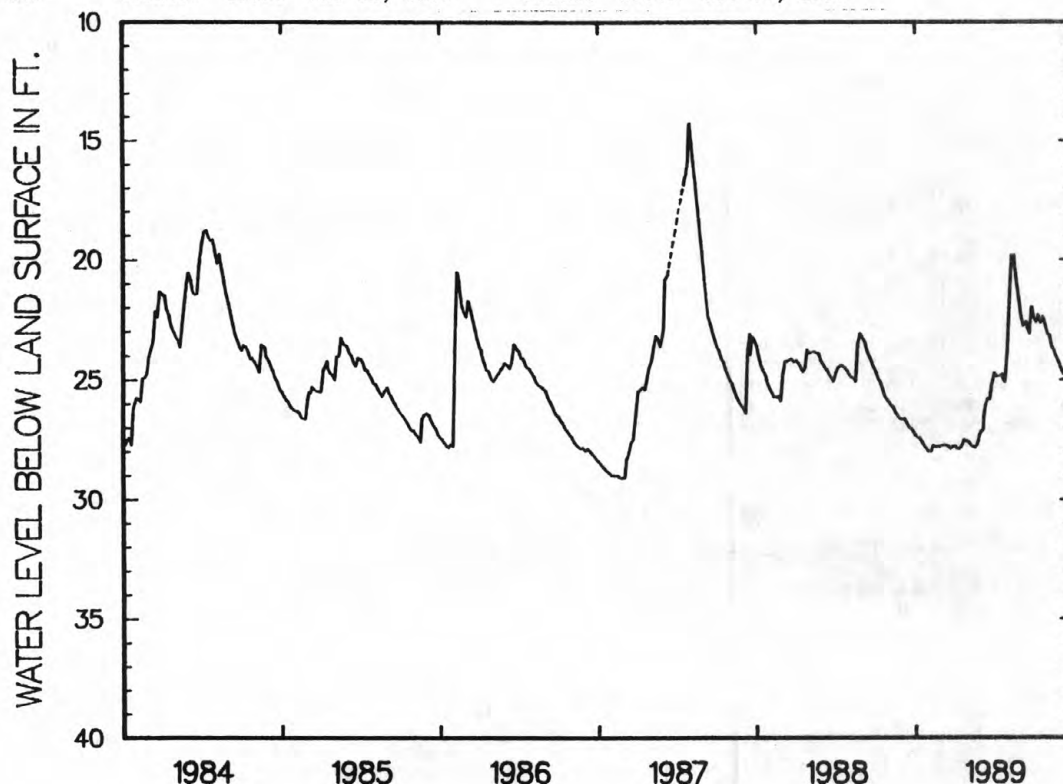
PERIOD OF RECORD.--June 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 14.27 ft below land-surface datum, Apr. 29, 1987; lowest recorded, 29.13 ft below land-surface datum, Dec. 13, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	27.40	28.00	27.73	27.88	27.75	27.08	24.88	21.80	22.81	22.65	23.18	24.75
10	27.46	27.75	27.75	27.90	27.80	26.10	24.85	19.82	22.62	22.31	23.63	24.82
15	27.60	27.81	27.79	27.76	27.85	25.80	24.82	19.86	22.88	22.68	23.80	25.10
20	27.75	27.81	27.89	27.51	27.68	25.83	24.99	20.75	23.11	22.40	24.05	24.10
25	27.86	27.80	27.80	27.55	27.30	25.20	25.12	21.49	22.00	22.69	24.24	23.76
EDM	28.00	27.75	27.78	27.60	27.15	24.75	23.84	22.34	22.45	23.10	24.51	23.27

WATER YEAR 1989 HIGHEST 19.50 MAY 12, 1989 LOWEST 28.02 NOV 04, 1988



GROUND-WATER LEVELS

485

ROCKINGHAM COUNTY

382150078424001. Local number, 41Q 1.

LOCATION.--Lat 38°21'50", long 78°42'40", Hydrologic Unit 02070005, at Virginia Department of Transportation garage, 1.3 mi southeast of McGaheysville. Owner: U.S. Geological Survey.

AQUIFER.--Conococheague Formation of late Cambrian age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 6.25 in., depth 310 ft, cased to 131 ft, open hole 131 to 310 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 1,105 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top edge of recorder shelf, 3.5 ft above land-surface datum.

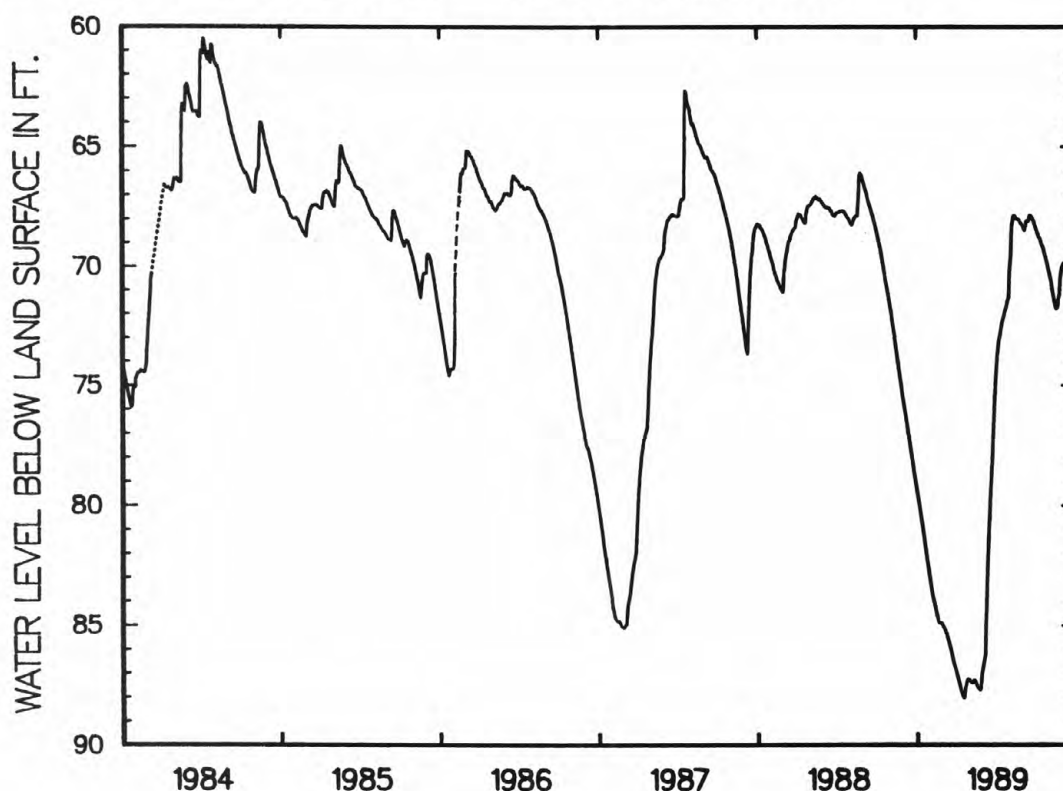
PERIOD OF RECORD.--August 1970 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 60.38 ft below land-surface datum, Dec. 26, 1972; lowest recorded, 88.08 ft below land-surface datum, Jan. 14, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	80.03	83.81	85.32	87.54	87.36	86.31	73.73	69.71	68.46	68.58	70.61	69.84
10	80.60	84.20	85.63	87.86	87.35	83.73	72.97	68.06	68.11	68.80	71.19	69.84
15	81.23	84.62	85.98	88.07	87.59	80.96	72.44	67.91	68.12	69.08	71.67	70.00
20	81.88	84.91	86.38	87.45	87.70	79.02	72.08	67.99	67.86	69.32	71.70	69.92
25	82.51	84.92	86.76	87.24	87.19	77.20	71.73	68.07	68.04	69.73	71.17	69.39
EOM	83.24	85.10	87.15	87.40	86.79	74.93	71.34	68.26	68.32	70.19	70.01	68.84

WATER YEAR 1988 HIGHEST 67.83 JUN 19, 1989 LOWEST 88.08 JAN 14, 1989



SOUTHAMPTON COUNTY

364109077230701. Local number, 51B 3.

LOCATION.--Lat 36°41'09", long 77°23'07", Hydrologic Unit 03010201, 150 ft west of the intersection of State Highway 615 and U.S. Highway 58, 0.5 mi south of Adams Grove. Owner: U.S. Geological Survey.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 253 ft, screened 165 to 175 ft, open hole 175 to 253 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 126 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 3.2 ft above land-surface datum.

PERIOD OF RECORD.--October 1974 to current year. Unpublished records available prior to July 1975 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 54.21 ft below land-surface datum, Apr. 30, 1978; lowest recorded, 60.03 ft below land-surface datum, Oct. 24, 25, 1981.

GROUND-WATER LEVELS

SOUTHAMPTON COUNTY--Continued

364109077230701. Local number, 51B 3--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	58.67	58.23	57.86	57.72	57.61	56.64	55.93	55.37	56.27	56.23	56.63	56.86
10	58.74	58.13	57.80	57.72	57.52	56.39	55.64	55.27	---	56.48	56.85	57.03
15	58.82	58.07	57.79	57.59	57.46	56.34	55.67	55.40	---	56.43	56.76	57.26
20	58.73	58.11	57.86	57.51	57.33	56.16	55.51	55.68	---	56.09	56.51	57.34
25	58.52	58.11	57.89	57.50	56.94	56.08	55.64	55.77	56.10	56.31	56.50	57.43
EOM	58.66	57.94	57.83	57.50	56.84	55.99	55.65	56.01	56.04	56.49	56.72	57.23

WATER YEAR 1989 HIGHEST 55.26 MAY 10, 11, 1989 LOWEST 58.83 OCT 14, 1988

363410077150801. Local number, 52A 1.

LOCATION.--Lat 36°34'10", long 77°15'08", Hydrologic Unit 03010204, along Seaboard Coastline railroad, 0.15 mi northwest of intersection of State Highways 195 and 701 in Branchville. Owner: L. W. Grizzard.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 217 ft, screened 204 to 217 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, bimonthly measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 44 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.8 ft above land-surface datum.

PERIOD OF RECORD.--September 1970 to December 1975, January 1978 to current year. Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 32.85 ft below land-surface datum, Sept. 9, 1970; lowest measured, 49.97 ft below land-surface datum; Sept. 21, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 12	49.90	MAR 16	49.37	JUN 22	49.37	SEP 21	49.97

WATER YEAR 1989 HIGHEST 49.37 MAR 16, JUN 22, 1989 LOWEST 49.97 SEP 21, 1989

363916077201001. Local number, 52B 8 SOW 178A.

LOCATION.--Lat 36°39'16", long 77°20'10", Hydrologic Unit 03010204, 0.25 mi northeast of State Highway 661, 0.6 mi south of the intersection of State Highways 652 and 661, and 4.5 mi southeast of Drewryville. Owner: Virginia Water Control Board.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 316 ft, screened 285 to 295 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Oct. 1, 1988, annual measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 120 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.6 ft above land-surface datum.

PERIOD OF RECORD.--March 1988 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 69.32 ft below land-surface datum, Mar. 7, 1988; lowest measured, 70.15 ft below land-surface datum, Oct. 14, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, MARCH TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 07	69.32

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	70.15	DEC 14	70.00	MAR 16	69.57	JUN 28	69.50	SEP 21	69.79

WATER YEAR 1989 HIGHEST 69.50 JUN 28, 1989 LOWEST 70.15 OCT 14, 1988

GROUND-WATER LEVELS

487

SOUTHAMPTON COUNTY--Continued

363916077201002. Local number, 52B 9 SOW 178B.

LOCATION.--Lat 36°39'16", long 77°20'10", Hydrologic Unit 03010204, 0.25 mi northeast of State Highway 661, 0.6 mi south of intersection of State Highways 652 and 661, and 4.5 mi southeast of Drewryville. Owner: Virginia Water Control Board.

AQUIFER.--Sand of lower Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 329 ft, screened 298 to 308 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to October 1987, digital recorder--60-minute punch; October 1987 to September 1988, annual measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 120 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

PERIOD OF RECORD.--December 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 68.87 ft below land-surface datum, Mar. 7, 1988; lowest recorded, 70.44 ft below land-surface datum, Dec. 10-12, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	69.52	DEC 14	69.50	MAR 16	69.23	JUN 28	69.09	SEP 21	69.30
WATER YEAR 1989		HIGHEST	69.09	JUN 28, 1989	LOWEST	69.52	OCT 14, 1988		

363916077201003. Local number, 52B 10, SOW 178C.

LOCATION.--Lat 36°39'16", long 77°20'10", Hydrologic Unit 03010204, 0.25 mi northeast of State Highway 661, 0.6 mi south of intersection of State Highways 652 and 661, and 4.5 mi southeast of Drewryville. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 233 ft, screened 218 to 228 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to October 1987, digital recorder--60-minute punch; October 1987 to September 1988, annual measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 120 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.9 ft above land-surface datum.

PERIOD OF RECORD.--December 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 69.75 ft below land-surface datum, Apr. 16, 1987; lowest recorded, 72.97 ft below land-surface datum, Oct. 1, 24, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	72.61	DEC 14	72.45	MAR 16	71.29	JUN 28	70.29	SEP 21	71.17
WATER YEAR 1989		HIGHEST	70.29	JUN 28, 1989	LOWEST	72.61	OCT 14, 1988		

363916077201004. Local number, 52B 11 SOW 178D.

LOCATION.--Lat 36°39'16", long 77°20'10", Hydrologic Unit 03010204, 0.25 mi northeast of State Highway 661, 0.6 mi south of intersection of State Highways 652 and 661, and 4.5 mi southeast of Drewryville. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 190 ft, screened 160 to 170 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to October 1987, digital recorder--60-minute punch; October 1987 to September 1988, annual measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 120 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.1 ft above land-surface datum.

PERIOD OF RECORD.--December 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 69.81 ft below land-surface datum, Apr. 16, 1987; lowest recorded, 73.03 ft below land-surface datum, Oct. 25, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	72.62	DEC 14	72.46	MAR 16	71.28	JUN 28	70.31	SEP 21	71.17
WATER YEAR 1989		HIGHEST	70.31	JUN 28, 1989	LOWEST	72.62	OCT 14, 1988		

GROUND-WATER LEVELS

SOUTHAMPTON COUNTY--Continued

363916077201005. Local number, 52B 12 SOW 178E.

LOCATION.--Lat 36°39'16", long 77°20'10", Hydrologic Unit 03010204, 0.25 mi northeast of State Highway 661, 0.6 mi south of intersection of State Highways 652 and 661, and 4.5 mi southeast of Drewryville. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 135 ft, screened 120 to 130 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to October 1987, digital recorder--60-minute punch; October 1987 to September 1988, annual measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 120 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.2 ft above land-surface datum.

PERIOD OF RECORD.--December 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 68.75 ft below land-surface datum, Apr. 16, 1987; lowest recorded, 71.90 ft below land-surface datum, Oct. 23, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	71.45	DEC 14	71.32	MAR 16	70.13	JUN 28	69.16	SEP 21	70.00

WATER YEAR 1989 HIGHEST 69.16 JUN 28, 1989 LOWEST 71.45 OCT 14, 1988

363916077201006. Local number, 52B 13 SOW 178F.

LOCATION.--Lat 36°39'16", long 77°20'10", Hydrologic Unit 03010204, 0.25 mi northeast of State Highway 661, 0.6 mi south of intersection of State Highways 652 and 661, and 4.5 mi southeast of Drewryville. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Miocene-Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 65 ft, screened 40 to 50 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to October 1987, digital recorder--60-minute punch; October 1987 to September 1988, annual measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 120 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.9 ft above land-surface datum.

PERIOD OF RECORD.--December 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 37.90 ft below land-surface datum, Apr. 29, 1987; lowest recorded, 43.77 ft below land-surface datum, Oct. 6-9, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	40.25	DEC 14	38.49	MAR 16	39.04	JUN 28	38.61	SEP 21	38.89

WATER YEAR 1989 HIGHEST 38.49 DEC 14, 1988 LOWEST 40.25 OCT 14, 1988

363722077014601. Local number, 54A 1.

LOCATION.--Lat 36°37'22", long 77°01'46", Hydrologic Unit 03010201, 100 ft west of State Highway 681, 0.5 mi north of intersection of State Highways 681 and 672, and 2.4 mi north of Sunbeam. Owner: William Britt.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 254 ft, screened 244 to 254 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, semiannual measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 35 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.03 ft above land-surface datum.

PERIOD OF RECORD.--August 1970 to December 1975, January 1978 to current year. Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 113.4 ft below land-surface datum, Aug. 17, 1970; lowest measured, 148.32 ft below land-surface datum, Dec. 12, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 12	148.32	MAR 16	147.70	JUN 22	148.18	SEP 21	147.58

WATER YEAR 1989 HIGHEST 147.58 SEP 21, 1989 LOWEST 148.32 DEC 12, 1988

GROUND-WATER LEVELS

489

SOUTHAMPTON COUNTY--Continued

363915077001101. Local number, 54B 1 SOW 046.

LOCATION.--Lat 36°39'15", long 77°00'11", Hydrologic Unit 03010201, at the Hercules plant on State Highway 650, 0.1 mi north of intersection of State Highways 671 and 650, 0.3 mi northwest of Delaware, and 1.7 mi northeast of Handsom. Owner: Hercules Incorporated.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 20 in. to 200 ft, diameter 10 in. from 200 to 610 ft, depth 610 ft, screened 358 to 368 ft, 390 to 410 ft, 510 to 520 ft, 524 to 534 ft, 590 to 600 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 19.4 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board. Water level affected by pumping of nearby well. PERIOD OF RECORD.--December 1971 to August 1974, November 1975, January 1978 to December 1988 (discontinued).

Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 133.37 ft below land-surface datum, Dec. 1, 1971; lowest measured, 286.00 ft below land-surface datum, May 6, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, OCTOBER TO DECEMBER 1988

	DATE	WATER LEVEL	DATE	WATER LEVEL
	OCT 11	176.10	DEC 12	172.49
PERIOD OCTOBER TO DECEMBER 1988	HIGHEST	172.49	DEC 12, 1988	LOWEST 176.10 OCT 11, 1988

363942077002701. Local number, 54B 12.

LOCATION.--Lat 36°39'42", long 77°00'27", Hydrologic Unit 03010201, off State Highway 650, 0.9 mi north of town of Delaware, and 1.8 mi northeast of Handsom. Owner: L. W. Overby.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 236 ft, screened 226 to 236 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, semiannual measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 23 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.8 ft above land-surface datum.

PERIOD OF RECORD.--September 1970 to December 1975, January 1978 to current year. Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 122.17 ft below land-surface datum, Dec. 29, 1970; lowest measured, 158.17 ft below land-surface datum, June 16, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
	DEC 12	157.68	MAR 17	156.82	JUN 16	158.17	SEP 20	155.80
WATER YEAR 1989	HIGHEST	155.80	SEP 20, 1989	LOWEST	158.17	JUN 16, 1989		

364121077013701. Local number, 54B 24 SOW 034.

LOCATION.--Lat 36°41'21", long 77°01'37", Hydrologic Unit 03010201, off U.S. Highway 58, 1.7 mi southeast of Courtland. Owner: Clarence Pittman.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in. to 71 ft, diameter 2 in. from 71 to 224 ft, depth 224 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, bimonthly measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 29 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.2 ft above land-surface datum.

PERIOD OF RECORD.--September 1970 to August 1974, December 1975, January 1978 to current year. Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 111.82 ft below land-surface datum, Dec. 29, 1970; lowest measured, 139.97 ft below land-surface datum, June 16, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
	DEC 12	139.68	MAR 17	138.88	JUN 16	139.97	SEP 20	138.60
WATER YEAR 1989	HIGHEST	138.60	SEP 20, 1989	LOWEST	139.97	JUN 16, 1989		

GROUND-WATER LEVELS

SOUTHAMPTON COUNTY--Continued

364706077072301. Local number, 54C 1.

LOCATION.--Lat 36°47'06", long 77°07'23", Hydrologic Unit 03010201, 0.25 mi northwest of intersection of State Highways 35 and 713 in Sebrell. Owner: Norfolk and Western Railway.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 10 in., depth 344 ft, screen depth unknown.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, bimonthly measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 58.4 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, at land-surface datum.

PERIOD OF RECORD.--1907, July 1938, April 1940 to December 1946, October 1948 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.00 ft below land-surface datum, 1907; lowest measured, 101.85 ft below land-surface datum, Dec. 12, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 06	101.55	DEC 12	101.85	MAR 17	101.37	JUN 16	101.54	SEP 20	101.84

WATER YEAR 1989 HIGHEST 101.37 MAR 17, 1989 LOWEST 101.85 DEC 12, 1988

363632076580101. Local number, 55A 3 SOW 086.

LOCATION.--Lat 36°36'32", long 76°58'01", Hydrologic Unit 03010201, 0.1 mi southeast of intersection of State Highways 689 and 687, 4.0 mi southwest of Franklin. Owner: Virginia Water Control Board.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 4 in., depth 745 ft, screened 714 to 724 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 18 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum prior to Jan. 11, 1988; 1.3 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board prior to Mar. 1, 1989; U.S. Geological Survey thereafter.

PERIOD OF RECORD.--March 1977, October 1978 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 125.00 ft below land-surface datum, Mar. 18, 1977; lowest measured, 152.26 ft below land-surface datum, Sept. 18, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	151.10	DEC 12	151.39	JAN 18	151.50	MAR 16	151.35	JUN 22	152.10	SEP 18	152.26
NOV 21	151.30										

WATER YEAR 1989 HIGHEST 151.10 OCT 11, 1988 LOWEST 152.26 SEP 18, 1989

364321076595401. Local number, 55B 51.

LOCATION.--Lat 36°43'22", long 76°59'55", Hydrologic Unit 03010201, off State Highway 611, 2.2 mi northwest of Hunterdale. Owner: Owen Wade.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 4 in., depth 332 ft, screened 322 to 327 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, semiannual measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 66 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of sanitary seal, 1.0 ft above land-surface datum.

