

United States
Department of the Interior
Geological Survey

WATER QUALITY RECORDS
IN MARYLAND AND DELAWARE

1964

Prepared in cooperation with

Delaware Geological Survey
Maryland Geological Survey
District of Columbia Department
of Sanitary Engineering

Copies of this report may be obtained from
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Towson, Maryland 21204

Streamflow records for most of the water quality stations in this report are contained in the following companion volume:

Surface Water Records of Maryland and Delaware.

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[Symbols after station name designate type of data: c, chemical;
t, water temperature; s, sediment]

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WATER QUALITY RECORDS IN MARYLAND AND DELAWARE, 1964

INTRODUCTION

The quality-of-water investigations of the U.S. Geological Survey are concerned with the chemical and physical characteristics of surface- and ground-water supplies of the Nation. The basic records for the 1964 water year for quality of surface waters within the States of Maryland and Delaware are given in this report. The data were collected and computed by the Water Resources Division of the U.S. Geological Survey, under the direction of J. W. Wark, district chief, Towson, Md., and N. H. Beamer, district chemist, Philadelphia, Pa.

The Geological Survey began publishing annual basic records of chemical quality, water temperatures, and suspended sediment in 1941 in the water-supply paper series, "Quality of Surface Waters of the United States." The records prior to 1948 were published each year in a single volume for the entire country and in two volumes in 1948 and 1949. Beginning in 1950, the records were published in four volumes and beginning in 1959 in five volumes; each volume covered an area where boundaries coincided with those of certain natural drainage areas. The records for Maryland and Delaware are contained in Parts 1 and 3 of the water-supply series. These publications are available in most major public libraries. (See "Annual Water-Supply Paper Series," p. 10.)

Distribution of this report is limited, and it is primarily for local and immediate use. The records will be published in the Geological Survey water-supply papers at 5-year intervals. The first compilation will cover only the years 1964 and 1965.

COOPERATION

The work was done under cooperative agreements between the U.S. Geological Survey and the following organizations:

Delaware: Delaware Geological Survey,
J. J. Groot, State geologist

Maryland: Maryland Geological Survey,
Kenneth N. Weaver, director
District of Columbia: Department of
Sanitary Engineering,
Mr. David V. Auld, director.

Several stations were operated from funds appropriated directly to the Geological Survey.

DEFINITION OF TERMS AND ABBREVIATIONS

The terms and abbreviations of water-quality and hydrologic data, as used in the text and tabular data of this report, are defined as follows:

Cfs-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It equals 86,400 cubic feet, 1.983471 acre-feet, or 646,317 gallons.

Cubic feet per second (cfs) is a unit expressing rates of discharge. One cubic foot per second is equal to the discharge of a stream of rectangular cross section, 1 foot wide and 1 foot deep, flowing water at an average velocity of 1 foot per second.

Discharge, in its simplest concept, means outflow; therefore, the use of this term is not restricted as to course or location, and it can be applied to describe the flow of water from a pipe or from a drainage basin. It is also correct to speak of the discharge of a canal or stream into a lake, a stream, or an ocean.

Daily mean discharge is the mean discharge for one day.

Mean daily discharge is the arithmetic mean discharge for the same day during a specific period of years.

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

Instantaneous discharge (at time of sampling).
If the discharge value at the time of sampling is reported instead of daily mean value, the heading of the discharge column will be "Discharge (cfs)."

Drainage area is that area, in a specified location,

measured in a horizontal plane, which is enclosed by a drainage divide.

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

Equivalents per million (epm) is a unit for expressing the concentration of chemical constituents in terms of the interreacting values of the electrically charged particles, or ions, in solution. One equivalent per million of a positively charged ion will react with one equivalent per million of a negatively charged ion. Parts per million is converted to equivalents per million by multiplying by the reciprocal of the combining weight of the ion.

Conversion factors: Parts per million to equivalents per million

Ion	Multiply by	Ion	Multiply by
Aluminum (Al^{+3}).....	0.11119	Hydroxide (OH^{-1}).....	0.05880
Arsenic (As^{+3}).....	.04004	Iodide (I^{-1}).....	.00788
Barium (Ba^{+2}).....	.01456	Iron (Fe^{+3}).....	.05372
Beryllium (Be^{+2}).....	.22192	Lead (Pb^{+2}).....	.00965
Bicarbonate (HCO_3^{-1}).....	.01639	Lithium (Li^{+1}).....	.14411
Bromide (Br^{-1}).....	.01251	Magnesium (Mg^{+2}).....	.08226
Cadmium (Cd^{+2}).....	.01779	Manganese (Mn^{+2}).....	.03640
Calcium (Ca^{+2}).....	.04990	Nickel (Ni^{+2}).....	.03406
Carbonate (CO_3^{-2}).....	.03333	Nitrate (NO_3^{-1}).....	.01613
Chloride (Cl^{-1}).....	.02821	Phosphate (PO_4^{-3}).....	.03159
Chromium (Cr^{+6}).....	.11539	Potassium (K^{+1}).....	.02557
Cobalt (Co^{+2}).....	.03394	Sodium (Na^{+1}).....	.04350
Copper (Cu^{+2}).....	.03148	Strontium (Sr^{+2}).....	.02282
Fluoride (F^{-1}).....	.05264	Sulfate (SO_4^{-2}).....	.02082
Hydrogen (H^{+1}).....	.99209	Zinc (Zn^{+2}).....	.03060

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

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of gage

height or discharge are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is obtained.

Hardness of water is the property of water attributable to the presence of alkaline earths and is expressed as equivalent calcium carbonate (CaCO_3). Hardness is a physical-chemical characteristic, not a substance.

Particle size is the diameter, in millimeters (mm) of suspended sediment or bed material determined by sieve and sedimentation methods.

Particle-size classification is the classification recommended by the American Geophysical Union Subcommittee on sediment terminology (Lane and others, 1947, p. 937). According to this classification, a particle having a diameter:

- Less than 0.004 mm is clay.
- Between 0.004 and 0.062 mm is silt.
- Between 0.062 and 2.0 mm is sand.

Parts per million (ppm) is a unit for expressing the concentration of chemical constituents by weight, usually as grams of constituents per million grams of a solution. In the laboratory the results are expressed in weights of solutes in a given volume of water. To express the results in parts per million, the data must be converted. For most waters this conversion is made by assuming that a liter of water weighs 1 kilogram; and thus milligrams per liter is equivalent to parts per million. Parts per million, for suspended sediment, is computed as 1 million times the ratio of the weight of sediment to the weight of the mixture of water and sediment.

Sediment is solid material both mineral and organic that is transported by, suspended in, or deposited by water. The amount, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are: Degree of slope, length of slope, soil characteristics, land usage, and amount and intensity of precipitation.

Sediment discharge is the rate at which dry weight of sediment passes a section of a stream or is the quantity of sediment, as measured by dry weight, or by volume, that is discharged in a given time.

Solute is any substance derived from the atmosphere, vegetation, soil, or rocks and dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current and is expressed in micromhos per centimeter at 25°C. Because the specific conductance is related to the number and specific chemical types of ions in solution, it can be used for approximating the salinity of the water. The following general relations are applicable:

Specific conductance x (0.65±0.05)=ppm dissolved solids;

$$\frac{\text{Specific conductance}}{100} = \frac{\text{total epm}}{2}$$

Stage is the height of a water surface above an established datum plane; also gage height.

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

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

Thermograph is a thermometer for continuously recording variations of temperature automatically on a chart. The term "temperature recorder" is used to indicate the location of the thermograph in station descriptions in the table headings.

Tons per day is the quantity of a substance in solution or suspension that passes a stream section during a 24-hour period.

Water year in Geological Survey reports dealing with surface water supply is the 12-month period, October 1 through September 30. The water year is designated by the calendar

year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1964, is called the "1964 water year."

STATION NUMBERS

A station number has been assigned as an added means of identification for each stream location where regular measurements of streamflow and determinations of water quality have been made. The numbers have been assigned to conform with the standard downstream order of listing gaging stations. The numbering system consists of two digits followed by a hyphen and a six digit number. The notation to the left of the hyphen identifies the Part or hydrologic region used by the Geological Survey for reporting hydrologic data. The number to the right of the hyphen represents the position of the location in the standard downstream order listing the stations within each of the parts. The assigned numbers are in numerical order but are not consecutive. They are so selected from the complete six digit number scale that intervening numbers will be available for future assignments to new locations. The identification number for each station in this report is printed to the left of the station name and contains only the essential digits. For example, the number is printed as 1-4821 for a station whose complete identification number is 01-4821.00.

COLLECTION AND EXAMINATION OF SAMPLES

Water samples for chemical and physical analyses usually are collected at or near points on streams where gaging stations are maintained for measurement of discharge by the Geological Survey. These discharge records are released as Surface Water Records of Maryland and Delaware, 1964.

Most of these records are used in conjunction with the computations of the chemical constituents and sediment loads in the report.

Solutes

The methods of collecting and compositing water samples for determining the concentration of solutes are described by Rainwater and Thatcher (1960). One sample can adequately define the water quality at a given time if the mixture of

solutes throughout the stream-cross section is homogeneous. However, the concentration of solutes at different locations in the stream-cross section may vary widely with different rates of water discharge depending on the source of material and the turbulence and mixing of the stream. It is necessary to sample some streams at several verticals across the channel to determine accurately the solute load. No single method of compositing samples is applicable to all problems related to the study of water quality. Although generally holding to the principle of 10-day periods, or the equivalent of three composite samples per month, modifications usually are made on the basis of dissolved-solids content, as indicated by measurements of conductivity of daily samples. Samples collected at monthly and miscellaneous water-quality stations were analyzed individually. The measurements are supplemented by other information, such as chloride content, river stage, and weather conditions.

Temperature

Water temperatures were measured at most of the water-quality stations. For daily stations, the water temperatures were taken at about the same time each day in order that the data would be relatively unaffected by diurnal variations in temperature. Most large swiftly flowing streams probably have a small diurnal variation in water temperature, whereas sluggish or shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. The thermometers used for determining the water temperature were accurate to plus or minus 0.5°F.

At stations where thermographs are located, the records consist of maximum and minimum temperatures for each day and the monthly averages of maximum daily and minimum daily temperatures.

Sediment

In general, suspended-sediment samples were collected daily with U.S. depth-integrating cable-suspended samplers from a fixed sampling point at one vertical in the cross section. The US DH-48 hand sampler was used at many stations during periods of low flow. Depth-integrated samples were collected periodically at three or more verticals in the cross section to determine the ratio of the cross-sectional distribution of the concentration of suspended sediment to the daily

sampling vertical. During periods of high or rapidly changing flow, samples were taken twice or more often throughout the day at most sampling stations.

For some periods when no samples were collected, daily loads of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately preceding and following the periods, and suspended-sediment loads for other periods of similar discharge. The estimates were further guided by weather conditions and sediment discharge for other stations.

In addition to the records of quantities of suspended sediment transported, records of periodic measurements of the particle size distribution of suspended sediment are included.

REFERENCES

The following publications are available for background information on the methods for collecting, analyzing and evaluating the chemical and physical properties of surface waters:

American Society for Testing Materials, 1954, Manual on industrial water: Am. Soc. for Testing Mat., Philadelphia, Pa., p. 356.

Colby, B. R., 1963, Fluvial sediments--a summary of source, transportation, deposition, and measurement of sediment discharge: U.S. Geol. Survey Bull. 1181-A, 47 p.

Colby, B. R., and Hubbell, D. W., 1961, Simplified methods for computing total sediment discharge with the modified Einstein procedure: U.S. Geol. Survey Water-Supply Paper 1593, 17 p.

