

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

# ***Low-Flow Statistics of Selected Streams in Chester County, Pennsylvania***

by Curtis L. Schreffler

**Water-Resources Investigations Report 98-4117**

prepared in cooperation with the

**CHESTER COUNTY WATER RESOURCES AUTHORITY**

Lemoyne, Pennsylvania  
1998

**U.S. DEPARTMENT OF THE INTERIOR**

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### CONVERSION FACTORS AND ABBREVIATIONS

<u>MULTIPLY</u>	<u>BY</u>	<u>TO OBTAIN</u>
<u>LENGTH</u>		
foot (ft)	0.3048	meter
mile (mi)	1.609	kilometer
<u>AREA</u>		
square mile (mi <sup>2</sup> )	2.590	square kilometer
<u>FLOW</u>		
cubic foot per second (ft <sup>3</sup> /s)	0.02832	cubic meter per second

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# LOW-FLOW STATISTICS OF SELECTED STREAMS IN CHESTER COUNTY, PENNSYLVANIA

by Curtis L. Schreffler

## ABSTRACT

Low-flow statistics for many streams in Chester County, Pa., were determined on the basis of data from 14 continuous-record streamflow stations in Chester County and data from 1 station in Maryland and 1 station in Delaware. The stations in Maryland and Delaware are on streams that drain large areas within Chester County. Streamflow data through the 1994 water year were used in the analyses. The low-flow statistics summarized are the 1Q10, 7Q10, 30Q10, and harmonic mean. Low-flow statistics were estimated at 34 partial-record stream sites throughout Chester County.

## INTRODUCTION

Rural regions of southeastern Pennsylvania surrounding Philadelphia, including Chester County (fig. 1), are undergoing population increases. Increasing suburban populations and subsequent increasing water use affect water resources. The Chester County Planning Commission (CCPC) estimates that 10 to 15 million gallons of additional water will be needed by the year 2020 for community systems to meet residential needs (Chester County Planning Commission, 1996a, p. ES-4). These estimates do not include large net increases from commercial, industrial, or institutional customers. In addition to increased demands for water supply, this projected growth will also require accommodating disposal of increased volumes of treated wastewaters through land application, injection to ground water, and discharge to streams.

In July 1996, Chester County Board of Commissioners adopted *Landscapes*, a comprehensive planning policy document, to guide growth management across the county (Chester County Planning Commission, 1996b). To support the implementation of *Landscapes*, a county-wide Water Resources Management Plan is being developed. This Water Resources Management Plan will quantify available resources and provide strategies to address water-supply needs, manage utilization of source waters (quality and quantity), and preserve the integrity of Chester County's natural resources (Janet Bowers, Executive Director, Chester County Water Resources Authority, written commun., 1998). Achieving these planning objectives requires a thorough understanding of the low-flow statistics of the watersheds of Chester County.

Low flow is defined as "fair-weather flow" or base flow, which is streamflow during non-storm periods that consists primarily of ground-water discharge. Low-flow characteristics, or statistics, must be known to develop resource-management plans. Low-flow statistics are particularly important to resource managers who must plan for adequate water supply for consumptive use, to engineering consultants who design wastewater treatment plants, to government officials responsible for water releases from reservoirs for low-flow augmentation, and to resource managers and conservationists who must ensure that sufficient flows are maintained to support aquatic communities.



Figure 1. Location of Chester County and surrounding area.

Low-flow statistics normally are derived from long-term streamflow data. The long-term data are used to calculate historical low flows and their frequency of occurrence. A statistic typically determined to characterize low flow is the 7-consecutive day, 10-year (7Q10) low-flow value. The 7Q10 is defined as the lowest mean streamflow over 7 consecutive days, which, on average, has and probably will occur once every 10-year period. The 7Q10 is of particular importance to wastewater dischargers. The 7Q10 is frequently adopted by regulators as the minimum flow to define discharge and instream pass-by permit conditions to protect stream-water quality (Commonwealth of Pennsylvania, 1994).

The U.S. Geological Survey (USGS), in cooperation with the Chester County Water Resources Authority (CCWRA), completed the study described here to determine low-flow statistics of streams in Chester County. The objectives of this study were to update low-flow statistics at USGS continuous-record streamflow stations, to estimate low-flow statistics at USGS partial-record sites, and to compile from USGS records low-flow streamflow measurements for streams throughout the county.

### **PURPOSE AND SCOPE**

This report presents low-flow statistics at USGS continuous-record streamflow stations and partial-record sites in Chester County and the methods used in determining the low-flow statistics. The following low-flow statistics are presented: the minimum average 1-day (1Q10), 7Q10, and 30-consecutive day (30Q10) low-flow value having a 10-year recurrence interval and the mean streamflow and harmonic mean streamflow determined from data collected over a station's period of record. Data are presented for 16 continuous-record streamflow stations: 14 in Chester County, 1 in Maryland (Big Elk Creek near Elk Mills, Md.), and 1 in Delaware (White Clay Creek near Newark, Del.). Low-flow statistics are presented for 34 partial-record sites where streamflow measurements have been made at irregular intervals. A brief discussion of the limitations of the low-flow statistics is included. The report also presents low-flow streamflow measurements made at 151 partial-record stations throughout the county. A table listing the partial-record stations and a table of streamflow measurements made at those stations are presented in the appendixes.

### **DRAINAGE SYSTEM**

Streams in Chester County drain to one of three major drainage systems, the Delaware River/Delaware River estuary, the Chesapeake Bay estuary, and the Susquehanna River watershed. Streams in northern Chester County drain to the Schuylkill River, which is a tributary to the Delaware River. Streams in the eastern part of the county drain to the Delaware River. Streams in the central and south central part of the county drain to the Christina River, which is a tributary to the Delaware River estuary. Streams in the southern part of the county drain to the Elk Creek and Northeast Creek watersheds, which are tributaries to the Chesapeake Bay estuary. Streams in the western part of the county drain to the Octoraro Creek and Pequea Creek Basins, which are tributaries to the Susquehanna River. The stream network, the major drainage basin divides, and the locations of continuous-record streamflow stations in Chester County and on Big Elk Creek and White Clay Creek are shown in figure 2.

### **PREVIOUS INVESTIGATIONS**

Bush and Shaw (1966) provided low-flow statistical tables for streamflow-measurement stations with unregulated flow and 10 or more years of record. Bush and Shaw (1966) also provided flow-duration tables for streamflow-measurement stations with 5 or more years of record. They estimated the annual minimum average 7-consecutive-day, 2-year recurrence interval (7Q2) and 7Q10 low-flow statistics at streamflow-measurement stations with less than 10 years of record at partial-record sites and miscellaneous measurement sites throughout Pennsylvania and adjacent states. Page and Shaw (1977) presented low-flow and flow-duration characteristics for 1,210 sites in and adjacent to Pennsylvania. Their report was an update of the report by Bush and Shaw (1966). Flippo (1982) developed multiple-regression equations to estimate low-flow-frequency characteristics for most streams in Pennsylvania. Carpenter and Hayes (1996) provided low-flow statistics of streams in Maryland and Delaware, which included statistics for the station Big Elk Creek near Elk Mills, Md.

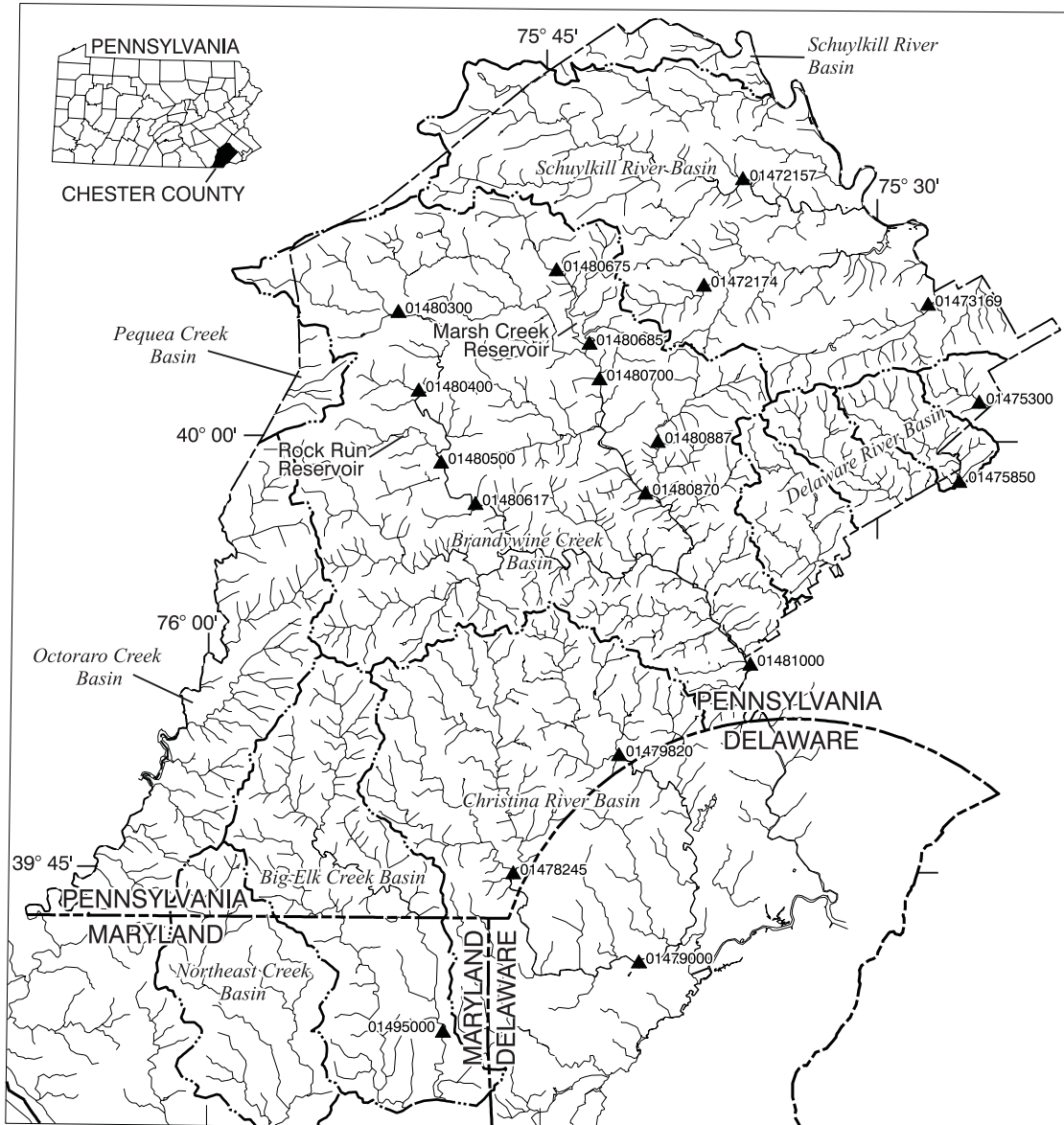


Figure 2. Continuous-record stations and major drainage basin divides in Chester County and surrounding area.



## LOW-FLOW STATISTICS OF SELECTED STREAMS

Low-flow statistics are estimated by use of statistical analyses of historical streamflow data. Statistical information based on streamflow data can be used to predict future variability of streamflow, not in terms of specific events, but in terms of probability of occurrence over a span of years (Nuckels, 1970). The probability of occurrence of annual low flows (low-flow characteristics) can be described by low-flow-frequency curves (Riggs, 1972).

Low-flow-frequency curves were used in this investigation to estimate low-flow statistics of streams in Chester County. The low-flow statistics determined are the annual minimum average 1Q10, 7Q10, and 30Q10 low-flow values. These statistics are based on the minimum average 1-day, 7-consecutive-day, and 30-consecutive-day flow from each year of record with a recurrence interval of 10 years (cumulative probability of 0.10). A 7Q10 of 1.0 ft<sup>3</sup>/s means that the probability is 1 in 10 that the annual minimum average 7-consecutive-day streamflow for any year will be less than 1.0 ft<sup>3</sup>/s, or that the annual minimum average 7-consecutive-day streamflow of less than 1.0 ft<sup>3</sup>/s should be expected at the site, on average, once every 10 years (Hayes, 1991). Low-flow data were analyzed on the basis of a climatic year April 1 to March 31. This period is used so that streamflow through the entire low-flow season, generally July through October, is included within the year.

An additional low-flow statistic, the harmonic mean, was determined for all continuous-record streamflow stations. The harmonic mean is determined by summing the inverses of daily mean streamflow data for the entire period of record and dividing the resulting sum by the number of data values. The quotient is reciprocated to yield the harmonic mean. In Pennsylvania, the harmonic mean may be used to evaluate effects on surface water from diffuse flow of contaminated ground water under regulations of the Land Recycling Program (Act 2) legislation (Pennsylvania Department of Environmental Protection, 1997).

### FACTORS AFFECTING LOW FLOWS

The low flow of streams is affected by many factors, such as underlying geology, impoundment regulations, stream diversions, basin topography, and short and long-term weather and climatic changes. The size of the drainage area is also a factor that affects the

magnitude of low flow; generally, drainage area and low flow are directly proportional. Land-use changes can affect low flow. If large areas of a basin are covered by impervious surfaces, such as parking lots, the increase in storm runoff and the reduced infiltration of precipitation will decrease the base flow of a watershed.

### GEOLOGY

The underlying geology of a basin affects low flow because at low flow (or base flow) most, if not all, of the streamflow is from ground-water discharge. The more permeable or more highly fractured the underlying bedrock, the more water that can be stored and subsequently discharged to the stream.

Chester County is underlain by crystalline and metamorphic rocks; shales, sandstones and siltstones; and carbonate rocks. In this report, the rocks have been generalized into four bedrock groups—gneiss, schist and phyllite, shale and sandstone, and carbonate rock. In Chester County, gneiss comprises 44 percent, schist and phyllite comprise 41 percent, shale and sandstone comprise 9 percent, and carbonate rock comprises 6 percent of the underlying bedrock (fig. 3).

Gneiss, schist, and phyllite are metamorphic crystalline rocks. Ground-water flow paths in these rocks are usually short; ground water flows from hilltops to stream valleys, and ground- and surface-water drainage divides usually coincide (Sloto, 1994). Ground water in these rocks generally is unconfined (water-table conditions), and the water table is usually a subdued replica of the land surface (Sloto, 1994).

Shales and sandstones are sedimentary rocks, and ground-water flow within these rocks may have local and regional components. In Chester County, shallow ground water discharges locally to nearby streams, and deeper, regional ground-water flow is toward the Schuylkill River, the point of regional ground-water discharge (Sloto, 1994). Streams that drain areas underlain by shales and siltstones generally have small amounts of flow during periods of low flow, and because of regional flow, ground-water and surface-water divides may not coincide.

Carbonate rock is made up of limestones and dolomites. Because carbonate rock can be dissolved by water, large solution openings or caverns can develop and transmit large amounts of water. Some streams in carbonate valleys are dry for extended periods, while

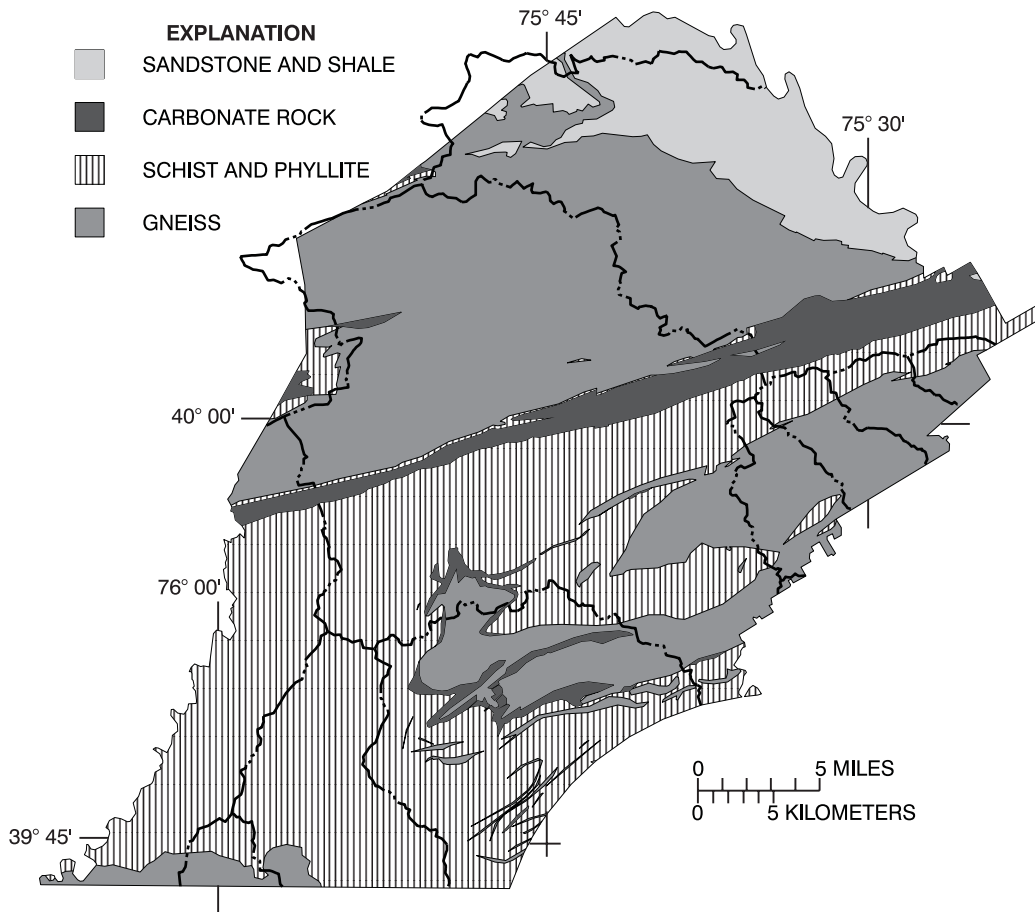


Figure 3. Generalized geology of Chester County, Pa.

those fed by large springs may have relatively large flows even during periods of otherwise low flow. Ground-water flow paths seldom mimic local topography, and ground-water and surface-water divides may not coincide. Also, streams crossing carbonate valleys may lose water to sink holes or may gain water from springs. Therefore, estimating low-flow statistics in streams underlain by carbonate rock where no streamflow-measurement station is present has questionable validity. Low-flow statistics for streams underlain by carbonate rock given in this report apply only to the immediate stream reach in which the continuous-record streamflow station is located.

Because geology affects low flow, the percentages of each bedrock group upstream from each streamflow-measurement station were determined (table 1). As explained later in the report, the percentage of each bedrock group above each streamflow-measurement station was used when estimating low-flow statistics at partial-record sites.

### IMPOUNDMENTS AND DIVERSIONS

Dams and reservoirs have a major effect on low flow of streams. Reservoirs are used for water supply and to augment low flow, which increases the magnitude of low flow. Releases of water from the Marsh Creek Reservoir, for example, during periods of low flow, increases base flow in Marsh Creek and Brandywine Creek downstream from the reservoir (fig. 2).

Low-flow statistics were determined for the continuous-record streamflow station Brandywine Creek at Chadds Ford, Pa., before and after the construction and subsequent operation of the Marsh Creek Reservoir, which started in November 1973. The 7Q10 for 1913-73 was 68.5 ft<sup>3</sup>/s, and the 7Q10 for 1973-94 was 89.4 ft<sup>3</sup>/s. The difference represents a 30-percent increase. Some of the increase in the 7Q10 can be attributed to changes in climatic conditions over the 82-year long period of record, but most of the increase in low flow can be attributed to releases from the Marsh Creek Reservoir.

Table 1. Percentage of bedrock groups above U.S. Geological Survey continuous-record stations in Chester County, Pennsylvania

U.S. Geological Survey station number	Station name	Drainage area (square miles)	Percentage of bedrock groups			
			Shale and sandstone	Carbonate rock	Schist and phyllite	Gneiss
01472157	French Creek near Phoenixville, Pa.	59.1	34.6	0.1	0.1	65.2
01472174	Pickering Creek near Chester Springs, Pa.	5.98				100.0
01473169	Valley Creek at Pa. Turnpike Bridge near Valley Forge, Pa.	20.8		68.1	22.8	9.1
01475300	Darby Creek at Waterloo Mills near Devon, Pa.	5.15			45.1	54.9
01475850	Crum Creek near Newtown Square, Pa.	15.8			20.3	79.7
01478245	White Clay Creek near Strickersville, Pa.	59.2		7.5	69.2	23.3
01479820	Red Clay Creek near Kennett Square, Pa.	28.3		10.0	41.1	48.9
01480300	West Branch Brandywine Creek near Honey Brook, Pa.	18.7		3.5	.1	96.4
01480500	West Branch Brandywine Creek at Coatesville, Pa.	45.8		1.4	.2	98.4
01480617	West Branch Brandywine Creek at Modena, Pa.	55.0		5.2	9.4	85.4
01480675	Marsh Creek near Glenmoore, Pa.	8.57				100.0
01480685	Marsh Creek near Downingtown, Pa.	20.3		.1		99.9
01480700	East Branch Brandywine Creek near Downingtown, Pa.	60.6			.2	99.8
01480870	East Branch Brandywine Creek below Downingtown, Pa.	89.9		8.4	10.5	81.1
01480887	Valley Creek at Ravine Road near Downingtown, Pa.	14.5		45.8	26.4	27.8
01481000	Brandywine Creek at Chadds Ford, Pa.	287.0		7.2	36.7	56.1

To demonstrate the effects of reservoir releases, flow-duration curves were constructed for a common period of record (1974-94) for (1) East Branch Brandywine Creek near Downingtown, Pa., which is affected by low-flow releases from Marsh Creek Reservoir, and (2) French Creek near Phoenixville, Pa., which is not affected by regulation. A flow-duration curve is a cumulative frequency curve that shows the percentage of time a specified flow was equaled or exceeded during a specified period (Searcy, 1959). The drainage area above East Branch Brandywine Creek near Downingtown is 60.6 mi<sup>2</sup>, and the drainage area above French Creek near Phoenixville is 59.1 mi<sup>2</sup>. The flow-duration curves from both stations are shown in figure 4. The 95-percent flow-exceedance value for East Branch Brandywine Creek is equal to or greater than 23.0 ft<sup>3</sup>/s; the 95-percent flow-exceedance streamflow for French Creek near Phoenixville is equal to or greater than 17.4 ft<sup>3</sup>/s. Therefore, for the period of record 1974-94, the streamflow duration at the 95th percentile at East Branch Brandywine Creek is 32 percent more than that at French Creek near Phoenixville. Some of the difference can be attributed to the different geologic settings, but a significant part is attributable to releases from Marsh Creek Reservoir.