PERIOD OF RECORD.--August to December 1970, November 1972 to December 1975, January 1978 to current year. Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 154.15 ft below land-surface datum, Dec. 29, 1970; lowest measured, 181.88 ft below land-surface datum, June 16, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 12	180.60	MAR 17	180.33	JUN 16	181.88	SEP 20	180.08

WATER YEAR 1989 HIGHEST 180.08 SEP 20, 1989 LOWEST 181.88 JUN 16, 1989

GROUND-WATER LEVELS

491

SOUTHAMPTON COUNTY--Continued

364628076552701. Local number, 55C 3.

LOCATION.--Lat 36°46'28", long 76°55'27", Hydrologic Unit 03010202, off State Highway 635 at Black Creek Baptist Church, 0.2 mi north of Black Creek, and 1.5 mi west of Burdette. Owner: Black Creek Baptist Church.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 312 ft, screened 300 to 312 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, semiannual measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 57 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of coupling breather pipe, 1.6 ft above land-surface datum.

PERIOD OF RECORD.--August 1970 to December 1975, January 1978 to current year. Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 132.80 ft below land-surface datum, Dec. 29, 1970; lowest measured, 164.06 ft below land-surface datum, June 16, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 13	162.18	MAR 17	161.98	JUN 16	164.06	SEP 20	162.26

WATER YEAR 1989 HIGHEST 161.98 MAR 17, 1989 LOWEST 164.06 JUN 16, 1989

365120076585101. Local number, 55C 10.

LOCATION.--Lat 36°51'20", long 76°58'51", Hydrologic Unit 03010202, 100 ft west of State Highway 616, 0.3 mi south of Berlin. Owner: R. L. Hurrup.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 326 ft, screened 316 to 326 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, semiannual measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 65 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

PERIOD OF RECORD.--August 1970 to December 1975, January 1978 to current year. Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 94.62 ft below land-surface datum, Aug. 21, 1970; lowest measured, 123.77 ft below land-surface datum, June 16, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 14	123.38	MAR 17	123.13	JUN 16	123.77	SEP 20	123.76

WATER YEAR 1989 HIGHEST 123.13 MAR 17, 1989 LOWEST 123.77 JUN 16, 1989

365415076535201. Local number, 55D 5.

LOCATION.--Lat 36°54'15", long 76°53'20", Hydrologic Unit 03010202, off State Highway 616, 0.25 mi southwest of intersection of State Highway 616 and U.S. Highway 460 in Ivor. Owner: Town of Ivor.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 8 in., depth 450 ft, screened 384 to 394 ft, 425 to 440 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, semiannual measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 90 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of water-level access line, 1.75 ft above land-surface datum.

PERIOD OF RECORD.--October 1970 to December 1975, January 1978 to current year. Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 120.47 ft below land-surface datum, Nov. 2, 1970; lowest measured, 155.05 ft below land-surface datum, Mar. 16, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 14	151.88	MAR 21	151.72	JUN 16	152.12	SEP 20	152.50

WATER YEAR 1989 HIGHEST 151.72 MAR 21, 1989 LOWEST 152.50 SEP 20, 1989

GROUND-WATER LEVELS

CITY OF SUFFOLK

363511076492901. Local number, 56A 1 SOW 047.

LOCATION.--Lat 36°35'11", long 76°49'29", Hydrologic Unit 03010203, at intersection of State Highways 666 and 667, 0.5 mi southeast of Cleopus. Owner: Virginia Water Control Board.

AQUIFER.--Sands of early and middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 1,149.5 ft, screened 401 to 406 ft, 495 to 500 ft, 628 to 633 ft, 727 to 732 ft, 989 to 999 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1989, bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 37 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board prior to Mar. 1, 1989; U.S. Geological Survey thereafter.

PERIOD OF RECORD.--June 1971 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 101.00 ft below land-surface datum, Nov. 15, 1973; lowest measured, 130.10 ft below land-surface datum, June 30, Aug. 10, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	129.75	DEC 13	129.50	JAN 18	129.70	MAR 20	129.83	JUN 19	129.97	SEP 19	129.29
NOV 21	129.50										

WATER YEAR 1989 HIGHEST 129.29 SEP 19, 1989 LOWEST 129.97 JUN 19, 1989

363625076522601. Local number, 56A 9 SOW 076A.

LOCATION.--Lat 36°36'25", long 76°52'26", Hydrologic Unit 03010203, 700 ft west of State Highway 615, 8.1 mi south of Holland. Owner: Virginia Water Control Board.

AQUIFER.--Sands of early, middle, and late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 519 ft, screened 452 to 457 ft, 500 to 505 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1989, bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 80 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.5 ft above land-surface datum prior to Jan. 12, 1988; 2.0 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board prior to Mar. 1, 1989; U.S. Geological Survey thereafter.

PERIOD OF RECORD.--July 1978 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 81.99 ft below land-surface datum, Jan. 8, 1979; lowest measured, 91.74 ft below land-surface datum, Mar. 20, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	91.35	NOV 21	91.20	JAN 18	91.50	MAR 20	91.74	JUN 19	91.65	SEP 20	91.57

WATER YEAR 1989 HIGHEST 91.20 NOV 21, 1988 LOWEST 91.74 MAR 20, 1989

363345076470201. Local number, 56A 10 SOW 088A.

LOCATION.--Lat 36°33'45", long 76°47'02", Hydrologic Unit 03010203, 0.1 mi north of intersection of State Highways 668 and 669, 1.9 mi west of Somerton. Owner: Virginia Water Control Board.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 1,060 ft, screened 1,050 to 1,060 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1989, semiannual measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 45 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum prior to Jan. 12, 1988; 1.3 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board prior to Mar. 1, 1989; U.S. Geological Survey thereafter.

PERIOD OF RECORD.--June 1977 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 104.70 ft below land-surface datum, June 30, 1980; lowest measured, 124.40 ft below land-surface datum, June 19, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	123.90	NOV 21	123.90	DEC 13	123.88	MAR 20	123.95	JUN 19	124.40	SEP 19	124.34

WATER YEAR 1989 HIGHEST 123.88 DEC 13, 1988 LOWEST 124.40 JUN 19, 1989

CITY OF SUFFOLK--Continued

363653076455401. Local number, 56A 11 SOW 089.

LOCATION.--Lat 36°36'53", long 76°45'54", Hydrologic Unit 03010203, off State Highway 616, 1.1 mi east of Holy Neck Church, and 3.4 mi north of Somerton. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 861 ft, screened 830 to 840 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1989, bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 79 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum prior to Nov. 18, 1987; 0.6 ft prior to Jan. 12, 1988; 1.3 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board prior to Mar. 1, 1989; U.S. Geological Survey thereafter.

PERIOD OF RECORD.--August 1977 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 154.00 ft below land-surface datum, Aug. 9, 1977; lowest measured, 177.50 ft below land-surface datum, Aug. 10, Oct. 12, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	177.50	DEC 13	177.21	JAN 18	177.30	MAR 21	177.26	JUN 20	177.49	SEP 19	176.94
NOV 21	177.30										

WATER YEAR 1989 HIGHEST 176.94 SEP 19, 1989 LOWEST 177.50 OCT 12, 1988

363345076470202. Local number, 56A 12 SOW 088B.

LOCATION.--Lat 36°33'45", long 76°47'02", Hydrologic Unit 03010203, 0.1 mi north of intersection of State Highways 668 and 669, 1.9 mi west of Somerton. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 580 ft, screened 570 to 580 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1989, bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 45 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum prior to Jan. 12, 1988; 1.3 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board prior to Mar. 1, 1989; U.S. Geological Survey thereafter.

PERIOD OF RECORD.--June 1977 to November 1982, June 1985 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 103.00 ft below land-surface datum, June 30, 1977; lowest measured, 132.82 ft below land-surface datum, June 19, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	132.50	DEC 13	132.56	JAN 18	132.60	MAR 20	132.73	JUN 19	132.82	SEP 19	132.51
NOV 21	132.40										

WATER YEAR 1989 HIGHEST 132.40 NOV 21, 1988 LOWEST 132.82 JUN 19, 1989

363625076522602. Local number, 56A 13 SOW 076B.

LOCATION.--Lat 36°36'25", long 76°52'26", Hydrologic Unit 03010203, 700 ft west of State Highway 615, 0.5 mi southwest of Olive Branch Church, and 8.1 mi south of Holland. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 807 ft, screened 797 to 802 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1989, bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 75 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum prior to Jan. 12, 1988; 0.8 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board prior to Mar. 1, 1989; U.S. Geological Survey thereafter.

PERIOD OF RECORD.--May 1979 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 204.34 ft below land-surface datum, Oct. 26, 1982; lowest measured, 219.46 ft below land-surface datum, Sept. 21, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	218.80	DEC 13	218.50	JAN 18	217.30	MAR 20	218.79	JUN 19	216.83	SEP 20	217.36
NOV 21	217.10										

WATER YEAR 1989 HIGHEST 216.83 JUN 19, 1989 LOWEST 218.80 OCT 11, 1988

GROUND-WATER LEVELS

CITY OF SUFFOLK--Continued

363625076522603. Local number, 56A 14 SOW 076C.

LOCATION.--Lat 36°36'25", long 76°52'26", Hydrologic Unit 03010203, 700 ft west of State Highway 615, 0.5 mi southwest of Olive Branch Church, and 8.1 mi south of Holland. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 735 ft, screened 730 to 735 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1989, bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 75 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum prior to Jan. 12, 1988; 1.2 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board prior to Mar. 1, 1989; U.S. Geological Survey thereafter.

PERIOD OF RECORD.--March 1979 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 205.62 ft below land-surface datum, Mar. 7, 1979; lowest measured, 213.58 ft below land-surface datum, Sept. 20, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	211.95	DEC 13	212.27	JAN 18	212.50	MAR 20	212.79	JUN 19	213.12	SEP 20	213.58
NOV 21	212.30										

WATER YEAR 1989 HIGHEST 211.95 OCT 11, 1988 LOWEST 213.58 SEP 20, 1989

363611076400901. Local number, 57A 6 SOW 085.

LOCATION.--Lat 36°36'11", long 76°40'09", Hydrologic Unit 03010203, at Virginia Department of Transportation shop off U.S. Highway 13, 0.3 mi northeast of Whaleyville. Owner: Virginia Water Control Board.

AQUIFER.--Sands of early and middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 1,095 ft, screened 660 to 665 ft, 833 to 838 ft, 988 to 993 ft, 1,069 to 1,074 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1989, bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 73 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.25 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board prior to Mar. 1, 1989; U.S. Geological Survey thereafter.

PERIOD OF RECORD.--February 1978 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 137.54 ft below land-surface datum, Mar. 22, 1978; lowest measured, 151.62 ft below land-surface datum, Mar. 8, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	151.47	DEC 13	151.35	JAN 18	150.70	MAR 21	151.16	JUN 19	150.73	SEP 18	150.85
NOV 21	151.25										

WATER YEAR 1989 HIGHEST 150.70 JAN 18, 1989 LOWEST 151.47 OCT 12, 1988

364013076434601. Local number, 57B 1.

LOCATION.--Lat 36°40'13", long 76°43'46", Hydrologic Unit 03010202, at the Virginia Swine Evaluation Station, 0.2 mi east of State Highway 610, and 2.3 mi southwest of Lummis. Owner: Virginia Cooperative Extension Service.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 496 ft, screened 472 to 496 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 65 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.7 ft above land-surface datum.

PERIOD OF RECORD.--August 1970 to December 1975, January 1978 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 127.09 ft below land-surface datum, Aug. 26, 1970; lowest measured, 162.34 ft below land-surface datum, Mar. 8, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 13	161.57	MAR 21	161.69	JUN 20	161.55	SEP 20	161.37

WATER YEAR 1989 HIGHEST 161.37 SEP 20, 1989 LOWEST 161.69 MAR 21, 1989

CITY OF SUFFOLK--Continued

363834076382301. Local number, 57B 8.

LOCATION.--Lat 36°38'27", long 76°38'05", Hydrologic Unit 03010205, 0.3 mi southwest of State Highway 664, 0.8 mi southeast of U.S. Highway 13, and 1.1 mi south of Nurneysville. Owner: Soren F. Andresen.

AQUIFER.--Sand of Miocene-Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing water well, diameter 2 in., depth 65 ft, screened 50 to 65 ft.

INSTRUMENTATION.--Quarterly measurement with a manometer by USGS personnel. Prior to Dec. 1, 1988, bimonthly measurement with a manometer.

DATUM.--Elevation of land-surface datum is 45 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: At land-surface datum.

PERIOD OF RECORD.--March 1975, November 1977 to current year. Unpublished records available March 1975 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.58 ft above land-surface datum, Mar. 20, 1989; lowest measured, at land-surface datum, Sept. 26, 1980.

WATER LEVEL, IN FEET ABOVE LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	2.73	DEC 15	4.10	MAR 20	6.58	JUN 19	4.98	SEP 18	4.74

NOTE.--Flowing well, readings given are above land surface.

WATER YEAR 1989 HIGHEST 6.58 MAR 20, 1989 LOWEST 2.73 OCT 26, 1988

364703076383701. Local number, 57C 21 SOW 099A.

LOCATION.--Lat 36°47'03", long 76°38'37", Hydrologic Unit 02080208, 700 ft south of U.S. Highway 460, 0.5 mi west of Providence Church, and 1.0 mi west of Kings Fork. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Eocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 248 ft, screened 238 to 248 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 72 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum prior to Jan. 12, 1988; 1.1 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1983 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 46.32 ft below land-surface datum, Apr. 19, 1984; lowest measured, 49.30 ft below land-surface datum, Aug. 9, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	48.80	JAN 17	48.90	MAR 14	48.80	APR 24	48.80	JUN 13	49.00	AUG 09	49.30
NOV 22	48.80										

WATER YEAR 1989 HIGHEST 48.80 OCT 12, NOV 22, 1988, MAR 14, APR 24, 1989 LOWEST 49.30 AUG 09, 1989

364703076383702. Local number, 57C 22 SOW 099B.

LOCATION.--Lat 36°47'03", long 76°38'37", Hydrologic Unit 02080208, 700 ft south of U.S. Highway 460, 0.5 mi west of Providence Church, and 1.0 mi west of Kings Fork. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 694 ft, screened 684 to 694 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 72 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 1.7 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1980 to current year. Unpublished records available prior to August 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 128.24 ft below land-surface datum, Feb. 18, 1980; lowest recorded, 176.13 ft below land-surface datum, Jan. 13, 14, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	158.00	157.64	157.64	157.60	157.40	157.11	156.45	155.80	155.61	155.63	155.83	156.67
10	157.94	157.64	157.59	157.60	157.35	157.13	156.25	155.63	155.60	155.65	155.90	156.70
15	158.02	157.67	157.70	157.53	157.39	157.13	156.24	155.60	155.62	155.69	155.88	156.90
20	157.97	157.60	157.91	157.38	157.29	157.22	156.01	155.60	155.65	155.64	156.01	156.89
25	157.83	157.60	157.72	157.43	157.12	156.94	155.95	155.49	155.58	155.79	156.17	156.90
EOM	157.86	157.64	157.69	157.33	157.10	156.60	155.83	155.61	155.61	155.84	156.48	156.92

WATER YEAR 1989 HIGHEST 155.46 MAY 24, 1989 LOWEST 158.10 OCT 01, 1988

GROUND-WATER LEVELS

CITY OF SUFFOLK--Continued

364703076383703. Local number, 57C 23 SOW 099C.

LOCATION.--Lat 36°47'03", long 76°38'37", Hydrologic Unit 02080208, 700 ft south of U.S. Highway 460, 0.5 mi west of Providence Church, and 1.0 mi west of Kings Fork. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 478 ft, screened 468 to 478 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 72 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.6 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1981 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 147.67 ft below land-surface datum, Nov. 5, 1984; lowest measured, 179.38 ft below land-surface datum, Jan. 12, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	159.50	JAN 17	159.80	MAR 14	159.10	APR 24	157.30	JUN 13	156.90	AUG 09	157.30
WATER YEAR 1989		HIGHEST	156.90	JUN 13, 1989	LOWEST	159.80	JAN 17, 1989				

364703076383704. Local number, 57C 24 SOW 099D.

LOCATION.--Lat 36°47'03", long 76°38'37", Hydrologic Unit 02080208, 700 ft south of U.S. Highway 460, 0.5 mi west of Providence Church, and 1.0 mi west of Kings Fork. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 25 ft, screened 20 to 25 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 72 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.5 ft above land-surface datum prior to Mar. 25, 1987; 2.0 ft prior to Jan. 12, 1988; 1.3 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--September 1983 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.90 ft below land-surface datum, Mar. 14, 1989; lowest measured, 15.20 ft below land-surface datum, Nov. 18, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	9.63	JAN 17	7.10	MAR 14	2.90	APR 24	4.90	JUN 13	8.90	AUG 09	11.50
NOV 22	7.70										
WATER YEAR 1989		HIGHEST	2.90	MAR 14, 1989	LOWEST	11.50	AUG 09, 1989				

363704076334501. Local number, 58A 1 SOW 036.

LOCATION.--Lat 36°37'02", long 76°33'45", Hydrologic Unit 03010205, 200 ft west of State Highway 604, 1.9 mi east of Cypress Chapel. Owner: Union Camp Corporation.

AQUIFER.--Sand of Eocene age.

WELL CHARACTERISTICS.--Jettied unused water well, diameter 3 in., depth 420 ft, screened 410 to 420 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1989, bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 32 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.5 ft above land-surface datum prior to Jan. 12, 1988; 2.1 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board prior to Mar. 1, 1989; U.S. Geological Survey thereafter.

PERIOD OF RECORD.--January 1938, February 1960, September 1970 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.05 ft below land-surface datum, Jan. 1, 1938; lowest measured, 18.98 ft below land-surface datum, Sept. 18, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	18.60	DEC 15	18.75	JAN 18	18.70	MAR 20	18.53	JUN 19	18.84	SEP 18	18.98
NOV 21	18.80										
WATER YEAR 1989		HIGHEST	18.53	MAR 20, 1989	LOWEST	18.98	SEP 18, 1989				

GROUND-WATER LEVELS

497

CITY OF SUFFOLK--Continued

363408076350001. Local number, 58A 2 SOW 042.

LOCATION.--Lat 36°34'08", long 76°35'00", Hydrologic Unit 03010205, 200 ft southwest of intersection of State Highways 32 and 678, 1.3 mi north of North Carolina State line, and 3.4 mi south of Cypress Chapel. Owner: Virginia Water Control Board.

AQUIFER.--Sands of early, middle, and late Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 4 in., depth 1,920 ft, screened 481 to 486 ft, 730 to 735 ft, 947 to 952 ft, 1,115 to 1,120 ft, 1,222 to 1,227 ft, 1,427 to 1,432 ft, 1,537 to 1,542 ft, 1,874 to 1,879 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1989, bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 58 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board prior to Mar. 1, 1989; U.S. Geological Survey thereafter.

PERIOD OF RECORD.--December 1971 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 72.52 ft below land-surface datum, Dec. 1, 1971; lowest measured, 96.30 ft below land-surface datum, Jan. 18, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	94.80	DEC 15	95.50	JAN 18	96.30	MAR 20	94.41	JUN 19	93.99	SEP 18	93.86
NOV 21	94.80										
WATER YEAR 1989		HIGHEST	93.86	SEP 18, 1989	LOWEST	96.30	JAN 18, 1989				

363303076330201. Local number, 58A 75 SOW 170.

LOCATION.--Lat 36°33'03", long 76°33'02", Hydrologic Unit 03010205, 100 ft north of North Carolina State line, 0.4 mi east of Desert Road, and 5.0 mi southeast of Cypress Chapel. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 535 ft, screened 525 to 535 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1989, bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 40 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board prior to Mar. 1, 1989; U.S. Geological Survey thereafter.

PERIOD OF RECORD.--July 1985 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 25.52 ft below land-surface datum, July 11, 1985; lowest measured, 29.20 ft below land-surface datum, Sept. 18, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	28.20	NOV 21	28.20	JAN 18	28.10	MAR 20	28.63	JUN 19	28.87	SEP 18	29.20
WATER YEAR 1989		HIGHEST	28.10	JAN 18, 1989	LOWEST	29.20	SEP 18, 1989				

GROUND-WATER LEVELS

CITY OF SUFFOLK--Continued

363655076332002. Local number, 58A 77 SOW 180A.

LOCATION.--Lat 36°36'55", long 76°33'20", Hydrologic Unit 03010205, 0.3 mi north of Great Dismal Swamp Wildlife Refuge Headquarters on Desert Road, 2.0 mi east of Cypress Chapel. Owner: Virginia Water Control Board.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in. to 1,158 ft, diameter 3 in. from 1,136 to 1,209 ft, depth 1,209 ft, screened 1,199 to 1,209 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 34.02 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.5 ft above land-surface datum.

PERIOD OF RECORD.--February 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 96.83 ft (revised) below land-surface datum, Sept. 30, 1987; lowest recorded, 98.55 ft below land-surface datum, Oct. 14, 1988.