Hem, J. D., 1959, Study and interpretation of the chemical characteristics of natural water: U.S. Geol. Survey Water-Supply Paper 1473, 269 p.

Lane, E. W. and others, 1947, Report of Subcommittee on terminology: Am. Geophys. Union Trans., v. 28, p. 937.

Langbein, W. B., and Iseri, K. T., 1960, General introduction and hydrologic definitions: U.S. Geol. Survey Water-Supply Paper 1541-A, 29 p.

Rainwater, F. H., and Thatcher, L. L., 1960, Methods for collection and analysis of water samples: U.S. Geol. Survey Water-Supply Paper 1454, 301 p.

U.S. Inter-Agency Committee on Water Resources, A study of methods used in measurement and analysis of sediment loads in streams:

- Report 11, 1957, The development and calibration of visual accumulation tube: St. Anthony Falls Hydraulic Lab., Minneapolis, Minn., 109 p., 43 figs.
- Report 12, 1957, Some fundamentals of particle-size analysis: U.S. Govt. Printing Office, Washington, D.C. 20402, 55 p. 9 figs.
- Report AA, 1959, Federal Inter-agency sedimentation instruments and reports: St. Anthony Falls Hydraulic Lab., Minneapolis, Minn., 41 p. 27 figs.
- Report 13, 1961, The single stage sampler for suspended sediment: U.S. Govt. Printing Office, Washington, D. C., 20402, 105 p. 51 figs.
- Report 14, 1963, Determinations of fluvial sediment discharge: U.S. Govt. Printing Office, Washington, D.C. 20402, 151 p. 70 figs.

**Annual Series of Water-Supply Papers
for Quality of Surface Waters**

U.S. Geological Survey Water-Supply Papers giving records of chemical quality and temperatures of surface waters and suspended-sediment loads of streams in the area covered by this report are listed below:

Water-Supply paper numbers and parts,
water years 1941-63

Year	Parts 1-14	Parts 1-4	Year	Parts 1-4	Parts 1-2	Parts 3-4
1941	942	-----	1953	1290	-----	-----
1942	950	-----	1954	1350	-----	-----
1945	970	-----	1955	1400	-----	-----
1944	1022	-----	1956	1450	-----	-----
1945	1030	-----	1957	1520	-----	-----
1946	1050	-----	1958	1571	-----	-----
1947	1102	-----	1959	-----	1641	1642
1948	-----	1132	1960	-----	*1741	*1742
1949	-----	1162	1961	-----	*1881	*1882
1950	-----	1186	1962	-----	1941	1942
1951	-----	1197	1963	-----	*1947	1948
1952	-----	1250				

- Part 1. North Atlantic slope basins
 2. South Atlantic slope and eastern Gulf of Mexico basins
 3. Ohio River basin
 4. St. Lawrence River basin

*In preparation

WATER QUALITY RECORDS

PART 1. NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN

1-4790. WHITE CLAY CREEK NEAR NEWARK, DEL.

LOCATION.--Bridge on western edge of Delaware Park, 4 miles east of Newark, New Castle County, and 0.5 mile downstream from gaging station.

DRAINAGE AREA.--87.8 square miles.

REMARKS.--Temperature, pH, and specific conductance of sediment samples available in district office at Towson, Md.

Chemical analyses, in parts per million, water year October 1963 to September 1964

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Specific conduct- ance (micro- mhos at 25°C)	pH	Color
														Calcium, magne- sium	Non- carbon- ate			
Oct. 19, 1963.....						29		103	21	31		2.4		88	4	301	6.9	18

DELAWARE RIVER BASIN--Continued

1-4790. WHITE CLAY CREEK NEAR NEWARK, DEL.--Continued

Periodic determinations of suspended-sediment discharge, water year October 1963 to September 1964
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (°F)	Sam- pling point	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Percent finer than size indicated, in millimeters										Method of analysis
Oct. 1, 1963.....	1135	61		28	12	1											
Oct. 8.....	1150	63		16	2	T											
Oct. 17.....	0815	56		16	9	T											
Oct. 24.....	1120	61		18	6	T											
Oct. 31.....	1130	49		16	16	1											
Nov. 6.....	1855	59		105	29	8											
Nov. 6.....	2210	59		221	350	210											
Nov. 7.....	1225	59		301	230	190											
Dec. 6.....	0745	39		43	23	3											
Dec. 13.....	0745	38		57	11	2											
Jan. 9, 1964.....	2015	44		3570	1850	18000											
Jan. 9.....	2035	44		3580	1540	15000											
Jan. 9.....	2150	41		3570	1240	12000											
Jan. 10.....	0310	42		800	710	1500											
Jan. 10.....	0625	41		538	440	640											
Jan. 20.....	1420	42		165	110	49											
Jan. 22.....	2115	35		179	110	53											
Jan. 26.....	1155	40		223	170	100											
Jan. 26.....	1610	41		193	100	52											
Jan. 26.....	2130	42		181	660	320											
Jan. 27.....	0855	37		129	26	9											
Jan. 31.....	0930	33		80	6	1											
Feb. 6.....	2355	43		744	1960	3900											
Feb. 7.....	0740	40		255	700	480											
Feb. 7.....	1230	42		197	330	180											
Feb. 7.....	2345	44		145	140	55											
Feb. 17.....	0745	33		131	140	50											
Mar. 3.....	0740	40		141	10	4											
Mar. 17.....	0745	45		89	6	1											
Mar. 25.....	0740	46		173	47	22											

T Less than 0.50 ton.

Apr. 1, 1964.....	0745	36		87	12	3													
Apr. 6.....	2315	47		223	100	60													
Apr. 7.....	1640	52		199	79	42													
Apr. 8.....	0735	50		237	81	52													
Apr. 8.....	1310	54		283	90	69													
Apr. 15.....	0735	53		165	15	7													
Apr. 22.....	0720	48		161	13	6													
Apr. 29.....	0615	49		157	37	16													
Apr. 30.....	2215	50		510	720	990													
May 7.....	0635	59		98	13	3													
May 14.....	0635	63		122	49	16													
May 21.....	0620	56		84	13	3													
July 1.....	1000	77		24	24	2													
July 8.....	0550	71		25	18	1													
July 8.....	1005	71		71	78	15													
July 10.....	0555	65		62	52	9													
July 13.....	0550	71		77	58	12													
July 16.....	0555	70		48	6	1													
July 31.....	0705	69		31	14	1													

Particle-size analyses of bed material, water year October 1963 to September 1964
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (°F)	Sam- pling point	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Bed Material											Method of analysis
							Percent finer than size indicated, in millimeters											
							0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.00	
1 Mar. 24, 1964.....	1330		2	157					0	0	5	46	77	92	98	99		S
2 Mar. 24.....	1415		2	151					0	1	2	38	67	82	90	94	95	S

1 Sample collected 0.5 mile downstream from gaging station.
2 Sample collected at gaging station.

DELAWARE RIVER BASIN--Continued

1-4800. RED CLAY CREEK AT WOODDALE, DEL.

LOCATION.--Temperature recorder at gaging station on right bank 12 feet upstream from bridge on State Highway 48, 0.3 mile south of Wooddale, New Castle County, and 2.3 miles north of Marshallton.

DRAINAGE AREA.--47.0 square miles.

RECORDS AVAILABLE.--Water temperatures: April 1953 to September 1964.

EXTREMES, 1963-64.--Water temperatures: Maximum, 83°F July 18, 19; minimum, 33°F on several days in December and January.

EXTREMES, 1953-64.--Water temperatures: Maximum, 87°F July 17, Aug. 2, 6, 1955 and July 19, 1963; minimum, freezing point on several days during winter months.

Chemical analyses, in parts per million, water year October 1963 to September 1964

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 19, 1963.....	10					32		98	28	39		5.0		98	18	351	6.9	15

DELAWARE RIVER BASIN--Continued

1-4800. RED CLAY CREEK AT WOODDALE, DEL.--Continued

Temperature (°F) of water, year October 1963 to September 1964

Temperature (°F) of water, water year October 1963 to September 1964																																		
Month	Day																															Aver		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
October																																		
Maximum	59	61	61	61	58	58	60	59	59	57	58	58	56	56	55	56	57	58	60	60	61	58	60	60	60	63	64	61	57	50	50	58		
Minimum	55	56	57	57	54	52	54	56	55	53	53	54	52	50	50	50	51	53	55	56	55	57	56	55	55	59	59	57	50	47	45	54		
November																																		
Maximum	51	52	49	48	49	54	55	55	54	54	54	51	48	46	46	46	51	51	50	48	50	51	54	54	47	43	47	46	51	51	--	50		
Minimum	49	49	45	44	45	48	54	54	52	51	51	47	45	44	45	43	45	48	48	46	48	48	50	47	42	41	43	44	46	44	--	47		
December																																		
Maximum	44	40	42	41	41	42	42	43	43	41	41	40	39	39	37	34	34	34	34	34	34	34	34	34	34	33	34	33	33	34	34	37		
Minimum	40	38	39	40	40	40	40	39	41	40	40	38	38	37	34	34	34	34	34	34	34	34	34	34	33	33	33	33	33	33	34	36		
January																																		
Maximum	34	33	33	35	35	37	39	38	41	41	37	35	34	34	34	34	34	34	34	34	34	37	39	40	41	44	44	41	41	39	39	39	37	
Minimum	33	33	33	33	34	34	37	36	37	37	35	34	34	34	34	33	33	33	33	33	33	34	37	39	40	41	41	39	39	36	37	37	36	
February																																		
Maximum	41	42	41	38	40	41	43	43	41	40	38	37	38	41	41	41	39	38	37	40	39	--	--	--	38	41	41	--	40	--	--	40		
Minimum	39	41	37	36	37	40	40	41	39	38	35	35	35	38	38	39	37	37	35	37	37	--	--	--	--	35	37	39	--	37	--	--	38	
March																																		
Maximum	40	44	44	44	50	49	47	47	51	56	52	46	44	45	47	47	48	48	44	47	47	44	48	50	55	58	55	52	53	50	47	48		
Minimum	37	39	43	42	43	46	43	44	46	51	46	42	39	41	45	43	44	43	40	41	41	40	43	45	49	54	50	47	50	47	43	44		
April																																		
Maximum	50	48	54	52	53	52	51	52	51	54	56	57	57	57	59	59	64	67	66	61	54	52	60	62	58	60	61	60	58	52	--	57		
Minimum	44	45	48	48	47	49	48	51	49	46	49	50	53	56	56	53	55	58	61	54	51	51	52	56	54	53	53	58	52	51	--	52		
May																																		
Maximum	54	59	61	64	65	66	67	70	69	68	68	66	66	67	66	66	68	69	71	72	69	69	72	74	74	71	72	71	67	66	65	67		
Minimum	51	52	54	55	57	58	59	61	65	64	61	62	64	63	62	60	62	62	64	68	63	62	66	69	71	66	68	66	63	61	62	62		
June																																		
Maximum	64	63	64	65	67	66	68	69	71	74	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Minimum	61	61	61	60	62	62	64	66	64	69	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
July																																		
Maximum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	83	83	--	81	77	80	79	75	73	--	77	82	81	77	--		
Minimum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	77	78	--	77	75	77	75	71	71	--	75	76	77	72	--		
August																																		
Maximum	74	72	72	68	70	74	72	76	74	68	72	77	74	70	69	66	69	69	70	69	72	77	78	79	77	79	76	73	74	77	79	73		
Minimum	69	71	68	64	66	68	68	71	68	66	67	71	68	65	62	63	65	66	65	63	67	69	73	73	73	74	71	69	70	71	75	68		
September																																		
Maximum	77	73	71	74	75	73	71	72	73	74	77	74	68	66	66	66	69	69	68	66	67	66	70	70	66	65	65	64	61	61	--	69		
Minimum	73	69	65	66	70	68	65	66	66	67	71	68	62	60	59	61	63	65	65	64	64	64	64	66	62	58	59	61	59	60	--	64		

DELAWARE RIVER BASIN--Continued

1-4815. BRANDYWINE CREEK AT WILMINGTON, DEL.