#### METHODS FOR DETERMINING LOW-FLOW STATISTICS

Different methods were used to determine low-flow statistics for continuous-record stations depending on the length of record at the station, the effect of regulation, and the effects of carbonate rock in the basin. Existing and discontinued streamflow-measurement stations were separated into four types: (1) continuous-record stations unaffected by regulation with greater than 10 years of record, (2) continuous-record stations unaffected by regulation with less than 10 years of record, (3) continuous-record stations affected by regulation, and (4) continuous-record stations with drainage areas dominated by carbonate rock. The low-flow-frequency curves and subsequent statistics for all streamflow-measurement stations were determined and calculated by fitting the logarithms of annual low-flow values to the Log-Pearson type III frequency distribution (Riggs, 1968). Streamflow data through the 1994 water year were used in the analyses. After the statistics were determined, variations and adjustments to the statistics were calculated depending on the station type.

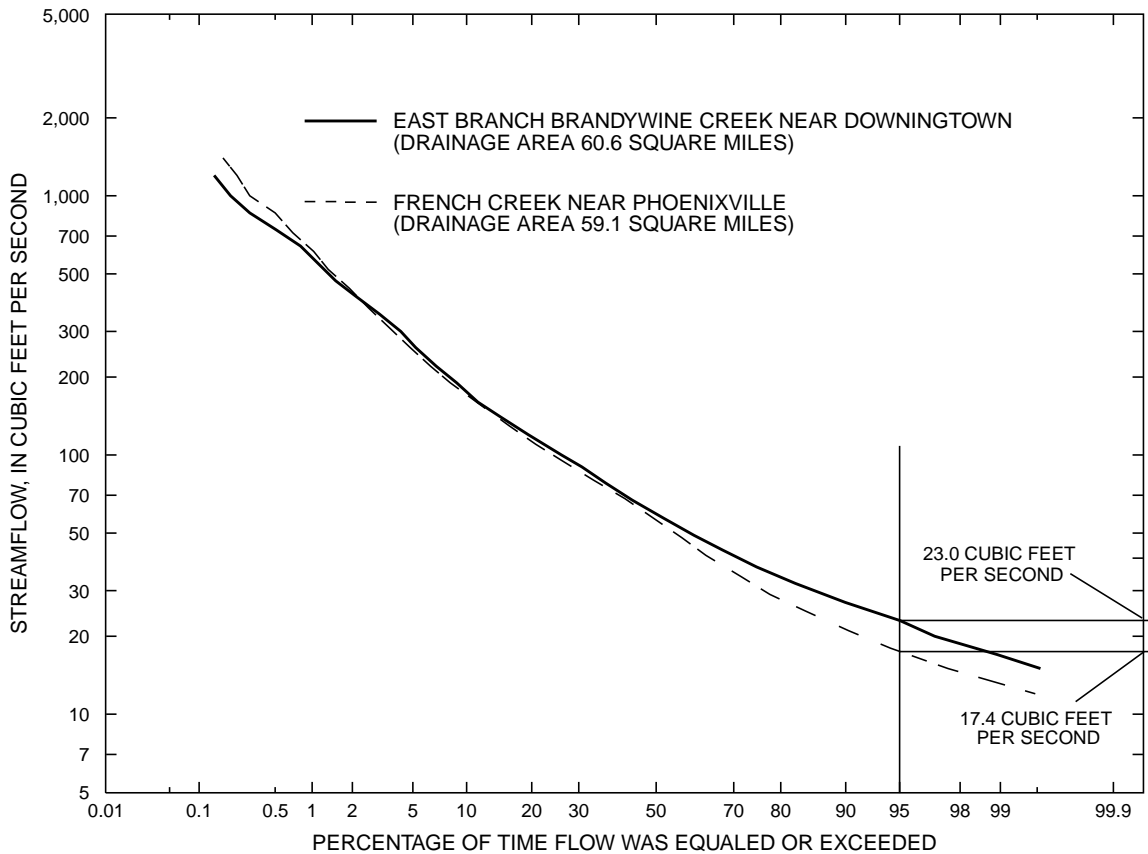


Figure 4. Flow-duration curves for East Branch Brandywine Creek near Downingtown, Pa., and French Creek near Phoenixville, Pa.

Partial-record sites were defined as sites where at least four low-flow measurements had been made. The measurements at the sites were correlated with daily mean streamflow at a selected index continuous-record station to estimate low-flow statistics.

**CONTINUOUS-RECORD STATIONS**

For streamflow-measurement stations that had greater than 10 years of record and that were unaffected by regulation or diversions, low-flow statistics were adjusted to long-term climatic conditions. These adjustments were made on the basis of the low-flow statistics for the station Big Elk Creek near Elk Mills, Md. (01495000), where streamflow data have been collected continuously since April 1932. Major droughts occurred in southeastern Pennsylvania in the early 1930's and the mid-1960's. Most continuous-record stations in Chester County were established in the mid to late 1960's. Because the index station has a long-term record that includes the droughts of the 1930's and 1960's, as well as several wet periods, the effect of an individual extremely wet

or extremely dry period does not bias the low-flow analysis. If low-flow statistics were based on a station's record with only 10 or 15 years of data collected primarily during wet periods, the analysis would be biased towards greater low flow.

To adjust the low-flow statistics at the continuous-record stations for long-term climatic conditions, the low-flow statistics for the entire period of record at the Big Elk Creek station were first determined. Secondly, low-flow statistics were determined for the entire period of record at each continuous-record station in Chester County that was not affected by regulation. Low-flow statistics for Big Elk Creek were then recalculated for only that period of record that coincided with the period of record available for each continuous-record station in Chester County. Finally, the low-flow statistics for the Chester County stations were adjusted to long-term climatic conditions by the following equation:

$$7Q10_{(station-long-term)} = \frac{7Q10_{Big\ Elk\ (long-term)}}{7Q10_{Big\ Elk\ (short-term)}} \times 7Q10_{(station-short-term)}$$

where  $7Q10_{(station-long-term)}$  is the 7-consecutive-day mean low flow having a 10-year-recurrence interval for the station adjusted to long-term climate conditions,

$7Q10_{Big\ Elk\ (long-term)}$  is the 7-consecutive-day mean low flow having a 10-year-recurrence interval for Big Elk Creek near Elk Mills, Md., for the entire period of record,

$7Q10_{Big\ Elk\ (short-term)}$  is the 7-consecutive-day mean low flow having a 10-year-recurrence interval for Big Elk Creek near Elk Mills, Md., for the period of record equal to the station, and

$7Q10_{(station-short-term)}$  is the 7-consecutive-day mean low flow having a 10-year-recurrence interval for the station for the entire period of record.

For continuous-record stations that have less than 10 years of record and are unaffected by regulation or diversions, low-flow statistics were determined by use of a correlation technique that used streamflow data from Big Elk Creek. This method was applicable to only one short-term continuous-record station—Red Clay Creek at Kennett Square, Pa. The method consisted of plotting the logarithms of daily mean streamflow data during separate base-flow recessions at Red Clay Creek against the logarithms of concurrent daily mean streamflow data for Big Elk Creek. A relation between the logarithm was defined by a correlation line determined by use of the MOVE1 (Maintenance of Variance Extension, Type 1) technique (Hirsch, 1982), and the low-flow statistics were determined from that correlation line. An example of determining the 7Q10 and 30Q10 for Red Clay Creek from the correlation line is shown on figure 5. The low-flow values are selected by transferring the low-flow statistics from the index station (Big Elk Creek at Elk Mills, Md.; 7Q10 = 10.3 ft<sup>3</sup>/s, 30Q10 = 12.8 ft<sup>3</sup>/s) through the correlation line to the short-term continuous-record station (Red Clay Creek near Kennett Square, Pa; 7Q10 = 3.0 ft<sup>3</sup>/s, 30Q10 = 4.2 ft<sup>3</sup>/s).

For continuous-record stations that are affected by regulation or diversions, low-flow statistics were not adjusted to long-term conditions because the regulation has more effect than climate. The low-flow statistics were determined by use of the Log-Pearson type III frequency distribution (Riggs, 1968) for the period of record after the regulation began.

For the station Valley Creek at Turnpike Bridge near Valley Forge, whose drainage area is dominated by carbonate rock, low-flow statistics were determined for the period of record. The statistics for this station were not adjusted to long-term conditions.

#### PARTIAL-RECORD SITES

A partial-record site was defined as a surface-water site at which a minimum of four streamflow measurements have been made during periods of low flow. The logarithms of the low-flow measurements (in cubic foot per second) at the partial-record sites were plotted against the logarithms of concurrent daily mean streamflow at a selected index station, and on the basis of the line of correlation determined by MOVE1, low-flow statistics were estimated (Stedinger and Thomas, 1985). After an index station was selected and the correlation completed, the low-flow statistics for the partial-record site were calculated by use of the index station's statistics that were adjusted to long-term climatic conditions.

Index stations were selected on the basis of the proximity of the station to the partial-record site, similar underlying geology, and similar drainage-area size. Stations used as index stations were Big Elk Creek at Elk Mills, Md., White Clay Creek near Newark, Del., West Branch Brandywine Creek near Honey Brook, Pa., and French Creek near Phoenixville, Pa.

A seasonal Kendall test for trend was applied to mean unadjusted streamflow data from the index stations. Trends in streamflow data can result from changes in land use over time or from a climatic trend. If a trend exists, it would affect the partial-record site

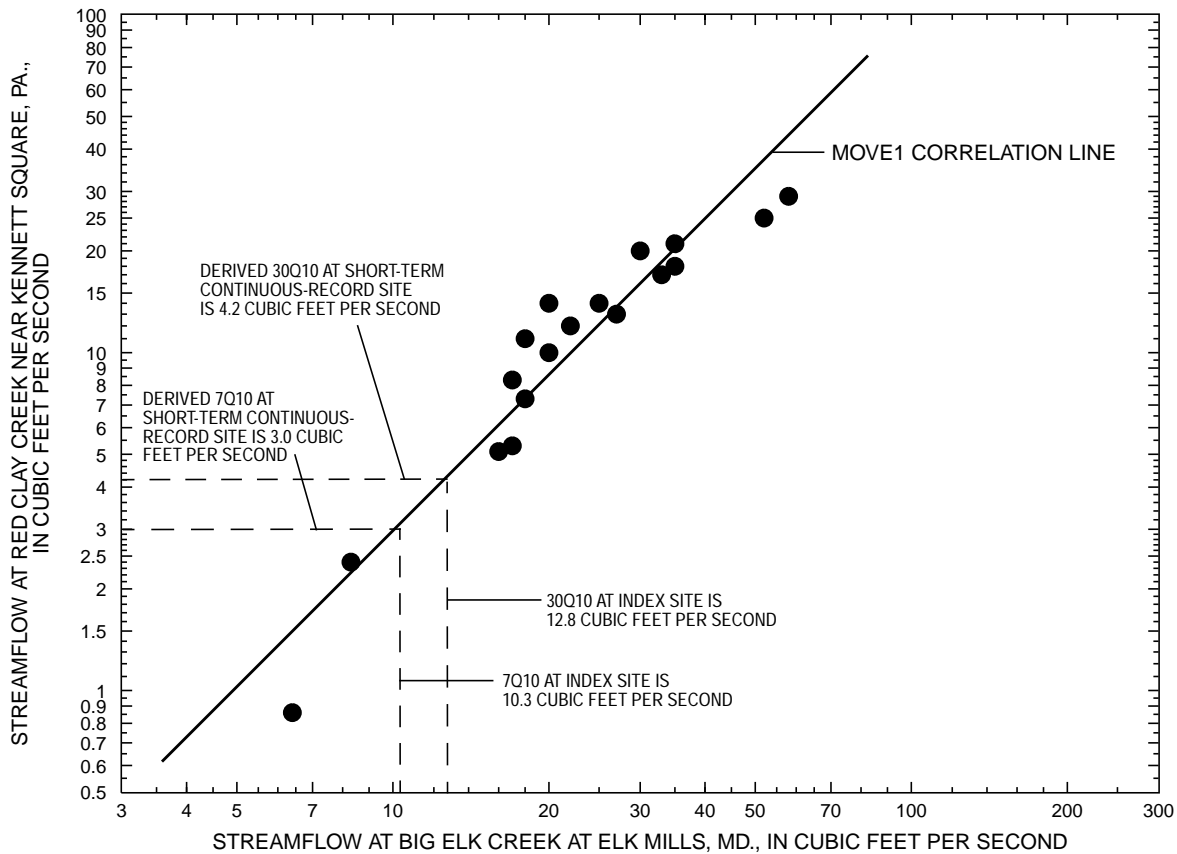


Figure 5. Correlation of concurrent daily mean streamflows at continuous-record station Red Clay Creek near Kennett Square, Pa., and index station Big Elk Creek at Elk Mills, Md.

low-flow statistics because the trend of the index station would be incorporated into the statistics for the partial-record site, even though the cause of the trend most likely would not be applicable to the partial-record site. No trends were identified in the streamflow data from the index stations.

A correlation coefficient of 0.7 between the logarithms of streamflow measurements and logarithms of concurrent daily mean streamflow at index stations was selected arbitrarily as acceptable. Estimates of low-flow statistics were not reported if the correlation coefficient was less than 0.7. Streamflow measurements at partial-record sites were not used in the analysis if the flow at the index station on the day of the measurement was greater than the 75-percent flow duration, which was chosen arbitrarily. Precipitation records were reviewed, and if significant precipitation occurred 5 days prior to the streamflow measurement, the measurements were not included in the analysis. Correlated streamflow measurements from Doe Run at Springdell, Pa., and Little Elk Creek near Lewisville, Pa., and concurrent daily mean

streamflow at Big Elk Creek at Elk Mills, Md., are shown in figures 6 and 7, respectively. On the basis of the correlation plots, the estimated 7Q10 for Doe Run and Little Elk Creek are 2.5 ft<sup>3</sup>/s and 2.0 ft<sup>3</sup>/s, respectively.

If a partial-record site was on a regulated stream, an index station was selected such that the streamflow record was affected by the same regulation. Partial-record sites on the East Branch Brandywine Creek below the Marsh Creek Reservoir and West Branch Brandywine Creek are affected by regulation. Stations used as index stations for these partial-record sites were East Branch Brandywine Creek below Downingtown and West Branch Brandywine Creek at Modena.

**LIMITATIONS OF THE LOW-FLOW STATISTICS**

The reliability of calculated low-flow statistics at long-term continuous-record stations depends on the length of record, the time period during which the data were recorded, the stability of basin characteristics, and

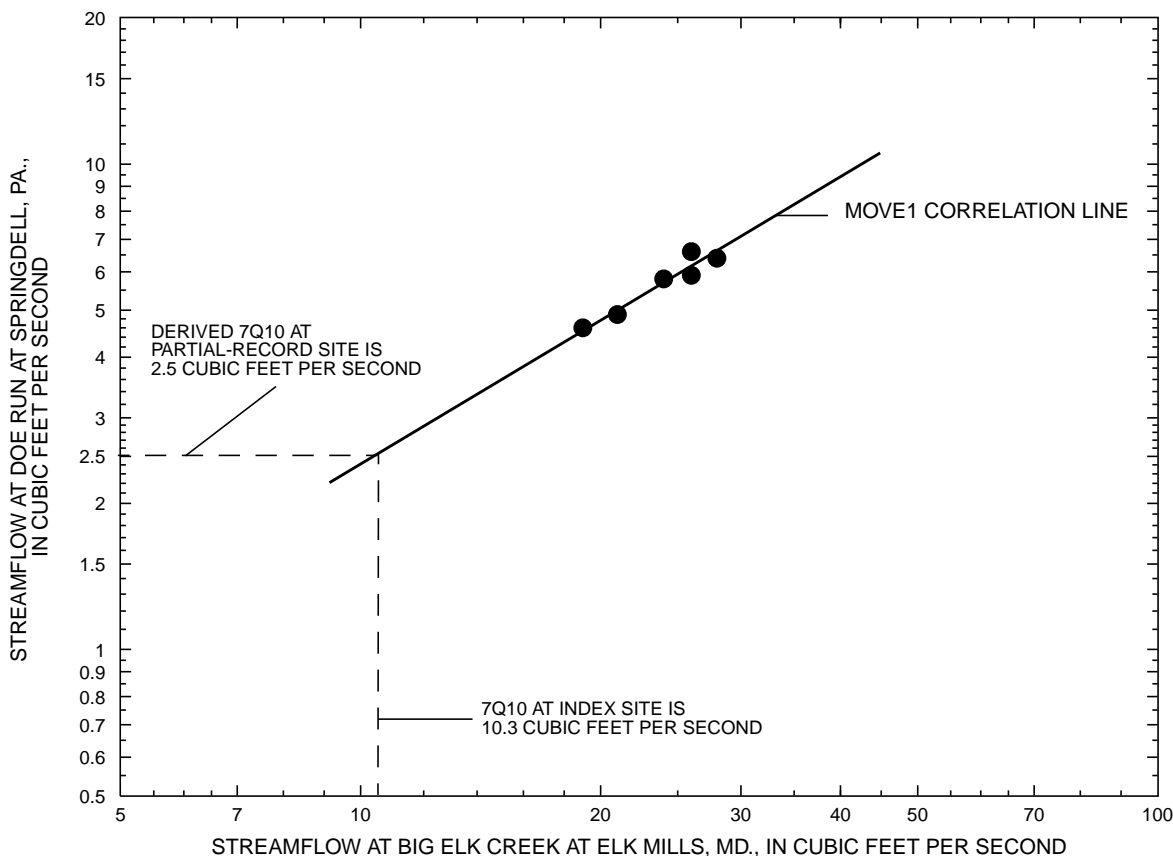


Figure 6. Correlation of streamflow measurements at partial-record site Doe Run near Springdell, Pa., and concurrent daily mean streamflow at index station Big Elk Creek at Elk Mills, Md.

the type of statistical analysis applied to the data (Hayes, 1991, p. 18). When calculating recurrence intervals of 10 years, it is preferable to have 20 years or more of data. The longer the period of record, the more confidence can be placed in the statistical analysis. The time period over which the data are collected is important because flow records that include data for several dry periods and wet periods should provide greater reliability than records that do not include such extreme or widely varying conditions. Basin characteristics, which affect the low flow of streams, inevitably change with time because of increasing development. Development typically results in increases in the number and extent of impervious surfaces, a reduction in vegetative losses of water (evapotranspiration), more rapid surface runoff, and either an increase or decrease in infiltration to ground water; all of which, in turn, affect the amount of water available for low flow.

The low-flow statistics presented for continuous-record stations and partial-record sites in this report apply only to the stream reach where the sites are

located. Low-flow statistics for other reaches along the stream will be different. Also, low-flow statistics presented for continuous-record stations that are affected by major regulations are applicable only if the regulation does not change.

For the partial-record sites, the distribution of the low-flow measurements over a large range of flows will improve the accuracy and increase subsequent confidence of the predicted low-flow statistics. For example, figure 6 shows the streamflow measurements from Doe Run in relation to concurrent daily mean streamflow for Big Elk Creek and the correlation line. The predicted 7Q10 lies outside the set of data points on the correlation line; the confidence in the low-flow estimates for Doe Run would be increased if some of the streamflow measurements were nearer the 7Q10. Hardison and Moss (1972) discuss the accuracy of estimating low-flow statistics by correlating low-flow streamflow measurements.