REVISIONS.--Water levels (lowest daily values) reported for the period February to September 1987 have been revised as shown in the following table. They supersede figures published in WDR VA-87-1.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, FEBRUARY TO SEPTEMBER 1987
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	---	---	---	---	97.73	97.41	97.39	97.40	97.38	97.35	97.25
10	---	---	---	---	97.81	97.64	97.44	97.42	97.52	97.39	97.25	97.09
15	---	---	---	---	97.84	97.59	97.51	97.46	97.44	97.35	97.33	96.92
20	---	---	---	---	97.78	97.50	97.39	97.48	97.46	97.42	97.22	96.91
25	---	---	---	---	97.74	97.52	97.38	97.51	97.40	97.44	97.27	96.94
EOM	---	---	---	---	97.76	97.44	97.37	97.50	97.45	97.41	97.21	96.92

PERIOD FEBRUARY TO SEPTEMBER 1987

HIGHEST 96.83 SEP 30, 1987

LOWEST 97.85 FEB 16, 1987

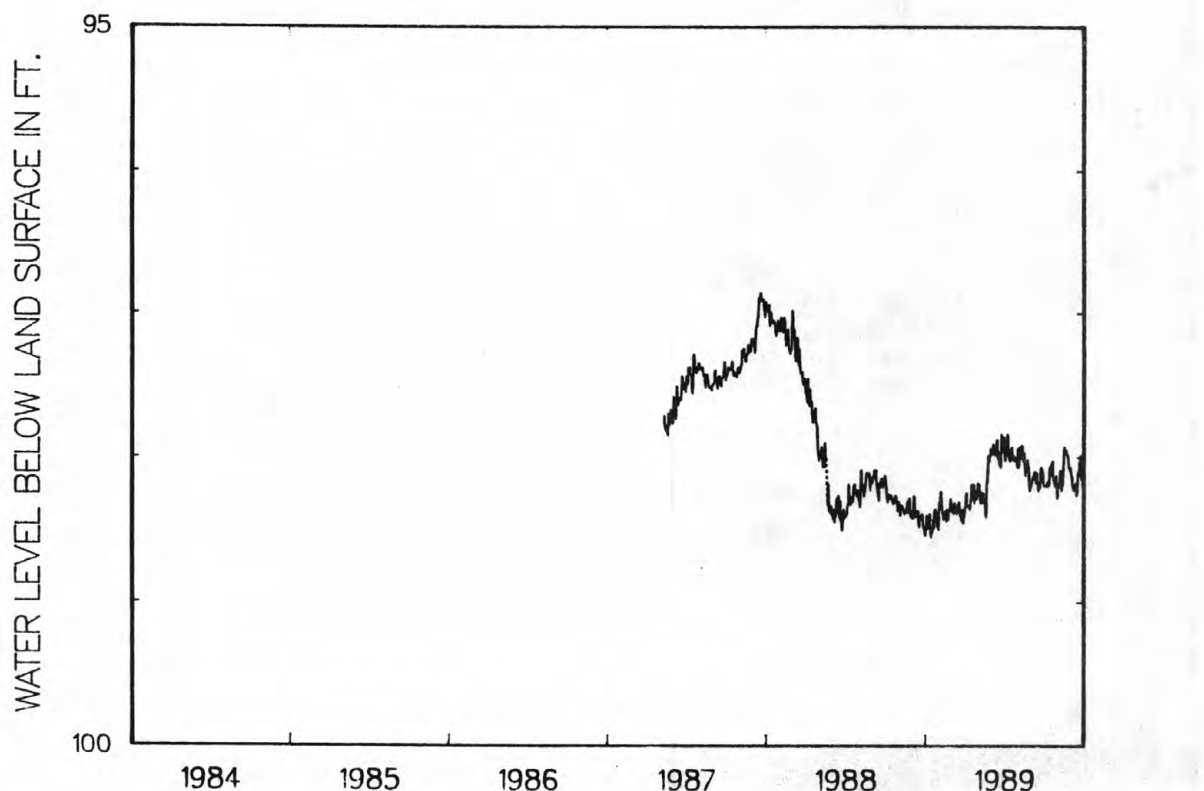
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	98.44	98.24	98.38	98.34	98.31	97.98	97.99	98.03	98.15	98.19	98.16	98.23
10	98.44	98.39	98.34	98.36	98.29	97.99	97.98	97.92	98.12	98.20	98.23	98.18
15	98.51	98.39	98.34	98.19	98.29	97.88	98.00	98.01	98.17	98.13	97.97	98.24
20	98.49	98.36	98.40	98.20	98.17	98.05	98.02	98.08	98.22	98.03	97.96	98.03
25	98.38	98.37	98.38	98.29	98.03	97.84	98.01	98.07	98.09	98.20	98.03	98.15
EOM	98.50	98.36	98.34	98.20	97.94	97.86	98.07	98.20	98.20	98.28	98.11	98.15

WATER YEAR 1989

HIGHEST 97.73 APR 07, 1989

LOWEST 98.55 OCT 14, 1988



GROUND-WATER LEVELS

499

CITY OF SUFFOLK--Continued

363655076332003. Local number, 58A 78 SOW 180B.

LOCATION.--Lat 36°36'55", long 76°33'20", Hydrologic Unit 03010205, 0.3 mi north of Great Dismal Swamp Wildlife Refuge Headquarters on Desert Road, 2.0 mi east of Cypress Chapel. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in. to 811 ft, diameter 2 in. from 766 to 850 ft, 860 to 880 ft, depth 880 ft, screened 850 to 860 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 34.02 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.5 ft above land-surface datum.

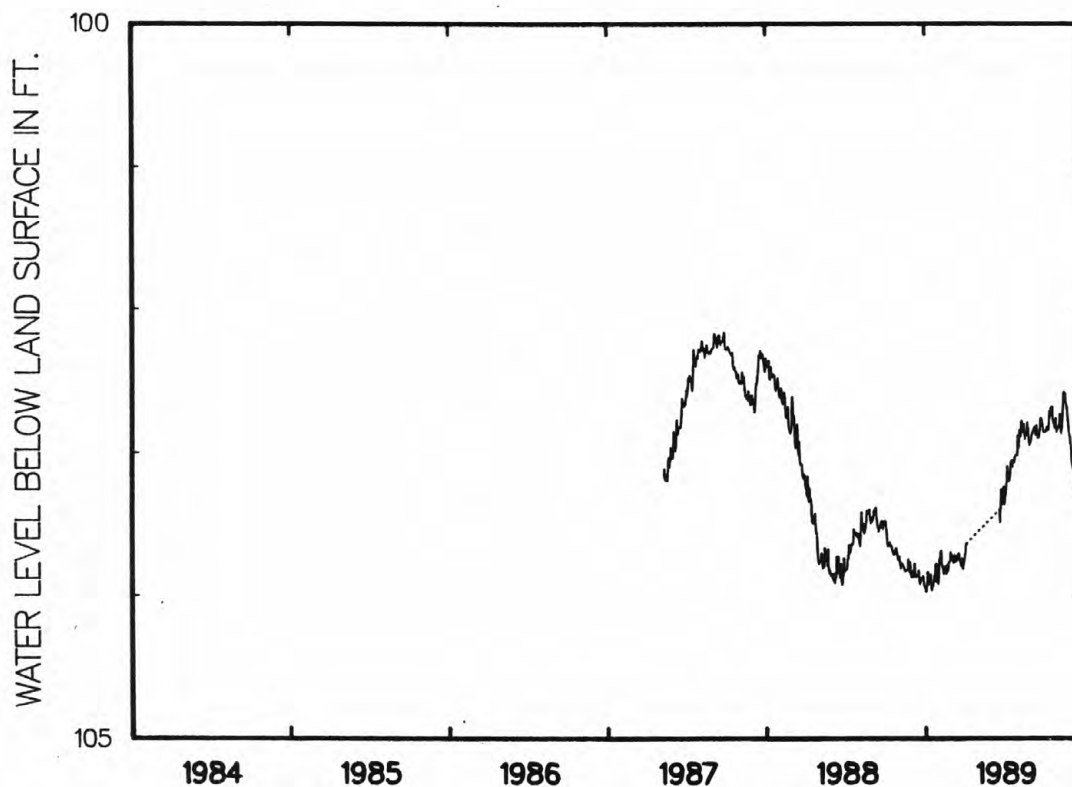
PERIOD OF RECORD.--February 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 102.14 ft below land-surface datum, June 5, 27, 1987; lowest recorded, 103.97 ft below land-surface datum, Oct. 1-3, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	103.90	103.69	103.77	---	---	---	103.28	102.95	102.87	102.84	102.80	103.11
10	103.89	103.80	103.72	---	---	---	103.18	102.81	102.83	102.85	102.87	103.14
15	103.96	103.80	103.71	---	---	---	103.15	102.85	102.85	102.75	102.60	103.26
20	103.90	103.78	103.76	---	---	---	103.10	102.88	102.90	102.68	102.63	103.09
25	103.81	103.77	103.74	---	---	103.25	103.04	102.83	102.77	102.83	102.77	103.25
EOM	103.92	103.75	103.71	---	---	103.23	103.02	102.93	102.86	102.84	102.94	103.29

WATER YEAR 1989 HIGHEST 102.53 AUG 15, 16, 1989 LOWEST 103.97 OCT 01-03, 1988



GROUND-WATER LEVELS

CITY OF SUFFOLK--Continued

363655076332004. Local number, 58A 79 SOW 180C.

LOCATION.--Lat 36°36'55", long 76°33'20", Hydrologic Unit 03010205, 0.3 mi north of Great Dismal Swamp Wildlife Refuge Headquarters on Desert Road, 2.0 mi east of Cypress Chapel. Owner: Virginia Water Control Board.

AQUIFER.--Aquia aquifer of Tertiary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in. to 670 ft, diameter 2 in. from 657 to 710 ft, depth 710 ft, screened 700 to 710 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 33.97 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.4 ft above land-surface datum.

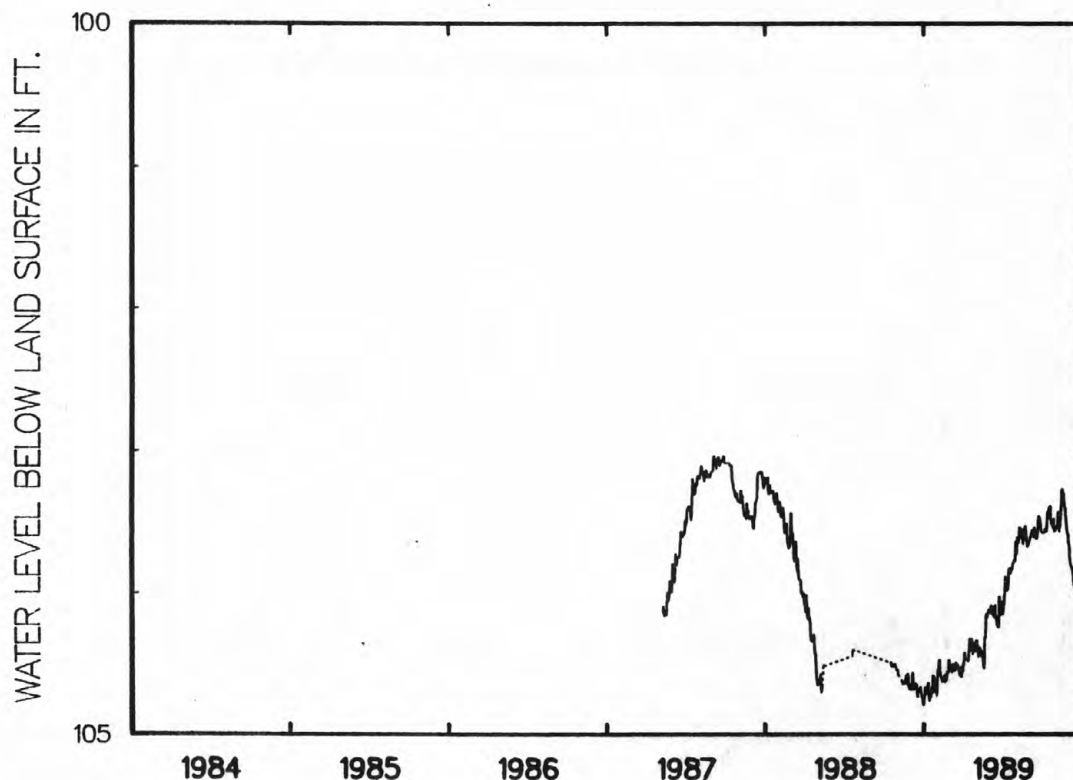
PERIOD OF RECORD.--February 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 102.72 ft below land-surface datum, May 11, 1987; lowest recorded, 104.79 ft below land-surface datum, Sept. 30, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	104.68	104.49	104.56	104.46	104.44	104.14	104.07	103.70	103.60	103.56	103.51	103.80
10	104.68	104.59	104.50	104.48	104.43	104.15	103.96	103.57	103.55	103.56	103.56	103.85
15	104.73	104.60	104.50	104.32	104.43	104.08	103.94	103.60	103.56	103.46	103.28	103.96
20	104.70	104.57	104.55	104.33	104.31	104.23	103.86	103.62	103.61	103.38	103.32	103.79
25	104.59	104.56	104.52	104.41	104.17	104.02	103.80	103.56	103.47	103.53	103.47	103.97
EOM	104.72	104.54	104.50	104.34	104.11	104.05	103.77	103.65	103.56	103.54	103.64	104.03

WATER YEAR 1989 HIGHEST 103.20 AUG 15, 1989 LOWEST 104.78 OCT 01, 1988



GROUND-WATER LEVELS

501

CITY OF SUFFOLK--Continued

363655076332005. Local number, 58A 80 SOW 180D.

LOCATION.--Lat 36°36'55", long 76°33'20", Hydrologic Unit 03010205, 0.3 mi north of Great Dismal Swamp Wildlife Refuge Headquarters on Desert Road, 2.0 mi east of Cypress Chapel. Owner: Virginia Water Control Board.

AQUIFER.--Aquia aquifer of Tertiary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in. to 397 ft, diameter 2 in. from 388 to 430 ft, depth 440 ft, screened 430 to 440 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 34.26 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.3 ft above land-surface datum.

PERIOD OF RECORD.--June 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.55 ft below land-surface datum, June 17, 1987; lowest recorded, 23.37 ft below land-surface datum, Feb. 10, 1988, affected by local pumpage.

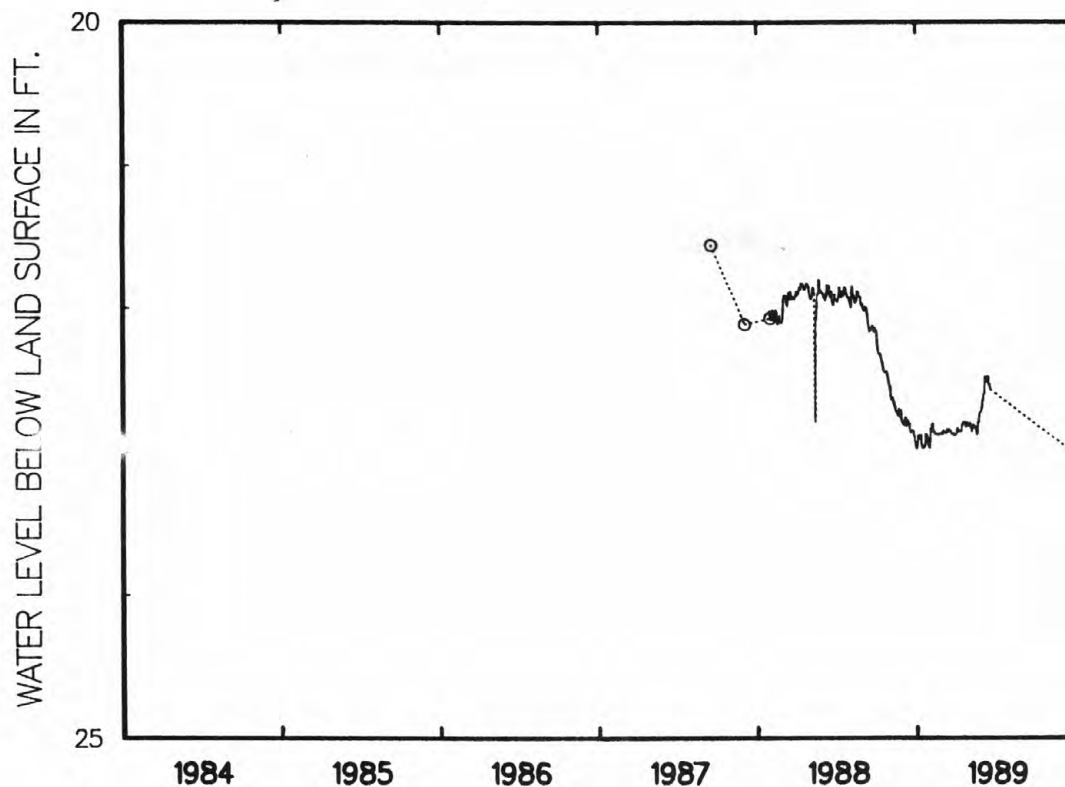
WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	22.87	22.82	22.86	22.85	22.85	22.59	---	---	---	---	---	---
10	22.90	22.85	22.83	22.85	22.82	22.49	---	---	---	---	---	---
15	22.96	22.87	22.84	22.79	22.82	22.47	---	---	---	---	---	---
20	22.95	22.87	22.86	22.78	22.78	22.56	---	---	---	---	---	22.89
25	22.88	22.86	22.86	22.81	22.71	---	---	---	---	---	---	22.95
EOM	22.97	22.87	22.86	22.79	22.67	---	---	---	---	---	---	22.95

WATER YEAR 1989

HIGHEST 22.45 MAR 06, 07, 1989

LOWEST 23.01 SEP 18, 1989



GROUND-WATER LEVELS

CITY OF SUFFOLK--Continued

363655076332006. Local number, 58A 81 SOW 180E.

LOCATION.--Lat 36°36'55", long 76°33'20", Hydrologic Unit 03010205, 0.3 mi north of Great Dismal Swamp Wildlife Refuge Headquarters on Desert Road, 2.0 mi east of Cypress Chapel. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Paleocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in. to 309 ft, diameter 2 in. from 298 to 329 ft, depth 329 ft, screened 319 to 329 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

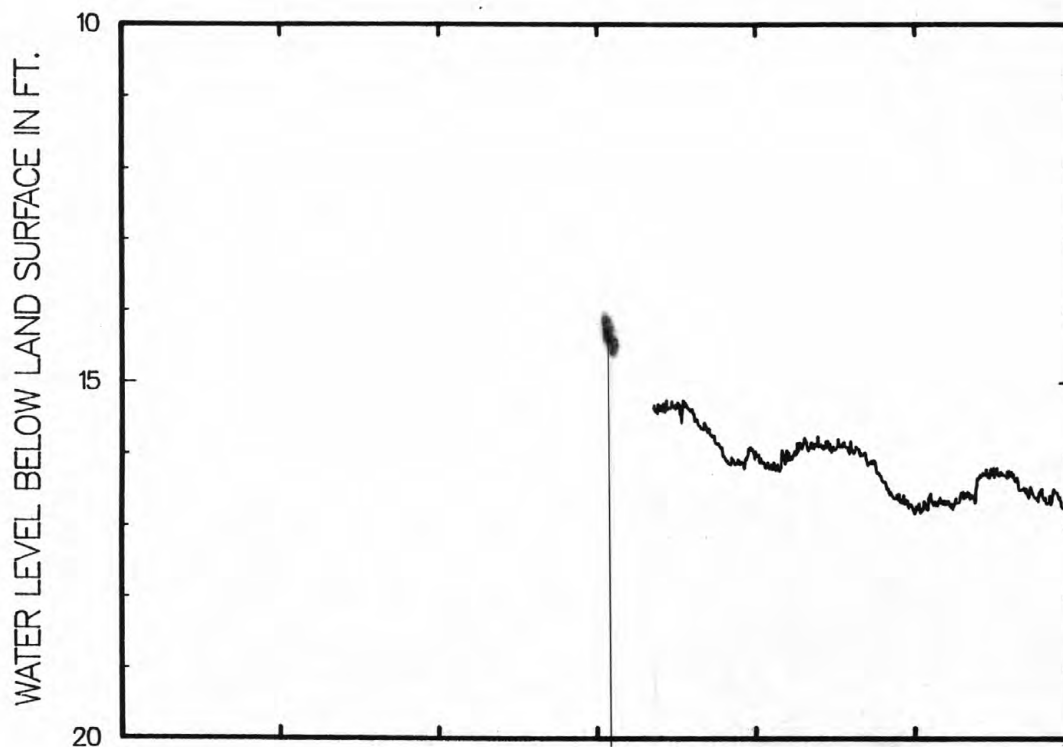
DATUM.--Elevation of land-surface datum is 34.00 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.4 ft above land-surface datum.

PERIOD OF RECORD.--February 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 15.07 ft below land-surface datum, Feb. 23, 1987; lowest recorded, 16.83 ft below land-surface datum, Sept. 30, Oct. 1, 1988, Sept. 13, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	16.72	16.57	16.70	16.68	16.63	16.30	16.28	16.31	16.49	16.59	16.67	16.75
10	16.73	16.66	16.65	16.68	16.60	16.29	16.28	16.26	16.47	16.64	16.70	16.74
15	16.80	16.68	16.66	16.53	16.59	16.21	16.29	16.32	16.50	16.57	16.51	16.81
20	16.77	16.67	16.71	16.52	16.46	16.33	16.29	16.37	16.61	16.48	16.52	16.55
25	16.68	16.67	16.69	16.59	16.35	16.20	16.29	16.36	16.48	16.64	16.56	16.64
EOM	16.78	16.67	16.68	16.53	16.28	16.19	16.33	16.49	16.57	16.68	16.64	16.61
WATER YEAR 1989			HIGHEST	16.11	APR 07, 1989	LOWEST	16.83	OCT 01, 1988, SEP 13, 1989				



GROUND-WATER LEVELS

503

CITY OF SUFFOLK--Continued

363655076332007. Local number, 58A 82 SOW 180F.

LOCATION.--Lat 36°36'55", long 76°33'20", Hydrologic Unit 03010205, 0.3 mi north of Great Dismal Swamp Wildlife Refuge Headquarters on Desert Road, 2.0 mi east of Cypress Chapel. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Eocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in. to 274 ft, diameter 2 in. from 262 to 306 ft, depth 306 ft, screened 286 to 306 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 33.87 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.5 ft above land-surface datum.