LOCATION.--At Henry Clay bridge in Wilmington, New Castle County, 0.2 mile upstream from gaging station, and 4.4 miles upstream from mouth.

DRAINAGE AREA.--314 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1950, November 1951 to September 1952, October 1956 to September 1964.

Water temperatures: November 1956 to September 1961.

Sediment records: December 1946 to September 1961, October 1963 to September 1964.

EXTREMES, 1963-64.--Sediment concentrations: Maximum daily, 1,000 ppm Jan. 10; minimum daily, 2 ppm Feb. 3-5.

Sediment loads: Maximum daily, 16,000 tons Jan. 10; minimum daily, 1 ton Oct. 13-20, 22-31 and Aug. 25-31.

EXTREMES, 1946-61, 1963-64.--Water temperatures (1956-61): Maximum, 86°F June 17, 1957; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 1,550 ppm Feb. 28, 1958; minimum daily, 1 ppm on many days.

Sediment loads: Maximum daily, 22,900 tons Feb. 28, 1958; minimum daily, less than 0.50 ton on many days.

REMARKS.--The stage discharge relation was affected by ice Dec. 17-20, 31, and Jan. 12-15. Published and unpublished chemical-quality data and water temperature, pH and specific conductance of sediment samples are on file in the WRD District office in Towson, Md. Streamflow records for water year October 1963 to September 1964 available in sub-district office at Dover, Del.

Chemical analyses, in parts per million, water year October 1963 to September 1964

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Color
																Calcium, magnesium	Non-carbonate				
Oct. 4, 1963...	94	14		0.01	0.00	18	6.3	11	4.1	60	29	14	0.2	6.5	143	71	22		221	7.0	7
Oct. 19.....	71	--		--	--	--	--	20	--	76	30	23	--	5.4	--	86	24		265	7.2	5
Dec. 5.....	216	14		.22	.03	18	4.9	11	2.5	51	25	12	.3	8.2	130	65	23		201	6.9	30
Jan. 6, 1964...	292	--		--	--	--	--	9.4	--	47	21	16	--	9.2	--	70	32		204	7.2	10
Mar. 2.....	459	--		--	--	--	--	7.4	--	46	21	11	--	8.9	--	66	29		178	6.3	5
May 22.....	434	--		--	--	--	--	6.2	--	51	18	8.8	--	8.2	--	66	24		172	6.5	5
July 8.....	276	--		--	--	--	--	9.2	--	57	19	11	--	7.3	--	68	22		183	6.7	15
July 30.....	142	--		--	--	--	--	12	--	61	25	12	--	6.2	--	72	22		202	6.9	10
Aug. 28.....	91	--		--	--	--	--	14	--	73	26	15	--	4.4	--	80	20		223	6.9	10
Sept. 30.....	231	7.6		.02	.00	16	7.8	13	5.0	51	31	16	.2	9.6	138	72	30		221	6.8	25

DELAWARE RIVER BASIN--Continued

1-4815. BRANDYWINE CREEK AT WILMINGTON, DEL.--Continued

 Suspended sediment, water year October 1963 to September 1964
 (Where no daily concentrations are reported, loads are estimated)

Day	OCTOBER			NOVEMBER			DECEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	159	18	8	77	17	4	642	47	81
2..	117	14	4	148	28	11	345	20	19
3..	103	12	3	129	18	6	271	8	6
4..	94	11	3	98	12	3	242	8	5
5..	87	10	2	87	12	3	216	8	5
6..	87	9	2	185	60	30	200	8	4
7..	89	10	2	3050	880	S 7700	187	8	4
8..	85	8	2	1340	150	540	207	10	6
9..	84	11	2	518	36	50	909	80	S 210
10..	81	15	3	288	23	18	493	33	44
11..	75	17	3	216	15	9	305	20	16
12..	77	10	2	182	11	5	273	16	12
13..	76	5	1	166	8	4	259	14	A 10
14..	76	5	1	155	5	2	249	10	A 7
15..	74	5	1	148	4	2	211	8	5
16..	76	5	1	140	4	2	177	6	3
17..	75	5	1	139	5	2	173	6	3
18..	73	5	1	136	7	3	173	6	3
19..	71	5	1	134	10	4	165	6	3
20..	71	7	1	128	10	3	145	6	2
21..	73	9	2	128	9	3	171	6	3
22..	72	7	1	129	7	3	164	6	3
23..	70	5	1	184	16	A 8	160	6	3
24..	72	5	1	511	46	63	184	6	3
25..	70	5	1	267	19	14	192	6	3
26..	71	5	1	186	10	5	183	6	3
27..	70	5	1	169	7	3	184	6	3
28..	70	5	1	159	6	J 3	177	6	3
29..	70	5	1	454	43	95	159	6	3
30..	68	5	1	1050	82	230	155	6	3
31..	64	5	1	--	--	--	145	6	2
Total	2500	--	56	10701	--	8828	7716	--	480
Day	JANUARY			FEBRUARY			MARCH		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	181	10	5	469	3	4	380	4	4
2..	297	16	A 13	467	3	4	459	5	6
3..	267	12	A 9	421	2	2	813	--	100
4..	340	--	20	371	2	2	924	--	200
5..	328	14	12	390	2	2	2450	260	S 1900
6..	292	10	8	602	65	J 200	1440	130	S 660
7..	532	25	36	1300	270	S 1100	714	22	42
8..	591	24	38	668	50	90	629	16	27
9..	2910	700	S 9400	531	18	26	609	15	25
10..	4750	1000	S 16000	471	14	18	614	14	23
11..	830	90	200	457	11	14	636	18	31
12..	510	--	40	410	8	9	557	9	14
13..	280	10	A 8	434	10	12	576	7	11
14..	218	8	A 5	441	4	5	598	8	13
15..	285	8	A 6	427	3	3	616	8	13
16..	352	10	A 10	550	7	10	568	8	12
17..	395	10	A 11	531	6	9	502	8	11
18..	362	10	A 10	455	5	6	474	7	9
19..	343	10	A 9	493	5	7	435	6	7
20..	441	--	20	497	5	7	423	6	7
21..	1590	--	800	427	5	6	463	8	10
22..	1330	140	500	392	5	5	705	16	A 30
23..	774	65	140	358	6	6	880	21	A 50
24..	644	32	56	375	6	6	939	32	S 83
25..	1770	170	S 1200	361	4	4	763	17	35
26..	1460	135	530	373	4	4	655	12	21
27..	739	25	50	399	6	6	602	9	15
28..	626	7	12	365	6	6	530	6	9
29..	518	5	7	397	5	5	521	5	7
30..	501	5	7	--	--	--	498	4	5
31..	458	4	5	--	--	--	475	3	4
Total	24914	--	29167	13832	--	1578	21448	--	3384

S Computed by subdividing day.

A Computed from partly estimated-concentration graph.

J Computed from partly estimated-concentration graph and subdividing day.

DELAWARE RIVER BASIN--Continued

1-4815. BRANDYWINE CREEK AT WILMINGTON, DEL.--Continued

 Suspended sediment, water year October 1963 to September 1964--Continued
 (Where no daily concentrations are reported, loads are estimated)

Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	476	4	5	2120	220	S 1400	360	15	15
2..	457	4	5	1280	48	170	373	15	15
3..	613	13	22	1040	26	73	358	15	14
4..	605	10	16	910	22	54	390	15	16
5..	497	7	9	842	20	45	338	20	18
6..	553	8	12	780	18	38	329	16	14
7..	1030	45	S 130	750	17	34	352	16	15
8..	1270	58	S 220	720	16	31	390	18	19
9..	1400	110	S 460	691	16	30	409	23	25
10..	784	25	53	651	16	28	351	16	15
11..	670	18	33	618	16	27	310	12	10
12..	608	15	25	597	19	31	285	9	7
13..	578	14	22	605	17	28	283	8	6
14..	714	17	33	629	19	32	289	8	6
15..	1000	31	84	568	19	29	267	8	6
16..	776	29	61	539	18	26	293	15	12
17..	625	17	29	529	18	26	260	14	10
18..	580	15	23	507	17	23	241	14	9
19..	567	15	23	474	16	20	241	16	10
20..	795	22	47	456	16	20	262	18	13
21..	1020	36	99	432	16	19	247	17	11
22..	952	27	69	434	15	18	221	18	11
23..	757	17	35	423	14	16	214	19	11
24..	671	13	24	406	14	15	289	40	B 30
25..	613	12	20	389	14	15	542	110	B 160
26..	587	12	19	366	13	13	235	32	A 20
27..	567	11	17	367	14	14	211	27	A 15
28..	744	26	52	358	13	14	187	22	11
29..	1230	--	400	353	13	14	180	14	7
30..	2410	240	S 2300	347	15	14	175	10	5
31..	--	--	--	348	15	14	--	--	--
Total	24149	--	4347	19529	--	2331	8882	--	536
Day	JULY			AUGUST			SEPTEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	167	10	4	121	10	3	107	6	2
2..	155	10	4	121	10	3	91	9	2
3..	159	10	4	197	22	J 12	83	8	2
4..	236	29	S 20	348	42	39	81	8	2
5..	197	31	16	179	18	9	79	11	2
6..	167	26	12	150	11	4	75	11	2
7..	153	23	10	136	10	4	71	11	2
8..	276	42	J 42	132	10	4	72	13	3
9..	604	120	S 210	125	9	3	83	14	3
10..	269	50	36	117	9	3	69	11	2
11..	209	35	20	127	13	4	67	10	2
12..	191	28	14	144	16	6	89	14	3
13..	318	48	A 41	132	15	5	116	18	6
14..	395	60	64	121	14	5	92	13	3
15..	358	44	43	116	12	4	84	10	2
16..	242	26	17	112	11	3	78	11	2
17..	191	20	10	113	10	3	78	12	3
18..	176	20	10	119	9	3	76	10	2
19..	165	20	9	123	9	3	80	10	2
20..	158	20	9	119	9	3	85	10	2
21..	173	24	11	111	8	2	88	10	2
22..	191	24	12	105	7	2	86	8	2
23..	158	22	9	102	6	2	85	8	2
24..	148	20	8	101	6	2	83	8	2
25..	155	19	8	97	5	1	77	8	2
26..	158	18	8	94	5	1	72	8	2
27..	155	17	7	92	5	1	76	8	2
28..	148	16	6	91	5	1	91	8	2
29..	145	15	6	89	4	1	442	82	98
30..	142	14	5	92	4	1	231	33	21
31..	134	12	4	99	5	1	--	--	--
Total	6493	--	679	3925	--	138	2987	--	184
Total discharge for year (cfs-days).....							147076		
Total load for year (tons).....							51708		

S Computed by subdividing day.

A Computed from partly estimated-concentration graph.

B Computed from estimated-concentration graph.

J Computed from partly estimated-concentration graph and subdividing day.