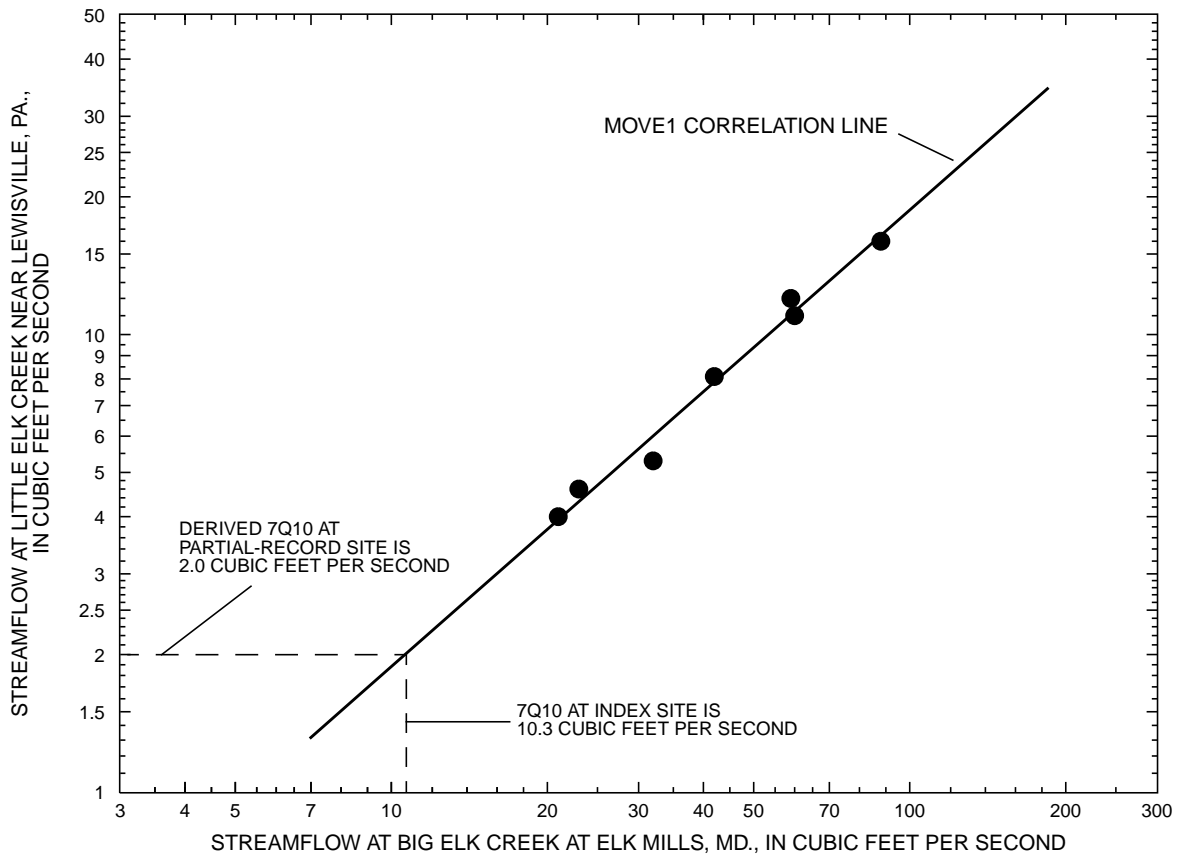


Figure 7. Correlation of streamflow measurements at partial-record site Little Elk Creek near Lewisville, Pa., and concurrent daily mean streamflow at index station Big Elk Creek at Elk Mills, Md.

**LOW-FLOW STATISTICS**

Low-flow statistics were determined for 16 continuous-record streamflow-measurement stations. Low-flow statistics for seven of these stations were adjusted to long-term climatic conditions. Low-flow statistics were estimated at 34 partial-record sites.

Low-flow statistics were not determined for the continuous-record station Valley Creek at Ravine Road near Downingtown, Pa. (01480887) (fig. 2). Because the station had not been operated for 10 years, frequency curves and low-flow statistics at the 10-year recurrence interval were not determined. Also, the basin is underlain predominantly by carbonate rock, thus no correlation to a continuous-record index station could be made. Also, low-flow statistics for continuous-record stations Birch Run near Wagontown, Pa. (01480400), and White Clay Creek near Strickersville, Pa. (01478245) (fig. 2), were not determined because they have been in operation only since February 1995

and August 1995, respectively. The locations of these stations are shown on figure 2 for informational purposes only.

**CONTINUOUS-RECORD STATIONS**

Continuous-record stations unaffected by regulation and for which low-flow statistics were determined and adjusted to long-term conditions include the following (station numbers in parenthesis):

- French Creek near Phoenixville, Pa. (01472157)
- Pickering Creek near Chester Springs, Pa. (01472174)
- Darby Creek at Waterloo Mills near Devon, Pa. (01475300)
- Crum Creek near Newtown Square, Pa. (01475850)
- West Branch Brandywine Creek near Honey Brook, Pa. (01480300)
- Marsh Creek near Glenmoore, Pa. (01480675)
- White Clay Creek near Newark, Del. (01479000)



Low-flow statistics for the discontinued station, Pickering Creek at Chester Springs, Pa., also were determined and included in this report because more than 10 years of record were available. Streamflow data at this station were collected from 1967 to 1983.

Continuous-record stations affected by regulation are in the Brandywine Creek Basin and include the following:

- West Branch Brandywine Creek at Coatesville, Pa. (01480500)
- West Branch Brandywine Creek at Modena, Pa. (01480617)
- East Branch Brandywine Creek near Downingtown, Pa. (01480700)
- East Branch Brandywine Creek below Downingtown, Pa. (01480870)
- Brandywine Creek at Chadds Ford, Pa. (01481000)

Significant low-flow augmentation affects the station Marsh Creek near Downingtown (01480685) and Brandywine Creek at Chadds Ford. Continuous streamflow record at Chadds Ford has been collected during two periods: from 1913 to 1953 and from 1962 to 1997. Because Marsh Creek Reservoir operations should continue into the foreseeable future, the low-flow statistics reported were determined from the start of operation of the reservoir until 1994. Record from continuous-record stations on the West Branch Brandywine Creek at Coatesville and at Modena are affected by the Rock Run Reservoir, which is a water-supply impoundment for the City of Coatesville.

Locations, drainage areas, period of record, and low-flow statistics 1Q10, 7Q10, 30Q10, harmonic mean, and mean flow for the period of record for 13 continuous-record stations in Chester County and the stations Big Elk Creek at Elk Mills, Md., and White Clay Creek near Newark, Del., are listed in table 2. The unadjusted low-flow statistics for the eight stations not affected by regulation are listed in table 3.

The continuous-record station Red Clay Creek at Kennett Square, Pa., had less than 10 years of record, and low-flow statistics are presented in table 4. Low-flow statistics are presented in table 2 for the station Valley Creek at the Pennsylvania Turnpike Bridge near Valley Forge, Pa., which is underlain predominantly by carbonate rock.

#### PARTIAL-RECORD SITES

The low-flow statistics, 1Q10, 7Q10, and 30Q10, were determined for 34 partial-record sites throughout Chester County (table 4). The low-flow statistics were determined by use of the MOVE1 correlation technique, and the statistics were correlated to the adjusted low-flow statistics for selected index stations. The low-flow statistic estimates are listed in table 4. Locations of partial-record sites are shown on figures 8 through 14.

For partial-record site Sucker Run near Coatesville, the 7Q10 was determined by Page and Shaw (1977) on the basis of 10 streamflow measurements made between 1944-53; no streamflow measurements have been made since that time period, and the 7Q10 is for informational purposes.

Table 2. Summary of adjusted and unadjusted low-flow statistics for long-term and short-term continuous-record stations in Chester County, Pennsylvania, and in Maryland and Delaware

[1Q10, 1-day, 10-year low-flow value; 7Q10, 7-day, 10-year low-flow value; 30Q10, 30-day, 10-year low-flow value; U, unregulated flow; R, regulated flow; LP, characteristics based on log-Pearson type III distribution; ADJ, characteristics based on log-Pearson type III distribution and adjusted to long-term index continuous-record station Big Elk Creek at Elk Mills, Md.; ft<sup>3</sup>/s, cubic feet per second]

U.S. Geological Survey station number	Station name	Location		Drainage area (square miles)	Period of record	Mean flow (ft <sup>3</sup> /s)	Low-flow statistics				Flow	Method of analysis
		Latitude	Longitude				1Q10 (ft <sup>3</sup> /s)	7Q10 (ft <sup>3</sup> /s)	30Q10 (ft <sup>3</sup> /s)	Harmonic mean (ft <sup>3</sup> /s)		
01472157	French Creek near Phoenixville, Pa.	40°09'05"	75°36'06"	59.1	Oct. 1968-94	89.2	8.1	8.8	11.1	38.5	U	ADJ
01472174	Pickering Creek near Chester Springs, Pa.	40°05'22"	75°37'50"	5.98	Oct. 1967-83	10.5	1.2	1.4	1.6	5.1	U	ADJ
01473169	Valley Creek at Pa. Turnpike Bridge near Valley Forge, Pa.	40°04'45"	75°27'40"	20.8	Oct. 1982-94	31.5	9.6	10.7	13.6	23.3	U	LP
01475300	Darby Creek at Waterloo Mills near Devon, Pa.	40°01'21"	75°25'20"	5.15	May 1972-94	8.9	1.1	1.3	1.7	4.5	U	ADJ
01475850	Crum Creek near Newtown Square, Pa.	39°58'35"	75°26'13"	15.8	Oct. 1981-94	22.5	1.5	2.9	4.9	11.5	U	ADJ
01480300	West Branch Brandywine Creek near Honey Brook, Pa.	40°04'22"	75°51'40"	18.7	June 1960-94	26.1	3.0	3.5	4.5	12.9	U	ADJ
01480500	West Branch Brandywine Creek at Coatesville, Pa.	39°59'08"	75°49'40"	45.8	Oct. 1943 - Dec. 1951 Jan. 1970-94	64.5	7.3	8.3	10.5	33.2	R	LP
01480617	West Branch Brandywine Creek at Modena, Pa.	39°57'42"	75°48'06"	55.0	Jan. 1970-94	87.4	14.2	17.5	21.1	50.2	R	LP
01480675	Marsh Creek near Glenmoore, Pa.	40°05'52"	75°44'31"	8.57	July 1966-94	12.7	.80	.91	1.3	4.7	U	ADJ
01480685	Marsh Creek near Downingtown, Pa.	40°03'19"	75°43'00"	20.3	June 1973-94	29.5	.57	.76	1.7	8.7	R	LP
01480700	East Branch Brandywine Creek near Downingtown, Pa.	40°02'05"	75°42'32"	60.6	Oct. 1965-94	90.0	11.6	13.4	17.6	48.6	R	LP
01480870	East Branch Brandywine Creek below Downingtown, Pa.	39°58'07"	75°40'25"	89.9	Feb. 1972-94	148	26.4	28.9	34.4	82.2	R	LP
01481000	Brandywine Creek at Chadds Ford, Pa. <sup>1</sup>	39°52'11"	75°35'37"	287	Aug. 1911 - Sept. 1953 Oct. 1962-94	400	66.8	73.0	84.2	236	R	LP
01479000	White Clay Creek near Newark, Del.	39°41'47"	75°40'31"	89.1	Oct. 1931 - Sept. 1936 June 1943 - Sept. 1957 Oct. 1959-94 <sup>2</sup>	118	12.8	14.8	20.0	61.5	U	ADJ
01495000	Big Elk Creek at Elk Mills, Md.	39°39'26"	75°49'20"	52.6	Apr. 1932-94	68.1	9.1	10.3	12.8	37.6	U	LP

<sup>1</sup> Station located in Delaware County.

<sup>2</sup> Statistics determined using the data period October 1959-94.

Table 3. Summary of unadjusted low-flow statistics for continuous-record stations based on log Pearson Type III frequency distribution

[1Q10, 1-day, 10-year low-flow value; 7Q10, 7-day, 10-year low-flow value; 30Q10, 30-day, 10-year low-flow value; ft<sup>3</sup>/s, cubic foot per second]

U.S. Geological Survey station number	Station name	Drainage area (square miles)	Period of record	Unadjusted low-flow statistics			
				1Q10 (ft <sup>3</sup> /s)	7Q10 (ft <sup>3</sup> /s)	30Q10 (ft <sup>3</sup> /s)	Harmonic mean (ft <sup>3</sup> /s)
01472157	French Creek near Phoenixville, Pa.	59.1	Oct. 1968-94	10.5	11.3	14.5	43.4
01472174	Pickering Creek near Chester Springs, Pa.	5.98	Oct. 1967-83	1.2	1.5	1.8	5.4
01475300	Darby Creek at Waterloo Mills near Devon, Pa.	5.15	May 1972-94	1.1	1.3	1.8	4.8
01475850	Crum Creek near Newtown Square, Pa.	15.8	Oct. 1981-94	1.5	3.2	5.6	12.1
01480300	West Branch Brandywine Creek near Honey Brook, Pa.	18.7	June 1960-94	3.0	3.4	4.3	12.8
01480675	Marsh Creek near Glenmoore, Pa.	8.57	July 1966-94	.80	.90	1.3	5.0
01479000	White Clay Creek near Newark, Del.	89.1	Oct. 1931-Sept. 1936 June 1943-Sept. 1957 Oct. 1959-94	12.6	14.0	18.8	61.3
01495000	Big Elk Creek at Elk Mills, Md.	52.6	Apr. 1932-94	9.1	10.3	12.8	37.6

Table 4. Summary of correlated low-flow statistics for partial-record sites determined by use of the MOVE1 correlation technique, Chester County, Pennsylvania

[1Q10, 1-day, 10-year low-flow value; 7Q10, 7-day, 10-year low-flow value; 30Q10, 30-day, 10-year low-flow value; ft<sup>3</sup>/s, cubic feet per second; --, not determined]

U.S. Geological Survey station number	Station name	Location		Drainage area (square miles)	Index station name	Number of measure- ments in correla- tion	Low-flow statistics		
		Latitude	Longitude				1Q10 (ft <sup>3</sup> /s)	7Q10 (ft <sup>3</sup> /s)	30Q10 (ft <sup>3</sup> /s)
<u>Schuylkill River Basin (fig. 8)</u>									
01472080	Pigeon Creek near Slonaker, Pa.	40°12'03"	75°37'10"	12.0	French Creek near Phoenixville, Pa.	14	1.6	1.7	2.2
01472110	Stony Run at Spring City, Pa.	40°10'01"	75°32'57"	4.07	West Branch Brandywine Creek near Honey Brook, Pa.	3	.06	.09	.17
01472138	French Creek near Coventryville, Pa.	40°10'14"	75°41'52"	23.1	French Creek near Phoenixville, Pa.	7	3.2	3.4	4.3
01472140	South Branch French Creek at Coventryville, Pa.	40°09'18"	75°42'52"	12.4	French Creek near Phoenixville, Pa.	5	2.2	2.4	3.0
01472183	Pine Creek at Chester Springs, Pa.	40°05'14"	75°36'45"	5.07	West Branch Brandywine Creek near Honey Brook, Pa.	3	1.2	1.5	1.9
01472190	Pickering Creek near Phoenixville, Pa.	40°06'33"	75°31'42"	31.4	French Creek near Phoenixville, Pa.	7	4.7	5.1	6.7
01473200	Trout Creek near Valley Forge, Pa.	40°05'25"	75°25'24"	6.28	West Branch Brandywine Creek near Honey Brook, Pa.	5	.60	.65	.75
<u>Ridley and Chester Creek Basins (fig. 9)</u>									
01476435	Ridley Creek at Dutton Mill near West Chester, Pa.	39°58'52"	75°31'02"	9.59	West Branch Brandywine Creek near Honey Brook, Pa.	12	2.2	2.5	3.1
01476848	East Branch Chester Creek below Goose Creek near West Chester, Pa.	39°55'45"	75°32'00"	19.6	West Branch Brandywine Creek near Honey Brook, Pa.	8	3.0	3.6	5.1
<u>East Branch Brandywine Creek Basin (fig. 10)</u>									
01480650	East Branch Brandywine Creek at Cupola, Pa.	40°05'55"	75°50'44"	6.17	West Branch Brandywine Creek near Honey Brook, Pa.	4	2.0	2.1	2.4
01480653	East Branch Brandywine Creek at Glenmoore, Pa.	40°05'48"	75°46'44"	16.5	West Branch Brandywine Creek near Honey Brook, Pa.	8	2.5	2.9	3.6
01480656	Indian Run near Springton, Pa.	40°04'33"	75°46'57"	4.24	West Branch Brandywine Creek near Honey Brook, Pa.	7	.26	.34	.53
01480662	Culbertson Run at Lyndell, Pa.	40°03'29"	75°45'07"	3.88	West Branch Brandywine Creek near Honey Brook, Pa.	4	.87	1.0	1.3
01480665	East Branch Brandywine Creek near Dorlan, Pa.	40°03'08"	75°43'28"	33.4	West Branch Brandywine Creek near Honey Brook, Pa.	9	5.8	6.8	8.9
01480950	East Branch Brandywine Creek at Wawaset, Pa.	39°55'35"	75°38'54"	124	East Branch Brandywine Creek below Downingtown, Pa.	8	34.1	37.5	45.0

Table 4. Summary of correlated low-flow statistics for partial-record sites determined by use of the MOVE1 correlation technique, Chester County, Pennsylvania—Continued

U.S. Geological Survey station number	Station name	Location		Drainage area (square miles)	Index station name	Number of measurements in correlation	Low-flow statistics		
		Latitude	Longitude				1Q10 (ft <sup>3</sup> /s)	7Q10 (ft <sup>3</sup> /s)	30Q10 (ft <sup>3</sup> /s)
<u>West Branch Brandywine Creek Basin (fig. 11)</u>									
01480610	Sucker Run near Coatesville, Pa.	39°58'20"	75°51'03"	2.60	Brandywine Creek at Chadds Ford, Pa. 1944-53 Page and Shaw (1977)	10	--	.40	--
01480632	Doe Run at Springdell, Pa.	39°54'25"	75°49'42"	11.8	Big Elk Creek at Elk Mills, Md.	6	2.2	2.5	3.1
01480629	Buck Run at Doe Run, Pa.	39°55'46"	75°49'24"	22.6	Big Elk Creek at Elk Mills, Md.	7	3.2	3.8	4.9
01480640	West Branch Brandywine Creek at Wawaset, Pa.	39°55'34"	75°39'47"	134	West Branch Brandywine Creek at Modena, Pa.	9	34.3	43.1	52.7
<u>Red and White Clay Creek Basins (fig. 12)</u>									
01479680	West Branch Red Clay Creek at Kennett Square, Pa.	39°50'13"	75°43'33"	9.56	White Clay Creek near Newark, Del.	8	1.9	2.1	2.8
01479700	West Branch Red Clay Creek near Kennett Square, Pa.	39°48'39"	75°42'19"	16.7	White Clay Creek near Newark, Del.	9	5.1	5.6	6.9
01479800	East Branch Red Clay Creek near Five Points, Pa.	39°49'11"	75°41'29"	10.0	White Clay Creek near Newark, Del.	7	1.2	1.4	2.1
<sup>1</sup> 01479820	Red Clay Creek near Kennett Square, Pa.	39°49'00"	75°41'31"	28.3	Big Elk Creek at Elk Mills, Md.	18	2.5	3.0	4.2
01478120	East Branch White Clay Creek near Avondale, Pa.	39°49'42"	75°46'52"	11.4	White Clay Creek near Newark, Del.	7	2.5	2.8	3.5
01478150	East Branch White Clay Creek at Landenberg, Pa.	39°46'40"	75°46'28"	27.0	White Clay Creek near Newark, Del.	10	4.9	5.6	7.5
01478190	Middle Branch White Clay Creek at Wickerton, Pa.	39°47'44"	75°49'27"	10.0	White Clay Creek near Newark, Del.	6	1.7	1.9	2.5
01478220	West Branch White Clay Creek near Chesterville, Pa.	39°45'56"	75°47'47"	9.90	White Clay Creek near Newark, Del.	8	1.3	1.5	2.1
01478230	Middle Branch White Clay Creek near Avondale, Pa.	39°45'02"	75°46'19"	25.5	White Clay Creek near Newark, Del.	4	3.3	3.9	5.4
<u>Big Elk Creek Basin (fig. 13)</u>									
01494900	East Branch Big Elk Creek at Elkview, Pa.	39°48'45"	75°54'04"	11.0	Big Elk Creek at Elk Mills, Md.	8	1.3	1.5	1.9
01494950	West Branch Big Elk Creek near Oxford, Pa.	39°46'45"	75°55'27"	9.95	Big Elk Creek at Elk Mills, Md.	9	1.5	1.8	2.3
01494990	Big Elk Creek near Lewisville, Pa.	39°43'48"	75°50'55"	41.0	Big Elk Creek at Elk Mills, Md.	12	6.8	7.7	9.6
01495320	Little Elk Creek near Lewisville, Pa.	39°43'13"	75°53'50"	13.4	Big Elk Creek at Elk Mills, Md.	4	1.8	2.0	2.5
<u>Octoraro Creek Basin (fig. 14)</u>									
01578343	Valley Creek near Atglen, Pa.	39°56'23"	75°59'06"	10.5	West Branch Brandywine Creek near Honey Brook, Pa.	5	.61	.79	1.2
01578345	East Branch Octoraro Creek at Steelville, Pa.	39°54'44"	75°59'44"	32.9	West Branch Brandywine Creek near Honey Brook, Pa.	3	7.1	8.3	10.6

<sup>1</sup> Continuous-record station.