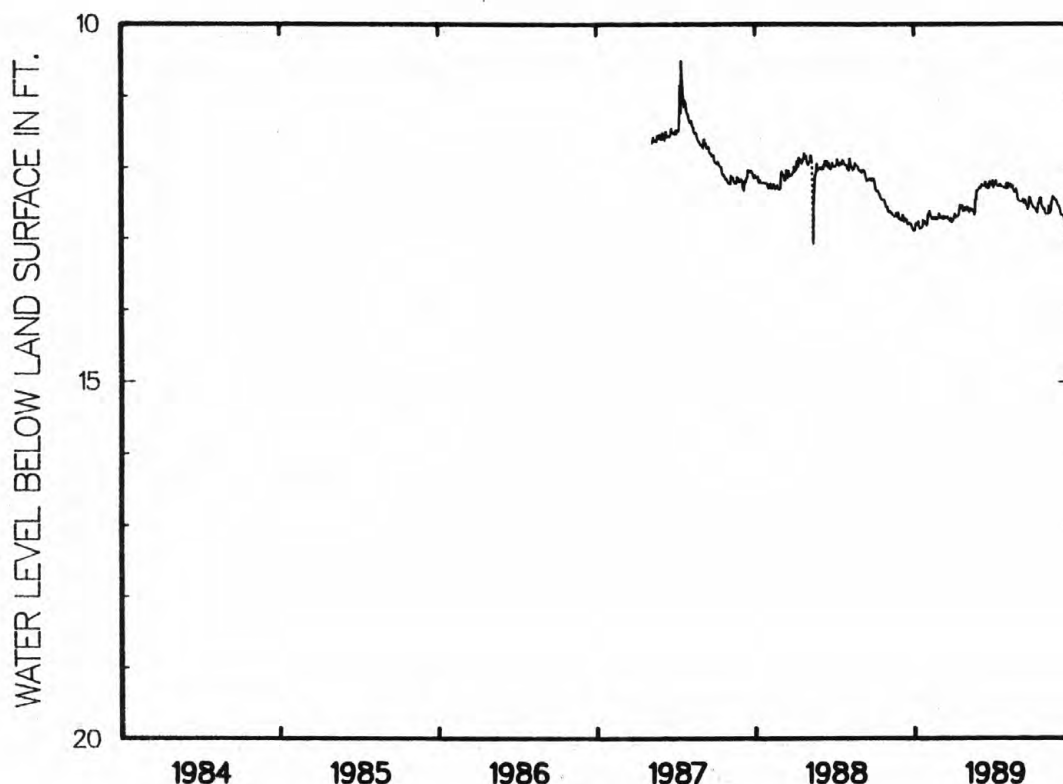
PERIOD OF RECORD.--February 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 6.12 ft below land-surface datum, Apr. 13, 1987; lowest recorded, 13.97 ft below land-surface datum, Feb. 11, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	12.78	12.63	12.73	12.71	12.64	12.27	12.24	12.29	12.48	12.57	12.66	12.68
10	12.79	12.70	12.69	12.69	12.61	12.26	12.25	12.24	12.46	12.63	12.65	12.69
15	12.85	12.71	12.70	12.53	12.60	12.20	12.26	12.29	12.49	12.52	12.44	12.76
20	12.83	12.70	12.74	12.54	12.46	12.30	12.27	12.34	12.60	12.44	12.45	12.45
25	12.76	12.71	12.73	12.61	12.32	12.19	12.28	12.34	12.44	12.59	12.49	12.54
EOM	12.82	12.70	12.71	12.56	12.27	12.18	12.30	12.47	12.53	12.65	12.58	12.52

WATER YEAR 1989 HIGHEST 12.11 APR 07, 1989 LOWEST 12.90 OCT 01, 1988



GROUND-WATER LEVELS

CITY OF SUFFOLK--Continued

363655076332008. Local number, 58A 83 SOW 180G.

LOCATION.--Lat 36°36'55", long 76°33'20", Hydrologic Unit 03010205, 0.3 mi north of Great Dismal Swamp Wildlife Refuge Headquarters on Desert Road, 2.0 mi east of Cypress Chapel. Owner: Virginia Water Control Board.

AQUIFER.--Yorktown-Eastover aquifer of Miocene-Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in. to 145 ft, diameter 2 in. from 135 to 165 ft, depth 165 ft, screened 155 to 165 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

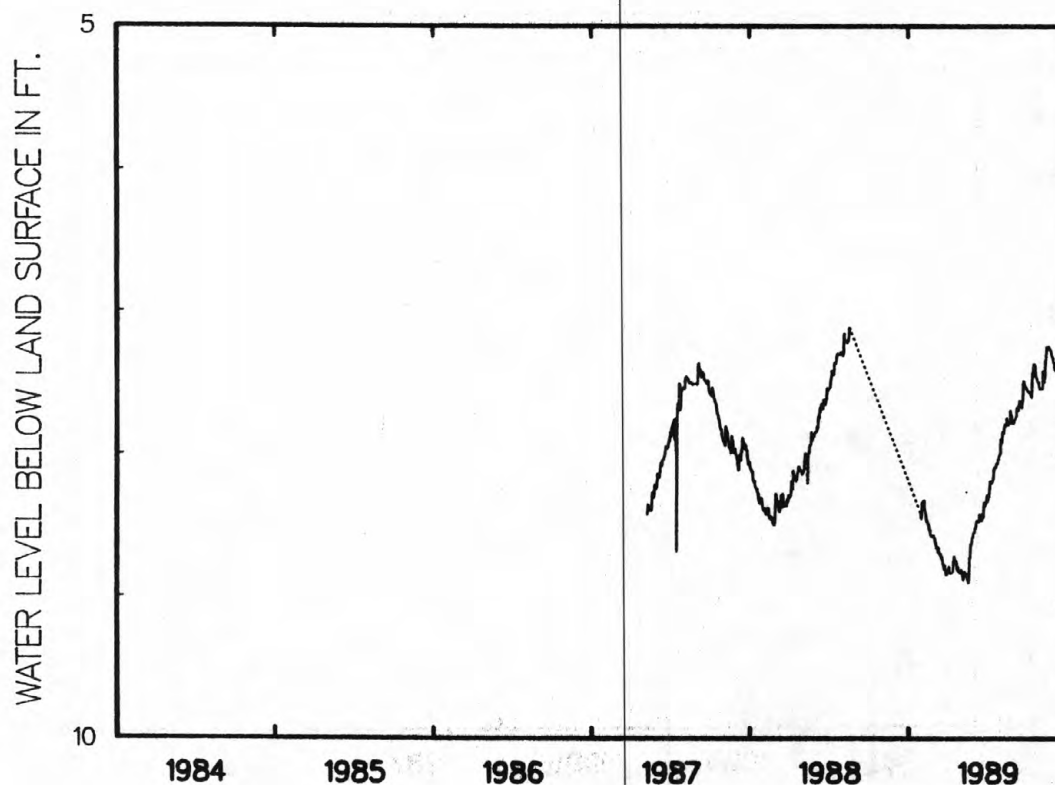
DATUM.--Elevation of land-surface datum is 33.84 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.5 ft above land-surface datum.

PERIOD OF RECORD.--February 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 6.46 ft below land-surface datum, Apr. 20, 1987; lowest recorded, 8.90 ft below land-surface datum, Feb. 16, 17, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	8.32	8.65	8.83	8.87	8.51	8.29	7.91	7.74	7.55	7.54	7.41
10	---	8.41	8.65	8.82	8.85	8.47	8.20	7.80	7.66	7.58	7.49	7.42
15	---	8.48	8.71	8.71	8.86	8.42	8.16	7.79	7.64	7.45	7.28	7.46
20	---	8.52	8.77	8.76	8.72	8.46	8.09	7.78	7.67	7.38	7.24	7.13
25	---	8.57	8.80	8.82	8.58	8.33	8.05	7.72	7.50	7.49	7.27	7.18
EOM	8.45	8.58	8.82	8.81	8.54	8.28	7.99	7.77	7.53	7.54	7.35	7.14
WATER YEAR 1989	HIGHEST 7.07		SEP 26, 1989		LOWEST 8.90		FEB 16, 17, 1989					



GROUND-WATER LEVELS

505

CITY OF SUFFOLK--Continued

363655076332009. Local number, 58A 84 SOW 180H.

LOCATION.--Lat 36°36'55", long 76°33'20", Hydrologic Unit 03010205, 0.3 mi north of Great Dismal Swamp Wildlife Refuge Headquarters on Desert Road, 2.0 mi east of Cypress Chapel. Owner: Virginia Water Control Board.

AQUIFER.--Columbia aquifer of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in., depth 20 ft, screened 10 to 20 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 33.87 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 2.5 ft above land-surface datum.

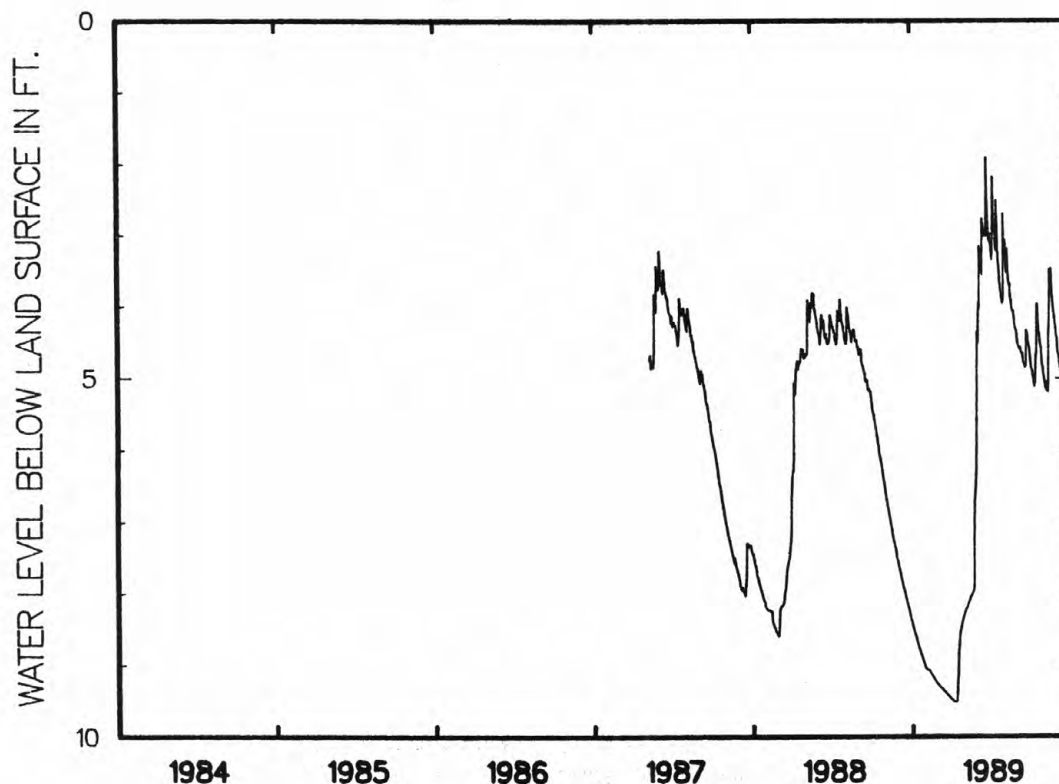
PERIOD OF RECORD.--February 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 1.47 ft below land-surface datum, Mar. 24, 1989; lowest recorded, 9.52 ft below land-surface datum, Jan. 5-9, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	8.53	9.07	9.32	9.52	8.17	3.95	3.35	3.32	4.56	4.88	5.14	4.70
10	8.63	9.10	9.35	9.50	8.10	3.31	2.89	3.45	4.61	5.05	5.18	4.93
15	8.75	9.15	9.39	8.90	8.01	3.03	3.22	3.70	4.73	4.67	3.83	5.18
20	8.85	9.20	9.42	8.52	7.95	3.00	3.37	3.97	4.86	4.18	3.65	3.12
25	8.94	9.25	9.45	8.37	6.49	2.28	3.78	4.11	4.38	4.52	4.08	3.84
EOM	9.04	9.29	9.49	8.24	5.24	2.97	3.94	4.37	4.59	4.89	4.43	3.97

WATER YEAR 1989 HIGHEST 1.47 MAR 24, 1989 LOWEST 9.52 JAN 05-09, 1989



CITY OF SUFFOLK--Continued

363928076332901. Local number, 58B 13.

LOCATION.--Lat 36°39'28", long 76°33'29", Hydrologic Unit 03010205, 700 ft east of State Highway 642, 4.0 mi south of Suffolk. Owner: Melvin Brinkley.

AQUIFER.--Columbia aquifer of Quaternary age.

WELL CHARACTERISTICS.--Dug unused water well, diameter 22 in., depth 15 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 40 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 1.9 ft above land-surface datum.

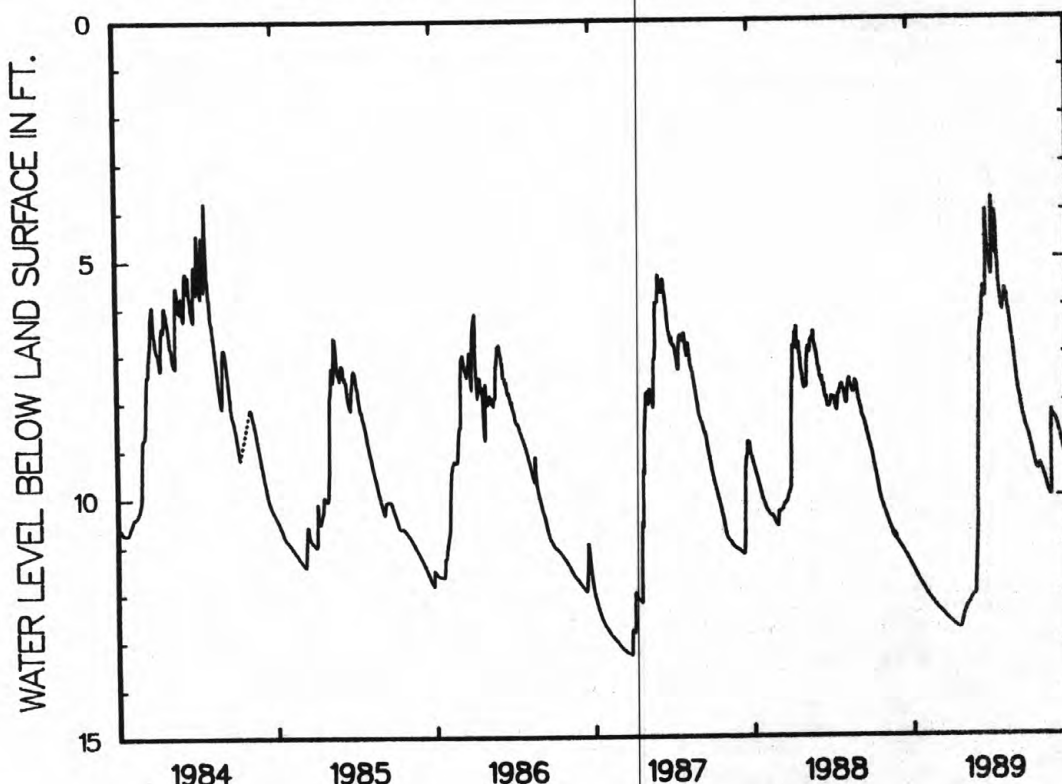
PERIOD OF RECORD.--March 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 2.95 ft below land-surface datum, May 25, 1979; lowest recorded, 13.44 ft below land-surface datum, Jan. 23-26, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	11.55	12.06	12.41	12.69	12.23	8.13	5.38	5.95	7.81	9.06	9.75	8.66
10	11.65	12.13	12.45	12.72	12.16	6.44	4.34	5.84	8.06	9.27	9.92	8.87
15	11.74	12.19	12.51	12.74	12.08	5.88	4.93	6.12	8.33	9.46	10.01	9.10
20	11.81	12.25	12.56	12.64	12.04	5.86	5.04	6.52	8.53	9.37	8.31	8.65
25	11.89	12.31	12.60	12.47	11.36	4.01	5.74	6.91	8.66	9.42	8.36	7.39
EOM	11.99	12.35	12.65	12.32	10.64	4.99	6.13	7.41	8.87	9.59	8.48	7.30

WATER YEAR 1989 HIGHEST 3.48 APR 08, 1989 LOWEST 12.74 JAN 14-18, 1989



364328076345201. Local number, 58B235.

LOCATION.--Lat 36°43'30", long 76°34'51", Hydrologic Unit 02080208, in the Planters Peanut Plant, 0.3 mi southeast of intersection of State Highway 337 and U.S. Highway 13 in Suffolk. Owner: Planters Peanut Company.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 10 in. to 254 ft, diameter 8 in. from 254 to 422 ft, diameter 6 in. from 422 to 570 ft, depth 570 ft, screened 530 to 561.6 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, bimonthly measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 53 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.5 ft above land-surface datum.

PERIOD OF RECORD.--August 1919, November 1977 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.0 ft below land-surface datum, Aug. 4, 1919; lowest measured, 153.21 ft below land-surface datum, Dec. 23, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	140.05	DEC 19	139.61	MAR 28	136.52	JUN 27	133.98	SEP 25	139.04

WATER YEAR 1989 HIGHEST 133.98 JUN 27, 1989 LOWEST 140.05 OCT 26, 1988

GROUND-WATER LEVELS

507

CITY OF SUFFOLK--Continued

364318076365501. Local number, 58B268 SOW 169A.

LOCATION.--Lat 36°43'18", long 76°36'55", Hydrologic Unit 02080208, 500 ft north of Norfolk and Western Railroad near Lake Kilby, 0.5 mi west of Suffolk. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 20 ft, screened 12 to 20 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 35 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.90 ft below land-surface datum, Mar. 15, 1989; lowest measured, 10.50 ft below land-surface datum, Oct. 18, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	10.50	JAN 18	7.20	MAR 15	3.90	APR 24	6.35	JUN 13	9.10	AUG 10	9.20
NOV 22	9.70										
WATER YEAR 1989		HIGHEST	3.90	MAR 15, 1989	LOWEST	10.50	OCT 18, 1988				

364318076365502. Local number, 58B269 SOW 169B.

LOCATION.--Lat 36°43'18", long 76°36'55", Hydrologic Unit 02080202, 500 ft north of Norfolk and Western Railroad near Lake Kilby, 0.5 mi west of Suffolk. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Paleocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 360 ft, screened 350 to 360 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 35 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.4 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--July 1985 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 43.06 ft below land-surface datum, July 8, 1985; lowest measured, 48.70 ft below land-surface datum, Aug. 10, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	48.10	JAN 18	48.10	MAR 15	48.00	APR 24	48.10	JUN 13	48.50	AUG 10	48.70
NOV 22	47.90										
WATER YEAR 1989		HIGHEST	47.90	NOV 22, 1988	LOWEST	48.70	AUG 10, 1989				

364318076365503. Local number, 58B270 SOW 169C.

LOCATION.--Lat 36°43'18", long 76°36'55", Hydrologic Unit 02080208, 500 ft north of Norfolk and Western Railroad near Lake Kilby, 0.5 mi west of Suffolk. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 500 ft, screened 490 to 500 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 35 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.4 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--July 1985 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 112.59 ft below land-surface datum, Feb. 25, 1986; lowest measured, 131.90 ft below land-surface datum, Jan. 12, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	124.40	JAN 18	123.10	MAR 15	124.30	APR 24	116.60	JUN 13	116.20	AUG 10	117.20
NOV 22	123.90										
WATER YEAR 1989		HIGHEST	116.20	JUN 13, 1989	LOWEST	124.40	OCT 18, 1988				

GROUND-WATER LEVELS

CITY OF SUFFOLK--Continued

364317076363501. Local number, 58B271 SOW 169D.

LOCATION.--Lat 36°43'17", long 76°36'35", Hydrologic Unit 02080208, 200 ft south of Norfolk and Western Railroad near Lake Kilby, 0.5 mi west of Suffolk. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 710 ft, screened 501 to 506 ft, 632 to 637 ft, 700 to 710 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 29 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.4 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--July 1985 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 107.70 ft below land-surface datum, Feb. 25, 1986; lowest recorded, 147.30 ft below land-surface datum, Dec. 23, 24, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	118.51	118.25	118.18	117.80	118.16	118.10	114.22	113.11	113.00	112.80	113.05	117.20
10	118.48	118.31	118.06	117.90	118.00	118.03	113.85	112.97	112.89	112.80	114.29	117.34
15	118.46	128.72	118.11	117.82	118.12	117.95	113.72	112.88	112.89	112.80	115.60	117.52
20	118.55	118.19	118.19	117.85	118.10	118.01	113.48	112.90	112.90	112.86	116.18	117.43
25	118.44	118.13	118.12	117.99	118.02	115.50	113.30	112.78	112.72	112.90	116.48	117.63
EOM	118.48	118.14	117.87	117.99	118.01	114.60	113.18	112.90	112.73	113.05	116.91	117.67

WATER YEAR 1989 HIGHEST 112.59 JUN 28, 1989 LOWEST 128.72 NOV 15, 1988

364319076365501. Local number, 58B272 SOW 169E.

LOCATION.--Lat 36°43'19", long 76°36'55", Hydrologic Unit 02080208, 400 ft south of Norfolk and Western Railroad near Lake Kilby, 0.6 mi west of Suffolk. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 733 ft, screened 498 to 508 ft, 550 to 555 ft, 702 to 712 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 41 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--July 1985 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 111.54 ft below land-surface datum, Feb. 25, 1986; lowest measured, 139.40 ft below land-surface datum, Jan. 12, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	133.55	JAN 18	132.80	MAR 15	133.60	APR 24	127.50	JUN 13	126.70	AUG 10	127.50
NOV 22	131.60										

WATER YEAR 1989 HIGHEST 126.70 JUN 13, 1989 LOWEST 133.60 MAR 15, 1989

364348076363201. Local number, 58B273 SOW 169F.

LOCATION.--Lat 36°43'48", long 76°36'32", Hydrologic Unit 02080208, 100 ft south of U.S. Highway 58 near Lake Kilby, 0.2 mi west of Suffolk. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 661 ft, screened 541 to 546 ft, 567 to 572 ft, 635 to 640 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 26 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.2 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--July 1985 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 111.54 ft below land-surface datum, Feb. 25, 1986; lowest recorded, 146.11 ft below land-surface datum, Dec. 24, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	126.90	126.60	126.51	125.71	126.23	126.25	118.70	117.67	117.60	117.18	117.65	125.89
10	126.88	126.68	126.39	125.86	126.10	126.24	118.31	117.48	117.43	117.20	122.25	126.11
15	126.95	127.01	126.42	125.81	126.15	126.14	118.20	117.35	117.39	117.19	124.09	126.26
20	126.90	126.45	126.50	125.73	126.20	126.20	117.91	117.40	117.38	117.18	124.80	126.15
25	126.81	126.50	126.39	125.92	126.22	120.28	117.84	117.29	117.19	117.19	125.12	126.22
EOM	126.81	126.50	125.79	125.95	126.22	119.15	117.70	117.50	117.18	117.61	125.54	126.39

WATER YEAR 1989 HIGHEST 116.03 MAY 11, 1989 LOWEST 127.10 OCT 01, 1988

GROUND-WATER LEVELS

509

CITY OF SUFFOLK--Continued

365055076355301. Local number, 58C 2.

LOCATION.--Lat 36°50'55", long 76°35'53", Hydrologic Unit 02080208, 900 ft northwest of State Highway 603, 0.5 mi south of Oakland. Owner: Scott Saunders.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 651 ft, screened 638 to 651 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Oct. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 87 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.6 ft above land-surface datum.