DELAWARE RIVER BASIN--Continued

1-4815. BRANDYWINE CREEK AT WILMINGTON, DEL.--Continued

Periodic determinations of suspended-sediment discharge and particle size, May 1963 to January 1964
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Sampling point	Water tem- per- ature (°F)	Mean Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis	
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000		2.000
May 28, 1963.....				149	13	5												
June 3.....				163	47	21												
June 11.....				281	45	34												
June 12.....				189	55	28												
June 13.....				145	35	14												
June 30.....				316	45	38												
July 1.....				135	13	5												
July 13.....				73	23	5												
July 15.....				130	16	6												
July 17.....				87	10	2												
July 18.....				82	16	4												
July 22.....				93	12	3												
July 25.....				81	18	4												
July 30.....				106	16	5												
Aug. 2.....				222	68	41												
Aug. 3.....				123	33	11												
Aug. 4.....				112	27	8												
Aug. 27.....				69	9	2												
Aug. 29.....				64	5	1												
Sept. 4.....				1020	260	S 920												
Sept. 5.....				289	98	76												
Sept. 6.....				138	43	16												
Sept. 7.....				105	29	8												
Sept. 10.....				84	7	2												
Sept. 12.....				76	13	3												
Sept. 17.....				245	20	13												
Sept. 19.....				116	10	3												
Sept. 25.....				78	10	2												
Sept. 27.....				78	7	1												
Jan. 10, 1964.....	0745		37	F 8580	460	--	10	26	39	51	68	78	86	95	99	100		SCBW

S Computed by subdividing day.
F Discharge at time of sampling.

DELAWARE RIVER BASIN--Continued

1-4821. DELAWARE RIVER AT DELAWARE MEMORIAL BRIDGE, WILMINGTON, DEL.

LOCATION.--Center of the navigational channel at the center of the Delaware Memorial Bridge, 1.9 miles downstream from the mouth of the Christina River.
DRAINAGE AREA.--11,030 square miles.

RECORDS AVAILABLE.--Chemical analyses: July 1955 to September 1964.

Water temperatures: October 1956 to September 1964.

EXTREMES, 1956-64.--Specific conductance (1963-64): Maximum, 12,800 micromhos Nov. 1, 1963; minimum, less than 250 micromhos on many days during January to May 1964.

Water temperatures: Maximum, 84°F on several days in 1961; minimum, freezing point on many days during winter months.

Specific conductance (micromhos at 25°C) of water, water year October 1963 to September 1964

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1	10200	4000	12800	6790	6610	1750	--	--	300	<250	2100	340	310	<250	260	<250	1360	320	3850	1200	5390	2300	--	--
2	9720	4750	12700	6890	7190	2070	--	--	270	<250	1600	350	280	<250	<250	<250	1510	380	4380	1400	5380	2250	--	--
3	10400	4800	12300	5910	7410	2000	--	--	<250	<250	1750	400	300	<250	<250	<250	1890	390	4500	1400	6550	2270	--	--
4	9580	4610	12400	6520	6200	2010	--	--	<250	<250	1850	400	<250	<250	<250	<250	1540	380	4560	1400	6530	2800	--	--
5	11000	4870	11800	6800	5900	1810	--	--	<250	<250	1650	470	270	<250	<250	<250	1810	390	4640	1400	6800	2660	--	--
6	10400	5190	11200	6990	5730	1900	--	--	1000	<250	690	290	300	<250	<250	<250	2380	460	4800	1500	5350	2510	--	--
7	10200	5000	12300	7210	5800	2060	--	--	550	<250	550	290	310	<250	<250	<250	2610	430	4800	725	6850	2650	--	--
8	10000	4700	10200	6900	5940	2030	--	--	<250	<250	360	280	290	<250	<250	<250	1870	470	4300	1850	7200	2800	8980	5210
9	11200	5520	9400	5260	5000	1990	--	--	250	<250	360	280	<250	<250	280	<250	2870	490	6150	1500	6550	2700	9170	5230
10	10700	5510	10100	4910	3700	1000	--	--	290	<250	360	<250	<250	<250	<250	<250	3080	480	5250	1400	6600	2800	9090	5220
11	10200	6020	9900	5000	--	--	--	--	400	<250	300	<250	370	<250	310	<250	2980	450	5650	1450	6360	3020	9000	5500
12	9990	5500	9300	4630	--	--	--	--	750	<250	300	<250	370	<250	425	<250	2920	510	4500	1550	--	--	8810	5210
13	10500	5620	9300	4150	--	--	--	--	1450	<250	300	<250	370	<250	500	<250	3180	500	4800	1600	--	--	8820	5890
14	10000	6000	8970	4310	--	--	--	--	1200	<250	280	<250	430	<250	590	<250	2980	600	4400	1450	--	--	10100	5910
15	9990	5700	8390	3900	--	--	--	--	1550	<250	<250	<250	420	<250	500	<250	2980	675	4550	1270	--	--	9140	5390
16	10300	5900	8650	3820	--	--	--	--	1200	<250	<250	<250	<250	<250	600	<250	2480	525	4150	1400	--	--	9520	5270
17	10200	5930	7060	3390	--	--	--	--	700	<250	<250	<250	270	<250	550	<250	2750	610	4290	1300	6800	3320	9230	5400
18	10600	6210	8790	4300	--	--	--	--	1450	250	<250	<250	270	<250	490	<250	2750	700	4300	1500	6670	3510	9720	5230
19	10400	6200	8300	4170	--	--	--	--	1900	270	<250	<250	290	<250	540	<250	2580	760	4250	1420	7460	3380	9910	5340
20	10700	6180	9000	4300	--	--	--	--	1700	280	<250	<250	260	<250	400	<250	2770	800	4450	1500	7300	3650	8310	5810
21	10900	6580	8790	4100	--	--	1920	300	800	260	<250	<250	280	<250	650	<250	2900	800	4500	1800	6010	3600	9560	5500
22	11400	7100	8930	4270	--	--	2300	350	1100	<250	<250	<250	260	<250	495	<250	3300	850	4650	1700	7790	3610	10000	5800
23	11000	6880	8930	4720	--	--	2000	320	1300	<250	<250	<250	<250	<250	580	<250	2790	960	--	1750	7400	3620	9120	5890
24	10800	6240	7220	3510	--	--	1700	300	1450	260	<250	<250	<250	<250	710	260	3600	900	--	2070	7200	3700	9200	5810
25	11200	6600	7620	3130	--	--	1950	300	1700	290	280	<250	<250	<250	440	250	3800	825	4500	2100	7200	3690	10900	6000
26	11100	6680	7610	3510	--	--	1000	<250	2100	310	380	<250	<250	<250	560	250	3360	980	5450	2100	7500	3610	11300	6090
27	11400	6820	7230	3470	--	--	320	<250	1500	300	<250	<250	<250	<250	800	280	3800	1000	5000	1980	7800	3910	11500	6710
28	--	6710	7700	3160	--	--	<250	<250	1900	310	290	<250	<250	<250	730	280	3700	1010	4900	1890	7500	4000	10600	6010
29	--	--	9510	3900	--	--	300	<250	1550	300	310	<250	270	<250	810	300	3860	1140	5000	2000	7780	4190	10500	5870
30	--	--	6590	1880	--	--	280	<250	--	--	<250	<250	270	<250	960	300	3650	1160	4620	1950	7760	3980	10200	5800
31	--	--	--	--	--	--	310	<250	--	--	<250	<250	--	--	900	310	--	--	5350	2200	8230	4180	--	--
Average	10520	5780	9430	4730	--	--	--	--	--	--	--	--	--	--	--	--	2800	665	4710	1610	6920	3260	--	--

DELAWARE RIVER BASIN--Continued

1-4821. DELAWARE RIVER AT DELAWARE MEMORIAL BRIDGE, WILMINGTON, DEL.--Continued

Dissolved oxygen, in parts per million, water year October 1963 to September 1964

Dissolved oxygen, in parts per million, water year October 1963 to September 1964																								
Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1	--	--					--	--	--	--	10.5	7.5	--	--	7.3	6.7	3.8	0.3	5.2	1.6	7.1	1.7	--	--
2	7.4	3.7					--	--	--	--	--	--	--	--	7.8	6.7	3.5	.1	5.8	1.8	6.3	2.1	7.7	3.3
3	8.0	3.9					--	--	--	--	9.4	6.7	8.5	6.7	8.0	6.4	3.5	.2	6.2	2.1	--	--	7.3	3.5
4	7.6	3.3					--	--	--	--	--	--	8.2	7.1	7.5	6.0	3.5	.3	6.0	1.5	--	--	6.8	3.2
5	8.1	3.7					--	--	--	--	--	--	8.8	7.0	6.9	6.0	4.3	.4	--	--	--	--	6.0	3.0
6	8.1	4.0					--	--	--	--	--	--	--	--	6.9	5.8	5.6	.7	--	--	--	--	6.3	2.8
7	8.1	4.0					--	--	--	--	--	--	--	--	6.3	5.4	5.4	1.1	--	--	--	--	6.0	2.8
8	7.9	3.9					--	--	--	--	--	--	5.7	4.1	--	5.0	1.0	--	--	--	6.7	2.3	6.5	3.1
9	--	--					--	--	--	--	--	--	6.7	3.7	--	--	5.0	.4	--	--	5.7	1.8	6.4	3.0
10	--	--					--	--	--	--	--	--	--	--	--	--	5.0	.2	5.1	1.0	5.6	2.1	6.4	3.0
11	7.8	4.8					--	--	--	--	--	--	--	--	--	--	4.9	.2	4.9	.8	5.1	1.6	5.9	3.2
12	8.5	5.0					--	--	--	--	--	--	--	--	6.1	3.5	5.0	.2	4.9	1.0	--	--	5.8	3.1
13	8.5	5.1					--	--	12.9	11.2	--	--	--	--	5.7	3.0	4.8	.1	--	--	--	--	--	--
14	--	--					--	--	12.6	9.8	--	--	--	--	5.2	2.5	4.4	.3	4.6	1.5	--	--	--	--
15	--	--					--	--	12.4	9.7	--	--	--	--	5.5	2.4	4.2	.5	4.1	1.0	6.0	2.4	6.7	4.1
16	--	--					--	--	12.1	9.4	--	--	5.1	3.9	5.2	2.3	4.2	1.0	4.0	.7	6.9	2.7	7.5	4.1
17	--	--					--	--	--	--	--	--	5.3	3.8	4.6	1.7	--	--	--	--	6.5	2.8	7.1	4.6
18	--	--					--	--	--	--	--	--	4.9	3.7	4.1	1.3	--	--	--	--	6.1	3.1	6.6	3.6
19	--	--					--	--	12.9	9.8	--	--	5.1	3.7	4.9	1.2	4.7	1.2	--	--	6.6	2.8	7.2	4.0
20	--	--					--	--	11.8	9.2	10.4	9.1	5.5	3.9	4.6	1.9	4.6	1.0	--	--	--	--	7.1	4.8
21	--	--					--	--	11.3	8.9	10.8	9.4	6.0	4.5	--	--	4.4	.6	--	--	--	--	7.2	4.6
22	--	--					--	--	11.5	9.0	10.7	9.6	5.4	4.7	--	--	4.8	.3	--	--	6.2	3.1	7.5	3.1
23	--	--					--	--	11.3	8.9	10.8	9.0	--	--	--	--	4.8	.9	--	--	--	--	7.8	5.9
24	--	--					10.0	8.1	--	--	--	--	5.1	4.1	--	--	4.6	.9	6.2	3.0	7.1	3.3	7.8	5.4
25	--	--					9.5	7.6	--	--	--	--	--	--	--	--	4.4	.5	--	--	--	--	7.5	5.2
26	--	--					--	--	10.3	7.3	--	--	5.7	3.8	3.9	1.8	4.7	.9	--	--	7.1	3.4	6.8	3.1
27	--	--					--	--	10.1	7.1	--	--	--	--	4.0	2.1	4.9	1.2	--	--	7.6	3.5	7.0	2.9
28	--	--					--	--	--	--	--	--	5.7	3.9	3.9	1.5	5.2	1.4	6.0	1.7	7.1	3.5	6.9	4.4
29	--	--					--	--	--	--	--	--	7.0	5.5	3.6	1.4	5.6	1.6	6.0	1.4	7.1	3.2	6.2	3.8
30	--	--					--	--	--	--	--	--	7.4	6.5	3.9	1.2	5.7	1.6	6.4	1.2	7.2	3.1	6.2	3.5
31	--	--					--	--	--	--	--	--	--	--	4.0	.1	--	--	7.5	1.8	7.2	2.6	--	--
Average...	--	--					--	--	--	--	--	--	--	--	--	--	4.7	0.7	--	--	--	--	6.8	3.7