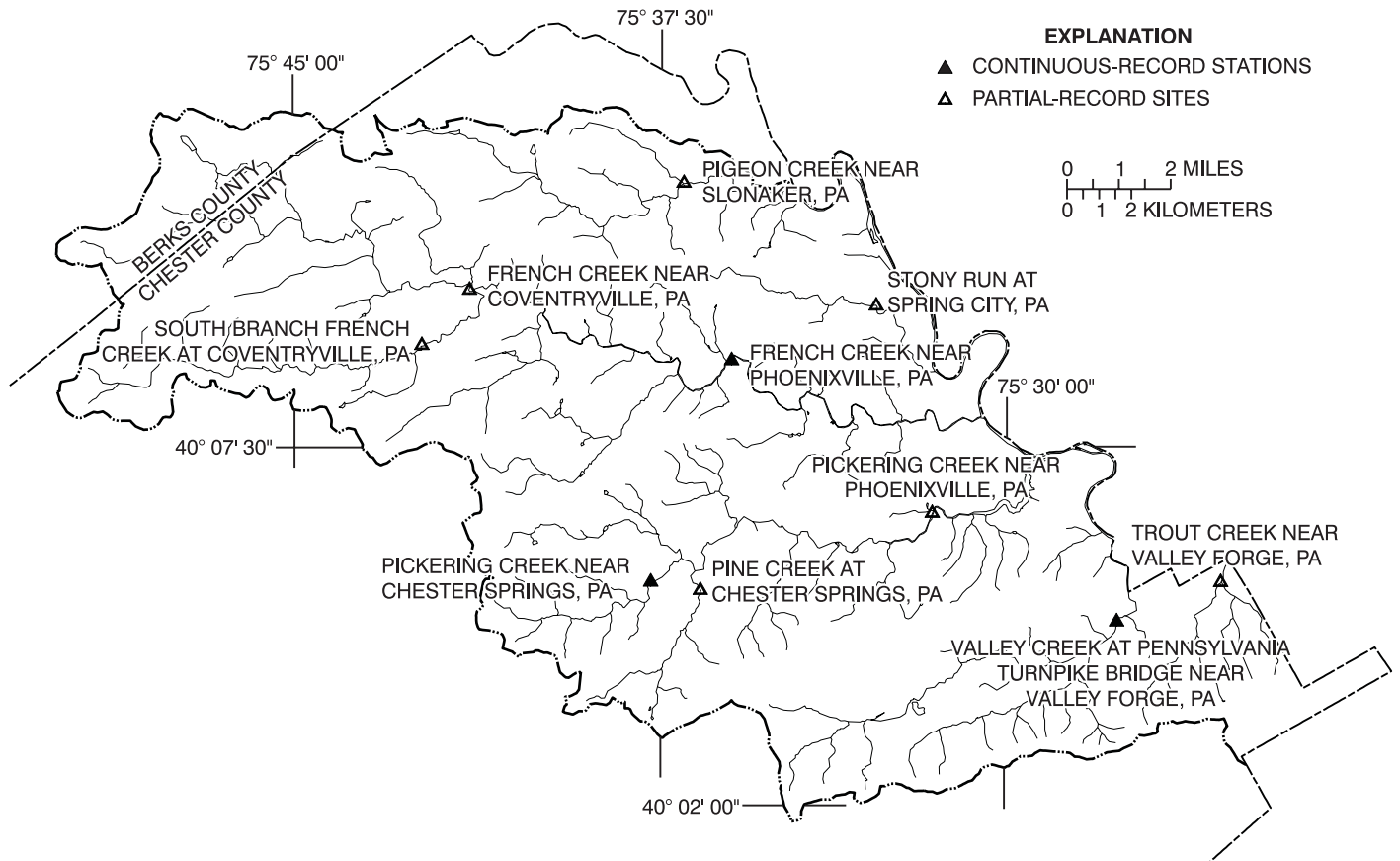


Figure 8. Locations of continuous-record stations and partial-record sites in the Schuylkill River Basin where low-flow statistics were determined.

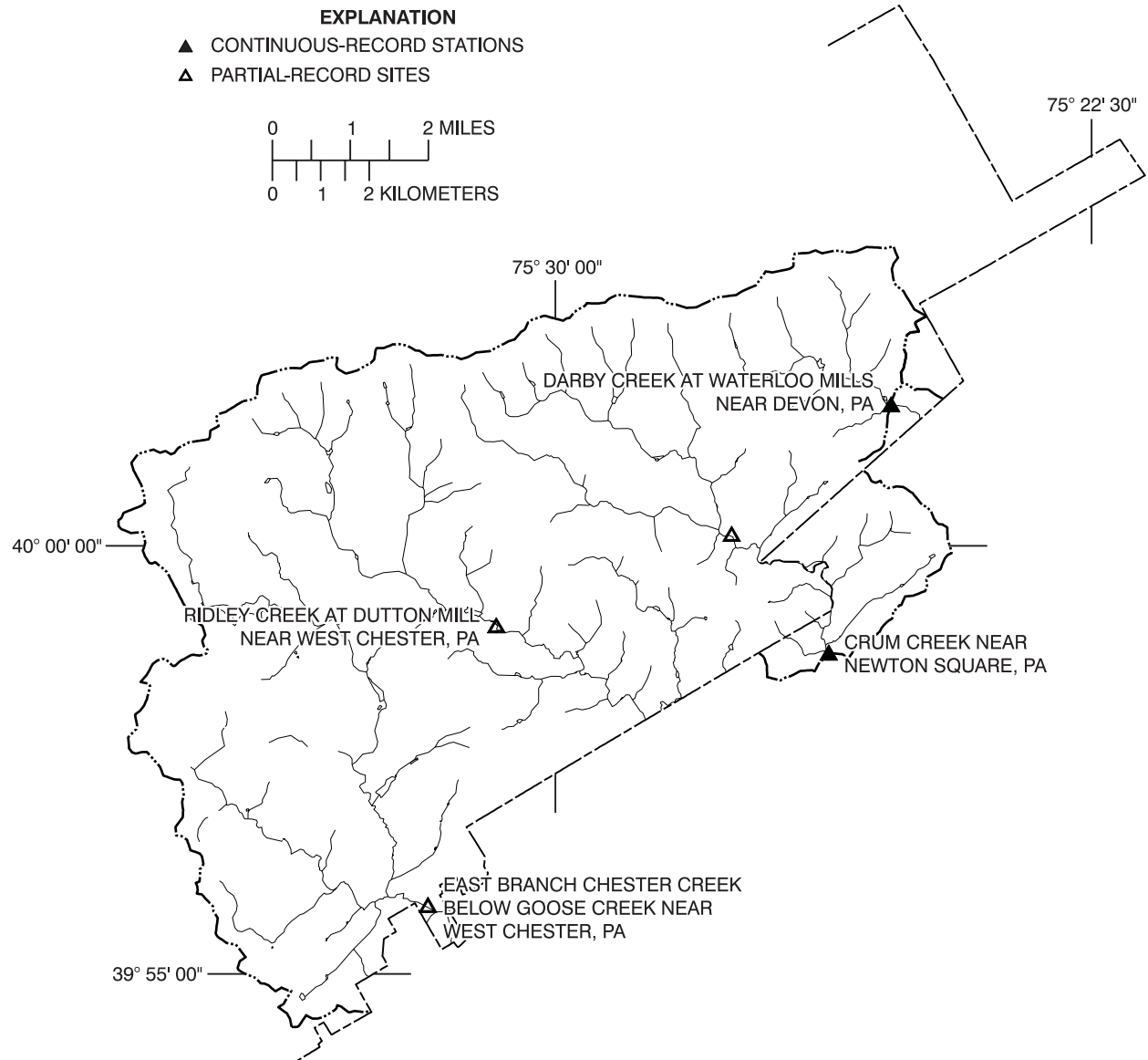


Figure 9. Locations of continuous-record stations and partial-record sites in the Darby, Crum, Ridley, and Chester Creek Basins where low-flow statistics were determined.



Figure 10. Locations of continuous-record stations and partial-record sites in the East Branch and main stem of the Brandywine Creek Basin where low-flow statistics were determined.





Figure 11. Locations of continuous-record stations and partial-record sites in the West Branch Brandywine Creek Basin where low-flow statistics were determined.

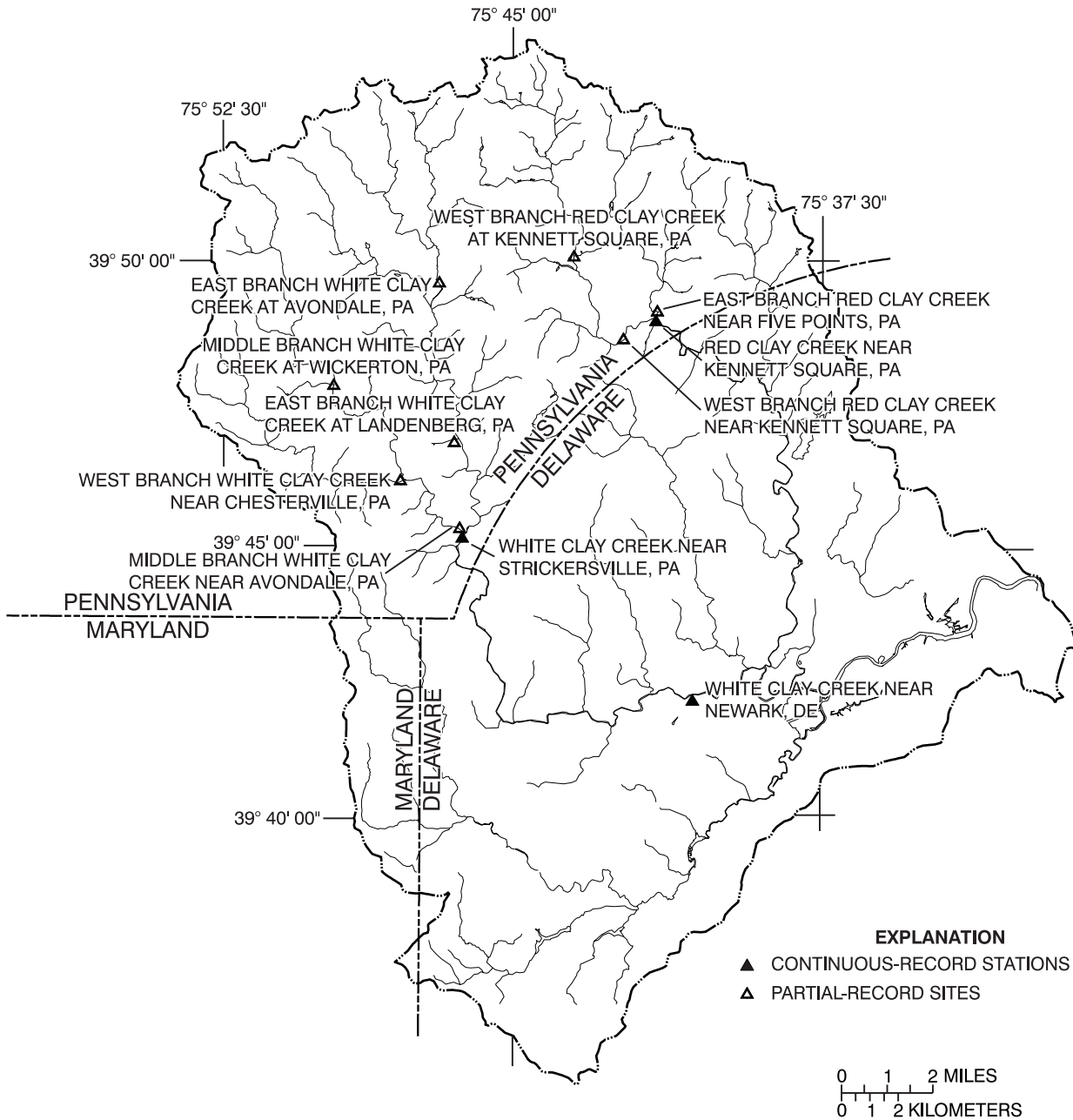


Figure 12. Locations of continuous-record stations and partial-record sites in the Red and White Clay Creek Basins where low-flow statistics were determined.

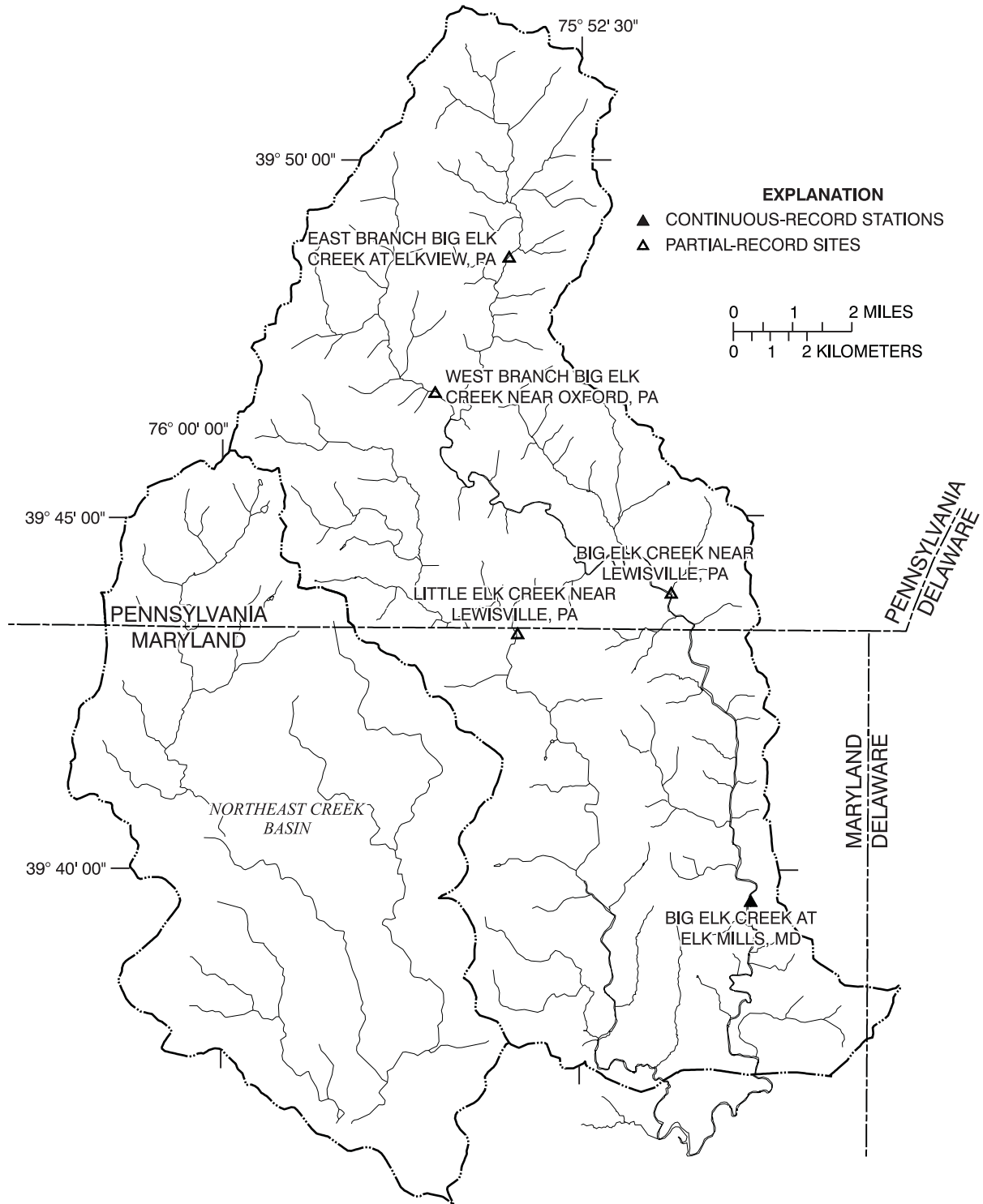


Figure 13. Locations of continuous-record stations and partial-record sites in the Elk Creek Basin where low-flow statistics were determined.

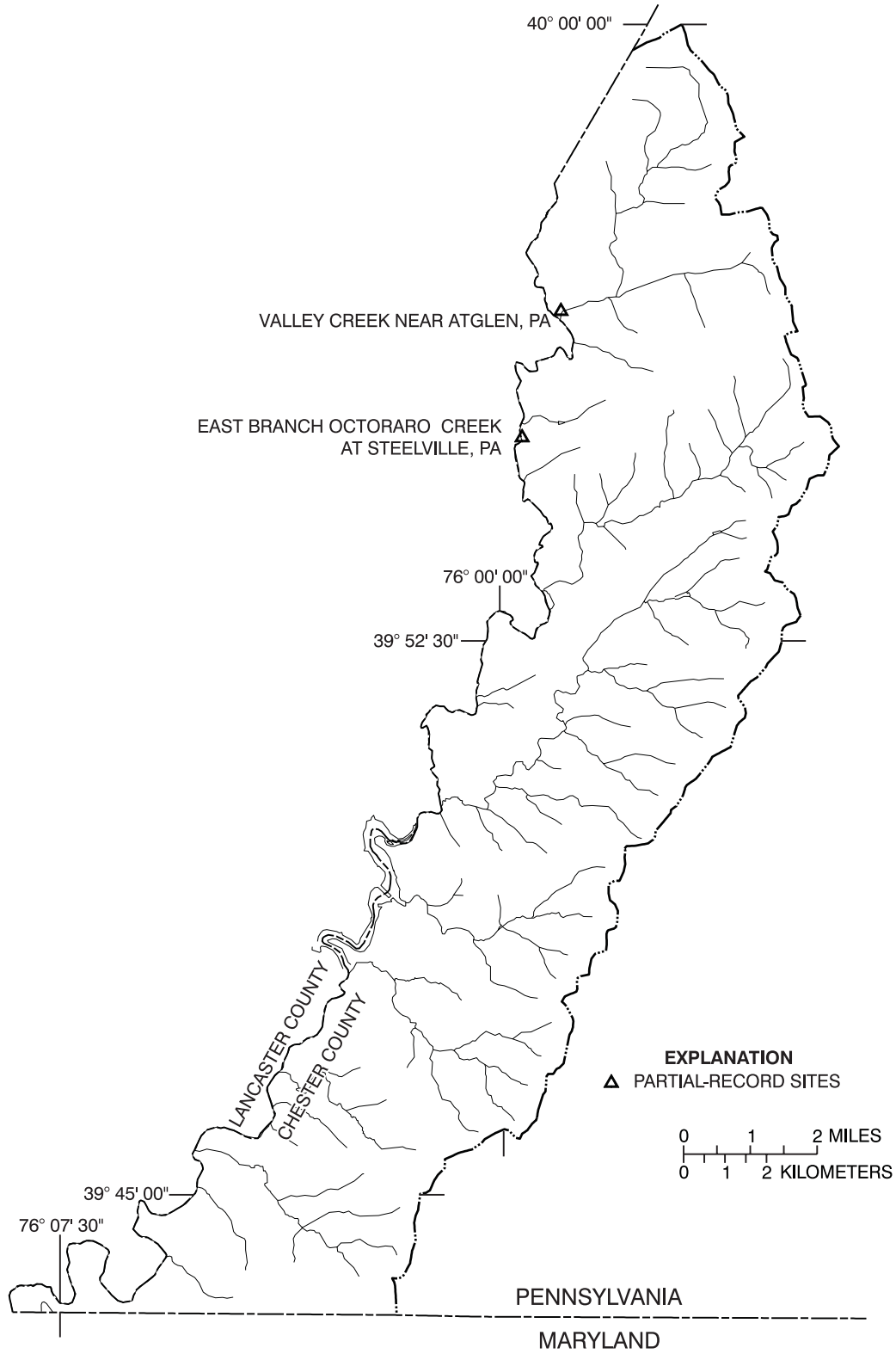


Figure 14. Locations of partial-record sites in the Octoraro Creek Basin where low-flow statistics were determined.

## SUMMARY

Low-flow statistics were determined from streamflow data for 14 continuous-record stations in Chester County, Pa., and from data for continuous-record stations Big Elk Creek at Elk Mills, Md., and White Clay Creek near Newark, Del. Streamflow data through the 1994 water year were used in the analyses. The low-flow statistics summarized are the 1Q10, 7Q10, 30Q10, and harmonic mean. Several methods were used in determining the low-flow statistics depending on the station type. The continuous-record stations were separated into four types: (1) stations with 10 or more years of record, (2) stations with less than 10 years of record, (3) stations affected by streamflow regulation, and (4) stations on streams that are predominantly underlain by carbonate rocks. The low-flow statistics for the stations with 10 or more years of record were adjusted to long-term climatic conditions by use of the station Big Elk Creek at Elk Mills, Md., as a long-term index station.

Low-flow statistics for continuous-record stations affected by regulation were not adjusted to long-term conditions, and statistics were determined for the period after regulation began. Because current regulation releases are not expected to change in the foreseeable future, the low-flow statistics estimated for these stations are representative of current and near-future stream conditions.

Low-flow statistics also were estimated for 34 partial-record sites in Chester County. The method used for estimating low-flow statistics at these sites related streamflow measurements at the site to daily mean streamflow at a selected continuous-record index station. The logarithms of the streamflow measurements were compared to the logarithms of concurrent daily mean streamflow at the selected index station. A relation was defined by a correlation line determined by use of the MOVE1 (Maintenance of Variance Extension, Type 1) technique. From the correlation line, low-flow statistics were determined.

The low-flow statistics determined for continuous-record stations and partial-record sites apply only to the stream reach in which the sites are located. Low-flow statistics for other reaches of streams will be different.