PERIOD OF RECORD.--August 1970, December 1971 to December 1975, January 1978 to current year. Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 117.40 ft below land-surface datum, Aug. 28, 1970; lowest measured, 173.32 ft below land-surface datum, Dec. 16, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 15	161.20	MAR 28	159.94	JUN 20	159.83	SEP 18	160.45

WATER YEAR 1989 HIGHEST 159.83 JUN 20, 1989 LOWEST 161.20 DEC 15, 1988

365218076313001. Local number, 58C 8.

LOCATION.--Lat 36°52'18", long 76°31'30", Hydrologic Unit 02080208, 0.5 mi west of Wilkerson Landing, 3.2 mi northeast of Chuckatuck. Owner: G. A. Nimo.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 562 ft, screened 552 to 562 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Oct. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 22 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

PERIOD OF RECORD.--August to December 1970, November 1972 to December 1975, January 1978 to current year. Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 48.40 ft below land-surface datum, Aug. 28, 1970; lowest measured, 94.53 ft below land-surface datum, Dec. 16, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 15	90.91	MAR 21	89.71	JUN 20	89.89	SEP 18	90.27

WATER YEAR 1989 HIGHEST 89.71 MAR 21, 1989 LOWEST 90.91 DEC 15, 1988

364512076343701. Local number, 58C 52.

LOCATION.--Lat 36°45'12", long 76°34'37", Hydrologic Unit 02080208, at Virginia Department of Transportation Headquarters, 2,000 ft east of U.S. Highway 460, and 0.8 mi southeast of Elephant Fork. Owner: Virginia Water Control Board.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 1,688 ft, cased to 1,620 ft, open hole, 1,620 to 1,688 ft.

INSTRUMENTATION.--Monthly measurement with chalked tape by USGS personnel.

DATUM.--Elevation of land-surface datum is 10 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.3 ft above land-surface datum.

PERIOD OF RECORD.--October 1984 to March 1989 (discontinued). Unpublished records available prior to October 1985 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.35 ft below land-surface datum, Nov. 2, 1984; lowest measured, 21.15 ft below land-surface datum, Mar. 28, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, OCTOBER 1988 TO MARCH 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	19.56	NOV 28	19.94	DEC 20	20.19	JAN 25	20.60	FEB 27	20.90	MAR 28	21.15

PERIOD OCTOBER 1988 TO MARCH 1989 HIGHEST 19.56 OCT 26, 1988 LOWEST 21.15 MAR 28, 1989

GROUND-WATER LEVELS

CITY OF SUFFOLK--Continued

364512076343702. Local number, 58C 53 SOW 162B.

LOCATION.--Lat 36°45'12", long 76°34'37", Hydrologic Unit 02080208, 750 ft northeast of Virginia Department of Transportation fuel storage area, 2,000 ft east of U.S. Highway 460, and 0.8 mi southeast of Elephant Fork.

Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in. to 294 ft, diameter 2 in. from 294 to 881 ft, depth 896 ft, screened 881 to 896 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 10 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.4 ft above land-surface datum.

PERIOD OF RECORD.--February 1983 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 69.41 ft below land-surface datum, Apr. 24, 1983; lowest recorded, 101.39 ft below land-surface datum, Dec. 20, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	81.21	80.81	80.83	80.80	80.80	80.49	80.04	79.64	79.62	79.46	79.52	80.14
10	81.25	80.91	80.77	80.85	80.74	80.69	79.93	79.36	79.44	79.44	79.62	80.10
15	81.29	---	80.95	80.64	80.71	80.38	79.83	79.44	79.44	79.49	79.59	80.32
20	81.25	80.88	80.89	80.65	80.62	80.50	79.76	79.47	79.52	79.42	79.74	80.27
25	81.08	80.89	80.84	80.73	80.80	80.31	79.67	79.38	79.42	79.54	79.74	80.27
EOM	81.07	80.80	80.75	80.61	80.43	79.93	79.62	79.49	79.43	79.58	79.91	80.27

WATER YEAR 1989 HIGHEST 78.76 JUN 28, 1989 LOWEST 82.20 OCT 11, 1988

364512076343705. Local number, 58C 56 SOW 162D.

LOCATION.--Lat 36°45'12", long 76°34'37", Hydrologic Unit 02080208, 750 ft northeast of Virginia Department of Transportation fuel storage area, 2,000 ft east of U.S. Highway 460, and 0.8 mi southeast of Elephant Fork.

Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 567 ft, screened 557 to 567 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 10 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 3.35 ft above land-surface datum.

REMARKS.--Levels may be affected by local pumpage.

PERIOD OF RECORD.--February 1983 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 77.24 ft below land-surface datum, Oct. 1, 1984; lowest measured, 104.14 ft below land-surface datum, Dec. 23, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	---	---	91.36	91.45	91.34	88.60	87.58	87.69	87.46	87.68	90.33
10	---	---	---	91.43	91.38	91.64	88.36	87.24	87.55	87.49	87.87	90.50
15	---	---	---	91.23	91.32	91.22	88.11	87.25	87.50	87.52	88.53	90.87
20	---	---	91.55	91.23	91.36	91.19	87.94	87.38	87.52	87.47	89.27	90.74
25	---	---	91.32	91.30	91.52	89.98	87.74	87.37	87.41	87.63	89.56	90.73
EOM	---	---	91.28	91.19	91.30	88.87	87.67	87.66	87.45	87.66	90.01	90.63

WATER YEAR 1989 HIGHEST 86.77 JUN 28, 1989 LOWEST 91.75 OCT 27, 1988

365133076351201. Local number, 58C 57 SOW 141A.

LOCATION.--Lat 36°51'33", long 76°35'12", Hydrologic Unit 02080208, 500 ft west of old Chuckatuck High School in Chuckatuck. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Miocene-Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 122 ft, screened 112 to 122 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 52 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.5 ft above land-surface datum prior to Jan. 12, 1988; 1.0 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1980 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.70 ft below land-surface datum, Apr. 25, 1989; lowest measured, 11.65 ft below land-surface datum, Nov. 26, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	10.30	JAN 17	10.40	MAR 14	9.65	APR 25	8.70	JUN 13	9.30	AUG 10	10.10
NOV 22	10.10										

WATER YEAR 1989 HIGHEST 8.70 APR 25, 1989 LOWEST 10.40 JAN 17, 1989

CITY OF SUFFOLK--Continued

365133076351202. Local number, 58C 58 SOW 141B.

LOCATION.--Lat 36°51'33", long 76°35'12", Hydrologic Unit 02080208, 500 ft west of old Chuckatuck High School in Chuckatuck. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 605 ft, screened 595 to 605 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 52 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.5 ft above land-surface datum prior to Jan. 12, 1988; 1.5 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1980 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 108.60 ft below land-surface datum, Apr. 24, 1980; lowest measured, 142.67 ft below land-surface datum, Jan. 12, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	126.20	JAN 17	126.10	MAR 14	125.10	APR 25	124.65	JUN 13	124.60	AUG 10	125.60
NOV 22	125.90										

WATER YEAR 1989	HIGHEST	124.60	JUN 13, 1989	LOWEST	126.20	OCT 18, 1988
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365133076351203. Local number, 58C 59 SOW 141C.

LOCATION.--Lat 36°51'33", long 76°35'12", Hydrologic Unit 02080208, 500 ft west of old Chuckatuck High School in Chuckatuck. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 447 ft, screened 437 to 447 ft.

INSTRUMENTATION.--Continuous strip-chart recorder.

DATUM.--Elevation of land-surface datum is 52 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1980 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 108.80 ft below land-surface datum, June 30, 1980; lowest recorded, 145.32 ft below land-surface datum, Jan. 15, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	130.85	128.90	130.37	130.70	130.04	129.10	128.25	127.81	128.53	128.38	129.55	129.23
10	129.95	129.65	130.00	130.59	130.24	129.10	128.45	127.99	128.32	128.68	129.30	129.44
15	130.18	130.30	130.69	130.65	130.23	129.15	128.47	127.25	128.55	129.00	129.05	129.65
20	130.40	130.20	130.95	130.56	129.78	128.15	128.30	127.86	128.64	128.70	129.11	129.33
25	129.61	129.80	130.52	130.54	129.70	127.42	128.29	128.23	128.25	129.30	129.39	128.91
EOM	129.71	129.99	130.61	129.99	129.60	127.70	127.95	128.32	128.32	129.67	129.32	128.58

WATER YEAR 1989	HIGHEST	126.94	APR 02, 1989	LOWEST	131.02	DEC 22, 1988
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365133076351204. Local number, 58C 60 SOW 141D.

LOCATION.--Lat 36°51'33", long 76°35'12", Hydrologic Unit 02080208, 500 ft west of old Chuckatuck High School in Chuckatuck. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 20 ft, screened 10 to 20 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 50 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum prior to Jan 12, 1988; 1.0 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1980 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.53 ft below land-surface datum, Feb. 18, 1980; lowest measured, 4.18 ft below land-surface datum, Nov. 4, 1984.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 17	3.32	JAN 12	2.22	MAR 15	2.47	MAY 02	2.60	JUN 29	2.39	AUG 09	2.60

WATER YEAR 1988	HIGHEST	2.22	JAN 12, 1988	LOWEST	3.32	NOV 17, 1987
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WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	3.40	JAN 17	2.30	MAR 14	1.30	APR 25	2.25	JUN 13	2.40	AUG 10	3.40
NOV 22	2.30										

WATER YEAR 1989	HIGHEST	1.30	MAR 14, 1989	LOWEST	3.40	OCT 18, 1988, AUG 10, 1989
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GROUND-WATER LEVELS

CITY OF SUFFOLK--Continued

364731076355501. Local number, 58C 61 SOW 159A.

LOCATION.--Lat 36°47'31", long 76°35'55", Hydrologic Unit 02080208, 0.5 mi northwest of intersection of State Highways 622 and 634, 2.3 mi northwest of Elephant Fork. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 25 ft, screened 20 to 25 ft, sounded to 17.50 ft on July 8, 1985.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 40 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.85 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board. Well reported dry several days in 1985-89.

PERIOD OF RECORD.--June 1981 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.95 ft below land-surface datum, Apr. 19, 1984; lowest measured, 17.50 ft below land-surface datum, many days 1985 to 1989*.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	*DRY	JAN 17	*DRY	MAR 14	12.05	APR 24	15.53	JUN 13	*DRY	AUG 09	*DRY
NOV 22	*DRY										

* See WELL CHARACTERISTICS paragraph.

WATER YEAR 1989 HIGHEST 12.05 MAR 14, 1989 LOWEST * WELL DRY (LOWER THAN 17.50 FT) SEVERAL DAYS DURING YEAR.

364731076355502. Local number, 58C 62 SOW 159B.

LOCATION.--Lat 36°47'31", long 76°35'55", Hydrologic Unit 02080208, 0.5 mi northwest of intersection of State Highways 622 and 634, 2.3 mi northwest of Elephant Fork. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 575 ft, screened 555 to 575 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 40 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.6 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1981 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 129.90 ft below land-surface datum, Aug. 28, 1984; lowest measured, 159.63 ft below land-surface datum, Jan. 13, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	142.45	JAN 17	141.40	MAR 14	141.35	APR 24	139.80	JUN 13	139.40	AUG 09	139.70
NOV 22	141.70										

WATER YEAR 1989 HIGHEST 139.40 JUN 13, 1989 LOWEST 142.45 OCT 11, 1988

364731076355503. Local number, 58C 63 SOW 159C.

LOCATION.--Lat 36°47'31", long 76°35'55", Hydrologic Unit 02080208, 0.5 mi northwest of intersection of State Highways 622 and 634, 2.3 mi northwest of Elephant Fork. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 2 in., depth 650 ft, screened 630 to 650 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 40 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.6 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--October 1981 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 127.75 ft below land-surface datum, Dec. 23, 1981; lowest measured, 158.33 ft below land-surface datum, Jan. 13, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	140.80	JAN 17	140.20	MAR 14	139.80	APR 24	138.70	JUN 13	138.40	AUG 09	138.80
NOV 22	140.30										

WATER YEAR 1989 HIGHEST 138.40 JUN 13, 1989 LOWEST 140.80 OCT 11, 1988

GROUND-WATER LEVELS

513

SURRY COUNTY

370408076460101. Local number, 56E 1.

LOCATION.--Lat 37°04'08", long 76°46'01" (corrected), Hydrologic Unit 03010202, off State Highway 617, 3.2 mi southwest of Bacons Castle. Owner: Buster E. Cox.

AQUIFER.--Sands of middle and late Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 18 in. to 360 ft, 8 in. from 333.5 to 705 ft, depth 705 ft, screened 401 to 411 ft, 431 to 441 ft, 463 to 473 ft, 495 to 505 ft, 540 to 555 ft, 700 to 705 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 93 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top edge of recorder shelf, 3.6 ft above land-surface datum.

PERIOD OF RECORD.--March 1942, April 1969 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 73.52 ft below land-surface datum, Mar. 10, 1942; lowest recorded, 155.84 ft below land-surface datum, Sept. 13, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	155.68	155.47	155.53	155.36	155.18	154.79	154.63	154.48	154.53	154.89	155.40	155.76
10	155.66	155.61	155.49	155.33	155.08	154.77	154.59	154.36	154.52	154.98	155.58	155.74
15	155.72	155.61	155.46	155.16	155.09	154.58	154.58	154.42	154.63	155.06	155.52	155.81
20	155.76	155.55	155.47	155.17	154.97	154.73	154.56	154.45	154.69	155.01	155.37	155.74
25	155.64	155.55	155.46	155.23	154.85	154.59	154.51	154.40	154.66	155.21	155.47	155.83
EOM	155.74	155.52	155.40	155.12	154.77	154.53	154.48	154.53	154.79	155.36	155.61	155.81

WATER YEAR 1989 HIGHEST 154.29 MAY 06, 1989 LOWEST 155.84 SEP 13, 1989

370800076500701. Local number, 56F 2 SOW 039.

LOCATION.--Lat 37°08'00", long 76°50'07", Hydrologic Unit 02080206, off State Highway 10, at Surry County Administration building in Surry. Owner: Town of Surry.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 367 ft, screened 350 to 362 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 122 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.1 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--December 1970 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 146.53 ft below land-surface datum, Mar. 1, 1971; lowest measured, 178.50 ft below land-surface datum, Oct. 11, 1988, Aug. 9, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	178.50	DEC 15	178.40	MAR 15	177.60	APR 24	177.50	JUN 12	177.70	AUG 09	178.50
NOV 21	178.45	JAN 17	178.15								

WATER YEAR 1989 HIGHEST 177.50 APR 24, 1989 LOWEST 178.50 OCT 11, 1988, AUG 09, 1989

370712076413201. Local number, 57E 11 SOW 094A.

LOCATION.--Lat 37°07'12", long 76°41'32", Hydrologic Unit 02080206, 0.5 mi east of State Highway 690, 2.5 mi northwest of Bacons Castle. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 605 ft, screened 595 to 605 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 45 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--July 1978 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 92.19 ft below land-surface datum, July 24, 1980; lowest measured, 108.90 ft below land-surface datum, Oct. 11, 1988, Aug. 9, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	108.90	JAN 17	107.50	MAR 15	105.70	APR 24	106.50	JUN 12	107.25	AUG 09	108.90
NOV 21	108.20										

WATER YEAR 1989 HIGHEST 105.70 MAR 15, 1989 LOWEST 108.90 OCT 11, 1988, AUG 09, 1989

GROUND-WATER LEVELS
SURREY COUNTY--Continued

370712076413202. Local number, 57E 12 SOW 094B.

LOCATION.--Lat 37°07'12", long 76°41'32", Hydrologic Unit 02080206, 0.5 mi east of State Highway 690, 2.5 mi northwest of Bacons Castle. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in. to 430 ft, diameter 3 in. from 430 to 440 ft, depth 440 ft, screened 430 to 440 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 45 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--July 1978 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 92.90 ft below land-surface datum, May 29, 1980; lowest measured, 109.65 ft below land-surface datum, Aug. 9, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	109.50	JAN 17	107.85	MAR 15	107.10	APR 24	106.85	JUN 12	107.80	AUG 09	109.50
NOV 21	108.60										

WATER YEAR 1989 HIGHEST 106.85 APR 24, 1989 LOWEST 109.50 OCT 11, 1988, AUG 09, 1989

370712076413203. Local number, 57E 13 SOW 094C.

LOCATION.--Lat 37°07'12", long 76°41'32", Hydrologic Unit 02080206, 0.5 mi east of State Highway 690, 2.5 mi northwest of Bacons Castle. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Miocene-Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in. to 41 ft, diameter 3 in. from 41 to 46 ft, depth 46 ft, screened 41 to 46 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 45 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.6 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--July 1978 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.90 ft below land-surface datum, May 29, 1980; lowest measured, 11.17 ft below land-surface datum, Dec. 13, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	9.65	JAN 17	10.20	MAR 15	6.90	APR 24	5.35	JUN 12	7.30	AUG 09	8.80
NOV 21	9.90										

WATER YEAR 1989 HIGHEST 5.35 APR 24, 1989 LOWEST 10.20 JAN 17, 1989

371132076405501. Local number, 57F 16 SOW 087A.

LOCATION.--Lat 37°11'32", long 76°40'55", Hydrologic Unit 02080206, at the end of State Highway 650 in Homewood, 7.6 mi northeast of Bacons Castle. Owner: Virginia Water Control Board.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 1,206 ft, screened 1,170 to 1,185 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 5 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--July 1978 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 53.22 ft below land-surface datum, July 20, 1978; lowest measured, 71.82 ft below land-surface datum, Dec. 15, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	71.65	DEC 15	71.82	MAR 15	70.05	APR 24	70.40	JUN 12	70.60	AUG 09	71.50
NOV 21	71.40	JAN 17	71.20								

WATER YEAR 1989 HIGHEST 70.05 MAR 15, 1989 LOWEST 71.82 DEC 15, 1988

GROUND-WATER LEVELS

515

SURREY COUNTY--Continued

371132076405502. Local number, 57F 24 SOW 087B.

LOCATION.--Lat 37°11'32", long 76°40'55", Hydrologic Unit 02080206, at the end of State Highway 650 in Homewood. 7.6 mi northeast of Bacons Castle. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 520 ft, screened 510 to 520 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 5 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--July 1978 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 62.17 ft below land-surface datum, Aug. 17, 1982; lowest measured, 81.30 ft below land-surface datum, Aug. 9, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 11	80.42	DEC 15	77.46	MAR 15	76.30	APR 24	75.70	JUN 12	78.50	AUG 09	80.50
NOV 21	77.40	JAN 17	76.50								

WATER YEAR 1989 HIGHEST 75.70 APR 24, 1989 LOWEST 80.50 AUG 09, 1989

SUSSEX COUNTY

365843077090201. Local number, 53D 3 SOW 048.

LOCATION.--Lat 36°58'43", long 77°09'02", Hydrologic Unit 03010201, off State Highway 40, 2.4 mi northeast of Homeville, and 5.5 mi south of Waverly. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 6 in., depth 554 ft, screened 279 to 284 ft, 358 to 363 ft, 439 to 444 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1989, bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 90 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.6 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board prior to Mar. 1, 1989; U.S. Geological Survey thereafter.

PERIOD OF RECORD.--August 1971 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 72.39 ft below land-surface datum, May 15, 1972; lowest measured, 86.45 ft below land-surface datum, Sept. 21, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 15	86.24	DEC 14	86.24	JAN 04	86.16	MAR 17	85.86	JUN 16	85.26	SEP 21	86.45

WATER YEAR 1989 HIGHEST 85.26 JUN 16, 1989 LOWEST 86.45 SEP 21, 1989

365530077104002. Local number, 53D 6 SOW 179A

LOCATION.--Lat 36°55'30", long 77°10'40", Hydrologic Unit 03010201, off State Highway 634, 1.4 mi south of State Highway 35, and 1.7 mi southeast of Homeville. Owner: Virginia Water Control Board.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 470 ft, screened 460 to 470 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1988, digital recorder--60-minute punch; Mar. 1 to Oct. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 90 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

PERIOD OF RECORD.--November 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 78.50 ft below land-surface datum, Feb. 12, 1988; lowest measured, 84.44 ft below land-surface datum, Oct. 25, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	84.44	DEC 14	84.42	MAR 17	83.80	JUN 16	82.95	SEP 21	84.30

WATER YEAR 1989 HIGHEST 82.95 JUN 16, 1989 LOWEST 84.44 OCT 25, 1988

GROUND-WATER LEVELS

SUSSEX COUNTY--Continued

365530077104003. Local number, 53D 7 SOW 179B.

LOCATION.--Lat 36°55'30", long 77°10'40", Hydrologic Unit 03010201, off State Highway 634, 1.4 mi south of State Highway 35, and 1.7 mi southeast of Homeville. Owner: Virginia Water Control Board.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in. to 398 ft, diameter 2 in. from 394 to 415 ft, depth 425 ft, screened 415 to 425 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Oct. 1, 1988, annual measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 90 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum.

PERIOD OF RECORD.--December 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 79.47 ft below land-surface datum, Dec. 17, 1985; lowest measured, 83.38 ft below land-surface datum, Oct. 25, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	83.38	DEC 14	83.34	MAR 17	82.18	JUN 16	81.63	SEP 21	83.15
WATER YEAR 1989		HIGHEST	81.63	JUN 16, 1989	LOWEST	83.38	OCT 25, 1988		

365530077104004. Local number, 53D 8 SOW 179C.

LOCATION.--Lat 36°55'30", long 77°10'40", Hydrologic Unit 03010201, off State Highway 634, 1.4 mi south of State Highway 35, and 1.7 mi southeast of Homeville. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in. to 256 ft, diameter 2 in. from 249 to 270 ft, depth 280 ft, screened 270 to 280 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1988, digital recorder--60-minute punch; Mar. 1 to Oct. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 90 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.4 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 78.79 ft below land-surface datum, Apr. 18, 1987; lowest measured, 83.11 ft below land-surface datum, Oct. 25, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	83.11	DEC 14	83.08	MAR 17	81.86	JUN 16	81.34	SEP 21	82.86
WATER YEAR 1989		HIGHEST	81.34	JUN 16, 1989	LOWEST	83.11	OCT 25, 1988		

365530077104005. Local number, 53D 9 SOW 179D.

LOCATION.--Lat 36°55'30", long 77°10'40", Hydrologic Unit 03010201, off State Highway 634, 1.4 mi south of State Highway 35, and 1.7 mi southeast of Homeville. Owner: Virginia Water Control Board.

AQUIFER.--Sand of middle Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in. to 185 ft, diameter 2 in. from 178 to 199 ft, depth 209 ft, screened 199 to 209 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1988, digital recorder--60-minute punch; Mar. 1 to Oct. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 90 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.1 ft above land-surface datum.