DELAWARE RIVER BASIN--Continued

1-4821. DELAWARE RIVER AT DELAWARE MEMORIAL BRIDGE, WILMINGTON, DEL.--Continued

Temperature (°F) of water, January to September 1964
(Recorder with temperature attachment, continuous mercury-actuated thermograph)

(recorder with temperature attachment, continuous mercury-actuated thermograph)																																	
Month	Day																															Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
January																																	
Maximum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35	36	--	--	--	--	--	--	
Minimum	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	35	35	--	--	--	--	--	--	
February																																	
Maximum	--	--	--	--	37	--	--	--	--	--	--	--	36	36	36	36	--	--	36	37	37	36	36	36	37	37	37	37	37	--	--	--	
Minimum	--	--	--	--	37	--	--	--	--	--	--	--	35	35	36	36	--	--	35	36	36	35	35	35	35	36	36	36	36	--	--	--	
March																																	
Maximum	37	38	38	--	42	43	44	45	--	--	46	46	46	45	45	44	44	44	42	42	41	42	42	43	45	--	--	--	--	--	--	--	
Minimum	36	37	38	--	39	41	42	43	--	--	45	45	43	43	43	43	43	42	42	42	41	41	42	42	43	--	--	--	--	--	--	--	
April																																	
Maximum	--	--	46	--	--	--	--	48	49	--	50	50	51	51	52	53	54	55	55	55	55	55	56	56	56	56	57	57	57	56	--	--	
Minimum	--	--	45	--	--	--	--	47	48	--	48	49	50	51	51	52	53	54	55	55	54	54	54	55	55	56	56	57	56	55	--	--	
May																																	
Maximum	55	55	55	56	57	58	58	--	--	--	--	63	63	64	64	65	66	67	67	68	--	--	--	--	--	71	71	--	--	--	--	--	
Minimum	55	54	54	55	55	57	57	--	--	--	--	62	63	63	64	64	65	65	67	67	--	--	--	--	--	70	70	--	--	--	--	--	
June																																	
Maximum	--	--	70	70	70	70	70	70	71	72	72	72	73	74	75	75	--	--	74	75	77	77	77	77	77	78	78	78	78	79	--	74	
Minimum	--	--	69	68	70	70	70	70	71	72	72	72	73	73	74	75	--	--	74	74	75	77	77	77	77	77	77	78	78	78	--	74	
July																																	
Maximum	79	80	80	80	--	--	79	--	--	78	78	78	--	79	79	80	--	--	--	--	--	--	--	--	82	--	--	--	80	81	80	80	--
Minimum	79	79	80	80	--	--	78	--	--	77	78	78	--	78	79	79	--	--	--	--	--	--	--	--	81	--	--	--	80	80	80	80	--
August																																	
Maximum	80	79	--	--	--	--	--	77	76	76	76	--	--	--	75	74	75	75	74	--	--	75	76	76	--	77	78	77	77	78	78	--	
Minimum	80	78	--	--	--	--	--	77	76	76	76	--	--	--	75	74	74	75	74	--	--	74	74	76	--	77	77	77	77	77	78	--	
September																																	
Maximum	79	77	77	78	77	77	77	--	--	--	77	77	--	--	72	72	72	72	72	70	69	69	70	70	70	68	68	68	67	67	--	72	
Minimum	78	77	76	76	76	76	76	--	--	--	77	76	--	--	72	71	71	71	70	69	69	69	69	70	68	68	68	67	67	66	--	72	

DELAWARE RIVER BASIN--Continued

1-4828. DELAWARE RIVER AT REEDY ISLAND JETTY, DEL.

LOCATION.--Specific conductance recorder on platform in river at Reedy Island Jetty, New Castle County. Installation is approximately 4.7 miles south of Chesapeake and Delaware Canal and 5.7 miles north of Liston Point.

DRAINAGE AREA.--11,222 square miles, approximately.

RECORDS AVAILABLE.--Specific conductance: October 1963 to September 1964.

EXTREMES, 1963-64.--Specific conductance: Maximum daily, 35,400 micromhos Nov. 7; minimum daily, 300 micromhos Mar. 18, 19.

REMARKS.--Records of daily specific conductance for period June 1956 to September 1963 available in the Quality of Water office at Trenton, N. J.

Specific conductance (micromhos at 25°C) water year October 1963 to September 1964

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1	--	--	24300	18600	16500	10500	21900	12500	6200	1000	14500	5450	6580	1000	--	--	10400	3700	--	--	16600	9900	18500	12700
2	--	--	23800	18500	19700	11300	18600	11700	4300	900	11000	5100	5200	1200	--	--	11200	4300	14200	7550	16000	9800	19800	12800
3	19800	4650	21500	17200	19700	11000	17700	11500	4750	750	12700	5700	5500	1360	--	--	11700	4450	14000	7700	18200	9900	19000	12900
4	19100	4510	24400	18000	18400	10200	18800	11200	6800	850	12700	5700	4400	800	--	--	10900	4400	14500	7600	18600	10600	18000	12800
5	20300	4660	23900	18300	17100	10200	18000	12400	8800	1500	12600	7000	5900	1200	--	--	12500	4250	15200	7700	18500	11000	17800	12800
6	20300	4480	24200	--	17400	10700	18800	11000	14000	1850	7600	3350	7290	2300	3940	350	12000	4800	15800	7900	17900	10400	18000	12700
7	19500	4370	35400	--	18000	10700	18500	11700	11800	3000	9100	2300	6900	2000	4600	400	12500	4900	17800	8400	18500	10800	18200	13300
8	19100	4490	27100	18400	19300	11000	18400	11200	8800	3050	8050	1600	7000	1750	5600	450	13200	4800	19700	9200	15500	10800	18000	13000
9	20400	4510	23000	16900	16500	11000	19500	11900	8800	1600	8400	1450	5200	800	6100	550	10500	4900	13400	8400	17000	10500	19000	13000
10	20500	4700	23600	16200	15000	8990	16200	11800	9500	1900	8050	1600	6400	820	6000	750	13600	5100	15800	8300	17500	10800	18900	13800
11	20400	4900	23500	16500	14800	7500	11900	4850	9500	3550	6750	900	6300	810	5600	950	12000	4900	16400	8300	16800	11000	19500	14600
12	19400	4740	22200	16300	16800	8000	14200	6000	12700	4650	8600	900	4510	900	6400	1050	12300	5000	16000	8400	17500	11800	19000	13600
13	20200	4810	22200	15500	17700	8050	16000	8700	15000	4600	3600	500	5310	910	7100	1200	12300	5100	16600	8900	17300	11000	21000	15000
14	19700	4810	21500	15500	17700	8500	17100	7100	12200	4700	2300	500	5610	1000	7150	1400	11600	5500	14500	8100	18000	11300	23000	15000
15	19000	4670	19800	14900	15100	6750	20300	8800	12600	4050	1400	450	5000	1000	6600	1500	--	--	14000	8000	19000	11500	22000	15000
16	19300	4830	20400	13800	15000	6150	18500	8900	14400	3800	750	370	4310	790	6700	1550	--	--	13400	7600	19000	11000	22000	14800
17	19000	4860	20300	13900	16100	6900	17800	8200	8800	3500	1150	370	3180	750	5550	1280	--	--	14100	8100	19000	11000	22000	15700
18	19600	4860	21300	14300	19000	8200	19200	9100	12000	4300	1000	300	2140	670	5400	1500	--	--	15000	8600	19500	11700	22500	15000
19	18500	4860	20000	14400	17300	7950	17500	8800	17800	4800	2450	300	3270	690	5900	1520	--	--	14500	6200	20000	11300	22000	15300
20	19300	4960	21900	14600	18700	7700	16400	10100	12200	5000	4050	360	3100	670	4100	1380	--	--	16000	6900	19500	11300	22500	16000
21	--	--	20100	14000	16200	7400	15400	7600	10300	3700	7800	1250	2900	650	6300	1300	--	--	16300	8100	19500	11700	22000	16000
22	--	--	21100	14400	21200	5900	15200	6600	12800	3550	8800	1950	2220	470	5700	1650	--	--	15500	7900	18500	12000	22000	16000
23	--	--	21400	14300	21100	10300	15800	6300	13200	3550	9400	1500	1870	480	6400	1400	--	--	15400	7900	17000	11500	23000	16500
24	19400	5190	19000	12300	21900	12800	15700	5900	14300	4250	8700	1600	1320	450	8020	1480	--	--	11800	8800	16500	11000	22000	16500
25	22000	5290	20100	12800	20700	12300	16800	6150	13900	4200	7800	1600	2470	420	7550	1900	--	--	15800	10400	19000	12000	19500	16000
26	21900	5740	20500	13300	20500	11300	13000	3500	14900	4300	8100	1650	1320	410	6300	1750	--	--	17800	10200	19000	12000	21000	15500
27	22500	5730	19000	12900	21700	11400	7500	1500	12600	4900	5500	1150	1070	400	8800	2300	--	--	15800	8800	18200	12000	20000	15800
28	24200	5860	20000	12700	22200	12300	4950	800	13600	5450	5450	1100	1400	400	8300	2150	--	--	15000	9100	18000	12300	19000	15000
29	22500	5890	21900	14600	21400	12500	5000	700	13000	5200	4700	1050	1400	450	9250	2580	--	--	16100	9900	18000	12500	20000	15000
30	--	--	21900	11800	18600	11900	5400	800	--	--	4300	1050	--	--	10200	3100	--	--	15600	9600	17500	12600	19500	14000
31	23900	5930	--	--	19000	12000	6100	900	--	--	4400	900	--	--	10900	3450	--	--	17100	9600	18500	12500	--	--
Average	20400	4970	22300	15175	18400	9720	15400	7680	11400	3400	6830	1900	4110	881	6710	1500	--	--	15400	8400	18100	11300	20300	14500

NANTICOKE RIVER BASIN

1-4870. NANTICOKE RIVER NEAR BRIDGEVILLE, DEL.

LOCATION.--At gaging station, 800 feet downstream from Gum Branch, and 2.5 miles southeast of Bridgeville, Sussex County.

DRAINAGE AREA.--75.4 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1961 to September 1964.

Chemical analyses, in parts per million, water year October 1963 to September 1964

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Color
																Calcium, magnesium	Non-carbonate				
Oct. 3, 1963...	36	18		0.17	0.02	4.8	1.9	12	7.0	25	2.0	11	0.0	21	92	20	0		143	7.1	8
Oct. 18.....	31	--		--	--	--	--	17	--	36	3.6	16	--	7.1	--	24	0		118	6.8	6
Dec. 2.....	48	20		.01	.00	4.0	1.5	8.0	1.2	11	8.8	7.9	.1	7.8	65	16	7		83	7.1	5
Feb. 7, 1964...	225	--		--	--	--	--	3.0	--	7	11	6.4	--	5.8	--	24	19		75	5.5	15
Mar. 6.....	226	--		--	--	--	--	5.8	--	8	11	6.4	--	7.0	--	20	14		76	5.7	18
Apr. 16.....	283	--		--	--	--	--	1.8	--	4	8.2	5.8	--	5.0	--	20	17		70	5.4	40
May 19.....	75	--		--	--	--	--	1.4	--	12	5.0	7.4	--	9.1	--	30	20		77	6.1	15
Aug. 20.....	25	16		.28	.00	4.0	3.9	7.2	2.0	37	.6	8.0	.1	.2	61	26	0		88	6.3	10
Sept. 29.....	A36	16		.01	.00	4.4	2.4	10	3.4	20	5.6	16	.1	5.2	79	21	4		119	6.6	5

A Mean daily (discharge range from 31 cfs to 40 cfs during day).