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**Appendix 1.** Continuous-record stations and partial-record sites for which streamflow measurements are compiled as of December 1996 in Chester County, Pennsylvania

[ND, drainage area not determined; C, continuous-record streamflow-measurement station; M, miscellaneous surface-water station; B, biological and surface-water sampling site; L, low-flow surface-water site; S, seepage investigation surface-water site]

U.S. Geological Survey station number	Station name	Latitude	Longitude	Drainage area	Station type
01472050	Pigeon Creek near Cedarville, Pa.	40°12'09"	75°40'22"	2.88	M
01472054	Pigeon Creek near Bucktown, Pa.	40°11'52"	75°40'10"	4.20	B
01472056	Unnamed tributary to Pigeon Creek near Porters Mill, Pa.	40°11'35"	75°39'47"	.33	M
01472060	Unnamed tributary to Pigeon Creek at Porters Mill, Pa.	40°11'18"	75°38'55"	.93	M
01472065	Pigeon Creek at Porters Mill, Pa.	40°11'31"	75°38'10"	7.00	B
01472068	Unnamed tributary to Pigeon Creek near Kenilworth, Pa.	40°11'47"	75°38'07"	.97	M
01472070	Unnamed tributary to Pigeon Creek near Slonaker, Pa.	40°11'47"	75°37'29"	1.09	M
01472075	Unnamed tributary to Pigeon Creek near Parker Ford, Pa.	40°12'04"	75°37'11"	2.22	M
01472080	Pigeon Creek near Slonaker, Pa.	40°12'03"	75°37'10"	12.0	B
01472085	Unnamed tributary to Pigeon Creek at Parker Ford, Pa.	40°11'55"	75°36'10"	.73	M
01472100	Pigeon Creek near Parker Ford, Pa.	40°11'48"	75°35'13"	14.0	L
01472103	Pigeon Creek at Parker Ford, Pa.	40°11'57"	75°34'58"	14.4	M
01472109	Stony Run near Spring City, Pa.	40°10'11"	75°34'45"	2.00	B
01472110	Stony Run at Spring City, Pa.	40°10'01"	75°32'57"	4.07	M
01472125	French Creek at Hopewell Village National Historical Area, Pa.	40°12'12"	75°46'11"	2.80	M
01472126	French Creek at Trythall, Pa.	40°11'45"	75°45'52"	5.18	B
01472129	French Creek near Knauertown, Pa.	40°11'12"	75°45'28"	11.6	M
01472130	French Creek near St. Peters, Pa.	40°11'03"	75°45'10"	12.0	L
01472138	French Creek near Coventryville, Pa.	40°10'14"	75°41'52"	23.1	B
01472140	South Branch French Creek at Coventryville, Pa.	40°09'18"	75°42'52"	12.4	B
01472150	French Creek at Coventryville, Pa.	40°10'16"	75°41'26"	36.9	B
01472154	French Creek near Pughtown, Pa.	40°09'17"	75°38'25"	47.1	B
01472155	Birch Run at Birchunville, Pa.	40°07'17"	75°39'14"	2.82	M
01472157	French Creek near Phoenixville, Pa.	40°09'05"	75°36'06"	59.1	C
01472160	French Creek at Phoenixville, Pa.	40°08'07"	75°31'08"	70.0	M
014721612	French Creek at Railroad Bridge at Phoenixville, Pa.	40°08'10"	75°30'41"	70.2	B
01472168	Pickering Creek at Byers, Pa.	40°04'43"	75°40'29"	.87	M
01472169	Pickering Creek near Byers, Pa.	40°04'44"	75°39'25"	3.00	M
01472170	Pickering Creek near Eagle, Pa.	40°04'43"	75°39'14"	3.06	B
01472171	Pickering Creek at Anselma, Pa.	40°05'00"	75°38'38"	4.01	M
01472172	Unnamed tributary to Pickering Creek at Anselma, Pa.	40°05'03"	75°38'16"	.82	M
01472173	Pickering Creek at Oppermans Corner, Pa.	40°05'02"	75°37'54"	5.66	M
01472174	Pickering Creek near Chester Springs, Pa.	40°05'22"	75°37'50"	5.98	C
01472175	Unnamed tributary to Pickering Creek at Art School Road near Chester Springs, Pa.	40°06'07"	75°39'32"	2.03	M
01472176	Unnamed tributary to Pickering Creek at Chester Springs, Pa.	40°06'03"	75°37'38"	4.33	M
01472180	Pickering Creek at Chester Springs, Pa.	40°05'44"	75°37'07"	11.1	M
01472182	Pine Creek near Lionville, Pa.	40°03'50"	75°37'55"	1.11	M
01472183	Pine Creek at Chester Springs, Pa.	40°05'14"	75°36'45"	5.07	M
01472184	Pickering Creek at Pikeland, Pa.	40°06'13"	75°36'03"	17.7	M
01472185	Unnamed tributary to Pickering Creek near Chester Springs, Pa.	40°06'49"	75°36'18"	2.47	M
014721854	Pickering Creek at Merlin, Pa.	40°06'25"	75°35'34"	21.2	B
01472186	Pigeon Run at Rapps Corner, Pa.	40°04'58"	75°35'31"	1.06	M

**Appendix 1.** Continuous-record stations and partial-record sites for which streamflow measurements are compiled as of December 1996 in Chester County, Pennsylvania—Continued

U.S. Geological Survey station number	Station name	Latitude	Longitude	Drainage area	Station type
01472187	Pigeon Run at Merlin, Pa.	40°05'37"	75°34'54"	2.84	M
01472188	Pickering Creek at Charlestown, Pa.	40°06'05"	75°34'17"	26.0	M
014721884	Pickering Creek at Charlestown Road Bridge at Charlestown, Pa.	40°05'57"	75°33'20"	27.5	B
01472189	Rock Run at Charlestown, Pa.	40°05'43"	75°32'34"	2.61	M
01472190	Pickering Creek near Phoenixville, Pa.	40°06'33"	75°31'42"	31.4	B
01472192	Unnamed tributary to Pickering Creek near Phoenixville, Pa.	40°06'20"	75°30'19"	1.21	M
01473154	Valley Creek at Mill Lane, Pa.	40°03'03"	75°33'17"	4.14	M
01473167	Little Valley Creek at Howellville, Pa.	40°04'00"	75°28'22"	6.45	B
01473168	Valley Creek near Valley Forge, Pa.	40°04'11"	75°28'25"	12.6	B
01473169	Valley Creek at Pa. Turnpike Bridge near Valley Forge, Pa.	40°04'45"	75°27'40"	20.8	C
01473170	Valley Creek at Wilson Road near Valley Forge, Pa.	40°04'53"	75°27'25"	22.0	M
01473200	Trout Creek near Valley Forge, Pa.	40°05'25"	75°25'24"	6.28	L
01475300	Darby Creek at Waterloo Mills near Devon, Pa.	40°01'21"	75°25'20"	5.15	C
01475830	Crum Creek near Paoli, Pa.	40°00'28"	75°27'55"	6.18	M
01475840	Crum Creek at Whitehorse, Pa.	39°59'54"	75°27'38"	10.1	B
01475845	Crum Creek at Goshen Road near Whitehorse, Pa.	39°59'24"	75°26'16"	12.5	M
01475850	Crum Creek near Newtown Square, Pa.	39°58'35"	75°26'13"	15.8	M
01476430	Unnamed tributary to Ridley Creek at Goshenville, Pa.	39°59'28"	75°32'40"	4.23	B
01476435	Ridley Creek at Dutton Mill near West Chester, Pa.	39°58'52"	75°31'02"	9.59	B
01476790	East Branch Chester Creek at Green Hill, Pa.	39°59'49"	75°35'40"	1.12	B
01476820	East Branch Chester Creek near Fern Hill, Pa.	39°59'10"	75°35'19"	1.85	M
01476830	East Branch Chester Creek at Milltown, Pa.	39°58'21"	75°32'57"	5.80	B
01476835	East Branch Chester Creek at Westtown, Pa.	39°56'26"	75°32'30"	10.5	B
01476836	East Branch Chester Creek near West Chester, Pa.	39°56'09"	75°32'29"	10.9	M
01476840	Goose Creek tributary to East Branch Chester Creek near West Chester, Pa.	39°56'04"	75°33'31"	4.07	B
01476848	East Branch Chester Creek below Goose Creek near West Chester, Pa.	39°55'45"	75°32'00"	19.6	B
01478100	Unnamed tributary to East Branch White Clay Creek near London Grove, Pa.	39°51'30"	75°47'01"	2.77	M
01478120	East Branch White Clay Creek at Avondale, Pa.	39°49'42"	75°46'52"	11.4	B
01478150	East Branch White Clay Creek at Landenberg, Pa.	39°46'40"	75°46'28"	27.0	L
01478190	Middle Branch White Clay Creek at Wickerton, Pa.	39°47'44"	75°49'27"	10.0	B
01478200	Middle Branch White Clay Creek near Landenberg, Pa.	39°46'54"	75°48'03"	12.7	M
01478220	West Branch White Clay Creek near Chesterville, Pa.	39°45'56"	75°47'47"	9.90	B
01478230	Middle Branch White Clay Creek near Avondale, Pa.	39°45'02"	75°46'19"	25.5	M
01478245	White Clay Creek near Strickersville, Pa.	39°44'51"	75°46'15"	59.2	C
01479680	West Branch Red Clay Creek at Kennett Square, Pa.	39°50'13"	75°43'33"	9.56	B
01479700	West Branch Red Clay Creek near Kennett Square, Pa.	39°48'39"	75°42'19"	16.7	L
01479795	East Branch Red Clay Creek at Five Points, Pa.	39°49'36"	75°41'30"	9.46	M
01479800	East Branch Red Clay Creek near Five Points, Pa.	39°49'11"	75°41'29"	10.0	B
01479820	Red Clay Creek near Kennett Square, Pa.	39°49'00"	75°41'31"	28.3	C
01480269	West Branch Brandywine Creek at Rockville, Pa.	40°04'48"	75°52'20"	5.93	M
01480280	Unnamed tributary to West Branch Brandywine Creek near Cambridge, Pa.	40°04'34"	75°54'57"	5.72	M
01480295	Two Log Run at Birdell, Pa.	40°04'06"	75°52'25"	2.81	M
01480300	West Branch Brandywine Creek near Honey Brook, Pa.	40°04'22"	75°51'40"	18.7	C

**Appendix 1.** Continuous-record stations and partial-record sites for which streamflow measurements are compiled as of December 1996 in Chester County, Pennsylvania—Continued

U.S. Geological Survey station number	Station name	Latitude	Longitude	Drainage area	Station type
01480310	West Branch Brandywine Creek near Birdell, Pa.	40°04'18"	75°51'30"	19.0	M
01480350	West Branch Brandywine Creek at Cedar Knoll, Pa.	40°02'22"	75°49'43"	24.6	M
01480400	Birch Run near Wagontown, Pa.	40°01'38"	75°50'43"	4.62	M
01480420	West Branch Brandywine Creek near Wagontown, Pa.	40°01'30"	75°50'40"	30.2	M
01480430	West Branch Brandywine Creek at Siousca, Pa.	40°00'23"	75°49'36"	33.4	M
01480434	West Branch Brandywine Creek at Rock Run, Pa.	39°59'36"	75°49'41"	37.5	B
01480460	Rock Run near Coatesville, Pa.	39°59'55"	75°52'15"	4.55	M
01480500	West Branch Brandywine Creek at Coatesville, Pa.	39°59'08"	75°49'40"	45.8	C
01480600	Sucker Run near Westwood, Pa.	39°58'11"	75°51'39"	1.75	M
01480610	Sucker Run near Coatesville, Pa.	39°58'20"	75°51'03"	2.60	L
01480617	West Branch Brandywine Creek at Modena, Pa.	39°57'42"	75°48'06"	55.0	C
01480620	West Branch Brandywine Creek at Mortonville, Pa.	39°56'47"	75°46'45"	61.9	M
01480622	Buck Run near Pomeroy Heights, Pa.	39°57'58"	75°53'36"	6.15	S
01480623	Buck Run at Pomeroy, Pa.	39°57'49"	75°53'37"	6.37	S
01480624	Buck Run below Pomeroy, Pa.	39°57'35"	75°53'25"	6.74	S
01480625	Buck Run at Stottsville, Pa.	39°57'28"	75°53'27"	6.77	S
01480627	Unnamed tributary to Buck Run at Stottsville, Pa.	39°57'27"	75°53'29"	3.78	S
01480629	Buck Run at Doe Run, Pa.	39°55'46"	75°49'24"	22.6	B
01480630	Buck Run near Doe Run, Pa.	39°55'46"	75°48'36"	24.4	L
01480632	Doe Run at Springdell, Pa.	39°54'25"	75°49'42"	11.8	B
01480640	West Branch Brandywine Creek at Wawaset, Pa.	39°55'34"	75°39'47"	134	B
01480647	East Branch Brandywine Creek near Church Hill, Pa.	40°06'04"	75°51'40"	4.23	B
01480648	East Branch Brandywine Creek near Cupola, Pa.	40°05'41"	75°51'14"	5.85	B
01480650	East Branch Brandywine Creek at Cupola, Pa.	40°05'55"	75°50'44"	6.17	M
01480652	Unnamed tributary to East Branch Brandywine Creek near Cupola, Pa.	40°06'30"	75°49'33"	3.85	M
01480653	East Branch Brandywine Creek at Glenmoore, Pa.	40°05'48"	75°46'44"	16.5	B
01480655	Indian Run at Germany Hollow Road near Brandywine Manor, Pa.	40°04'25"	75°49'01"	1.94	M
01480656	Indian Run near Springton, Pa.	40°04'33"	75°46'57"	4.24	B
01480657	North Branch Indian Run at Glenmoore, Pa.	40°04'36"	75°46'52"	1.60	M
01480658	Indian Run at Glenmoore, Pa.	40°04'41"	75°46'19"	6.26	M
01480659	East Branch Brandywine Creek at Cornog, Pa.	40°04'37"	75°45'18"	25.7	M
01480660	East Branch Brandywine Creek at Lyndell, Pa.	40°03'34"	75°44'40"	27.1	M
01480662	Culbertson Run at Lyndell, Pa.	40°03'29"	75°45'07"	3.88	M
01480665	East Branch Brandywine Creek near Dorlan, Pa.	40°03'08"	75°43'28"	33.4	L
01480670	Marsh Creek near Wallace, Pa.	40°06'19"	75°45'17"	7.61	M
01480675	Marsh Creek near Glenmoore, Pa.	40°05'52"	75°44'31"	8.57	C
01480680	Marsh Creek near Lyndell, Pa.	40°03'58"	75°43'38"	17.8	M
01480685	Marsh Creek near Downingtown, Pa.	40°03'19"	75°43'00"	20.3	C
01480690	Marsh Creek near Dorlan, Pa.	40°03'07"	75°43'07"	20.3	M
01480692	East Branch Brandywine Creek at Dorlan, Pa.	40°02'51"	75°43'03"	54.0	M
01480700	East Branch Brandywine Creek near Downingtown, Pa.	40°02'05"	75°42'32"	60.6	C
01480780	Beaver Creek at Downingtown, Pa.	40°00'28"	75°42'32"	18.0	M
01480800	East Branch Brandywine Creek at Downingtown, Pa.	40°00'20"	75°42'20"	81.6	M
01480870	East Branch Brandywine Creek below Downingtown, Pa.	39°58'07"	75°40'25"	89.9	C
01480871	Valley Creek <sup>1</sup> at Church Farm School near Exton, Pa.	40°02'12"	75°35'53"	.86	M



**Appendix 1.** Continuous-record stations and partial-record sites for which streamflow measurements are compiled as of December 1996 in Chester County, Pennsylvania—Continued

U.S. Geological Survey station number	Station name	Latitude	Longitude	Drainage area	Station type
01480872	Unnamed tributary to Valley Creek <sup>1</sup> at Swedesford Road near Exton, Pa.	40°02'26"	75°36'08"	0.88	M
01480873	Unnamed tributary to Valley Creek <sup>1</sup> at Ship Road near Exton, Pa.	40°01'55"	75°36'38"	.46	M
01480874	Valley Creek <sup>1</sup> at Lakeside Street near Exton, Pa.	40°01'57"	75°37'01"	3.13	M
01480875	Unnamed tributary to Valley Creek <sup>1</sup> at Brookview Street near Exton, Pa.	40°02'05"	75°37'07"	.53	M
01480876	Valley Creek <sup>1</sup> at Chester County Library near Exton, Pa.	40°01'52"	75°37'16"	4.08	M
01480877	Unnamed tributary to Valley Creek <sup>1</sup> at Chester County Library near Exton, Pa.	40°01'51"	75°37'15"	1.34	M
014808775	Unnamed tributary to Valley Creek <sup>1</sup> at Waterloo Road near Exton, Pa.	40°01'59"	75°38'08"	2.33	M
01480878	Unnamed tributary to Valley Creek at Highway 30 at Exton, Pa.	40°01'35"	75°38'11"	2.64	C
01480880	Valley Creek <sup>1</sup> at Exton, Pa.	40°01'22"	75°38'37"	8.96	M
01480881	Valley Creek <sup>1</sup> near Whitford Road near Exton, Pa.	40°01'16"	75°38'38"	9.03	M
01480882	Unnamed tributary to Valley Creek <sup>1</sup> at Whitford Road near Exton, Pa.	40°01'14"	75°38'31"	1.06	M
01480883	Valley Creek <sup>1</sup> at Clover Mill Road near Exton, Pa.	40°00'43"	75°39'20"	11.6	M
01480884	Unnamed tributary to Valley Creek <sup>1</sup> at Clover Mill Road near Exton, Pa.	40°00'43"	75°39'23"	1.69	M
01480885	Valley Creek <sup>1</sup> near Downingtown, Pa.	40°00'23"	75°39'59"	13.9	M
01480887	Valley Creek <sup>1</sup> at Ravine Road near Downingtown, Pa.	39°59'55"	75°39'52"	14.5	C
01480890	Valley Creek <sup>1</sup> near Altor, Pa.	39°58'56"	75°39'53"	16.0	M
01480900	Broad Run near Altor, Pa.	39°58'54"	75°39'47"	4.04	M
01480903	Valley Creek <sup>1</sup> at Mullsteins Meadows near Downingtown, Pa.	39°58'31"	75°39'48"	20.4	B
01480950	East Branch Brandywine Creek at Wawaset, Pa.	39°55'35"	75°38'54"	124	B
01480990	Ring Run near Hamorton, Pa.	39°51'55"	75°38'10"	.62	M
01481000	Brandywine Creek at Chadds Ford, Pa. <sup>2</sup>	39°52'11"	75°35'37"	287	C
01494900	East Branch Big Elk Creek at Elkview, Pa.	39°48'48"	75°54'04"	11.0	B
01494950	West Branch Big Elk Creek near Oxford, Pa.	39°46'47"	75°55'27"	9.95	B
01494980	Big Elk Creek at Lewisville, Pa.	39°44'08"	75°52'33"	31.0	L
01494990	Big Elk Creek near Lewisville, Pa.	39°43'48"	75°50'55"	41.0	L
01495300	Little Elk Creek at Elk Mills, Pa.	39°43'36"	75°54'28"	11.8	M
01495320	Little Elk Creek near Lewisville, Pa.	39°43'13"	75°53'50"	13.4	M
01578340	East Branch Octoraro Creek at Christiana, Pa.	39°56'57"	75°59'32"	11.8	B
01578341	East Branch Octoraro Creek below Christiana, Pa.	39°56'54"	75°59'30"	11.9	S
01578342	East Branch Octoraro Creek near Christiana, Pa.	39°56'43"	75°59'32"	12.2	S
01578343	Valley Creek near Atglen, Pa.	39°56'23"	75°59'06"	10.5	B
01578344	East Branch Octoraro Creek below Valley Creek near Atglen, Pa.	39°56'06"	75°58'56"	28.8	S
01578345	East Branch Octoraro Creek at Steelville, Pa.	39°54'44"	75°59'44"	32.9	B
01578350	Muddy Run at Cream, Pa.	39°49'57"	76°00'15"	13.3	M
01578360	East Branch Octoraro Creek near Mt. Vernon, Pa.	39°49'50"	76°01'05"	75.6	M

<sup>1</sup> Valley Creek also referred to as West Valley Creek.

<sup>2</sup> Gage located in Delaware County, Pennsylvania.