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

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 76.51 ft below land-surface datum, Apr. 17, 1987; lowest recorded, 82.56 ft below land-surface datum, Nov. 25, 26, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	82.46	DEC 14	82.31	MAR 17	80.82	JUN 16	80.59	SEP 21	82.20
WATER YEAR 1989		HIGHEST	80.59	JUN 16, 1989	LOWEST	82.46	OCT 25, 1988		

SUSSEX COUNTY--Continued

365530077104006. Local number, 53D 10 SOW 179E.

LOCATION.--Lat 36°55'30", long 77°10'40", Hydrologic Unit 03010201, off State Highway 634, 1.4 mi south of State Highway 35, and 1.7 mi southeast of Homeville. Owner: Virginia Water Control Board.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in. to 130 ft, diameter 4 in. from 140 to 145 ft, depth 145 ft, screened 130 to 140 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1988, digital recorder--60-minute punch; Mar. 1 to Oct. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 90 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.3 ft above land-surface datum.

PERIOD OF RECORD.--December 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 76.25 ft below land-surface datum, Apr. 24, 1987; lowest measured, 80.73 ft below land-surface datum, Oct. 25, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	80.73	DEC 14	80.52	MAR 17	78.88	JUN 16	78.85	SEP 21	80.40

WATER YEAR 1989 HIGHEST 78.85 JUN 16, 1989 LOWEST 80.73 OCT 25, 1988

365530077104007. Local number, 53D 11 SOW 179F.

LOCATION.--Lat 36°55'30", long 77°10'40", Hydrologic Unit 03010201, off State Highway 634, 1.4 mi south of State Highway 35, and 1.7 mi southeast of Homeville. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Paleocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in. to 82 ft, diameter 4 in. from 92 to 97 ft, depth 97 ft, screened 82 to 92 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1988, digital recorder--60-minute punch; Mar. 1 to Oct. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 90 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

PERIOD OF RECORD.--December 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 70.60 ft below land-surface datum, Apr. 20, 1987; lowest recorded, 77.16 ft below land-surface datum, Nov. 28-30, Dec. 1, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	76.70	DEC 14	76.70	MAR 17	73.43	JUN 16	72.03	SEP 21	74.27

WATER YEAR 1989 HIGHEST 72.03 JUN 16, 1989 LOWEST 76.70 OCT 25, DEC. 14, 1988

365530077104008. Local number, 53D 12 SOW 179G.

LOCATION.--Lat 36°55'30", long 77°10'40", Hydrologic Unit 03010201, off State Highway 634, 1.4 mi south of State Highway 35, and 1.7 mi south of Homeville. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Miocene-Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4.5 in. to 47 ft, diameter 4 in. from 57 to 67 ft, depth 67 ft, screened 47 to 57 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1988, digital recorder--60-minute punch; Mar. 1 to Oct. 1, 1988, occasional measurement with chalked tape.

DATUM.--Elevation of land-surface datum is 90 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

PERIOD OF RECORD.--December 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 11.46 ft below land-surface datum, Apr. 29, 1987; lowest recorded, 27.09 ft below land-surface datum, Nov. 25-27, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	25.00	DEC 14	24.48	MAR 17	12.76	JUN 16	18.97	SEP 21	23.95

WATER YEAR 1989 HIGHEST 12.76 MAR 17, 1989 LOWEST 25.00 OCT 25, 1988

365235077150501. Local number, 53E 5 SOW 045.

LOCATION.--Lat 37°02'37", long 77°11'30", Hydrologic Unit 03010201, 400 ft northeast of State Highway 625, 2.5 mi north of Newville. Owner: Butler Lumber Company.

AQUIFER.--Sand of Paleocene age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 4 in., depth 172 ft, screened 162 to 172 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Mar. 1, 1989, bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 126.65 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing, 0.3 ft above land-surface datum prior to Mar. 8, 1988; 1.2 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board prior to Mar. 1, 1989; U.S. Geological Survey thereafter.

PERIOD OF RECORD.--September 1971, October 1974 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 81.90 ft below land-surface datum, Mar. 16, 1976; lowest measured, 91.85 ft below land-surface datum, Jan. 4, 1989.

GROUND-WATER LEVELS

SUSSEX COUNTY--Continued

365235077150501. Local number, 53E 5 SOW 045--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 15	91.79	JAN 04	91.85	FEB 28	90.50	MAR 17	90.38	JUN 16	88.30	SEP 21	91.08
DEC 14	91.80										
WATER YEAR 1989		HIGHEST 88.30 JUN 16, 1989		LOWEST 91.85 JAN 04, 1989							

CITY OF VIRGINIA BEACH

364850076120701. Local number, 61C 23 SOW 129.

LOCATION.--Lat 36°48'50", long 76°12'07", Hydrologic Unit 02080208, at Woodstock Elementary School in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 8 in. to 68 ft, diameter 6 in. from 68 to 78 ft, depth 78 ft, screened 68 to 73 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.1 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.20 ft below land-surface datum, Apr. 25, 1989; lowest measured, 17.77 ft below land-surface datum, Aug. 26, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	11.35	JAN 13	11.80	MAR 15	11.32	MAY 10	9.54	JUN 21	10.80	AUG 03	12.54
WATER YEAR 1988		HIGHEST 9.54 MAY 10, 1988		LOWEST 12.54 AUG 03, 1988							

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	12.20	JAN 11	12.10	MAR 14	10.40	APR 25	9.20	JUN 21	11.40	AUG 17	10.70
NOV 16	11.55										
WATER YEAR 1989		HIGHEST 9.20 APR 25, 1989		LOWEST 12.20 OCT 17, 1988							

364920076093601. Local number, 61C 25 SOW 130.

LOCATION.--Lat 36°49'20", long 76°09'36", Hydrologic Unit 02080208, at Kempsville Elementary School in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 6 in., depth 71 ft, screened 61 to 66 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 10 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.12 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1978 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.55 ft below land-surface datum, June 20, 1984; lowest measured, 17.76 ft below land-surface datum, July 18, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	11.30	JAN 13	12.38	MAR 15	10.54	MAY 10	8.68	JUN 21	12.30	AUG 03	13.58
WATER YEAR 1988		HIGHEST 8.68 MAY 10, 1988		LOWEST 13.58 AUG 03, 1988							

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	12.78	JAN 11	12.08	MAR 14	10.18	APR 25	8.63	JUN 22	10.98	AUG 17	10.38
NOV 16	10.98										
WATER YEAR 1989		HIGHEST 8.63 APR 25, 1989		LOWEST 12.78 OCT 17, 1988							

CITY OF VIRGINIA BEACH--Continued

364920076093201. Local number, 61C 27 SOW 174A.

LOCATION.--Lat 36°49'20", long 76°09'32", Hydrologic Unit 02080208, at Kempsville High School in Virginia Beach.

Owner: Virginia Water Control Board.

AQUIFER.--Sand of Miocene-Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 3 in., depth 175 ft, screened 160 to 170 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.8 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1984 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.09 ft below land-surface datum, Apr. 25, 1984; lowest measured, 11.73 ft below land-surface datum, Aug. 6, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	9.50	JAN 11	9.00	MAR 14	8.50	APR 25	6.90	JUN 22	8.20	AUG 17	8.90
NOV 16	9.00										

WATER YEAR 1989 HIGHEST 6.90 APR 25, 1989 LOWEST 9.50 OCT 17, 1988

364920076093202. Local number, 61C 28 SOW 174B.

LOCATION.--Lat 36°49'20", long 76°09'32", Hydrologic Unit 02080208, at Kempsville High School in Virginia Beach.

Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 3 in., depth 80 ft, screened 65 to 75 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.2 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1984 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.51 ft below land-surface datum, Apr. 25, 1984; lowest measured, 17.99 ft below land-surface datum, July 18, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	12.40	JAN 11	10.80	MAR 14	9.00	APR 25	7.85	JUN 22	9.90	AUG 17	10.60
NOV 16	10.10										

WATER YEAR 1989 HIGHEST 7.85 APR 25, 1989 LOWEST 12.40 OCT 17, 1988

364837076092001. Local number, 61C 29 SOW 175.

LOCATION.--Lat 36°48'37", long 76°09'20", Hydrologic Unit 02080208, at Providence Elementary School in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 3 in., depth 105 ft, screened 90 to 100 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.1 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1984 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.17 ft below land-surface datum, Apr. 25, 1984; lowest measured, 13.09 ft below land-surface datum, July 18, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	9.80	JAN 11	8.90	MAR 14	6.60	APR 25	6.45	JUN 21	8.70	AUG 17	7.30
NOV 16	8.60										

WATER YEAR 1989 HIGHEST 6.45 APR 25, 1989 LOWEST 9.80 OCT 17, 1988

GROUND-WATER LEVELS

CITY OF VIRGINIA BEACH--Continued

365325076114001. Local number, 61D 4 SOW 154.

LOCATION.--Lat 36°53'25", long 76°11'40", Hydrologic Unit 02080108, 200 ft west of Barrs Road, 0.4 mi north of Burton Station Road in Virginia Beach. Owner: City of Virginia Beach.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 8 in. to 200 ft, diameter 4 in. from 200 to 1,130 ft, depth 1,130 ft, screened 1,000 to 1,010 ft, 1,020 to 1,070 ft, 1,080 to 1,120 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 24 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.17 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--December 1980 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 63.47 ft below land-surface datum, Mar. 20, 1981; lowest measured, 74.43 ft below land-surface datum, Aug. 11, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	71.95	JAN 19	72.23	MAR 15	72.48	APR 27	72.51	JUN 20	72.86	AUG 04	73.40
WATER YEAR 1988		HIGHEST	71.95	NOV 19, 1987		LOWEST	73.40	AUG 04, 1988			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	74.03	JAN 12	74.18	MAR 13	74.03	APR 26	74.03	JUN 20	74.33	AUG 11	74.43
NOV 16	73.93										
WATER YEAR 1989		HIGHEST	73.93	NOV 16, 1988		LOWEST	74.43	AUG 11, 1989			

365425076105001. Local number, 61D 5 SOW 155.

LOCATION.--Lat 36°54'25", long 76°10'50", Hydrologic Unit 02080108, 100 ft east of Ferry Road, 0.3 mi northwest of Diamond Springs Road in Virginia Beach. Owner: City of Virginia Beach.

AQUIFER.--Sand of early Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 12 in. to 102 ft, diameter 6 in. from 102 to 150 ft, diameter 4 in. from 150 to 1,380 ft, depth 1,380 ft, screened 1,207 to 1,229 ft, 1,250 to 1,264 ft, 1,286 to 1,306 ft, 1,345 to 1,367 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 11 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.8 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--December 1980 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 49.75 ft below land-surface datum, Dec. 17, 1980; lowest measured, 62.00 ft below land-surface datum, June 20, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	59.17	JAN 19	59.59	MAR 15	59.68	APR 27	59.60	JUN 20	60.02	AUG 04	60.70
WATER YEAR 1988		HIGHEST	59.17	NOV 19, 1987		LOWEST	60.70	AUG 04, 1988			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	61.15	JAN 12	61.10	MAR 13	61.20	APR 26	61.50	JUN 20	62.00	AUG 11	61.90
NOV 16	60.90										
WATER YEAR 1989		HIGHEST	60.90	NOV 16, 1988		LOWEST	62.00	JUN 20, 1989			

GROUND-WATER LEVELS

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CITY OF VIRGINIA BEACH--Continued

365327076080501. Local number, 61D 6 SOW 124.

LOCATION.--Lat 36°53'27", long 76°08'05", Hydrologic Unit 02080108, at Thoroughgood School in Virginia Beach.

Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 8 in. to 25 ft, diameter 6 in. from 25 to 40 ft, depth 40 ft, screened 25 to 30 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 25 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.8 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1978 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.85 ft below land-surface datum, Apr. 27, 1984; lowest measured, 10.72 ft below land-surface datum, Nov. 12, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	10.00	JAN 12	9.80	MAR 13	8.75	APR 26	5.90	JUN 22	7.40	AUG 11	7.90
NOV 16	9.50										

WATER YEAR 1989 HIGHEST 5.90 APR 26, 1989 LOWEST 10.00 OCT 17, 1988

363537076061001. Local number, 62A 2 SOW 097A.

LOCATION.--Lat 36°33'54", long 76°06'14", Hydrologic Unit 03010205, 0.2 mi south of Baum Road, 0.25 mi west of Craggs Causeway in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 76 ft, screened 66 to 76 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 10 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--July 1979 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.18 ft below land-surface datum, Apr. 30, 1980; lowest measured, 6.68 ft below land-surface datum, Nov. 28, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	5.10	JAN 11	4.50	MAR 13	2.75	APR 25	2.45	JUN 21	3.35	AUG 17	2.85
NOV 16	5.10										

WATER YEAR 1989 HIGHEST 2.45 APR 25, 1989 LOWEST 5.10 OCT 17, NOV 16, 1988

363537076061002. Local number, 62A 3 SOW 097B.

LOCATION.--Lat 36°33'54", long 76°06'14", Hydrologic Unit 03010205, 0.2 mi south of Baum Road, 0.25 mi west of Craggs Causeway in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 24 ft, screened 20 to 24 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 10 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.5 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--July 1979 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.59 ft below land-surface datum, Feb. 16, 1983; lowest measured, 6.50 ft below land-surface datum, Oct. 17, 1983.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	5.55	JAN 11	2.00	MAR 13	0.90	APR 25	1.65	JUN 21	2.30	AUG 17	2.00
NOV 16	4.80										

WATER YEAR 1989 HIGHEST 0.90 MAR 13, 1989 LOWEST 5.55 OCT 17, 1988

CITY OF VIRGINIA BEACH--Continued

364126076003501. Local number, 62B 1 SOW 098A.

LOCATION.--Lat 36°41'26", long 76°00'35", Hydrologic Unit 03010205, on north side of Pleasant Ridge Road at the Virginia Department of Transportation shop, 0.9 mi east of Pleasant Ridge in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 24 ft, screened 20 to 24 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 10 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.8 ft above land-surface datum prior to Mar. 2, 1988; 1.05 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1979 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.45 ft below land-surface datum, Jan. 11, Aug. 17, 1989; lowest measured, 11.95 ft below land-surface datum, Sept. 16, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	4.65	JAN 11	1.45	MAR 13	1.55	APR 25	2.35	JUN 21	3.45	AUG 17	1.45
NOV 16	3.35										
WATER YEAR 1989		HIGHEST	1.45	JAN 11, AUG 17, 1989		LOWEST	4.65	OCT 17, 1988			

364126076003502. Local number, 62B 2 SOW 098B.

LOCATION.--Lat 36°41'26", long 76°00'35", Hydrologic Unit 03010205, on north side of Pleasant Ridge Road at the Virginia Department of Transportation shop, 0.9 mi east of Pleasant Ridge in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 98 ft, screened 88 to 98 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 10 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.8 ft above land-surface datum prior to Mar. 2, 1988; 1.2 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--June 1979 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1.70 ft below land-surface datum, Mar. 13, 1989; lowest measured, 11.76 ft below land-surface datum, Sept. 16, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	4.60	JAN 11	2.80	MAR 13	1.70	APR 25	2.10	JUN 21	3.35	AUG 17	2.60
NOV 16	2.60										
WATER YEAR 1989		HIGHEST	1.70	MAR 13, 1989		LOWEST	4.60	OCT 17, 1988			

364713076030701. Local number, 62C 2 SOW 092A.

LOCATION.--Lat 36°47'15", long 76°03'08", Hydrologic Unit 03010205, at entrance to Oceana Naval Air Station on London Bridge Road in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand and shell of the Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 102 ft, screened 97 to 102 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.08 ft above land-surface datum prior to Mar. 2, 1988; 0.7 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--December 1977 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.00 ft below land-surface datum, Dec. 1, 1977; lowest measured, 15.29 ft below land-surface datum, July 17, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	12.76	JAN 31	11.87	MAR 02	10.70	APR 27	10.10	JUN 20	10.80	AUG 03	12.60
WATER YEAR 1988		HIGHEST	10.10	APR 27, 1988		LOWEST	12.76	NOV 19, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	13.20	JAN 11	12.00	MAR 13	10.40	APR 20	9.40	JUN 21	11.40	AUG 17	11.00
NOV 16	12.40										
WATER YEAR 1989		HIGHEST	9.40	APR 20, 1989		LOWEST	13.20	OCT 17, 1988			

GROUND-WATER LEVELS

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CITY OF VIRGINIA BEACH--Continued

364715076030801. Local number, 62C 3 SOW 092B.

LOCATION.--Lat 36°47'15", long 76°03'08", Hydrologic Unit 03010205, at entrance to Oceana Naval Air Station on London Bridge Road in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 58 ft, screened 53 to 58 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.05 ft above land-surface datum prior to Mar. 2, 1988; 0.9 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1978 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.36 ft below land-surface datum, Feb. 16, 1983; lowest measured, 11.07 ft below land-surface datum, Aug. 6, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	10.20	JAN 11	9.10	MAR 13	5.10	APR 20	5.10	JUN 21	8.40	AUG 17	5.70
NOV 16	9.30										

WATER YEAR 1989 HIGHEST 5.10 MAR 13, APR 20, 1989 LOWEST 10.20 OCT 17, 1988

364711076060001. Local number, 62C 4 SOW 083.

LOCATION.--Lat 36°47'11", long 76°06'00", Hydrologic Unit 03010205, 0.3 mi northeast of State Highway 165, 3.5 mi northwest of Princess Anne, and in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Miocene-Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 149 ft, screened 118 to 128 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 13 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.8 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March 1978 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.10 ft below land-surface datum, Feb. 20, 1980; lowest measured, 14.87 ft below land-surface datum, July 17, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	12.40	DEC 19	11.05	MAR 14	9.30	APR 20	8.30	JUN 21	10.10	AUG 10	10.70
NOV 16	11.50	JAN 11	10.80								

WATER YEAR 1989 HIGHEST 8.30 APR 20, 1989 LOWEST 12.40 OCT 17, 1988

364504076031301. Local number, 62C 5 SOW 093.

LOCATION.--Lat 36°45'04", long 76°03'13", Hydrologic Unit 03010205, 200 ft southeast of intersection of State Highways 149 and 165 in Princess Anne, in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 65 ft, screened 60 to 65 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 7 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.91 ft above land-surface datum prior to Mar. 2, 1988; 0.6 ft thereafter.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--February 1978 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.84 ft below land-surface datum, Feb. 8, 1978; lowest measured, 7.88 ft below land-surface datum, Nov. 12, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	7.40	JAN 11	6.30	MAR 13	4.65	APR 20	4.40	JUN 21	6.50	AUG 10	6.50
NOV 16	6.60										

WATER YEAR 1989 HIGHEST 4.40 APR 20, 1989 LOWEST 7.40 OCT 17, 1988

GROUND-WATER LEVELS

CITY OF VIRGINIA BEACH--Continued

365158076030401. Local number, 62C 6 SOW 125.

LOCATION.--Lat 36°51'58", long 76°03'04", Hydrologic Unit 02080108, at Trantwood Elementary School in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 4 in., depth 57 ft, screened 52 to 57 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.1 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1978 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.86 ft below land-surface datum, Feb. 28, 1979; lowest measured, 11.19 ft below land-surface datum, July 17, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	9.75	JAN 12	9.50	MAR 13	7.45	APR 26	7.35	JUN 21	8.40	AUG 11	8.30
NOV 16	9.30										

WATER YEAR 1989 HIGHEST 7.35 APR 26, 1989 LOWEST 9.75 OCT 17, 1988

364906076043901. Local number, 62C 7 SOW 126.

LOCATION.--Lat 36°49'06", long 76°04'39", Hydrologic Unit 02080108, at Plaza Elementary School in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 6 in., depth 67 ft, screened 55 to 60 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 5 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.1 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1978 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.84 ft below land-surface datum, Feb. 16, 1983; lowest measured, 7.32 ft below land-surface datum, July 17, 1986, Nov. 19, 1987.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	6.75	JAN 11	5.80	MAR 13	3.45	APR 25	4.10	JUN 21	5.20	AUG 17	4.00
NOV 16	6.00										

WATER YEAR 1989 HIGHEST 3.45 MAR 13, 1989 LOWEST 6.75 OCT 17, 1988

364745076004301. Local number, 62C 9 SOW 172A.

LOCATION.--Lat 36°47'45", long 76°00'43", Hydrologic Unit 03010205, at the end of Phantom Boulevard, 0.25 mi south of Harpers Road and Oceana Naval Air Station in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Miocene-Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 3 in., depth 170 ft, screened 155 to 165 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 17 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.6 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1984 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.46 ft below land-surface datum, Apr. 25, 1984; lowest measured, 12.37 ft below land-surface datum, Aug. 6, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	11.00	JAN 11	10.40	MAR 13	8.45	APR 20	7.80	JUN 21	9.90	AUG 17	9.60
NOV 16	10.50										

WATER YEAR 1989 HIGHEST 7.80 APR 20, 1989 LOWEST 11.00 OCT 17, 1988

GROUND-WATER LEVELS

525

CITY OF VIRGINIA BEACH--Continued

364745076004302. Local number, 62C 10 SOW 172B.

LOCATION.--Lat 36°47'45", long 76°00'43", Hydrologic Unit 03010205, at the end of Phantom Boulevard, 0.25 mi south of Harpers Road and Oceana Naval Air Station in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Miocene-Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 3 in., depth 280 ft, screened 270 to 280 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 17 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.8 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1984 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.98 ft below land-surface datum, Apr. 25, 1984; lowest measured, 12.75 ft below land-surface datum, Aug. 6, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	11.30	JAN 11	10.70	MAR 13	8.90	APR 20	8.40	JUN 21	10.30	AUG 17	10.20
NOV 16	10.90										

WATER YEAR 1989 HIGHEST 8.40 APR 20, 1989 LOWEST 11.30 OCT 17, 1988

364745076004303. Local number, 62C 11 SOW 172C.

LOCATION.--Lat 36°47'45", long 76°00'43", Hydrologic Unit 03010205, at the end of Phantom Boulevard, 0.25 mi south of Harpers Road and Oceana Naval Air Station in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well; diameter 3 in., depth 35 ft, screened 20 to 30 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 17 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.7 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--May 1984 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.40 ft below land-surface datum, Apr. 20, 1989; lowest measured, 8.20 ft below land-surface datum, Nov. 19, 1987, June 21, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	8.20	JAN 13	6.95	MAR 02	6.80	APR 27	6.52	JUN 20	7.08	AUG 03	7.50

WATER YEAR 1988 HIGHEST 6.52 APR 27, 1988 LOWEST 8.20 NOV 19, 1987

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	7.80	JAN 11	7.30	MAR 13	5.45	APR 20	5.40	JUN 21	8.20	AUG 17	5.50
NOV 16	7.50										

WATER YEAR 1989 HIGHEST 5.40 APR 20, 1989 LOWEST 8.20 JUN 21, 1989

364745076004304. Local number, 62C 12 SOW 172D.

LOCATION.--Lat 36°47'45", long 76°00'43", Hydrologic Unit 03010205, at the end of Phantom Boulevard, 0.25 mi south of Harpers Road and Oceana Naval Air Station in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 3 in., depth 75 ft, screened 60 to 70 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 17 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.9 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1984 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.56 ft below land-surface datum, Apr. 25, 1984; lowest measured, 7.99 ft below land-surface datum, July 17, 1986.