PATUXENT RIVER BASIN

1-5925. PATUXENT RIVER NEAR LAUREL, MD.

LOCATION.--At gaging station at Rocky Gorge Pumping Station, 600 feet downstream from Rocky Gorge Dam, 0.7 mile upstream from Walker Branch, and 1.3 miles northwest of Laurel, Prince Georges County.

DRAINAGE AREA.--132 square miles.

RECORDS AVAILABLE.--Chemical analyses: July 1963 to April 1964 (discontinued).

Chemical analyses, in parts per million, October 1963 to April 1964

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Color
																Calcium, magnesium	Non-carbonate				
Oct. 2, 1963..	11	7.5	0.4	6.9	0.00	8.0	1.9	3.0	2.2	30	3.4	4.5	0.0	4.1	60	28	4		81	6.6	70
Oct. 16.....	10	7.8	.4	8.0	3.0	7.2	2.4	3.3	2.4	29	3.4	4.3	.1	3.5	57	28	4		81	6.6	--
Oct. 22A.....	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		115	6.1	--
Oct. 25.....	10	7.6	--	9.4	3.0	6.5	2.9	B7.4	--	34	4.2	4.7	.1	5.3	59	28	0		88	6.4	--
Nov. 4.....	9.7	2.6	--	.99	.01	5.9	2.3	B4.1	--	24	6.0	4.6	.1	.9	42	24	5		74	6.6	--
Nov. 14.....	11	2.0	--	.66	.61	6.0	1.7	B5.3	--	24	6.4	4.5	.0	1.2	44	22	3		72	6.7	10
Nov. 25.....	12	5.6	--	.68	.33	6.4	1.7	3.0	2.8	22	7.4	4.5	.1	2.1	52	23	5		76	7.0	--
Dec. 7.....	12	3.4	--	.44	.14	5.6	2.2	3.1	2.4	23	6.2	4.2	.1	1.6	46	23	4		73	6.8	--
Dec. 18.....	12	3.2	--	.20	.04	6.3	1.8	B5.3	--	23	6.2	5.5	.0	2.0	42	24	4		71	6.7	10
Jan. 10, 1964.	13	3.6	--	.40	.05	6.3	1.8	B5.8	--	22	6.8	5.5	.0	2.9	41	23	5		72	6.6	10
Jan. 24.....	90	4.1	.2	.50	.08	6.2	1.8	B4.1	--	10	6.8	4.7	.1	1.9	46	23	7		71	7.1	--
Feb. 4.....	52	13	--	.31	.20	6.8	1.5	B4.1	--	21	7.2	4.6	.1	.8	46	23	6		69	7.5	--
Feb. 14.....	51	4.4	--	.30	.36	5.6	1.9	3.5	2.2	21	7.4	4.9	.0	1.6	45	22	5		71	6.6	3
Feb. 26.....	46	5.5	--	.31	.07	5.6	1.9	2.6	2.2	20	7.8	4.0	.0	2.0	43	22	6		70	6.9	2
Mar. 5.....	148	5.7	--	.33	.39	5.6	1.9	3.4	2.2	20	7.6	5.1	.1	2.1	47	22	6		70	6.8	4
Mar. 16.....	115	4.1	--	.51	.08	6.2	1.8	B4.1	--	10	6.8	4.7	.1	1.9	46	23	7		70	7.1	--
Mar. 25.....	155	6.8	--	.33	.18	8.2	.1	B4.8	--	18	7.6	4.6	.1	2.7	51	21	6		68	7.3	--
Apr. 2.....	107	6.8	.1	.22	.00	5.2	1.9	3.2	1.9	18	5.8	4.8	.0	3.0	47	21	6		71	6.7	3
Apr. 14.....	150	6.3	--	.20	.10	6.0	1.7	3.1	2.0	16	6.8	4.1	.1	3.6	50	22	9		74	6.8	5

A Field determination.

B Calculated Na plus K, reported as Na.

PATUXENT RIVER BASIN--Continued

1-5944.1. LITTLE PATUXENT RIVER AT FORT GEORGE G. MEADE, MD.

LOCATION.--At Simond's bridge on State Highway 198, about 4 miles east of Laurel on Fort George G. Meade Military Reservation, Anne Arundel County.

DRAINAGE AREA.--127 square miles.

RECORDS AVAILABLE.--Chemical analyses: June 1963 to April 1964 (discontinued).

Chemical analyses, in parts per million, October 1963 to April 1964

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Color
																Calcium, magnesium	Non-carbonate				
Oct. 2, 1963..	30	11	0.4	0.71	0.00	9.5	3.0	8.3	4.1	40	12	8.6	0.0	0.3	95	36	3		125	6.4	25
Oct. 16.....	21	11	.2	.57	.22	10	3.4	9.0	2.8	50	8.6	7.5	.2	.0	79	39	0		129	6.6	--
Oct. 25.....	23	10	--	.48	.08	12	3.2	A12	--	54	12	8.3	.2	.2	87	43	0		145	6.6	--
Nov. 4.....	31	12	--	.59	.01	11	3.3	A8.7	--	40	11	9.2	.1	2.3	86	41	8		132	6.8	--
Nov. 14.....	49	15	--	2.6	.14	10	2.9	A7.6	--	35	11	7.2	.0	4.3	78	37	9		116	6.9	0
Nov. 25.....	68	13	--	.61	.09	9.5	3.0	6.1	2.9	30	13	8.0	.1	3.2	76	36	12		115	6.8	--
Dec. 7.....	69	15	--	.57	.12	9.3	3.2	6.3	2.0	34	11	6.6	.1	2.4	78	36	8		112	7.0	--
Dec. 18.....	78	16	--	.51	.04	9.6	3.0	A8.3	--	32	13	9.0	.0	3.3	75	36	10		110	6.6	5
Dec. 30.....	B68	15	--	.69	.05	9.4	2.7	A8.5	--	31	11	9.0	.0	4.4	74	34	9		107	6.8	5
Jan. 10, 1964.	474	7.5	--	3.1	.10	6.8	1.9	A6.2	--	14	15	6.5	.0	2.8	60	36	8		112	7.0	10
Jan. 24.....	65	12	--	.88	.14	6.2	4.0	A6.2	--	22	14	7.4	.1	2.3	74	32	14		97	7.2	--
Feb. 4.....	103	15	--	.45	.04	9.8	2.2	A6.4	--	26	12	7.1	.1	3.7	75	34	12		101	7.4	--
Feb. 14.....	127	13	--	.67	.10	9.2	2.7	8.5	1.6	29	11	14	.0	1.9	75	34	10		123	6.8	3
Feb. 26.....	B140	15	--	.47	.30	8.4	2.9	5.4	1.4	26	13	8.0	.0	2.9	72	33	12		107	6.6	3
Mar. 5.....	B300	10	--	1.6	.70	8.4	2.7	5.9	2.0	24	13	8.6	.0	2.7	69	32	13		109	7.0	3
Mar. 16.....	B140	12	--	.47	.02	8.8	2.1	A8.0	--	29	11	7.4	.2	2.0	74	30	7		103	7.3	--
Mar. 25.....	B145	12	--	.62	.04	6.8	3.7	A8.5	--	28	14	7.4	.1	2.6	71	32	9		101	7.5	--
Apr. 2.....	131	12	--	.41	.01	7.6	3.2	6.0	1.4	32	9.4	7.4	.0	2.4	68	32	6		105	6.8	4
Apr. 13.....	142	11	--	.46	.03	9.3	2.4	5.8	1.6	28	11	6.6	.1	1.2	74	33	10		110	6.5	--

A Calculated Na plus K, reported as Na.

B Estimated.

PATUXENT RIVER BASIN--Continued

1-5944.5. PATUXENT RIVER AT HARDESTY, MD.

LOCATION.--At Queen Anne bridge at Hardesty, Prince Georges County, about 0.2 mile downstream from Davidsonville Branch, and 0.7 mile south of State Highway 214.
 DRAINAGE AREA.--371 square miles.
 RECORDS AVAILABLE.--Chemical analyses: June 1963 to April 1964 (discontinued).

Chemical analyses, in parts per million, October 1963 to April 1964

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Color
																Calcium, magnesium	Non-carbonate				
Oct. 2, 1963..	104	10	0.4	2.1	0.00	10	1.7	5.9	3.5	24	19	7.8	0.2	0.1	90	32	13		114	6.4	15
Oct. 16.....	69	11	.1	2.1	.00	11	2.6	8.4	3.2	36	13	9.4	.2	3.7	96	38	9		133	6.5	5
Oct. 25.....	73	10	.2	1.5	.00	11	3.0	8.6	3.6	42	12	9.9	.3	1.0	99	40	6		134	6.4	10
Nov. 4.....	100	11	--	.19	.02	9.5	3.0	A9.4	--	31	16	9.2	.2	1.1	83	36	11		127	6.5	--
Nov. 14.....	131	13	.1	1.4	.00	10	3.2	6.6	3.0	26	17	8.6	.2	4.2	91	38	17		124	6.5	5
Nov. 25.....	210	11	--	1.4	.25	8.9	2.4	5.8	2.8	21	16	6.6	.1	3.6	74	32	15		111	6.6	--
Dec. 7.....	164	13	.1	1.1	.28	9.3	2.7	6.3	2.4	22	16	7.2	.2	4.5	79	34	16		116	7.0	--
Dec. 18.....	169	12	.2	1.0	.08	9.7	2.5	7.2	2.1	20	17	10	.1	5.9	74	34	18		117	6.4	5
Dec. 30.....	107	12	.1	2.0	.08	9.5	2.3	9.0	2.0	20	15	14	.1	6.0	77	33	16		120	7.3	5
Jan. 10, 1964.	2180	6.1	.1	3.2	.09	5.7	1.8	3.6	2.4	8	14	7.0	.0	2.0	49	21	14		74	5.8	10
Jan. 24.....	196	9.0	.7	1.2	.02	7.8	2.1	5.2	2.0	14	17	7.5	.0	1.6	66	28	17		101	6.0	3
Feb. 4.....	300	11	.2	.75	.02	8.2	2.3	5.1	2.0	19	15	6.8	.0	2.6	70	30	15		101	6.6	2
Feb. 14.....	423	9.9	.3	.77	.02	8.4	2.2	8.6	2.2	18	13	14	.0	4.2	82	30	15		122	6.5	2
Feb. 26.....	300	11	.4	.77	.00	8.0	2.4	5.4	1.8	19	15	7.5	.0	1.8	67	30	15		102	6.2	3
Mar. 5.....	741	4.6	.7	1.2	.00	8.0	2.2	6.7	2.0	16	17	9.0	.1	3.2	70	29	16		108	7.1	3
Mar. 16.....	368	9.9	.2	.64	.00	7.4	2.3	5.1	1.8	20	13	6.8	.0	1.7	64	28	12		95	6.7	4
Mar. 25.....	773	9.0	.4	.89	.00	7.6	1.9	5.2	1.9	15	14	7.0	.0	2.9	64	27	15		97	6.4	2
Apr. 2.....	354	9.5	--	.60	.12	6.8	2.7	5.5	1.4	20	13	7.7	.0	3.2	60	28	12		95	6.5	3
Apr. 13.....	425	7.8	--	.79	.10	8.1	1.9	4.9	1.9	18	13	6.4	.1	3.0	68	28	13		101	6.5	--

A Calculated Na plus K, reported as Na.