**Appendix 2. Streamflow measurements made by the U.S. Geological Survey at partial-record sites in Chester County, Pennsylvania**

[ft<sup>3</sup>/s, cubic feet per second]

**Station name:** Pigeon Creek near Cedarville, Pa.  
**Station number:** 01472050

Date	Streamflow (ft <sup>3</sup> /s)
08-31-67	0.43
08-31-67	1.5
09-12-67	1.2
09-12-67	.38

**Station name:** Pigeon Creek near Bucktown, Pa.  
**Station number:** 01472054

Date	Streamflow (ft <sup>3</sup> /s)
11-14-69	1.3
02-19-70	4.2
05-04-71	4.5
09-28-71	6.2
10-09-72	3.6
10-29-82	1.5
09-29-96	1.5

**Station name:** Unnamed tributary to Pigeon Creek near Porters Mill, Pa.  
**Station number:** 01472056

Date	Streamflow (ft <sup>3</sup> /s)
08-31-67	0.80
09-12-67	.13

**Station name:** Unnamed tributary to Pigeon Creek at Porters Mill, Pa.  
**Station number:** 01472060

Date	Streamflow (ft <sup>3</sup> /s)
08-31-67	0.80
09-12-67	.59

**Station name:** Pigeon Creek at Porters Mill, Pa.  
**Station number:** 01472065

Date	Streamflow (ft <sup>3</sup> /s)
11-14-69	2.4
02-19-70	8.8
05-05-70	8.3
09-29-70	2.7
05-04-71	8.8
09-28-71	12
10-09-72	7.1
10-29-82	2.4

**Station name:** Unnamed tributary to Pigeon Creek near Kenilworth, Pa.  
**Station number:** 01472068

Date	Streamflow (ft <sup>3</sup> /s)
08-31-67	0.42
09-12-67	.34

**Station name:** Unnamed tributary to Pigeon Creek near Slonaker, Pa.  
**Station number:** 01472070

Date	Streamflow (ft <sup>3</sup> /s)
08-31-67	1.1
09-12-67	.72

**Station name:** Unnamed tributary to Pigeon Creek near Parker Ford, Pa.  
**Station number:** 01472075

Date	Streamflow (ft <sup>3</sup> /s)
08-30-67	1.6
09-12-67	1.0

**Station name:** Pigeon Creek near Slonaker, Pa.  
**Station number:** 01472080

Date	Streamflow (ft <sup>3</sup> /s)
11-05-69	4.3
11-14-69	4.2
11-20-69	9.1
12-11-69	28
01-06-70	10
02-19-70	12
03-31-70	20
05-06-70	12
05-13-70	16
06-16-70	8.5
07-29-70	5.2
09-11-70	3.9
09-29-70	3.0
10-30-70	5.7
02-18-71	18
04-07-71	47
05-04-71	14
08-17-71	6.3
09-28-71	19
04-13-72	31
07-26-72	2.5
10-09-72	11
10-03-73	8.8
10-03-74	4.1
10-24-74	4.6
11-05-75	7.3
02-17-76	31
10-26-76	17
10-06-77	3.5
10-20-77	7.7
08-14-78	13
10-04-78	6.0
10-31-78	6.2
07-02-79	11
10-21-80	2.6
04-07-81	8.1
08-13-81	6.4
10-16-81	3.1
09-23-82	5.8
10-18-82	3.6
10-29-82	25
11-23-82	4.4
01-14-83	8.8
03-18-83	23
08-11-83	4.2
10-05-83	3.4
10-21-83	25

**Station name:** Pigeon Creek near Slonaker, Pa.—Continued  
**Station number:** 01472080

Date	Streamflow (ft <sup>3</sup> /s)
02-09-84	15
05-01-84	22
10-22-84	16
11-20-84	5.1
04-26-85	7.1
05-21-85	8.6
06-20-85	5.8
10-11-85	6.6
06-03-86	7.7
10-10-86	3.4
11-13-87	29
07-08-88	6.1
10-14-88	3.8
11-09-88	5.4
10-11-89	10
10-04-90	3.9
07-10-91	6.7
08-07-91	4.2
09-09-91	3.5
10-08-91	3.6
10-13-92	5.5
10-08-93	4.2
10-31-94	4.3
11-22-95	11
11-06-96	13

**Station name:** Unnamed tributary to Pigeon Creek at Parker Ford, Pa.  
**Station number:** 01472085

Date	Streamflow (ft <sup>3</sup> /s)
08-30-67	0.51
09-12-67	.40

**Station name:** Pigeon Creek near Parker Ford, Pa.  
**Station number:** 01472100

Date	Streamflow (ft <sup>3</sup> /s)
10-14-43	3.1
08-21-46	8.4
09-23-47	5.4
08-31-48	13
10-04-48	8.0
07-14-49	14
08-19-49	4.8
10-02-50	5.9
09-25-51	4.5
09-24-52	8.5
08-25-53	5.5
10-22-53	3.2
08-05-55	4.5
08-06-57	3.2
08-20-81	4.2
09-19-81	9.0
09-17-82	6.2
08-23-83	4.5
04-26-85	7.1
09-16-86	3.5
10-10-86	3.4
07-12-88	6.9
10-14-88	3.8
07-10-91	6.6

**Appendix 2. Streamflow measurements made by the U.S. Geological Survey at partial-record sites in Chester County, Pennsylvania—Continued**

**Station name:** Pigeon Creek near Parker Ford, Pa.—Continued  
**Station number:** 01472100

Date	Streamflow (ft <sup>3</sup> /s)
08-07-91	4.2
09-09-91	3.5

**Station name:** Pigeon Creek at Parker Ford, Pa.  
**Station number:** 01472103

Date	Streamflow (ft <sup>3</sup> /s)
08-30-67	10
09-12-67	6.4

**Station name:** Stony Run near Spring City, Pa.  
**Station number:** 01472109

Date	Streamflow (ft <sup>3</sup> /s)
11-12-69	0.50
02-19-70	5.2
05-06-70	6.9
09-29-70	.70
05-04-71	1.0
09-28-71	1.9
10-09-72	2.2
10-19-82	.45
10-20-83	.33
03-23-84	4.7
04-26-84	3.0
05-22-84	2.0
06-13-84	2.3
07-17-84	3.0
08-21-84	1.3
09-18-84	.63
10-09-84	.53
11-20-84	.29
12-13-84	.71
10-11-85	.75
10-10-86	.27
11-13-87	2.2
11-09-88	.41
10-11-89	2.3
10-04-90	.67
10-08-91	.17
10-08-92	.25
10-08-93	.38
11-01-94	.65
11-13-95	2.1
11-06-96	2.3

**Station name:** Stony Run at Spring City, Pa.  
**Station number:** 01472110

Date	Streamflow (ft <sup>3</sup> /s)
11-05-69	0.75
11-13-69	.70
11-20-69	2.1
12-11-69	12
01-06-70	4.1
02-19-70	7.1
03-31-70	9.4
05-06-70	9.4
05-13-70	3.1
06-16-70	1.4
07-29-70	.57

**Station name:** Stony Run at Spring City, Pa.—Continued  
**Station number:** 01472110

Date	Streamflow (ft <sup>3</sup> /s)
09-11-70	0.39
09-29-70	9.1
10-30-70	.68
02-18-71	3.3
04-07-71	20
05-04-71	2.3
05-13-71	21
06-22-71	1.8
08-17-71	2.2
09-28-71	3.6
11-02-71	6.1
10-09-72	3.7
04-13-72	6.2
05-09-72	17
07-26-72	2.5
10-03-74	1.8
02-17-76	8.8
10-06-77	.47
08-14-78	4.6
10-04-78	.79
07-05-79	2.2
03-18-80	15
10-21-80	.25
10-19-82	.75

**Station name:** French Creek at Hope-well Village National Historic Area, Pa.  
**Station number:** 01472125

Date	Streamflow (ft <sup>3</sup> /s)
08-29-51	1.1
09-04-51	1.2
09-20-51	.76

**Station name:** French Creek at Trythall, Pa.

**Station number:** 01472126

Date	Streamflow (ft <sup>3</sup> /s)
10-26-82	4.2

**Station name:** French Creek near Knauertown, Pa.

**Station number:** 01472129

Date	Streamflow (ft <sup>3</sup> /s)
12-09-69	9.7
02-24-70	16
05-07-70	17
10-05-70	5.6
05-10-71	15
10-04-71	11
10-30-72	12
10-26-82	18

**Station name:** French Creek near St. Peters, Pa.

**Station number:** 01472130

Date	Streamflow (ft <sup>3</sup> /s)
08-21-81	0.10
09-19-81	.25

**Station name:** French Creek near St. Peters, Pa.—Continued  
**Station number:** 01472130

Date	Streamflow (ft <sup>3</sup> /s)
09-15-82	4.6
08-24-83	5.8
04-29-85	5.8
09-26-85	2.5
09-23-86	3.3
07-12-88	5.2
10-14-88	4.9
06-03-91	5.8
07-09-91	12
08-13-91	6.9
09-09-91	15

**Station name:** French Creek near Coventryville, Pa.

**Station number:** 01472138

Date	Streamflow (ft <sup>3</sup> /s)
11-03-50	19
05-22-51	27
08-23-51	19
12-09-69	24
02-24-70	28
05-20-70	30
10-05-70	11
05-10-71	30
10-04-71	23
10-30-72	18
11-04-82	7.3
10-18-83	9.5
10-10-84	10
10-10-85	11
10-22-86	5.0
10-16-87	10
10-20-88	7.3
10-23-89	32
11-16-90	16
10-09-91	6.8
10-15-92	9.8
10-14-93	16
10-27-94	10
11-06-95	14

**Station name:** South Branch French Creek at Coventryville, Pa.

**Station number:** 01472140

Date	Streamflow (ft <sup>3</sup> /s)
05-26-64	12
09-02-64	3.2
09-18-64	2.4
12-09-69	13
02-24-70	16
05-07-70	16
10-05-70	5.8
05-10-71	16
10-04-71	12
10-30-72	9.6
11-04-82	6.9
10-18-83	4.7
10-10-84	7.8
10-10-85	7.7
10-22-86	4.4
10-16-87	7.6
10-20-88	5.5
10-23-89	19

**Appendix 2. Streamflow measurements made by the U.S. Geological Survey at partial-record sites in Chester County, Pennsylvania—Continued**

**Station name:** South Branch French Creek at Coventryville, Pa.—Continued  
**Station number:** 01472140

Date	Streamflow (ft <sup>3</sup> /s)
11-16-90	9.6
10-09-91	4.5
10-15-92	5.6
10-14-93	8.3
10-27-94	6.0
11-06-95	8.4

**Station name:** French Creek at Coventryville, Pa.  
**Station number:** 01472150

Date	Streamflow (ft <sup>3</sup> /s)
09-21-59	9.7
10-05-60	28
10-11-61	11
07-10-62	11
05-15-63	16
09-03-63	5.8
10-21-63	9.0
09-18-64	8.2
10-21-65	9.6
04-18-66	16
09-13-66	5.0
09-26-67	22
05-15-68	33
09-19-68	11
08-28-69	14
08-21-81	7.4
09-19-81	17
09-15-82	7.4
08-24-83	15
04-29-85	19
09-26-85	4.4
09-16-86	9.5
07-12-88	21
10-14-88	14
06-03-91	23
07-09-91	11
08-13-91	6.2
09-09-91	15

**Station name:** French Creek near Pughtown, Pa.  
**Station number:** 01472154

Date	Streamflow (ft <sup>3</sup> /s)
12-10-69	37
02-24-70	42
05-20-70	43
10-05-70	22
05-10-71	61
10-04-71	46
10-30-72	37
11-02-82	19
10-20-83	30
10-10-84	23
10-11-85	24
10-31-86	17
10-14-87	28
10-21-88	16
10-24-89	60
11-15-90	35
10-15-91	15
10-14-92	20
10-15-93	24

**Station name:** French Creek near Pughtown, Pa.—Continued  
**Station number:** 01472154

Date	Streamflow (ft <sup>3</sup> /s)
10-27-94	20
11-06-95	29

**Station name:** Birch Run at Birchrunville, Pa.  
**Station number:** 01472155

Date	Streamflow (ft <sup>3</sup> /s)
09-01-66	0.24

**Station name:** French Creek at Phoenixville, Pa.  
**Station number:** 01472160

Date	Streamflow (ft <sup>3</sup> /s)
09-10-47	22
09-28-51	21

**Station name:** French Creek at railroad bridge at Phoenixville, Pa.  
**Station number:** 014721612

Date	Streamflow (ft <sup>3</sup> /s)
10-05-70	38
05-11-71	91
10-04-71	68
10-24-72	55
11-02-82	30
10-20-83	52
10-10-84	35
10-09-85	43
10-31-86	24
10-13-87	39
10-19-88	35
10-24-89	120
11-15-90	51
10-21-91	27
10-13-92	45
10-18-93	35
10-28-94	31
11-07-95	47

**Station name:** Pickering Creek at Byers, Pa.  
**Station number:** 01472168

Date	Streamflow (ft <sup>3</sup> /s)
09-01-66	0.19
09-26-67	.43

**Station name:** Pickering Creek near Byers, Pa.  
**Station number:** 01472169

Date	Streamflow (ft <sup>3</sup> /s)
09-26-67	1.4

**Station name:** Pickering Creek near Eagle, Pa.  
**Station number:** 01472170

Date	Streamflow (ft <sup>3</sup> /s)
10-22-69	3.0
02-18-70	4.7
05-04-70	2.4
09-28-70	1.5
05-03-71	2.3
09-27-71	1.6
10-03-72	2.4
10-18-82	1.3
10-17-83	1.1
10-05-84	1.8
10-08-85	1.8
10-07-86	.57
10-09-87	1.1
10-13-88	.87
10-05-89	2.4
10-03-90	1.2
10-03-91	.78
10-07-92	.70
10-05-93	1.2
10-25-94	1.4
10-12-95	.82
10-31-96	3.9

**Station name:** Pickering Creek at Anselma, Pa.  
**Station number:** 01472171

Date	Streamflow (ft <sup>3</sup> /s)
09-26-67	1.5

**Station name:** Unnamed tributary to Pickering Creek at Anselma, Pa.  
**Station number:** 01472172

Date	Streamflow (ft <sup>3</sup> /s)
09-27-67	0.93

**Station name:** Pickering Creek at Oppermans Corner, Pa.  
**Station number:** 01472173

Date	Streamflow (ft <sup>3</sup> /s)
09-27-67	3.1

**Station name:** Unnamed tributary to Pickering Creek at Art School Road near Chester Springs, Pa.  
**Station number:** 01472175

Date	Streamflow (ft <sup>3</sup> /s)
12-12-67	29
12-12-67	31
12-12-67	44
12-12-67	38
12-12-67	10
12-28-67	21
12-29-67	31
03-13-68	25
03-17-68	53
03-17-68	53
03-17-68	46
03-18-68	62

Appendix 2. Streamflow measurements made by the U.S. Geological Survey at partial-record sites in Chester County, Pennsylvania—Continued

**Station name:** Unnamed tributary to Pickering Creek at Art School Road near Chester Springs, Pa.—Continued  
**Station number:** 01472175

Date	Streamflow (ft <sup>3</sup> /s)
03-18-68	53
03-18-68	24
05-28-68	15
05-28-68	42
05-28-68	62
05-28-68	61
05-29-68	22
06-19-68	3.5
08-21-81	.50
09-18-81	7.2
09-17-82	.25
08-16-83	.25
09-20-84	.24
04-26-85	.09
09-16-86	.21
07-08-88	.25
10-13-88	.21
06-06-91	.22
07-09-91	.09
08-14-91	.18
09-13-91	.28

**Station name:** Unnamed tributary to Pickering Creek at Chester Springs, Pa.  
**Station number:** 01472176

Date	Streamflow (ft <sup>3</sup> /s)
09-01-66	0.43
09-28-67	1.2
10-27-67	2.4
11-28-67	1.9

**Station name:** Pickering Creek at Chester Springs, Pa.  
**Station number:** 01472180

Date	Streamflow (ft <sup>3</sup> /s)
05-15-68	10
09-20-68	4.8

**Station name:** Pine Creek near Lionville, Pa.  
**Station number:** 01472182

Date	Streamflow (ft <sup>3</sup> /s)
01-29-67	1.1
02-03-67	1.4
03-22-67	3.3
10-03-67	.63
02-26-68	.70
03-13-68	5.0
03-17-68	18
03-17-68	20
03-17-68	14
03-17-68	15
03-17-68	8.4
03-18-68	20
03-18-68	4.2
05-28-68	3.2
05-28-68	7.4
05-28-68	12
05-28-68	18
05-28-68	15

**Station name:** Pine Creek near Lionville, Pa.—Continued  
**Station number:** 01472182

Date	Streamflow (ft <sup>3</sup> /s)
05-29-68	7.4
08-15-68	3.5
08-15-68	3.6

**Station name:** Pine Creek at Chester Springs, Pa.  
**Station number:** 01472183

Date	Streamflow (ft <sup>3</sup> /s)
03-06-67	21
03-15-67	10
03-24-67	16
04-06-67	7.1
06-08-67	3.6
08-07-67	4.1
10-13-67	3.4
10-19-67	3.7
11-28-67	3.2
01-18-68	5.7

**Station name:** Pickering Creek at Pikeland, Pa.  
**Station number:** 01472184

Date	Streamflow (ft <sup>3</sup> /s)
01-22-67	17
04-10-67	23

**Station name:** Unnamed tributary to Pickering Creek near Chester Springs, Pa.  
**Station number:** 01472185

Date	Streamflow (ft <sup>3</sup> /s)
11-28-67	0.58
01-18-68	1.8
01-20-76	1.2
02-28-76	1.4
03-16-76	4.3
07-31-76	.65
10-13-76	.60

**Station name:** Pickering Creek at Merlin, Pa.  
**Station number:** 014721854

Date	Streamflow (ft <sup>3</sup> /s)
11-10-69	24
02-18-70	27
05-05-70	29
09-28-70	11
05-03-71	22
09-27-71	28
10-03-72	18
10-18-82	9.1
10-17-83	8.4
10-05-84	14
10-07-85	15
10-08-86	8.4
10-08-87	9.2
10-14-88	7.7
10-04-89	26

**Station name:** Pickering Creek at Merlin, Pa.—Continued  
**Station number:** 014721854

Date	Streamflow (ft <sup>3</sup> /s)
10-03-90	9.7
10-02-91	7.2
10-07-92	6.2
10-06-93	8.0
10-25-94	13
10-12-95	7.1

**Station name:** Pigeon Run at Rapps Corner, Pa.  
**Station number:** 01472186

Date	Streamflow (ft <sup>3</sup> /s)
10-02-67	10

**Station name:** Pigeon Run at Merlin, Pa.  
**Station number:** 01472187

Date	Streamflow (ft <sup>3</sup> /s)
01-23-67	8.1
02-20-67	3.9
03-24-67	9.1
05-12-67	2.2
10-13-67	1.8
11-28-67	1.8
01-19-68	4.0
03-13-75	5.3
10-06-77	1.3
10-03-78	1.6

**Station name:** Pickering Creek at Charlestown, Pa.  
**Station number:** 01472188

Date	Streamflow (ft <sup>3</sup> /s)
01-22-67	30
03-22-67	43
10-04-67	12

**Station name:** Pickering Creek at Charlestown Road bridge at Charlestown, Pa.  
**Station number:** 014721884

Date	Streamflow (ft <sup>3</sup> /s)
11-11-69	18
02-18-70	41
05-03-71	25
09-27-71	49
10-03-72	24
10-19-82	13
10-17-83	11
10-09-84	17
10-07-85	22
10-06-86	11
10-08-87	13
10-12-88	11
10-04-89	33
10-02-90	13
10-02-91	8.1
10-06-92	7.6
10-06-93	10

**Appendix 2. Streamflow measurements made by the U.S. Geological Survey at partial-record sites in Chester County, Pennsylvania—Continued**

**Station name:** Pickering Creek at Charlestown Road bridge at Charlestown, Pa.—Continued

**Station number:** 014721884

Date	Streamflow (ft <sup>3</sup> /s)
10-26-94	15
10-11-95	9.7
10-02-96	33

**Station name:** Rock Run at Charlestown, Pa.

**Station number:** 01472189

Date	Streamflow (ft <sup>3</sup> /s)
01-25-67	4.2
02-19-67	3.8
03-16-67	5.5
04-10-67	2.8
06-14-67	2.1
01-18-68	3.5

**Station name:** Pickering Creek near Phoenixville, Pa.

**Station number:** 01472190

Date	Streamflow (ft <sup>3</sup> /s)
12-20-66	18
01-23-67	39
02-02-67	43
03-08-67	85
03-21-67	48
04-07-67	74
04-19-67	34
04-24-67	46
06-02-67	26
06-14-67	20
09-21-67	15
10-11-67	22
10-20-67	19
12-05-67	35
02-04-68	50
02-20-68	29
04-03-68	38
04-14-68	31
05-15-68	30
06-19-68	50
08-09-68	17
11-12-69	17
02-18-70	45
05-05-70	46
09-28-70	19
05-03-71	30
09-27-71	74
10-03-72	33
03-13-75	56
09-19-78	50
10-03-78	15
07-05-79	40
03-07-80	30
09-09-80	8.1
08-13-81	13
08-20-81	8.5
09-17-81	15
10-15-81	7.7
05-07-82	30
09-14-82	17
09-23-82	23
10-18-82	16
11-02-82	16

**Station name:** Pickering Creek near Phoenixville, Pa.—Continued

**Station number:** 01472190

Date	Streamflow (ft <sup>3</sup> /s)
11-23-82	23
01-14-83	29
03-15-83	49
08-17-83	15
10-05-83	15
02-09-84	48
10-22-84	23
10-08-85	22
09-16-86	9.0
10-06-86	11
10-13-87	11
07-08-88	18
10-12-88	11
10-06-89	35
10-12-90	14
10-07-91	10
10-06-92	7.1
10-07-93	12
07-15-94	40
10-26-94	18
10-11-95	11
10-31-96	41

**Station name:** Unnamed tributary to Pickering Creek near Phoenixville, Pa.

**Station number:** 01472192

Date	Streamflow (ft <sup>3</sup> /s)
10-06-67	0.76

**Station name:** Valley Creek at Mill Lane, Pa.

**Station number:** 01473154

Date	Streamflow (ft <sup>3</sup> /s)
03-20-84	11
04-26-84	12
05-22-84	8.5
06-12-84	7.9
07-17-84	6.9
08-22-84	3.9
09-18-84	2.4
10-11-84	2.9
11-21-84	2.1
12-12-84	2.7
03-13-85	2.4
09-02-87	1.4

**Station name:** Little Valley Creek at Howellville, Pa.

**Station number:** 01473167

Date	Streamflow (ft <sup>3</sup> /s)
10-15-82	4.8
10-21-83	4.0
03-20-84	19
04-26-84	17
05-22-84	15
06-06-84	13
06-12-84	14
06-14-84	13
06-19-84	18
07-17-84	9.1
08-21-84	7.0

**Station name:** Little Valley Creek at Howellville, Pa.—Continued

**Station number:** 01473167

Date	Streamflow (ft <sup>3</sup> /s)
08-28-84	6.5
09-18-84	4.8
10-09-84	6.0
11-21-84	4.1
12-12-84	5.1
10-09-85	5.9
11-07-86	7.1
11-16-87	9.6
10-26-88	4.6
11-06-89	8.4
11-14-90	5.5
10-05-92	3.1
11-18-93	4.4
11-07-94	3.5
10-30-95	6.4
10-24-96	12