GROUND-WATER LEVELS

CITY OF VIRGINIA BEACH--Continued

364745076004304. Local number, 62C 12 SOW 172D--Continued

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	7.58	JAN 13	6.15	MAR 02	5.58	APR 27	5.28	JUN 20	6.12	AUG 03	6.85
WATER YEAR 1988		HIGHEST	5.28	APR 27, 1988		LOWEST	7.58	NOV 19, 1987			

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	7.20	JAN 11	6.70	MAR 13	4.00	APR 20	3.80	JUN 21	6.40	AUG 17	4.30
WATER YEAR 1989		HIGHEST	3.80	APR 20, 1989		LOWEST	7.20	OCT 17, 1988			

364613075583201. Local number, 63C 2 SOW 100B.

LOCATION.--Lat 36°46'13", long 75°58'32", Hydrologic Unit 03010205, at Hampton Roads Sanitary District sludge disposal site off Old Dam Neck Road, 1.7 mi southeast of intersection of Oceana Boulevard and Old Dam Neck Road in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well; diameter 1.25 in., depth 54 ft, screened 49 to 54 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 8 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.85 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--March 1981 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.33 ft below land-surface datum, Mar. 26, 1983; lowest measured, 10.58 ft below land-surface datum, Mar. 20, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	7.65	NOV 29	6.96	MAR 13	4.79	MAY 09	5.15	JUL 24	4.86
WATER YEAR 1989		HIGHEST	4.79	MAR 13, 1989		LOWEST	7.65	OCT 17, 1988	

364613075583202. Local number, 63C 3 SOW 100C.

LOCATION.--Lat 36°46'13", long 75°58'32", Hydrologic Unit 03010205, at Hampton Roads Sanitary District sludge disposal site off Old Dam Neck Road, 1.7 mi southeast of intersection of Oceana Boulevard and Old Dam Neck Road in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 1.25 in., depth 35 ft, screened 30 to 35 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 8 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.63 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1981 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.79 ft below land-surface datum, Feb. 16, Apr. 20, 1983; lowest measured, 12.35 ft below land-surface datum, Apr. 20, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	7.14	NOV 29	6.52	MAR 13	4.03	MAY 09	4.75	JUL 24	5.31
WATER YEAR 1989		HIGHEST	4.03	MAR 13, 1989		LOWEST	7.14	OCT 17, 1989	

GROUND-WATER LEVELS

527

CITY OF VIRGINIA BEACH--Continued

364722075591801. Local number, 63C 4 SOW 173A.

LOCATION.--Lat 36°47'22", long 75°59'18", Hydrologic Unit 02080108, at Redwing Park, 0.7 mi northeast of intersection of Oceana Boulevard and Dam Neck Road in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Miocene-Pliocene age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 3 in., depth 291 ft, screened 281 to 291 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 8 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.8 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1984 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.10 ft below land-surface datum, June 21, 1989; lowest measured, 4.63 ft below land-surface datum, Nov. 12, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	4.40	JAN 11	4.40	MAR 13	3.90	APR 20	3.90	JUN 21	3.10	AUG 17	3.80
NOV 16	4.40										

WATER YEAR 1989 HIGHEST 3.10 JUN 21, 1989 LOWEST 4.40 OCT 17, NOV 16, 1988, JAN 11, 1989

364722075591802. Local number, 63C 5 SOW 173B.

LOCATION.--Lat 36°47'22", long 75°59'18", Hydrologic Unit 02080108, at Redwing Park, 0.7 mi northeast of intersection of Oceana Boulevard and Dam Neck Road in Virginia Beach. Owner: Virginia Water Control Board.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 3 in., depth 95 ft, screened 80 to 90 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 9 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.9 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--April 1984 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.00 ft below land-surface datum, Apr. 20, 1989; lowest measured, 7.63 ft below land-surface datum, Aug. 6, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	5.20	JAN 11	4.20	MAR 13	2.40	APR 20	2.00	JUN 21	4.60	AUG 17	4.30
NOV 16	4.40										

WATER YEAR 1989 HIGHEST 2.00 APR 20, 1989 LOWEST 5.20 OCT 17, 1988

WESTMORELAND COUNTY

381110076550501. Local number, 55P 5.

LOCATION.--Lat 38°11'10", long 76°55'05", Hydrologic Unit 02070011, behind craft shop at George Washington Birthplace National Monument, 3.8 mi southeast of Colonial Beach. Owner: National Park Service.

AQUIFER.--Sand of undifferentiated Cretaceous age.

WELL CHARACTERISTICS.--Drilled observation water well, diameter 6 in., depth 471 ft, screened 451 to 466 ft.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 24 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of recorder shelf, 3.0 ft above land-surface datum.

PERIOD OF RECORD.--June 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 25.05 ft below land-surface datum, June 24, 1974; lowest recorded, 41.64 ft below land-surface datum, Sept. 30, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	40.51	40.38	40.66	40.54	40.28	39.97	39.95	40.04	40.34	40.32	40.86	41.16
10	40.62	40.65	40.38	40.46	40.52	39.88	40.06	39.86	40.44	40.47	41.01	41.24
15	41.01	40.59	40.20	40.39	40.33	39.77	39.83	39.87	40.32	40.50	41.17	41.39
20	40.82	40.47	40.45	40.35	40.23	40.23	39.87	39.88	40.38	40.22	41.08	41.25
25	40.62	40.56	40.37	40.36	40.27	39.85	39.97	39.93	40.34	40.42	41.01	41.49
EOM	40.69	40.50	40.36	40.27	40.07	39.71	40.01	40.26	40.39	40.90	41.26	41.64

WATER YEAR 1989 HIGHEST 39.29 MAR 12, 1989 LOWEST 41.64 SEP 30, 1989

GROUND-WATER LEVELS

WESTMORELAND COUNTY--Continued

381132076551001. Local number, 55P 9.

LOCATION.--Lat 38°11'32", long 76°55'10", Hydrologic Unit 02070011, at George Washington Birthplace National Monument, 500 ft east of park road, 0.6 mi north of the end of State Highway 204, and 3.4 mi southeast of Colonial Beach. Owner: National Park Service.

AQUIFER.--Sand of Quaternary age.

WELL CHARACTERISTICS.--Dug unused water well, diameter 36 in., depth 22.6 ft.

INSTRUMENTATION.--Monthly measurements with chalked tape by USGS personnel.

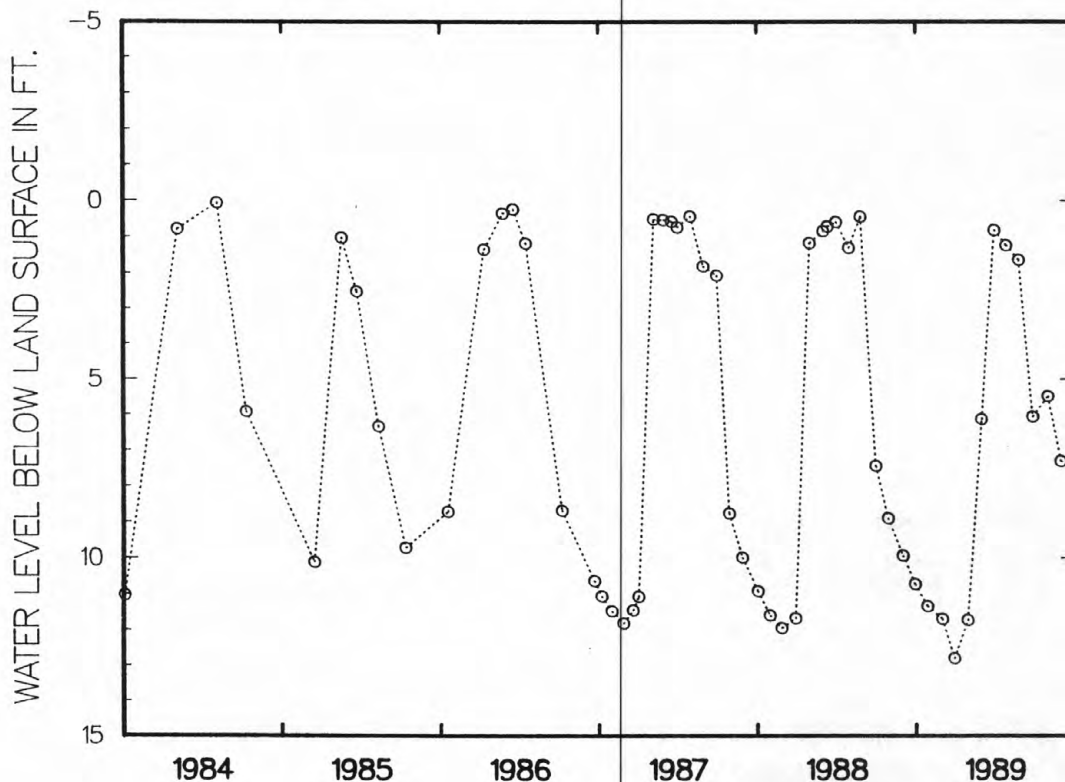
DATUM.--Elevation of land-surface datum is 17 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of concrete lip on casing, 1.65 ft above land-surface datum.

PERIOD OF RECORD.--July 1977 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.11 ft below land-surface datum, Oct. 11, 1979; lowest measured, 12.80 ft below land-surface datum, Dec. 27, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	11.35	DEC 27	12.80	FEB 28	6.14	APR 26	1.24	JUN 26	6.07	AUG 29	7.31
NOV 29	11.70	JAN 27	11.73	MAR 30	.82	MAY 25	1.64	JUL 31	5.49	SEP 28	7.46
WATER YEAR 1989		HIGHEST .82 MAR 30, 1989		LOWEST 12.80 DEC 27, 1988							



380538076490801. Local number, 56N 1 SOW 016.

LOCATION.--Lat 38°05'38", long 76°49'08", Hydrologic Unit 02080104, at Washington and Lee School, 0.5 mi east of Montross. Owner: Westmoreland County Public Schools.

AQUIFER.--Sand of undifferentiated Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 4 in. to 189 ft, 2 in. from 189 to 641 ft, depth 641 ft, screened 608 to 628 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 149 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--August 1967 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 133.47 ft below land-surface datum, Aug. 28, 1967; lowest measured, 157.20 ft below land-surface datum, Jan. 28, 1980.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 15	156.33	FEB 28	155.82	APR 18	155.63	JUN 14	156.31	AUG 02	156.54	SEP 25	156.47
JAN 04	155.97										
WATER YEAR 1989		HIGHEST 155.63 APR 18, 1989		LOWEST 156.54 AUG 02, 1989							

GROUND-WATER LEVELS

529

CITY OF WILLIAMSBURG

371610076423001. Local number, 57G 31.

LOCATION.--Lat 37°16'10", long 76°42'30", Hydrologic Unit 02080206, on the campus of the College of William and Mary in the old powerplant, 200 ft west of the intersection of Boundary Street and State Highways 5 and 31 (Francis Street), 500 ft south of intersection of State Highways 5 and 31 (Jamestown Road) and Boundary Street, and in the city of Williamsburg. Owner: College of William and Mary.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 10 in. to 261 ft, diameter 8 in. from 158 to 442 ft, depth 442 ft, screened 395 to 432 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurements with chalked tape.

DATUM.--Elevation of land-surface datum is 80 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.47 ft above land-surface datum.

PERIOD OF RECORD.--July 1924, September 1978, September 1983 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 60.00 ft below land-surface datum, July 1924; lowest measured, 149.00 ft below land-surface datum, July 17, 1985.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 08	137.38

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 12	141.43	MAR 20	140.37	JUN 20	143.10	SEP 18	145.94
WATER YEAR 1989 HIGHEST 140.37 MAR 20, 1989 LOWEST 145.94 SEP 18, 1989							

YORK COUNTY

371916076375901. Local number, 57G 2.

LOCATION.--Lat 37°19'16", long 76°37'59", Hydrologic Unit 02080107, at Building 3101 on Camp Peary Naval Reservation, 3.3 mi northeast of Williamsburg. Owner: U.S. Department of the Navy.

AQUIFER.--Sand and gravel of undifferentiated Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 10 in. to 352 ft, diameter 8 in. from 352 to 387 ft, depth 387 ft, screen depth unknown.

INSTRUMENTATION.--Digital recorder--60-minute punch.

DATUM.--Elevation of land-surface datum is 15 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.2 ft above land-surface datum.

PERIOD OF RECORD.--January 1968 to current year.

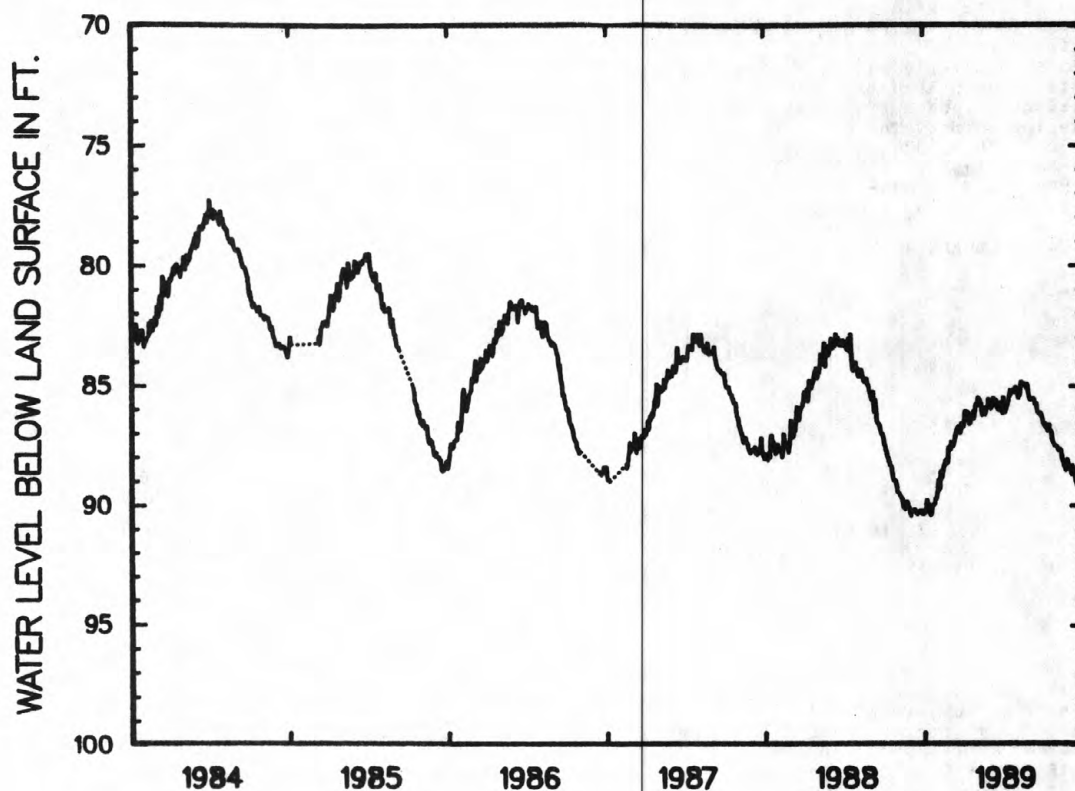
EXTREMES FOR PERIOD OF RECORD.--Highest water level recorded, 43.09 ft below land-surface datum, Mar. 7, 1968; lowest recorded, 90.51 ft below land-surface datum, Aug. 29, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
LOWEST VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	89.78	88.91	87.58	86.35	85.80	85.83	86.16	85.58	85.58	86.58	87.66	88.35
10	90.01	88.77	87.00	86.64	86.31	85.78	85.85	84.93	85.61	86.87	87.68	88.74
15	90.40	88.33	86.77	86.26	86.10	85.75	85.40	84.99	85.72	86.87	88.21	89.22
20	89.97	88.07	86.94	86.07	86.02	86.07	85.27	84.95	86.15	87.05	88.34	89.02
25	89.70	87.70	86.59	85.87	85.77	85.88	85.32	85.01	86.14	87.46	88.09	89.26
EOM	89.26	87.63	86.36	85.49	85.69	85.47	85.30	85.65	86.57	87.56	88.50	89.22
WATER YEAR 1989 HIGHEST 83.95 MAY 24, 1989 LOWEST 90.46 OCT 14, 1988												

GROUND-WATER LEVELS
YORK COUNTY--Continued

371916076375901. Local number, 57G 2--Continued



371654076401601. Local number, 57G 17 SOW 068.

LOCATION.--Lat 37°16'54", long 76°40'16", Hydrologic Unit 02080107, 0.05 mi east of State Highway 716 at Parkway Estates, 0.5 mi east of Williamsburg. Owner: Sydnor Hydrodynamics.

AQUIFER.--Sand of undifferentiated Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 8 in., depth 452.3 ft, screened 411 to 426 ft, 442.2 to 452.3 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 60 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.85 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--November 1972 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 106.09 ft below land-surface datum, Nov. 22, 1972; lowest measured, 148.26 ft below land-surface datum, Aug. 11, 1986.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	147.15	JAN 13	138.05	MAR 01	136.55	APR 26	136.55	JUN 27	140.95	AUG 03	141.25
NOV 29	138.95										
WATER YEAR 1989		HIGHEST	136.55	MAR 01, APR 26, 1989		LOWEST	147.15	OCT 19, 1988			

GROUND-WATER LEVELS

531

YORK COUNTY--Continued

371735076391501. Local number, 57G 19 SOW 069.

LOCATION.--Lat 37°17'35", long 76°39'15", Hydrologic Unit 02080107, 250 ft east of State Highway 716 at Queens Lake Subdivision, 1.6 mi east of Williamsburg. Owner: Sydnor Hydrodynamics.

AQUIFER.--Sand of undifferentiated Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 6 in., depth 515 ft, screened 420 to 430 ft, 445 to 460 ft, 505 to 515 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 64 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.1 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--November 1972 to current year. Unpublished records available prior to October 1985 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 109.95 ft below land-surface datum, Nov. 29, 1972; lowest measured, 136.40 ft below land-surface datum, Oct. 19, 1988.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	136.40	JAN 13	132.30	MAR 01	131.20	APR 26	130.30	JUN 27	133.30	AUG 03	133.50
NOV 29	132.70										

WATER YEAR 1989 HIGHEST 130.30 APR 26, 1989 LOWEST 136.40 OCT 19, 1988

371853076421501. Local number, 57G 59.

LOCATION.--Lat 37°18'53", long 76°42'00", Hydrologic Unit 02080206, 0.25 mi southeast of State Highway 645 in Waller Mill Park, 2.6 mi northeast of the intersection of U.S. Highway 60 (Richmond Road) and State Highway 645 (Airport Road), and 3.1 mi north of the city of Williamsburg. Owner: City of Williamsburg.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled withdrawal water well, diameter 4 in., depth 470 ft, screened 450 to 470 ft.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurements with chalked tape.

DATUM.--Elevation of land-surface datum is 74 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 1.0 ft above land-surface datum.

PERIOD OF RECORD.--December 1971, November 1984 to current year. Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 101.87 ft below land-surface datum, Mar. 16, 1986; lowest measured, 120.00 ft below land-surface datum, Dec. 7, 1971.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL
MAR 04	104.01	MAR 14	104.00

WATER YEAR 1988 HIGHEST 104.00 MAR 14, 1988 LOWEST 104.01 MAR 04, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 13	107.12	MAR 20	112.65	JUN 20	105.95	SEP 18	115.67

WATER YEAR 1989 HIGHEST 105.95 JUN 20, 1989 LOWEST 115.67 SEP 18, 1989

GROUND-WATER LEVELS

YORK COUNTY--Continued

371601076343501. Local number, 58G 2.

LOCATION.--Lat 37°16'01", long 76°34'35", Hydrologic Unit 02080107, 3.2 mi northwest of the intersection of State Highway 238 and Main Road at Gate 1 on the Yorktown Naval Weapons Station in Lackey. Owner: U.S. Department of the Navy.

AQUIFER.--Sand of late Cretaceous age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 18 in., depth 445 ft, screen depth unknown.

INSTRUMENTATION.--Quarterly measurement with chalked tape by USGS personnel. Prior to Dec. 1, 1988, occasional measurements with chalked tape.

DATUM.--Elevation of land-surface datum is 10 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 0.7 ft above land-surface datum.

PERIOD OF RECORD.--August 1918, December 1971, December 1983 to July 1985, February 1987 to current year.

Unpublished records available prior to October 1987 in files of the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 61.41 ft below land-surface datum, Dec. 7, 1971; highest reported, 2 ft above land-surface datum, Aug. 1, 1918; lowest measured, 95.40 ft below land-surface datum, Sept. 18, 1989.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAR 14	83.16

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 12	89.37	MAR 20	92.69	JUN 20	88.34	SEP 18	95.40

WATER YEAR 1989 HIGHEST 88.34 JUN 20, 1989 LOWEST 95.40 SEP 18, 1989

371535076373501. Local number, 59F 1 SOW 027.

LOCATION.--Lat 37°13'04", long 76°29'19", Hydrologic Unit 02080107, at U.S. Naval Supply Center, 1.6 mi southeast of Yorktown. Owner: U.S. Naval Supply Center.

AQUIFER.--Chickahominy-Piney Point aquifer of Eocene-Oligocene age.

WELL CHARACTERISTICS.--Drilled unused water well, diameter 10 in., depth 446 ft, screened 421 to 446 ft.

INSTRUMENTATION.--Bimonthly measurement with chalked tape by Virginia Water Control Board personnel.

DATUM.--Elevation of land-surface datum is 50 ft above National Geodetic Vertical Datum of 1929, from topographic map. Measuring point: Top of casing, 2.8 ft above land-surface datum.

REMARKS.--Records provided by the Virginia Water Control Board.