PATUXENT RIVER BASIN--Continued

1-5945.6. PATUXENT RIVER AT NOTTINGHAM, MD.

LOCATION.--At wharf on right bank at Nottingham, Prince Georges County, about 0.9 mile upstream from Tanyard Branch, and 2.4 miles east of Naylor.

DRAINAGE AREA.--581 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1963 to April 1964 (discontinued).

Chemical analyses, in parts per million, October 1963 to April 1964

Date of collection	Tidal Stage	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Color
																Calcium, magnesium	Non-carbonate				
Oct. 4, 1963..	High	1.4	--	1.3	0.87	39	88	A706	--	33	180	1260	0.3	0.7	2420	458	431		4200	6.5	--
Oct. 16.....	Low	2.8	0.3	1.2	.10	34	63	530	23	34	134	925	.1	1.1	1660	344	316		3100	6.7	10
Oct. 25.....	Low	2.1	--	.99	.86	46	103	A859	--	36	223	1520	.2	1.3	3020	540	511		5020	6.4	--
Nov. 4.....	Low-flood	4.9	--	5.7	.60	47	96	A803	--	35	202	1430	.2	.5	2560	512	484		4650	7.0	10
Nov. 14.....	Hi-flood	10	--	2.9	.24	12	13	A104	--	21	43	175	.0	.5	390	84	67		702	6.4	20
Nov. 25.....	Ebb	12	--	1.8	.40	12	6.8	A43	--	32	27	68	.1	.9	193	58	32		351	6.8	--
Dec. 7.....	Low	11	.2	2.5	.05	9.2	3.2	12	3.0	18	21	20	.0	1.2	91	36	21		150	7.1	10
Dec. 18.....	Low	12	.4	1.8	.05	11	3.2	11	2.5	26	20	19	.0	.2	92	40	19		147	6.2	20
Dec. 30.....	Low	15	.4	1.8	.07	13	4.2	18	2.7	29	23	20	.0	4.2	121	50	26		201	6.5	5
Jan. 10, 1964.	Low	8.3	.1	4.3	.08	7.3	1.9	5.5	2.5	10	18	9.5	.0	1.9	62	26	18		93	5.8	10
Jan. 24.....	High	13	--	2.2	.00	9.8	4.0	A16	--	18	22	26	.2	.8	115	41	26		155	6.8	--
Feb. 4.....	Flood	13	--	1.4	.34	9.5	2.4	A6.9	--	21	18	8.7	.2	.2	78	34	17		105	7.2	--
Feb. 14.....	Hi-flood	12	--	3.1	.77	9.2	2.9	9.9	1.9	17	21	17	.0	1.8	88	35	21		140	6.5	2
Feb. 26.....	Low-flood	12	--	1.8	.46	9.2	2.7	8.0	1.7	15	20	14	.1	1.2	78	34	22		127	6.8	3
Mar. 5.....	Ebb	13	--	2.4	.50	8.8	3.4	12	1.8	19	22	20	.1	.0	90	36	21		149	6.3	--
Mar. 16.....	Low	12	--	2.5	.00	9.0	2.7	A7.4	--	20	18	8.4	.2	2.2	78	34	17		108	7.4	--
Mar. 25.....	High	11	--	2.9	.22	9.0	1.9	A6.4	--	17	17	9.0	.2	.0	74	30	17		103	6.8	--
Apr. 2.....	Low-ebb	12	--	1.6	.28	8.4	2.9	4.9	1.8	20	18	8.6	.0	1.5	69	33	17		108	6.9	3
Apr. 13.....	Flood	13	--	1.9	.31	9.2	2.4	6.5	2.0	14	24	9.4	.1	1.6	83	33	22		124	6.2	--

A Calculated Na plus K, reported as Na.

PATUXENT RIVER BASIN--Continued

1-5947. PATUXENT RIVER AT BENEDICT, MD.

LOCATION.--On bridge at State Highway 231 at Benedict, Charles County, about 2 miles downstream from Swanson Creek.

DRAINAGE AREA.--742 square miles.

RECORDS AVAILABLE.--Chemical analyses: June 1963 to April 1964.

Water temperatures: October 1963 to September 1964.

EXTREMES, 1963-64.--Water temperatures: Maximum, 86°F July 16, 17; minimum, freezing point Feb. 12.

Chemical analyses, in parts per million, October 1963 to April 1964

Date of collection	Tidal Stage	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Color
																Calcium, magnesium	Non-carbonate				
Oct. 4, 1963..	Low-flood	2.6	1.0	0.84	0.05	156	484	3720	159	58	966	6940	0.7	0.4	12900	2380	2330		18000	6.9	5
Oct. 4A.....	Low-flood	--	--	--	--	--	--	--	--	--	--	6660	--	--	--	--	--		18400	--	--
Oct. 4B.....	Low-flood	--	--	--	--	--	--	--	--	--	--	6860	--	--	--	--	--		18900	--	--
Oct. 16.....	Low	1.9	.8	.56	.04	181	551	4450	170	66	1120	8010	.7	.4	14800	2720	2670		20300	6.9	5
Nov. 4.....	Hi-flood	2.2	--	.00	.01	196	600	C4950	--	71	1240	8770	.7	.0	16700	2960	2900		22800	6.8	--
Nov. 14.....	Flood	2.3	--	.58	.02	190	587	C4900	--	71	1220	8660	.6	.0	16500	2890	2830		22500	6.8	--
Nov. 14A.....	Flood	2.7	--	.26	.03	170	519	C4280	--	64	1050	7600	.6	.2	14300	2560	2510		20200	6.6	--
Nov. 25.....	Low	2.5	--	.21	.01	183	581	C4800	--	70	1180	8500	.7	.4	16100	2850	2790		22200	7.3	--
Dec. 7.....	Low-flood	2.7	--	.22	.07	185	549	C4840	--	69	1150	8500	.7	1.6	15600	2720	2660		21100	6.9	--
Dec. 7A.....	Low-flood	3.7	--	.10	.03	163	513	C4020	--	64	1040	7180	.6	.4	13600	2520	2470		18900	7.6	--
Dec. 7B.....	Low-flood	--	--	--	--	--	--	--	--	--	--	8880	--	--	17100	--	--		22600	--	--
Dec. 18.....	Low-ebb	3.4	--	.53	.07	183	550	C4540	--	68	1120	8060	.6	1.6	15000	2720	2660		20400	6.9	--
Dec. 18A.....	Low-ebb	3.6	--	.02	.04	168	547	C4390	--	67	1090	7810	.5	.0	14400	2670	2620		19700	6.9	--
Dec. 18B.....	Low-ebb	2.8	--	.00	.08	178	553	C4460	--	68	1120	7930	.6	.0	15000	2720	2660		20200	6.8	--
Dec. 30.....	Low-flood	3.2	--	.01	.03	183	586	C4720	--	70	1160	8410	.9	1.2	15500	2870	2810		20800	7.1	--
Dec. 30A.....	Low-flood	3.2	--	.00	.03	193	604	C4580	--	70	1160	8260	.7	.4	15500	2970	2910		20800	6.8	--
Dec. 30B.....	Low-flood	3.2	1.0	.01	.03	190	545	4880	178	72	1170	8600	.8	.4	15800	2720	2660		21200	7.2	5
Jan. 15, 1964.	Hi-flood	3.0	.7	.83	.02	203	559	4530	179	72	1130	8450	.2	4.9	15100	2810	2750		22800	6.8	10
Jan. 15A.....	Hi-flood	--	--	--	--	--	--	--	--	--	--	7910	--	--	--	--	--		19800	--	--
Jan. 15B.....	Hi-flood	--	--	--	--	--	--	--	--	--	--	8150	--	--	--	--	--		21000	--	--
Jan. 24.....	Ebb	3.1	--	.23	.00	178	512	C4370	--	63	1080	7700	.6	.8	14800	2550	2500		22100	6.7	--
Jan. 24A.....	Ebb	--	--	--	--	--	--	--	--	--	--	4610	--	--	--	--	--		12800	--	--
Jan. 24B.....	Ebb	--	--	--	--	--	--	--	--	--	--	7750	--	--	--	--	--		19400	--	--
Feb. 4.....	Low-flood	3.5	--	.48	.02	178	492	C4330	--	62	1050	7610	.7	.0	14500	2470	2420		21800	6.8	--
Feb. 4A.....	Low-flood	--	--	--	--	--	--	--	--	--	--	5270	--	--	--	--	--		14500	--	--
Feb. 4B.....	Low-flood	--	--	--	--	--	--	--	--	--	--	7220	--	--	--	--	--		19300	--	--
Feb. 14.....	High	3.7	--	.91	.03	158	475	C3970	--	61	978	7020	.6	.0	13300	2350	2300		20200	6.7	--
Feb. 14A.....	High	--	--	--	--	--	--	--	--	--	--	6700	--	--	--	--	--		17200	--	--
Feb. 14B.....	High	--	--	--	--	--	--	--	--	--	--	7430	--	--	--	--	--		18400	--	--
Feb. 26.....	Hi-flood	4.4	--	.41	.06	138	378	C3380	--	45	841	5910	.5	.0	11600	1900	1860		17200	6.5	--

A Sampled near top.

B Sampled near bottom.

C Calculated Na plus K, reported as Na.

PATUXENT RIVER BASIN--Continued

1-5947. PATUXENT RIVER AT BENEDICT, MD.--Continued

Chemical analyses, in parts per million, October 1963 to April 1964--Continued

Chemical analyses, in parts per million, October 1963 to April 1964--Continued																	Hardness as CaCO ₃		Total acidity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Color
Date of collection	Tidal Stage	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Calcium, magnesium	Non-carbonate					
Feb. 26, 1964A	Hi-flood	--	--	--	--	--	--	--	--	--	--	5710	--	--	--	--	--	--	15500	--	--	
Feb. 26B.....	Hi-flood	--	--	--	--	--	--	--	--	--	--	6650	--	--	--	--	--	--	16800	--	--	
Mar. 5.....	Low-ebb	5.3	--	1.1	0.35	124	433	C3040	--	54	780	5560	0.5	0.8	10800	2090	2050	16400	--	--		
Mar. 5A.....	Low-ebb	--	--	--	--	--	--	--	--	--	--	5520	--	--	--	--	--	14900	--	--		
Mar. 5B.....	Low-ebb	--	--	--	--	--	--	--	--	--	--	5620	--	--	--	--	--	14800	--	--		
Mar. 16.....	Low-ebb	5.7	--	1.1	.03	119	331	C2910	--	51	714	5100	.5	.0	9650	1660	1620	15200	6.6	--		
Mar. 16A.....	Low-ebb	--	--	--	--	--	--	--	--	--	--	3890	--	--	--	--	--	11300	--	--		
Mar. 16B.....	Low-ebb	--	--	--	--	--	--	--	--	--	--	4930	--	--	--	--	--	13600	--	--		
Mar. 25.....	Hi-ebb	5.4	--	.24	.03	139	363	C3080	--	55	750	5460	.5	.8	10200	1840	1790	15600	6.7	--		
Mar. 25A.....	Hi-ebb	--	--	--	--	--	--	--	--	--	--	5050	--	--	--	--	--	13600	--	--		
Mar. 25B.....	Hi-ebb	--	--	--	--	--	--	--	--	--	--	5510	--	--	--	--	--	15400	--	--		
Apr. 13.....	Low-flood	8.7	0.7	.87	.19	90	237	C1680	--	43	475	3100	.3	2.8	6060	1200	1170	9900	6.9	2		
Apr. 13A.....	Low-flood	--	--	--	--	--	--	--	--	--	--	2920	--	--	--	--	--	8320	--	--		
Apr. 13B.....	Low-flood	--	--	--	--	--	--	--	--	--	--	3180	--	--	--	--	--	8980	--	--		

A Sampled near top.