**Station name:** Valley Creek near Valley Forge, Pa.

**Station number:** 01473168

Date	Streamflow (ft <sup>3</sup> /s)
10-15-82	18
10-21-83	3.2
06-19-84	38
07-06-84	27
07-17-84	22
08-28-84	13
09-11-84	15
10-09-84	17
10-09-85	10
11-07-86	15
11-16-87	13
10-26-88	9.8
11-06-89	17
11-14-90	12
10-28-91	8.2
10-05-92	9.3
11-18-93	11
11-07-94	14
10-30-95	13
10-24-96	27

**Station name:** Valley Creek at Wilson Road near Valley Forge, Pa.

**Station number:** 01473170

Date	Streamflow (ft <sup>3</sup> /s)
11-08-74	17
11-27-74	20
03-13-75	35
09-12-75	24
10-12-77	17
10-10-78	22
04-18-79	43
06-28-79	30
05-08-80	48
06-26-80	20
08-11-80	14

**Appendix 2. Streamflow measurements made by the U.S. Geological Survey at partial-record sites in Chester County, Pennsylvania—Continued**

**Station name:** Trout Creek near Valley Forge, Pa.

**Station number:** 01473200

Date	Streamflow (ft <sup>3</sup> /s)
08-21-46	4.0
09-24-47	1.9
08-31-48	5.2
10-04-48	2.8
08-18-49	1.6
10-02-50	1.4
09-05-51	1.7
09-23-52	4.8
08-25-53	3.0
10-22-53	1.8
08-05-55	.96
08-06-57	1.4
08-21-81	.16
09-17-81	.22
09-17-81	.70
09-17-82	.97
08-26-83	.83
09-21-84	1.3
04-29-85	.35
07-12-88	1.0
10-14-88	.74
06-06-91	1.0
07-09-91	1.0
08-14-91	.73
09-09-91	.92

**Station name:** Crum Creek near Paoli, Pa.

**Station number:** 01475830

Date	Streamflow (ft <sup>3</sup> /s)
02-10-70	9.2
05-27-70	8.1
10-06-70	2.5
05-11-71	6.8
10-05-71	6.2
10-16-72	4.2
10-13-82	2.4

**Station name:** Crum Creek at Whitehorse, Pa.

**Station number:** 01475840

Date	Streamflow (ft <sup>3</sup> /s)
05-27-70	12
10-06-70	5.4
05-11-71	13
10-05-71	12
10-16-72	8.0
10-13-82	4.0
10-27-83	4.2
10-25-84	6.3
10-15-85	4.5
10-09-86	2.7
11-02-87	4.6
10-18-88	2.7
10-18-89	9.6
11-02-90	4.6
10-29-91	4.4
10-21-92	3.5
10-28-93	4.4
10-03-94	4.2
10-19-95	4.5
10-16-96	11

**Station name:** Crum Creek at Goshen Road, near Whitehorse, Pa.

**Station number:** 01475845

Date	Streamflow (ft <sup>3</sup> /s)
04-21-49	14

**Station name:** Crum Creek near Newtown Square, Pa.

**Station number:** 01475850

Date	Streamflow (ft <sup>3</sup> /s)
01-29-32	11
04-22-75	21
09-16-75	12

**Station name:** Unnamed tributary to Ridley Creek at Goshenville, Pa.

**Station number:** 01476430

Date	Streamflow (ft <sup>3</sup> /s)
05-28-70	5.5
10-06-70	2.1
10-05-71	5.2
10-16-72	3.5
10-14-82	2.0
10-27-83	3.1
10-25-84	2.7
10-15-85	3.3
10-09-86	1.5
10-26-87	2.6
10-25-88	3.5
11-14-89	5.4
10-30-90	2.4
11-06-91	2.3
10-20-92	2.2
10-25-93	2.9
10-07-94	2.2
10-25-95	3.5
10-28-96	7.6

**Station name:** Ridley Creek at Dutton Mill near West Chester, Pa.

**Station number:** 01476435

Date	Streamflow (ft <sup>3</sup> /s)
05-28-70	12
10-06-70	4.6
05-17-75	22
04-22-77	12
11-28-77	16
10-04-78	6.9
07-18-79	11
10-23-79	18
03-07-80	10
06-24-80	8.2
10-23-80	2.8
05-07-81	6.0
07-20-82	9.9
10-14-82	4.9
10-27-83	11
10-15-84	8.7
10-15-85	10
10-09-86	5.7
10-15-87	7.8
10-25-88	5.0
11-14-89	12
10-30-90	6.2
11-06-91	4.9

**Station name:** Ridley Creek at Dutton Mill near West Chester, Pa.—Continued

**Station number:** 01476435

Date	Streamflow (ft <sup>3</sup> /s)
10-20-92	5.0
10-25-93	7.8
10-07-94	5.0
10-23-95	10
10-23-96	22

**Station name:** East Branch Chester Creek at Green Hill, Pa.

**Station number:** 01476790

Date	Streamflow (ft <sup>3</sup> /s)
09-13-57	0.42
03-07-70	3.3
05-22-70	3.2
10-26-70	.80
05-17-71	2.6
10-11-71	2.3
10-10-72	1.5
10-15-82	.51
10-26-83	.80
10-11-84	1.1
10-16-85	.91
10-15-86	.52
11-09-87	.72
11-02-88	.77
10-26-89	3.8
10-05-90	.74
10-21-91	0.40
10-22-92	.59
10-28-93	.76
10-17-94	.71
10-23-95	1.2

**Station name:** East Branch Chester Creek near Fern Hill, Pa.

**Station number:** 01476820

Date	Streamflow (ft <sup>3</sup> /s)
09-13-57	0.70

**Station name:** East Branch Chester Creek at Milltown, Pa.

**Station number:** 01476830

Date	Streamflow (ft <sup>3</sup> /s)
02-28-70	10
05-16-70	13
10-26-70	2.5
05-17-71	7.6
10-11-71	7.0
10-10-72	4.6
10-22-82	1.4
10-26-83	1.9
10-11-84	3.7
10-16-85	4.2
10-15-86	1.7
11-09-87	2.5
11-02-88	7.6
10-26-89	6.3
10-05-90	2.1
10-21-91	2.5
10-23-92	2.5
10-26-93	2.1
10-21-94	4.0

**Appendix 2. Streamflow measurements made by the U.S. Geological Survey at partial-record sites in Chester County, Pennsylvania—Continued**

**Station name:** East Branch Chester Creek at Milltown, Pa.—Continued  
**Station number:** 01476830

Date	Streamflow (ft <sup>3</sup> /s)
10-24-95	4.7
10-07-96	12

**Station name:** East Branch Chester Creek at Westtown, Pa.  
**Station number:** 01476835

Date	Streamflow (ft <sup>3</sup> /s)
02-21-70	6.9
05-09-70	10
10-26-70	4.4
05-17-71	13
10-11-71	12
10-10-72	7.8
10-22-82	2.8
10-26-83	5.3
10-11-84	6.0
10-16-85	5.9
10-16-86	3.9
11-05-87	5.7
11-03-88	6.3
10-26-89	13
10-25-90	7.6
10-22-91	4.5
10-22-92	3.8
10-26-93	6.6
10-21-94	5.0
10-24-95	8.6
10-07-96	16

**Station name:** East Branch Chester Creek near West Chester, Pa.  
**Station number:** 01476836

Date	Streamflow (ft <sup>3</sup> /s)
04-26-75	19
04-22-77	11
10-26-77	5.6
07-26-78	8.6
10-04-78	6.0
06-25-80	12
10-16-80	2.2
05-06-81	7.4
07-20-82	16

**Station name:** Goose Creek tributary to East Branch Chester Creek near West Chester, Pa.

**Station number:** 01476840

Date	Streamflow (ft <sup>3</sup> /s)
03-14-70	9.1
05-01-70	14
10-26-70	2.0
10-22-82	7.9
11-04-88	12
10-25-89	14
10-25-90	12
11-04-91	10
10-23-92	10
11-19-93	10
10-21-94	11
10-25-95	11

**Station name:** Goose Creek tributary to East Branch Chester Creek near West Chester, Pa.—Continued

**Station number:** 01476840

Date	Streamflow (ft <sup>3</sup> /s)
10-04-96	14

**Station name:** East Branch Chester Creek below Goose Creek near West Chester, Pa.

**Station number:** 01476848

Date	Streamflow (ft <sup>3</sup> /s)
10-26-83	18
10-11-84	21
10-28-85	16
10-16-86	28
11-05-87	18
11-03-88	18
10-25-89	31
10-25-90	20
10-22-91	12
10-22-92	12
10-26-93	20
10-17-94	12
10-24-95	24

**Station name:** Unnamed tributary to East Branch White Clay Creek near London Grove, Pa.

**Station number:** 01478100

Date	Streamflow (ft <sup>3</sup> /s)
06-06-78	3.2

**Station name:** East Branch White Clay Creek at Avondale, Pa.

**Station number:** 01478120

Date	Streamflow (ft <sup>3</sup> /s)
06-02-70	10
10-27-70	4.8
05-18-71	12
10-12-71	10
10-17-72	8.3
10-20-82	4.6
11-01-83	6.3
10-19-84	9.9
10-25-85	7.9
10-30-86	5.6
11-17-87	7.7
11-08-88	6.6
10-31-89	15
11-01-90	7.0
11-14-91	5.1
11-16-92	7.5
11-24-93	6.8
11-03-94	4.6
11-09-95	8.2

**Station name:** East Branch White Clay Creek near Landenberg, Pa.

**Station number:** 01478150

Date	Streamflow (ft <sup>3</sup> /s)
06-11-70	24
08-09-71	18
08-07-72	29
03-01-73	44
09-13-73	18
05-21-74	12
04-22-75	43
09-17-75	27
04-20-76	32
11-17-76	19
04-21-77	31
09-07-78	16
06-26-80	23
08-21-81	12
09-21-81	16
09-09-82	13
09-20-83	11
09-20-84	21
09-27-84	21
04-30-85	17
09-17-86	7.1
07-08-88	11
10-13-88	8.8
06-04-91	17
07-09-91	18
08-07-91	5.3
09-09-91	7.4

**Station name:** Middle Branch White Clay Creek at Wickerton, Pa.

**Station number:** 01478190

Date	Streamflow (ft <sup>3</sup> /s)
06-02-70	9.2
10-27-70	4.9
05-18-71	12
10-12-71	10
10-17-72	8.8
10-20-82	3.3
11-02-83	4.7
10-18-84	6.8
10-25-85	6.8
12-02-86	8.8
10-29-87	7.1
10-31-88	5.6
10-31-89	12
11-09-90	5.5
11-13-91	3.7
11-12-92	5.5
11-24-93	5.9
11-08-94	4.3
11-09-95	6.4

**Station name:** Middle Branch White Clay Creek near Landenberg, Pa.

**Station number:** 01478200

Date	Streamflow (ft <sup>3</sup> /s)
05-08-70	14
05-06-81	6.2
07-09-82	8.2



**Appendix 2. Streamflow measurements made by the U.S. Geological Survey at partial-record sites in Chester County, Pennsylvania—Continued**

**Station name:** West Branch White  
Clay Creek near Chesterville, Pa.  
**Station number:** 01478220

Date	Streamflow (ft <sup>3</sup> /s)
06-02-70	7.3
10-27-70	3.9
05-24-71	9.7
10-12-71	9.9
10-17-72	8.2
10-20-82	3.3
11-02-83	4.3
10-18-84	5.4
10-25-85	6.2
11-25-86	9.8
10-29-87	7.6
10-31-88	4.1
10-31-89	13
11-09-90	4.1
11-13-91	3.9
11-16-92	6.3
11-23-93	5.6
11-03-94	3.0
11-09-95	5.7

**Station name:** Middle Branch White  
Clay Creek near Avondale, Pa.  
**Station number:** 01478230

Date	Streamflow (ft <sup>3</sup> /s)
11-09-82	16
10-25-88	26
02-16-89	53
08-08-89	33
11-07-89	32
12-14-89	15
03-15-90	29
05-01-90	31
07-03-90	18
08-14-90	32
10-03-90	12
11-28-90	14
01-22-91	25
05-14-91	26
07-02-91	11
11-20-91	11
01-29-92	20
03-16-92	17
05-26-92	17
08-27-92	9.1
02-19-93	58
05-18-93	39
07-01-93	19
07-11-94	9.0
10-17-95	11
11-21-95	10
09-10-96	18

**Station name:** West Branch Red Clay  
Creek at Kennett Square, Pa.  
**Station number:** 01479680

Date	Streamflow (ft <sup>3</sup> /s)
06-02-70	12
10-27-70	5.2
05-18-71	14
10-12-71	12
10-17-72	9.0
11-01-82	4.9
11-01-83	5.7

**Station name:** West Branch Red Clay  
Creek at Kennett Square, Pa.—Continued  
**Station number:** 01479680

Date	Streamflow (ft <sup>3</sup> /s)
10-19-84	8.5
10-18-85	6.7
11-18-86	6.9
10-30-87	6.2
11-08-88	5.6
10-30-89	12
10-31-90	6.0
11-07-91	4.5
10-27-92	3.8
11-22-93	5.9
11-08-94	3.9
10-18-95	4.8
11-05-96	12

**Station name:** West Branch Red Clay  
Creek near Kennett Square, Pa.  
**Station number:** 01479700

Date	Streamflow (ft <sup>3</sup> /s)
06-11-70	16
08-10-71	12
08-07-72	20
03-01-73	30
09-13-73	12
05-21-74	20
04-22-75	26
09-17-75	23
04-20-76	23
11-17-76	12
04-21-77	16
09-07-78	17
06-26-80	14
08-21-81	8.4
09-21-81	9.6
09-09-82	7.1
09-20-83	8.7
09-27-84	16
04-30-85	13
04-28-86	20
05-01-86	19
09-03-86	9.2
09-09-86	7.1
09-17-86	6.9
07-08-88	7.6
10-13-88	7.8
06-04-91	13
07-09-91	11
08-07-91	11
09-09-91	7.3

**Station name:** East Branch Red Clay  
Creek at Five Points, Pa.  
**Station number:** 01479795

Date	Streamflow (ft <sup>3</sup> /s)
09-03-86	3.2
09-09-86	2.6

**Station name:** East Branch Red Clay  
Creek near Five Points, Pa.  
**Station number:** 01479800

Date	Streamflow (ft <sup>3</sup> /s)
06-02-70	9.1
10-27-70	4.6
05-18-71	13
10-12-71	12
10-17-72	8.0
11-01-82	4.2
11-01-83	4.6
10-19-84	6.7
10-18-85	5.9
11-18-86	7.1
11-17-87	8.4
11-08-88	6.4
10-30-89	14
11-01-90	5.5
11-07-91	3.6
10-27-92	4.0
11-22-93	6.6
11-08-94	3.7
10-18-95	4.9
11-05-96	12

**Station name:** West Branch Brandy-  
wine Creek at Rockville, Pa.  
**Station number:** 01480269

Date	Streamflow (ft <sup>3</sup> /s)
08-08-67	2.2
09-13-67	1.4

**Station name:** Unnamed tributary to  
West Branch Brandywine Creek near  
Cambridge, Pa.

**Station number:** 01480280

Date	Streamflow (ft <sup>3</sup> /s)
06-28-55	2.6
07-27-55	1.6
09-23-58	3.5

**Station name:** Two Log Run at  
Birdell, Pa.

**Station number:** 01480295

Date	Streamflow (ft <sup>3</sup> /s)
08-08-67	2.7
09-13-67	1.9

**Station name:** West Branch Brandy-  
wine Creek near Birdell, Pa.

**Station number:** 01480310

Date	Streamflow (ft <sup>3</sup> /s)
06-28-55	9.5
07-27-55	4.9
08-04-55	3.5

**Appendix 2. Streamflow measurements made by the U.S. Geological Survey at partial-record sites in Chester County, Pennsylvania—Continued**

**Station name:** West Branch Brandywine Creek at Cedar Knoll, Pa.

**Station number:** 01480350

Date	Streamflow (ft <sup>3</sup> /s)
07-14-49	45
09-04-58	17

**Station name:** Birch Run near Wagontown, Pa.

**Station number:** 01480400

Date	Streamflow (ft <sup>3</sup> /s)
10-07-58	1.8

**Station name:** West Branch Brandywine Creek near Wagontown, Pa.

**Station number:** 01480420

Date	Streamflow (ft <sup>3</sup> /s)
06-28-55	13
07-27-55	2.7
08-04-55	4.7

**Station name:** West Branch Brandywine Creek at Siousca, Pa.

**Station number:** 01480430

Date	Streamflow (ft <sup>3</sup> /s)
06-28-55	14
07-27-55	6.8
08-04-55	4.7

**Station name:** Rock Run near Coatesville, Pa.

**Station number:** 01480460

Date	Streamflow (ft <sup>3</sup> /s)
09-25-58	2.6

**Station name:** Sucker Run near Westwood, Pa.

**Station number:** 01480600

Date	Streamflow (ft <sup>3</sup> /s)
09-12-44	0.84
08-22-46	.36
09-25-47	3.1
08-31-48	1.7
10-04-48	1.5
08-19-49	.52
10-02-50	1.3
08-06-51	.73
09-05-51	.73
09-23-52	1.0
08-25-53	.73
10-23-53	.65
08-03-55	.20

**Station name:** Sucker Run near Coatesville, Pa.

**Station number:** 01480610

Date	Streamflow (ft <sup>3</sup> /s)
05-12-81	3.0
04-15-82	3.2
05-20-88	13
04-05-89	34
05-16-89	69
03-05-93	16

**Station name:** West Branch Brandywine Creek at Mortonville, Pa.

**Station number:** 01480620

Date	Streamflow (ft <sup>3</sup> /s)
04-15-49	47

**Station name:** Buck Run near Pomeroy Heights, Pa.

**Station number:** 01480622

Date	Streamflow (ft <sup>3</sup> /s)
11-14-73	3.5

**Station name:** Buck Run at Pomeroy, Pa.

**Station number:** 01480623

Date	Streamflow (ft <sup>3</sup> /s)
11-14-73	3.6

**Station name:** Buck Run below Pomeroy, Pa.

**Station number:** 1480624

Date	Streamflow (ft <sup>3</sup> /s)
11-14-73	4.8

**Station name:** Buck Run at Stottsville, Pa.

**Station number:** 1480625

Date	Streamflow (ft <sup>3</sup> /s)
11-14-73	4.2

**Station name:** Unnamed tributary to Buck Run at Stottsville, Pa.

**Station number:** 01480627

Date	Streamflow (ft <sup>3</sup> /s)
11-14-73	2.3

**Station name:** Buck Run at Doe Run, Pa.

**Station number:** 01480629

Date	Streamflow (ft <sup>3</sup> /s)
10-28-82	11
10-28-83	11
10-31-84	18
10-29-85	11

**Station name:** Buck Run at Doe Run, Pa.—Continued

**Station number:** 01480629

Date	Streamflow (ft <sup>3</sup> /s)
10-30-86	8.6
11-19-87	15
11-14-88	15
11-07-89	19
10-17-90	12
10-31-91	8.2
10-16-92	13
11-08-93	13
11-14-94	11
11-28-95	21

**Station name:** Buck Run near Doe Run, Pa.

**Station number:** 01480630

Date	Streamflow (ft <sup>3</sup> /s)
04-14-49	29
06-28-55	14
07-27-55	8.4
08-21-81	19
09-21-81	18
09-10-82	20
08-10-83	31
09-25-85	15
04-28-86	20
05-01-86	20
07-08-88	33
10-13-88	20
06-04-91	43
07-09-91	25
08-14-91	14
09-09-91	15

**Station name:** Doe Run at Springdell, Pa.

**Station number:** 01480632

Date	Streamflow (ft <sup>3</sup> /s)
10-28-82	5.0
10-28-83	5.4
10-31-84	10
10-29-85	6.6
10-30-86	4.6
11-19-87	7.2
11-14-88	6.7
11-07-89	14
10-17-90	5.9
10-31-91	4.9
10-16-92	6.4
11-08-93	7.1
11-09-94	5.8
11-28-95	10

**Station name:** West Branch Brandywine Creek at Wawaset, Pa.

**Station number:** 01480640

Date	Streamflow (ft <sup>3</sup> /s)
07-25-62	10
10-18-62	17
01-29-63	12
04-29-63	9.0
08-01-63	4.0
10-24-63	7.0

**Appendix 2. Streamflow measurements made by the U.S. Geological Survey at partial-record sites in Chester County, Pennsylvania—Continued**

**Station name:** West Branch Brandywine Creek at Wawaset, Pa.—Continued  
**Station number:** 01480640

Date	Streamflow (ft <sup>3</sup> /s)
01-17-64	14
07-22-64	7.0
10-07-64	5.0
01-06-65	13
04-07-65	31
06-30-65	5.0
09-30-65	6.0
01-03-66	25
03-16-66	15
06-29-66	53
09-22-66	19
12-13-66	39
06-06-67	56
08-29-67	79
11-27-67	62
02-29-68	89
05-21-68	88
08-12-68	52
11-13-68	93
11-10-70	81
11-11-70	120
10-02-72	65
10-21-82	59
10-31-83	71
10-22-85	74
11-03-86	51
11-03-87	69
10-11-88	57
10-15-90	79
10-30-91	50
10-29-92	56
11-15-93	84
10-11-94	52