PERIOD OF RECORD.--October 1969 to current year. Unpublished records available prior to October 1987 in files of the Virginia Water Control Board.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 40.00 ft below land-surface datum, Oct. 27, 1969; lowest measured, 44.69 ft below land-surface datum, July 9, 1981.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20	42.85	JAN 19	43.00	MAR 07	42.71	MAY 11	43.05	JUN 22	42.95	AUG 24	43.02

WATER YEAR 1988 HIGHEST 42.71 MAR 07, 1988 LOWEST 43.05 MAY 11, 1988

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	43.10	JAN 19	43.15	MAR 02	42.90	APR 27	42.60	JUN 27	43.00	AUG 02	42.60
NOV 30	43.05										

WATER YEAR 1989 HIGHEST 42.60 APR 27, AUG 02, 1989 LOWEST 43.15 JAN 19, 1989

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

LOCAL IDENTIFIER				GEO-LOGIC UNIT	DATE	DEPTH BELOW LAND SURFACE (WATER LEVEL) (FEET)	DEPTH OF WELL, TOTAL (FEET)	DEPTH TO BOTTOM OF SAMPLE INTER-VAL (FT)	DEPTH TO TOP OF SAMPLE INTER-VAL (FT)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD)	SPECIFIC CONDUCTANCE (US/CM)
ACCOMACK COUNTY											
64H 7 SOW 102B	372905075474001	121CSPKU	03-01-89	3.25	220.00	220	210	6.0	1500		
64H 6 SOW 102A	372905075474002	121CSPKU	03-01-89	2.82	154.00	154	144	6.0	510		
64H 5 SOW 102C	372922076470101	121CSPKU	03-01-89	3.98	306.00	306	296	6.0	70000		
64J 36	373511075483501	121CSPKU	02-02-89	--	230.00	230	215	32.0	385		
65K 42	373750075441501	121CSPKU	02-01-89	--	225.00	225	210	41.0	255		
64K 7 SOW 106C	373845075522501	121CSPKU	03-02-89	1.27	176.00	176	166	3.0	1400		
64K 8 SOW 106B	373845075522503	121CSPKU	03-02-89	1.08	95.00	95	85	3.0	480		
64K 21	374029075492501	121CSPKU	02-02-89	--	185.00	185	170	6.0	340		
66K 6	374249075362901	121CSPKU	02-03-89	--	215.00	210	200	6.0	340		
64L 1	374559075451501	121CSPKU	02-02-89	--	135.00	135	115	5.0	700		
65L 12	374809075381801	121CSPKU	02-02-89	--	220.00	220	200	36.0	240		
65L 9	374931075390801	121CSPKU	02-02-89	--	155.00	155	140	3.0	250		
66M 39	375623075301901	121CSPKU	02-02-89	--	180.00	180	165	25.0	340		
NORTHAMPTON COUNTY											
63G 43	371620075581501	121CSPKU	03-03-89	--	215.00	215	110	15.0	265		
63G 23 SOW 111B	371653075584802	121CSPKU	03-01-89	12.15	280.00	280	270	15.0	290		
63G 24 SOW 111C	371653075584803	121CSPKU	03-01-89	13.92	330.00	330	330	15.0	2000		
63G 15 SOW 104C	371709075560801	121CSPKU	02-28-89	20.35	310.00	310	300	28.0	570		
63G 16 SOW 104B	371709075560802	121CSPKU	02-28-89	17.60	240.00	240	230	28.0	190		
63G 17 SOW 104A	371709075560803	121CSPKU	02-28-89	16.20	140.00	140	130	28.0	285		
63G 45	371740075555901	121CSPKU	02-03-89	--	170.00	170	155	27.0	265		
63G 40	371930075563901	121CSPKU	02-03-89	--	175.00	175	160	35.0	260		
63H 4 SOW 103C	372705075555901	121CSPKU	03-02-89	11.93	235.00	235	225	17.0	1500		
63H 5 SOW 103B	372705075555902	121CSPKU	03-02-89	11.67	132.00	132	122	17.0	360		
63H 12	372832075531201	121CSPKU	02-03-89	--	150.00	150	135	20.0	240		
64J 39	373013075510701	121CSPKU	03-03-89	--	175.00	175	160	32.0	210		
64J 33	373058075482301	121CSPKU	03-03-89	--	160.00	160	145	10.0	400		
YORK COUNTY											
59F 7	370838076261801	121CSPKU	08-30-89	--	118.00	118	88	15.0	710		
59F 17	370854076250101	121CSPKU	08-31-89	--	120.00	120	80	5.0	640		
59F 15	370925076254401	121CSPKU	08-31-89	--	120.00	120	80	10.0	1200		
59F 16	370937076253901	121CSPKU	08-31-89	--	120.00	120	80	10.0	1550		
59F 11	370942076245701	121CSPKU	08-30-89	--	115.00	115	80	10.0	790		
59F 25	370955076262101	121CSPKU	08-30-89	--	115.00	115	95	10.0	485		
59F 44	371021076243101	121CSPKU	08-30-89	--	130.00	--	--	5.0	1750		
59F 47	371021076245101	121CSPKU	08-29-89	--	130.00	130	90	7.0	1550		
59F 45	371022076243401	121CSPKU	08-29-89	--	110.00	--	--	5.0	1850		
59F 49	371031076255901	121CSPKU	08-30-89	--	110.00	110	90	10.0	1450		
59F 43	371032076244701	121CSPKU	08-30-89	--	90.00	--	--	5.0	1750		
59F 22	371037076253701	121CSPKU	08-31-89	--	120.00	120	80	10.0	1500		
59F 30	371038076261601	121CSPKU	08-29-89	--	110.00	110	65	7.0	1100		
59F 31	371038076261602	121CSPKU	08-30-89	--	95.00	--	--	7.0	1300		
59F 42	371051076250101	121CSPKU	08-29-89	--	22.00	--	--	5.0	1100		
59F 41	371053076252401	110QRNR	08-31-89	--	12.00	--	--	7.0	920		
59F 52	371056076242901	121CSPKU	08-31-89	--	95.00	95	65	5.0	550		
CITY OF CHESAPEAKE											
61B 2 SOW 091A	364227076074701	121CSPKU	03-22-89	7.58	97.00	97	92	15.0	1650		
61B 5 SOW 091B	364227076074702	211CRCSU	03-21-89	48.21	1060.00	1060	1040	15.0	6000		
61B 6 SOW 091C	364227076074703	000SAND	03-21-89	5.48	780.00	780	760	15.0	80000		
61B 7 SOW 091D	364227076074704	110QRNR	03-22-89	1.06	22.00	22	17	15.0	200		
61B 12	364227076074706	217PTXN	03-07-89	37.28	1831.00	1830	1820	15.0	>8000		
61B 13	364227076074707	217PPSC	03-07-89	55.62	1390.00	1380	1370	15.0	9000		
61B 14	364227076074708	211CRCSU	03-08-89	51.32	1113.00	1100	1090	15.0	6000		
61B 15	364227076074709		03-08-89	--	790.00	769	759	15.0	7000		
61B 16	364227076074710		03-09-89	--	690.00	680	670	15.0	8000		
61B 17	364227076074711	121CSPKU	03-09-89	5.92	108.00	98	88	15.0	1500		
61B 18	364227076074712	110QRNR	03-22-89	6.70	67.00	67	57	15.0	300		
61B 19	364227076074713	110QRNR	03-22-89	2.90	20.00	20	10	15.0	220		

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

LOCAL IDENT- IFIER	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH (STAND- ARD UNITS)	PH LAB (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
ACCOMACK COUNTY										
64H 7 SOW 102B	1600	8.00	--	16.5	--	--	--	--	--	--
64H 6 SOW 102A	524	7.60	--	16.0	--	--	--	--	--	--
64H 5 SOW 102C	7130	7.60	7.60	17.0	12	370	36	67	1200	45
64J 36	--	--	--	19.0	--	--	--	--	--	--
65K 42	--	--	--	15.0	--	--	--	--	--	--
64K 7 SOW 106C	1460	7.80	--	15.5	--	--	--	--	--	--
64K 8 SOW 106B	490	7.30	--	15.0	--	--	--	--	--	--
64K 21	--	--	--	19.0	--	--	--	--	--	--
66K 6	--	--	--	16.0	--	--	--	--	--	--
64L 1	--	--	--	18.0	--	--	--	--	--	--
65L 12	--	--	--	19.0	--	--	--	--	--	--
65L 9	--	--	--	19.0	--	--	--	--	--	--
66M 39	--	--	--	17.0	--	--	--	--	--	--
NORTHAMPTON COUNTY										
63G 43	--	--	--	14.0	--	--	--	--	--	--
63G 23 SOW 111B	299	7.70	--	16.0	--	--	--	--	--	--
63G 24 SOW 111C	2440	7.50	7.80	17.0	25	220	32	35	330	22
63G 15 SOW 104C	637	7.80	--	15.5	--	--	--	--	--	--
63G 16 SOW 104B	240	7.70	--	15.5	--	--	--	--	--	--
63G 17 SOW 104A	260	7.50	--	14.5	--	--	--	--	--	--
63G 45	--	--	--	20.0	--	--	--	--	--	--
63G 40	--	--	--	15.0	--	--	--	--	--	--
63H 4 SOW 103C	1580	8.10	--	16.5	--	--	--	--	--	--
63H 5 SOW 103B	370	7.70	--	15.5	--	--	--	--	--	--
63H 12	--	--	--	14.0	--	--	--	--	--	--
64J 39	--	--	--	10.5	--	--	--	--	--	--
64J 33	--	--	--	11.0	--	--	--	--	--	--
YORK COUNTY										
59F 7	563	6.80	7.90	21.0	<1	74	19	6.5	93	7.0
59F 17	506	--	--	--	--	--	--	--	--	--
59F 15	826	7.10	--	23.0	--	--	--	--	--	--
59F 16	995	7.20	--	24.0	--	--	--	--	--	--
59F 11	626	7.20	7.70	23.0	<1	260	94	6.9	28	8.3
59F 25	393	7.30	8.00	25.5	<1	130	29	13	31	9.3
59F 44	1180	6.90	--	26.0	--	--	--	--	--	--
59F 47	1080	6.80	7.50	23.0	2	390	110	27	76	15
59F 45	1250	7.00	7.40	21.0	2	420	120	29	89	15
59F 49	989	7.10	--	25.0	--	--	--	--	--	--
59F 43	1240	6.90	--	25.0	--	--	--	--	--	--
59F 22	975	7.20	--	24.0	--	--	--	--	--	--
59F 30	774	7.00	7.80	26.0	2	180	39	19	91	13
59F 31	887	6.90	--	25.0	--	--	--	--	--	--
59F 42	681	7.10	7.40	25.0	2	310	110	8.5	39	4.7
59F 41	553	6.90	--	24.0	--	--	--	--	--	--
59F 52	401	7.20	--	25.0	--	--	--	--	--	--
CITY OF CHESAPEAKE										
61B 2 SOW 091A	1710	7.00	7.40	17.0	15	270	59	29	240	18
61B 5 SOW 091B	5740	8.00	7.90	18.5	4	87	15	12	1100	25
61B 6 SOW 091C	9100	7.60	7.60	18.0	4	200	25	33	1900	55
61B 7 SOW 091D	195	5.60	6.00	15.0	13	40	6.8	5.6	14	1.1
61B 12	40700	6.80	6.70	16.0	4	3300	960	230	8100	94
61B 13	14800	7.20	7.40	16.0	10	570	120	65	3000	43
61B 14	5880	7.70	7.90	18.0	22	110	21	13	1200	23
61B 15	7810	8.08	7.80	16.5	25	140	20	22	1700	39
61B 16	9190	7.40	7.60	17.0	7	210	31	33	1900	4.8
61B 17	1620	7.30	7.70	15.5	17	240	54	26	240	21
61B 18	278	6.50	6.90	16.0	95	87	27	4.8	21	3.3
61B 19	208	5.70	6.10	14.0	15	38	6.2	5.4	17	1.1

QUALITY OF GROUND WATER

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WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

LOCAL IDENT- IFIER	ALKA- LITY WAT WH TOT FET FIELD MG/L AS CACO3	ALKA- LITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
ACCOMACK COUNTY										
64H 7 SOW 102B	--	--	--	350	--	--	--	--	--	--
64H 6 SOW 102A	--	--	--	51	--	--	--	--	--	--
64H 5 SOW 102C	373	388	4.5	2000	0.70	15	3750	3600	<0.100	8.50
64J 36	--	--	--	18	--	--	--	--	--	--
65K 42	--	--	--	8.6	--	--	--	--	--	--
64K 7 SOW 106C	--	--	--	310	--	--	--	--	--	--
64K 8 SOW 106B	--	--	--	34	--	--	--	--	--	--
64K 21	--	--	--	17	--	--	--	--	--	--
66K 6	--	--	--	9.2	--	--	--	--	--	--
64L 1	--	--	--	69	--	--	--	--	--	--
65L 12	--	--	--	9.3	--	--	--	--	--	--
65L 9	--	--	--	7.5	--	--	--	--	--	--
66M 39	--	--	--	6.5	--	--	--	--	--	--
NORTHAMPTON COUNTY										
63G 43	--	--	--	11	--	--	--	--	--	--
63G 23 SOW 111B	--	--	--	9.0	--	--	--	--	--	--
63G 24 SOW 111C	221	224	18	630	0.50	15	1260	1220	<0.100	2.60
63G 15 SOW 104C	--	--	--	130	--	--	--	--	--	--
63G 16 SOW 104B	--	--	--	14	--	--	--	--	--	--
63G 17 SOW 104A	--	--	--	19	--	--	--	--	--	--
63G 45	--	--	--	15	--	--	--	--	--	--
63G 40	--	--	--	11	--	--	--	--	--	--
63H 4 SOW 103C	--	--	--	290	--	--	--	--	--	--
63H 5 SOW 103B	--	--	--	35	--	--	--	--	--	--
63H 12	--	--	--	11	--	--	--	--	--	--
64J 39	--	--	--	11	--	--	--	--	--	--
64J 33	--	--	--	14	--	--	--	--	--	--
YORK COUNTY										
59F 7	225	222	3.0	39	0.30	19	324	322	--	--
59F 17	--	--	--	30	--	--	--	--	--	--
59F 15	--	--	--	110	--	--	--	--	--	--
59F 16	--	--	--	160	--	--	--	--	--	--
59F 11	260	242	17	32	0.20	28	252	371	--	--
59F 25	185	174	6.0	24	0.40	18	231	242	--	--
59F 44	--	--	--	120	--	--	--	--	--	--
59F 47	291	295	120	88	0.20	23	592	635	--	--
59F 45	314	244	130	140	0.10	25	669	737	--	--
59F 49	--	--	--	100	--	--	--	--	--	--
59F 43	--	--	--	95	--	--	--	--	--	--
59F 22	--	--	--	91	--	--	--	--	--	--
59F 30	257	252	10	93	0.40	18	504	439	--	--
59F 31	--	--	--	110	--	--	--	--	--	--
59F 42	265	236	38	44	0.20	21	355	429	--	--
59F 41	--	--	--	36	--	--	--	--	--	--
59F 52	--	--	--	36	--	--	--	--	--	--
CITY OF CHESAPEAKE										
61B 2 SOW 091A	294	288	27	420	0.30	37	1070	1010	<0.100	1.20
61B 5 SOW 091B	453	463	120	1500	1.3	13	3050	3060	<0.100	2.20
61B 6 SOW 091C	617	727	160	2600	1.3	16	5050	5170	<0.100	5.90
61B 7 SOW 091D	64	62	12	24	0.10	20	159	137	<0.100	0.120
61B 12	113	88	580	17000	0.10	16	28600	27100	<0.100	3.50
61B 13	242	246	280	5000	0.40	13	8900	8680	<0.100	5.00
61B 14	429	442	130	1600	1.4	13	3310	3270	<0.100	2.80
61B 15	630	633	180	2100	1.3	11	4390	4460	<0.100	4.40
61B 16	716	727	180	2600	1.3	18	5160	5210	<0.100	5.00
61B 17	276	282	20	340	0.20	36	897	905	<0.100	1.10
61B 18	116	112	11	18	0.20	44	191	206	<0.100	0.320
61B 19	61	60	15	17	0.10	19	130	134	<0.100	0.080

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989

LOCAL IDENT- IFIER	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	BORON, DIS- SOLVED (UG/L AS B)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)
ACCOMACK COUNTY										
64H 7 SOW 102B	--	--	--	--	--	--	--	--	--	--
64H 6 SOW 102A	--	--	--	--	--	--	--	--	--	--
64H 5 SOW 102C	8.9	0.050	10	1700	340	270	<10	10	10	3.0
64J 36	--	--	--	--	--	--	--	--	--	--
65K 42	--	--	--	--	--	--	--	--	--	--
64K 7 SOW 106C	--	--	--	--	--	--	--	--	--	--
64K 8 SOW 106B	--	--	--	--	--	--	--	--	--	--
64K 21	--	--	--	--	--	--	--	--	--	--
66K 6	--	--	--	--	--	--	--	--	--	--
64L 1	--	--	--	--	--	--	--	--	--	--
65L 12	--	--	--	--	--	--	--	--	--	--
65L 9	--	--	--	--	--	--	--	--	--	--
66M 39	--	--	--	--	--	--	--	--	--	--
NORTHAMPTON COUNTY										
63G 43	--	--	--	--	--	--	--	--	--	--
63G 23 SOW 111B	--	--	--	--	--	--	--	--	--	--
63G 24 SOW 111C	2.6	0.070	20	500	1500	150	20	10	<10	1.8
63G 15 SOW 104C	--	--	--	--	--	--	--	--	--	--
63G 16 SOW 104B	--	--	--	--	--	--	--	--	--	--
63G 17 SOW 104A	--	--	--	--	--	--	--	--	--	--
63G 45	--	--	--	--	--	--	--	--	--	--
63G 40	--	--	--	--	--	--	--	--	--	--
63H 4 SOW 103C	--	--	--	--	--	--	--	--	--	--
63H 5 SOW 103B	--	--	--	--	--	--	--	--	--	--
63H 12	--	--	--	--	--	--	--	--	--	--
64J 39	--	--	--	--	--	--	--	--	--	--
64J 33	--	--	--	--	--	--	--	--	--	--
YORK COUNTY										
59F 7	--	<0.010	<10	170	<10	4	<10	1	11	1.1
59F 17	--	--	--	--	--	--	--	--	--	--
59F 15	--	--	--	--	--	--	--	--	--	--
59F 16	--	--	--	--	--	--	--	--	--	--
59F 11	--	0.020	<10	70	400	170	20	16	12	2.3
59F 25	--	<0.010	<10	160	100	7	<10	<1	140	0.5
59F 44	--	--	--	--	--	--	--	--	--	--
59F 47	--	<0.010	<10	160	1400	740	20	16	11	--
59F 45	--	0.010	10	140	900	710	<10	15	24	--
59F 49	--	--	--	--	--	--	--	--	--	--
59F 43	--	--	--	--	--	--	--	--	--	--
59F 22	--	--	--	--	--	--	--	--	--	--
59F 30	--	0.030	<10	340	1900	490	<10	7	6	--
59F 31	--	--	--	--	--	--	--	--	--	--
59F 42	--	<0.010	<10	70	5900	4400	30	35	14	--
59F 41	--	--	--	--	--	--	--	--	--	--
59F 52	--	--	--	--	--	--	--	--	--	--
CITY OF CHESAPEAKE										
61B 2 SOW 091A	1.2	0.250	20	470	5000	440	50	15	8	5.6
61B 5 SOW 091B	2.0	0.030	20	3600	760	110	20	20	20	0.5
61B 6 SOW 091C	6.4	0.110	20	6500	8200	280	40	10	<10	5.1
61B 7 SOW 091D	0.30	0.060	20	40	12000	15000	240	280	36	3.0
61B 12	8.9	0.020	<50	5200	15000	16000	3300	3400	420	0.7
61B 13	5.1	0.020	<20	5200	3900	3800	280	220	20	0.3
61B 14	2.8	0.030	<10	3500	800	650	40	40	<10	0.1
61B 15	4.3	0.190	30	6100	4500	790	50	10	<10	0.9
61B 16	5.2	0.020	<10	6000	740	430	10	<10	10	1.5
61B 17	1.4	0.160	<10	320	1000	470	20	12	6	4.9
61B 18	0.20	0.680	20	50	5000	5900	140	150	92	1.8
61B 19	<0.20	0.050	20	20	13000	14000	240	270	2000	2.4

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FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI).

Multiply inch-pound units	By	To obtain SI units
<i>Length</i>		
inches (in)	2.54×10^1	millimeters (mm)
	2.54×10^{-2}	meters (m)
feet (ft)	3.048×10^{-1}	meters (m)
miles (mi)	1.609×10^0	kilometers (km)
<i>Area</i>		
acres	4.047×10^3	square meters (m ²)
	4.047×10^{-1}	square hectometers (hm ²)
	4.047×10^{-3}	square kilometers (km ²)
square miles (mi ²)	2.590×10^0	square kilometers (km ²)
<i>Volume</i>		
gallons (gal)	3.785×10^0	liters (L)
	3.785×10^0	cubic decimeters (dm ³)
	3.785×10^{-3}	cubic meters (m ³)
million gallons	3.785×10^3	cubic meters (m ³)
	3.785×10^{-3}	cubic hectometers (hm ³)
cubic feet (ft ³)	2.832×10^1	cubic decimeters (dm ³)
	2.832×10^{-2}	cubic meters (m ³)
cfs-days	2.447×10^3	cubic meters (m ³)
	2.447×10^{-3}	cubic hectometers (hm ³)
acre-feet (acre-ft)	1.233×10^3	cubic meters (m ³)
	1.233×10^{-3}	cubic hectometers (hm ³)
	1.233×10^{-6}	cubic kilometers (km ³)
<i>Flow</i>		
cubic feet per second (ft ³ /s)	2.832×10^1	liters per second (L/s)
	2.832×10^1	cubic decimeters per second (dm ³ /s)
	2.832×10^{-2}	cubic meters per second (m ³ /s)
gallons per minute (gal/min)	6.309×10^{-2}	liters per second (L/s)
	6.309×10^{-2}	cubic decimeters per second (dm ³ /s)
	6.309×10^{-5}	cubic meters per second (m ³ /s)
million gallons per day	4.381×10^1	cubic decimeters per second (dm ³ /s)
	4.381×10^{-2}	cubic meters per second (m ³ /s)
<i>Mass</i>		
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

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