**Station name:** East Branch Brandywine Creek near Church Hill, Pa.  
**Station number:** 01480647

Date	Streamflow (ft <sup>3</sup> /s)
11-03-82	1.6

**Station name:** East Branch Brandywine Creek near Cupola, Pa  
**Station number:** 01480648

Date	Streamflow (ft <sup>3</sup> /s)
11-03-82	2.6
11-03-83	3.2
10-17-84	2.9
10-23-85	2.6
10-29-86	3.1
10-19-87	3.6
11-16-88	4.3
10-16-89	4.4
10-26-90	2.6
11-01-91	1.9
10-26-92	2.7
11-03-93	6.1
10-12-94	1.9
11-27-95	5.4

**Station name:** East Branch Brandywine Creek at Cupola, Pa.  
**Station number:** 01480650

Date	Streamflow (ft <sup>3</sup> /s)
09-01-66	0.69
01-11-67	6.3
02-05-67	6.9
03-29-67	16
04-13-67	5.7
04-13-67	4.8
04-18-67	7.7
05-25-67	4.3
07-26-67	2.2
08-29-67	3.1
08-31-67	2.4
08-31-67	3.7
10-11-67	15
12-01-67	3.4
01-10-68	3.5
02-22-68	3.5
03-19-68	17
04-02-68	4.7
05-14-68	4.2

**Station name:** Unnamed tributary to East Branch Brandywine near Cupola, Pa.  
**Station number:** 01480652

Date	Streamflow (ft <sup>3</sup> /s)
01-12-67	2.6
02-15-67	3.5
03-29-67	8.7
04-27-67	18
05-12-67	5.8
06-09-67	1.8
07-26-67	1.1
08-30-67	1.8
10-12-67	.93
11-30-67	1.2

**Station name:** East Branch Brandywine Creek at Glenmoore, Pa.  
**Station number:** 01480653

Date	Streamflow (ft <sup>3</sup> /s)
09-02-66	1.4
01-13-67	19
02-03-67	15
11-03-82	7.6
11-03-83	7.6
10-17-84	9.2
10-23-85	7.0
12-05-86	25
10-23-87	8.0
11-15-88	12
11-01-89	20
10-26-90	11
11-01-91	7.0
11-17-92	13
11-04-93	11
10-12-94	6.2
12-01-95	13

**Station name:** Indian Run at Germany Hollow Road near Brandywine Manor, Pa.  
**Station number:** 01480655

Date	Streamflow (ft <sup>3</sup> /s)
09-02-67	0.49
12-04-67	3.5
12-11-67	8.6
06-19-68	1.8

**Station name:** Indian Run near Springton, Pa.  
**Station number:** 01480656

Date	Streamflow (ft <sup>3</sup> /s)
11-03-82	1.9
10-17-84	2.7
10-23-85	.94
10-29-86	1.8
10-19-87	2.0
11-15-88	2.2
10-16-89	3.0
11-13-90	3.7
11-05-91	1.7
10-26-92	1.7
11-02-93	3.1
10-14-94	1.7
11-27-95	2.5

**Station name:** North Branch Indian Run at Glenmoore, Pa.  
**Station number:** 01480657

Date	Streamflow (ft <sup>3</sup> /s)
01-14-67	2.1
08-08-67	.68
09-02-67	.54
09-13-67	.45

**Station name:** Indian Run at Glenmoore, Pa.  
**Station number:** 01480658

Date	Streamflow (ft <sup>3</sup> /s)
09-02-66	0.70
03-05-67	7.1
03-29-67	14
04-20-67	5.5
06-05-67	4.1
07-26-67	2.1
08-07-67	3.5
10-12-67	2.3
10-19-67	5.5
11-30-67	1.9
01-20-68	7.0

**Station name:** East Branch Brandywine Creek at Cornog, Pa.  
**Station number:** 01480659

Date	Streamflow (ft <sup>3</sup> /s)
06-29-55	11
07-26-55	7.6
09-04-67	9.2

**Appendix 2. Streamflow measurements made by the U.S. Geological Survey at partial-record sites in Chester County, Pennsylvania—Continued**

**Station name:** East Branch Brandywine Creek at Lyndell, Pa.

**Station number:** 01480660

Date	Streamflow (ft <sup>3</sup> /s)
09-02-66	4.0
01-13-67	32
04-11-67	24
09-06-67	11

**Station name:** Culbertson Run at Lyndell, Pa.

**Station number:** 01480662

Date	Streamflow (ft <sup>3</sup> /s)
01-14-67	6.2
02-16-67	9.7
03-06-67	26
03-31-67	5.0
04-27-67	20
05-11-67	12
06-06-67	2.7
07-26-67	1.4
09-18-67	2.3
10-12-67	2.2
10-20-67	2.9
12-01-67	2.6
01-17-68	4.4

**Station name:** East Branch Brandywine Creek near Dorlan, Pa.

**Station number:** 01480665

Date	Streamflow (ft <sup>3</sup> /s)
09-02-66	5.2
12-19-66	28
02-17-67	39
04-24-67	37
06-05-67	21
06-13-67	17
06-16-67	19
06-28-67	11
07-13-67	20
10-12-67	16
10-19-67	35
11-09-67	19
11-30-67	12
12-01-67	17
01-17-68	42
02-05-68	42
02-23-68	32
04-04-68	36
04-05-68	41
04-14-68	29
06-20-68	47
08-07-68	18
09-25-68	11
08-21-81	7.0
09-21-81	9.7
09-14-82	14
08-10-83	12
04-26-85	16
07-08-88	12
06-04-91	21
07-09-91	15
08-13-91	15
09-09-91	7.5

**Station name:** Marsh Creek near Wallace, Pa.

**Station number:** 01480670

Date	Streamflow (ft <sup>3</sup> /s)
07-26-55	0.46
07-29-55	1.4

**Station name:** Marsh Creek near Lyndell, Pa.

**Station number:** 01480680

Date	Streamflow (ft <sup>3</sup> /s)
12-07-65	2.4
10-26-67	26

**Station name:** Marsh Creek near Downingtown, Pa.

**Station number:** 01480685

Date	Streamflow (ft <sup>3</sup> /s)
09-01-66	2.4

**Station name:** Marsh Creek near Dorlan, Pa.

**Station number:** 01480690

Date	Streamflow (ft <sup>3</sup> /s)
06-29-55	8.4
07-26-55	4.8
09-04-58	11

**Station name:** East Branch Brandywine Creek at Dorlan, Pa.

**Station number:** 01480692

Date	Streamflow (ft <sup>3</sup> /s)
09-01-66	5.7

**Station name:** Beaver Creek at Downingtown, Pa.

**Station number:** 01480780

Date	Streamflow (ft <sup>3</sup> /s)
10-13-43	4.7
07-14-49	15
09-01-66	2.2
11-13-73	6.3

**Station name:** East Branch Brandywine Creek at Downingtown, Pa.

**Station number:** 01480800

Date	Streamflow (ft <sup>3</sup> /s)
09-02-66	8.5
11-13-73	37

**Station name:** Valley Creek at Church Farm School near Exton, Pa.

**Station number:** 01480871

Date	Streamflow (ft <sup>3</sup> /s)
08-16-90	0.24
09-05-90	.21
10-10-90	.19
11-08-90	.15
01-24-91	.40
02-05-91	.38
03-20-91	.48
04-03-91	.64
05-10-91	.69
06-06-91	.10
07-10-91	.28
09-05-91	.21

**Station name:** Unnamed tributary to Valley Creek at Swedesford Road near Exton, Pa.

**Station number:** 01480872

Date	Streamflow (ft <sup>3</sup> /s)
08-16-90	0.10
09-05-90	.10
10-10-90	.10
11-08-90	.06
01-24-91	.19
02-05-91	.17
03-20-91	.19
04-03-91	.29
05-10-91	.27
06-06-91	.16
07-10-91	.10

**Station name:** Unnamed tributary to Valley Creek at Ship Road near Exton, Pa.

**Station number:** 01480873

Date	Streamflow (ft <sup>3</sup> /s)
08-16-90	0.57
09-05-90	.57
10-10-90	.41
11-07-90	.33
12-10-90	.36
01-24-91	1.2
02-04-91	.56
03-20-91	.94
04-02-91	.86
05-08-91	1.0
06-06-91	.38
07-10-91	.37

**Station name:** Valley Creek at Lakeside Street near Exton, Pa.

**Station number:** 01480874

Date	Streamflow (ft <sup>3</sup> /s)
08-16-90	0.85
09-06-90	.84
10-10-90	.33
11-08-90	.37
12-10-90	.57
01-24-91	2.1
02-04-91	1.6
03-20-91	1.9

**Appendix 2. Streamflow measurements made by the U.S. Geological Survey at partial-record sites in Chester County, Pennsylvania—Continued**

**Station name:** Valley Creek at Lake-side Street near Exton, Pa.—Continued  
**Station number:** 01480874

Date	Streamflow (ft <sup>3</sup> /s)
04-02-91	2.2
05-10-91	1.7
06-07-91	0.85
07-11-91	.64

**Station name:** Unnamed tributary to Valley Creek at Brookview Street near Exton, Pa.  
**Station number:** 01480875

Date	Streamflow (ft <sup>3</sup> /s)
08-16-90	0.33
09-06-90	.25
10-10-90	.12
11-08-90	.23
12-10-90	.19
01-24-91	.78
02-04-91	.64
03-20-91	.62
04-02-91	.70
05-10-91	.69
06-07-91	.42
07-10-91	.25
10-07-91	.06

**Station name:** Valley Creek at Chester County Library near Exton, Pa.  
**Station number:** 01480876

Date	Streamflow (ft <sup>3</sup> /s)
08-16-90	2.3
09-05-90	1.6
10-10-90	.85
11-06-90	.94
12-11-90	1.2
01-23-91	4.6
02-05-91	3.6
03-20-91	4.4
04-02-91	4.9
05-08-91	4.5
06-05-91	1.9
07-11-91	1.2

**Station name:** Unnamed tributary to Valley Creek at Chester County Library near Exton, Pa.  
**Station number:** 01480877

Date	Streamflow (ft <sup>3</sup> /s)
08-16-90	0.77
09-05-90	1.3
10-10-90	.39
11-06-90	.35
01-23-91	1.6
02-05-91	.94
03-20-91	1.4
04-02-91	1.7
05-08-91	1.4
06-05-91	.64

**Station name:** Unnamed tributary to Valley Creek at Waterloo Road near Exton, Pa.  
**Station number:** 014808775

Date	Streamflow (ft <sup>3</sup> /s)
08-16-90	1.2
09-05-90	1.1
10-11-90	.74
11-06-90	1.1
12-10-90	1.6
01-23-91	2.4
02-05-91	1.9
03-21-91	2.3
04-02-91	2.6
05-10-91	2.0
06-05-91	1.2
07-09-91	.85

**Station name:** Valley Creek at Exton, Pa.  
**Station number:** 01480880

Date	Streamflow (ft <sup>3</sup> /s)
09-01-66	0.81

**Station name:** Valley Creek near Whitford Road near Exton, Pa.  
**Station number:** 01480881

Date	Streamflow (ft <sup>3</sup> /s)
08-17-90	3.6
09-05-90	3.2
10-11-90	2.0
11-06-90	3.4
12-10-90	3.4
01-23-91	8.2
02-04-91	6.6
03-21-91	8.0
04-03-91	8.6
05-10-91	7.5
06-05-91	3.4
07-11-91	2.0
09-05-91	3.2

**Station name:** Unnamed tributary to Valley Creek at Whitford Road near Exton, Pa.  
**Station number:** 01480882

Date	Streamflow (ft <sup>3</sup> /s)
08-16-90	0.60
09-05-90	.48
10-12-90	.29
11-06-90	.55
12-10-90	.62
01-23-91	1.7
02-05-91	1.2
03-21-91	1.4
04-03-91	1.4
05-10-91	1.2
06-05-91	.62
07-11-91	.32
10-04-91	.28

**Station name:** Valley Creek at Clover Mill Road near Exton, Pa.  
**Station number:** 01480883

Date	Streamflow (ft <sup>3</sup> /s)
08-17-90	6.4
09-06-90	5.1
10-11-90	3.8
11-07-90	3.1
12-07-90	6.2
01-24-91	12
02-04-91	10
03-21-91	11
04-03-91	12
05-08-91	12
06-06-91	4.7
07-09-91	3.6
09-06-91	5.1

**Station name:** Unnamed tributary to Valley Creek at Clover Mill Road near Exton, Pa.  
**Station number:** 01480884

Date	Streamflow (ft <sup>3</sup> /s)
08-17-90	0.08
09-06-90	.06
12-07-90	.13
01-24-91	.82
02-04-91	.44
03-21-91	.62
04-03-91	.77
05-08-91	.75
06-06-91	.03
07-09-91	.06

**Station name:** Valley Creek near Downingtown, Pa.  
**Station number:** 01480885

Date	Streamflow (ft <sup>3</sup> /s)
09-01-66	2.3

**Station name:** Valley Creek at Ravine Road near Downingtown, Pa.  
**Station number:** 01480887

Date	Streamflow (ft <sup>3</sup> /s)
08-17-90	6.6
09-06-90	5.6
10-11-90	3.7
11-07-90	3.7
12-11-90	7.2
01-24-91	16
02-05-91	9.7
03-21-91	15
04-03-91	13
05-09-91	11
06-10-91	4.2
07-09-91	2.4

**Station name:** Valley Creek near Altor, Pa.  
**Station number:** 01480890

Date	Streamflow (ft <sup>3</sup> /s)
09-13-57	3.0

**Appendix 2. Streamflow measurements made by the U.S. Geological Survey at partial-record sites in Chester County, Pennsylvania—Continued**

**Station name:** Broad Run near Altor, Pa.

**Station number:** 01480900

Date	Streamflow (ft <sup>3</sup> /s)
09-13-57	1.6
08-17-90	2.7
09-06-90	2.7
10-11-90	2.1
11-07-90	2.0
12-11-90	2.5
01-24-91	6.6
02-11-91	4.8
03-21-91	5.4
04-03-91	6.7
05-09-91	5.6
06-10-91	2.6
07-12-91	2.3
10-05-91	2.8

**Station name:** Valley Creek at Mullsteins Meadows near Downingtown, Pa.

**Station number:** 01480903

Date	Streamflow (ft <sup>3</sup> /s)
10-28-82	7.3
10-31-83	7.0
10-16-84	11
10-31-85	8.3
10-08-86	5.5
11-04-87	7.8
10-14-88	12
10-06-89	21
08-17-90	12
09-06-90	8.6
10-11-90	6.1
11-07-90	9.0
12-11-90	10
01-24-91	28
02-11-91	19
03-21-91	24
04-03-91	23
05-09-91	21
06-07-91	9.2
07-12-91	7.7
11-18-91	4.5
11-17-92	7.4
11-04-93	8.6
10-06-94	5.4
11-21-95	21

**Station name:** East Branch Brandywine Creek at Wawaset, Pa.

**Station number:** 01480950

Date	Streamflow (ft <sup>3</sup> /s)
07-25-62	33
10-18-62	29
01-29-63	44
04-29-63	50
08-01-63	59
10-24-63	19
01-17-64	72
07-22-64	32
10-07-64	20
01-06-65	52
06-30-65	25
09-30-65	22
06-24-66	29
09-22-66	99

**Station name:** East Branch Brandywine Creek at Wawaset, Pa.—Continued

**Station number:** 01480950

Date	Streamflow (ft <sup>3</sup> /s)
10-02-72	92
10-21-82	56
10-31-83	78
10-16-84	68
10-22-85	55
11-03-86	50
11-04-87	66
10-06-88	52
10-15-90	86
10-30-91	51
10-29-92	46
11-16-93	55
10-11-94	57

**Station name:** Ring Run near Hamorton, Pa.

**Station number:** 01480990

Date	Streamflow (ft <sup>3</sup> /s)
11-14-60	0.84

**Station name:** East Branch Big Elk Creek at Elkview, Pa.

**Station number:** 01494900

Date	Streamflow (ft <sup>3</sup> /s)
06-03-70	9.1
11-03-70	5.1
05-24-71	13
10-18-71	12
10-23-72	7.2
11-01-82	3.2
11-02-83	4.7
10-18-84	7.4
10-28-86	5.0
10-27-87	4.6
10-17-88	4.1
10-12-89	11
10-18-90	4.7
10-25-91	3.7
11-10-92	5.7
11-10-93	6.4
11-04-94	4.4
11-30-95	8.7
10-25-96	15

**Station name:** West Branch Big Elk Creek near Oxford, Pa.

**Station number:** 01494950

Date	Streamflow (ft <sup>3</sup> /s)
06-03-70	9.9
11-03-70	6.3
05-24-71	14
10-18-71	12
10-23-72	7.2
11-01-82	3.4
11-02-83	6.6
10-18-84	7.0
10-17-85	6.4
10-28-86	4.9
10-27-87	4.9
10-17-88	4.7
10-12-89	9.7

**Station name:** West Branch Big Elk Creek near Oxford, Pa.—Continued

**Station number:** 01494950

Date	Streamflow (ft <sup>3</sup> /s)
10-29-90	8.9
10-25-91	5.0
11-10-92	5.7
11-10-93	7.6
11-04-94	4.7
11-30-95	8.2
10-25-96	13

**Station name:** Big Elk Creek at Lewisville, Pa.

**Station number:** 01494980

Date	Streamflow (ft <sup>3</sup> /s)
04-14-49	47
07-30-75	53
05-06-76	30
10-05-77	14
08-15-78	28
10-02-78	17
09-25-79	43
10-23-80	13
08-21-81	12
09-18-81	24
09-09-82	12
09-27-84	26
04-30-85	15
09-17-86	6.9
07-08-88	14
09-13-88	13
06-04-91	19
07-09-91	17
09-09-91	11

**Station name:** Big Elk Creek near Lewisville, Pa.

**Station number:** 01494990

Date	Streamflow (ft <sup>3</sup> /s)
04-26-90	49
07-03-90	34
07-02-91	19
08-07-91	15
10-01-91	14
11-21-91	18
12-13-91	31
01-27-92	30
03-16-92	28
05-26-92	33
10-05-92	16
11-09-92	24
02-19-93	62
05-13-93	72
08-27-93	16

**Station name:** Little Elk Creek at Elk Mills, Pa.

**Station number:** 01495300

Date	Streamflow (ft <sup>3</sup> /s)
07-14-49	15

**Appendix 2. Streamflow measurements made by the U.S. Geological Survey at partial-record sites in Chester County, Pennsylvania—Continued**

**Station name:** Little Elk Creek near Lewisville, Pa.

**Station number:** 01495320

Date	Streamflow (ft <sup>3</sup> /s)
07-30-75	16
05-06-76	11
10-05-77	4.6
08-15-78	8.1
10-02-78	5.3
09-25-79	12
10-23-80	4.0

**Station name:** East Branch Octoraro Creek at Christiana, Pa.

**Station number:** 01578340

Date	Streamflow (ft <sup>3</sup> /s)
06-08-70	8.5
11-03-70	20
05-24-71	14
10-18-71	13
10-23-72	8.3
11-14-73	6.4
10-27-82	4.0
10-28-83	6.9
10-26-84	7.5
10-24-85	5.3
11-20-86	4.7
11-18-87	11
11-07-88	7.1
10-27-89	9.1
10-18-90	5.4
10-24-91	4.8
11-09-92	5.3
10-19-93	7.9
11-21-94	6.0
10-26-95	6.8
10-30-96	15

**Station name:** East Branch Octoraro Creek below Christiana, Pa.

**Station number:** 01578341

Date	Streamflow (ft <sup>3</sup> /s)
11-14-73	6.0

**Station name:** East Branch Octoraro Creek near Christiana, Pa.

**Station number:** 01578342

Date	Streamflow (ft <sup>3</sup> /s)
11-14-73	6.4

**Station name:** Valley Creek near Atglen, Pa.

**Station number:** 01578343

Date	Streamflow (ft <sup>3</sup> /s)
06-08-70	9.1
11-03-70	5.4
05-24-71	9.8
10-18-71	10
10-23-72	7.8
10-27-82	4.4
10-28-83	5.9
10-26-84	6.9

**Station name:** Valley Creek near Atglen, Pa.—Continued

**Station number:** 01578343

Date	Streamflow (ft <sup>3</sup> /s)
10-24-85	6.4
11-20-86	6.1
11-18-87	15
11-07-88	5.7
10-27-89	9.0
10-18-90	4.4
10-24-91	3.6
11-09-92	4.8
10-19-93	5.9
11-23-94	5.3
10-26-95	5.3
10-30-96	15

**Station name:** East Branch Octoraro Creek below Valley Creek near Atglen, Pa.

**Station number:** 01578344

Date	Streamflow (ft <sup>3</sup> /s)
11-14-73	17

**Station name:** East Branch Octoraro Creek at Steelville, Pa.

**Station number:** 01578345

Date	Streamflow (ft <sup>3</sup> /s)
06-08-70	27
11-03-70	17
05-24-71	40
10-18-71	36
10-23-72	24
10-27-82	14

**Station name:** Muddy Run at Cream, Pa.

**Station number:** 01578350

Date	Streamflow (ft <sup>3</sup> /s)
07-14-49	12
07-14-94	7.0

**Station name:** East Branch Octoraro Creek near Mount Vernon, Pa.

**Station number:** 01578360

Date	Streamflow (ft <sup>3</sup> /s)
04-22-75	9.0
09-18-75	64