B Sampled near bottom.

C Calculated Na plus K, reported as Na.

PATUXENT RIVER BASIN--Continued

1-5947. PATUXENT RIVER AT BENEDICT, MD.--Continued

Temperature (°F) of water, water year October 1963 to September 1964
(Recorder with temperature sensor attachment, thermocouple probe at river surface)

Month	Day																																	Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
October																																		
Maximum	--	--	--	--	--	--	--	--	--	66	66	65	65	65	65	66	66	66	65	65	64	64	66	64	65	66	64	62	59	57	--	--		
Minimum	--	--	--	--	--	--	--	--	--	64	64	64	62	61	62	62	62	63	63	63	62	62	62	62	63	63	62	58	53	51	--	--		
November																																		
Maximum	56	55	53	53	53	53	53	54	53	--	--	--	--	--	--	52	53	54	54	53	53	54	55	54	--	--	--	52	53	52	--	--		
Minimum	54	51	48	48	51	51	53	53	52	--	--	--	--	--	--	47	50	51	53	51	52	51	53	50	--	--	--	50	51	47	--	--		
December																																		
Maximum	48	47	47	46	46	46	46	46	46	44	43	43	43	43	41	39	37	37	35	33	--	--	--	--	--	--	--	--	--	--	--	--	--	
Minimum	45	43	44	42	43	43	42	43	43	42	40	40	41	41	37	35	33	34	33	33	--	--	--	--	--	--	--	--	--	--	--	--	--	
January																																		
Maximum	--	--	--	--	--	--	38	37	39	39	36	35	34	--	--	--	--	--	--	34	35	37	38	37	40	39	39	38	37	37	37	--	--	
Minimum	--	--	--	--	--	--	36	34	37	37	33	33	33	--	--	--	--	--	--	33	34	33	34	35	37	38	37	36	34	34	34	--	--	
February																																		
Maximum	38	39	37	37	38	39	40	40	40	41	40	36	36	38	37	38	39	37	38	38	38	39	--	--	40	38	--	--	--	--	--	--	38	
Minimum	36	36	35	33	34	37	38	38	37	39	34	32	34	36	34	36	35	36	37	37	37	36	36	--	--	37	36	--	--	--	--	--	36	
March																																		
Maximum	--	41	40	41	46	--	47	49	50	55	54	--	49	48	48	49	50	49	46	47	46	45	49	49	51	54	59	53	53	51	48	49		
Minimum	--	38	38	40	41	--	45	45	46	49	48	--	46	46	47	45	47	45	43	44	44	42	44	45	48	50	51	51	51	47	44	45		
April																																		
Maximum	47	46	50	50	52	49	51	52	50	53	55	54	55	56	58	59	59	61	64	62	59	59	63	62	60	60	60	62	60	57	--	56		
Minimum	46	45	46	47	46	49	49	49	48	47	49	51	51	54	55	53	55	56	59	58	56	56	56	58	57	56	57	58	58	56	--	53		
May																																		
Maximum	56	57	56	62	63	64	67	68	69	69	68	71	69	70	68	68	70	71	71	73	73	73	76	78	75	73	72	72	70	71	71	69		
Minimum	55	54	55	56	58	59	60	63	64	66	64	65	66	67	64	62	64	66	67	69	69	68	71	72	72	71	69	69	66	67	68	65		
June																																		
Maximum	70	69	73	72	72	72	73	74	77	78	78	77	78	77	78	79	79	77	76	78	82	85	84	82	82	82	83	83	82	83	85	--	78	
Minimum	68	67	67	70	68	69	71	72	72	74	75	73	74	75	75	76	74	74	74	76	79	78	79	79	79	78	78	78	78	79	--	74		
July																																		
Maximum	84	83	83	82	80	82	81	79	79	81	83	80	79	82	84	86	86	84	83	85	85	83	85	84	81	80	82	--	--	--	82	82		
Minimum	80	80	80	80	78	76	77	78	76	76	77	79	78	78	79	80	82	82	81	82	82	82	82	81	79	77	78	--	--	--	78	76		
August																																		
Maximum	78	77	76	--	--	77	77	78	77	76	77	77	75	75	74	74	74	74	74	75	76	78	79	79	79	79	79	78	79	79	79	79		
Minimum	80	79	78	--	--	80	80	80	79	78	78	79	78	76	77	76	77	77	79	79	81	82	81	82	81	82	81	81	80	81	81	77		
September																																		
Maximum	80	80	80	80	80	79	79	--	79	80	80	80	76	72	72	73	73	72	73	72	71	71	72	71	71	70	69	69	67	67	--	74		
Minimum	79	77	76	77	78	77	76	--	76	78	78	76	71	70	69	70	70	72	72	71	70	69	69	69	67	68	67	66	65	--	72			

PATUXENT RIVER BASIN--Continued

1-5948.3. PATUXENT RIVER AT SOLOMONS, MD.

LOCATION.--At buoy in Patuxent River estuary off Sandy Point at Solomons, Calvert County.

DRAINAGE AREA.--909 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1963 to May 1964.

Chemical analyses, in parts per million, October 1963 to May 1964

Date of collection	Tidal Stage	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Color
																Calcium, magnesium	Non-carbonate				
Oct. 4, 1963..	Low	1.6	--	0.09	0.02	211	662	A5360	--	78	1360	9510	0.8	0.2	18500	3250	3190	--	24700	6.8	--
Oct. 4B.....	Low	--	--	--	--	--	--	--	--	--	--	9320	--	--	--	--	--	--	24500	--	--
Oct. 4C.....	Low	--	--	--	--	--	--	--	--	--	--	9800	--	--	--	--	--	--	25300	--	--
Oct. 11B.....	Hi-flood	1.6	--	.00	.00	222	665	A5600	--	79	1380	9910	.6	2.4	17900	3290	3220	--	26400	6.9	8
Oct. 24B.....	Low-flood	1.6	--	.00	.00	220	665	A5470	--	78	1300	9720	.6	3.0	17600	3240	3180	--	25000	7.0	10
Nov. 6B.....	Low-flood	1.5	--	.00	.00	234	709	A6110	--	84	1420	10800	.7	3.2	19400	3500	3430	--	27800	6.9	5
Nov. 18.....	Low-flood	1.1	--	.68	.06	232	746	A5800	--	78	1460	10400	.9	.2	19600	3650	3590	--	25600	7.5	--
Jan. 15, 1964B	Flood	--	--	--	--	--	--	--	--	--	--	9430	--	--	--	--	--	--	22700	--	--
Jan. 15C.....	Flood	--	--	--	--	--	--	--	--	--	--	9860	--	--	--	--	--	--	23500	--	--
Jan. 15.....	Flood	2.1	0.9	.07	.03	210	616	5680	197	79	1360	9620	.9	1.2	17900	3060	3000	--	23600	7.4	5
Feb. 3B.....	Hi-flood	1.6	--	.00	.00	202	606	A4940	--	84	1240	8770	.7	1.0	17200	3000	2930	--	24600	7.5	--
Feb. 26B.....	High-ebb	1.8	--	.00	.00	187	581	A4520	--	63	1120	8130	.7	.0	15600	2860	2810	--	23100	7.0	--
Mar. 23B.....	--	2.3	--	.00	.00	131	353	A3030	--	51	762	5340	.5	2.0	10300	1780	1740	--	16000	6.8	--
Apr. 8.....	Ebb	1.9	--	.00	.00	171	407	A3310	--	58	843	5930	.6	1.8	11800	2100	2050	--	17600	6.8	--
Apr. 13.....	Ebb	2.7	.6	2.7	.00	151	414	3080	121	59	809	5700	.5	1.6	11300	2080	2030	--	16600	7.0	2
Apr. 13B.....	Ebb	--	--	--	--	--	--	--	--	--	--	5570	--	--	--	--	--	--	15300	--	--
Apr. 13B.....	Ebb	--	--	--	--	--	--	--	--	--	--	5770	--	--	--	--	--	--	15300	--	--
May 5B.....	--	--	--	--	--	--	--	--	--	--	--	3420	--	--	--	--	--	--	11400	--	--

A Calculated Na plus K, reported as Na.

B Sampled at 5 foot depth.

C Sampled near bottom.

1-5955. NORTH BRANCH POTOMAC RIVER AT KITZMILLER, MD.

DRAINAGE AREA.--225 square miles.

RECORDS AVAILABLE.--Water temperatures: August 1961 to September 1964.

EXTREMES, 1963-64.--Water temperatures: Maximum, 86°F July 20, 21; minimum, freezing point on many days during winter months.

EXTREMES, 1961-64.--Water temperatures: Maximum, 86°F July 20, 21, 1964; minimum, freezing point on many days during winter months.

REMARKS.--Records fair, probably because of friction in recorder. No temperature record May 22 to June 1. No temperature record June 20-30; range 64°F to 83°F.

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Month	Day																															Average	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
October																																	
Maximum	60	61	62	61	59	60	62	60	58	58	60	61	59	58	59	59	59	62	62	62	60	57	60	62	60	62	58	60	55	48	47	59	
Minimum	53	52	57	55	50	50	53	56	52	50	50	55	51	50	50	51	50	53	54	54	53	53	55	54	52	53	54	55	46	44	43	52	
November																																	
Maximum	47	46	42	43	45	45	46	46	46	45	45	43	40	38	38	41	44	48	48	48	46	47	47	45	39	38	43	42	41	39	--	44	
Minimum	46	41	38	37	42	45	45	46	45	44	43	40	38	38	38	38	40	44	46	40	44	44	45	39	37	35	38	38	39	35	--	41	
December																																	
Maximum	35	34	34	34	34	34	34	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	
Minimum	34	33	33	34	33	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	
January																																	
Maximum	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34	34	34	34	32	32	32	32	
Minimum	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34	34	32	32	32	32	32	
February																																	
Maximum	33	33	33	32	33	32	35	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	--	--	32	
Minimum	32	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	--	--	32	
March																																	
Maximum	32	36	35	36	39	40	42	42	44	44	41	38	42	42	42	44	42	40	40	38	41	44	45	46	46	44	46	46	42	37	41		
Minimum	32	32	35	35	36	38	40	41	41	41	38	38	38	40	42	40	42	38	36	38	38	38	38	40	43	43	39	41	42	37	35	39	
April																																	
Maximum	42	38	43	42	44	44	47	47	44	46	48	49	48	50	50	46	53	56	55	54	52	53	54	55	54	54	52	55	54	50	--	49	
Minimum	35	36	37	38	39	43	44	44	40	41	43	45	46	46	46	43	45	50	54	52	50	50	51	51	49	49	50	50	50	48	--	46	
May																																	
Maximum	48	51	54	58	59	61	60	59	64	62	62	62	62	60	62	64	65	66	70	70	70	--	--	--	--	--	--	--	--	--	--	--	
Minimum	48	48	48	52	53	54	56	57	58	58	56	58	60	54	52	54	58	58	58	62	58	--	--	--	--	--	--	--	--	--	--	--	
June																																	
Maximum	--	65	66	66	69	68	68	75	79	79	80	78	76	76	78	72	73	72	80	--	--	--	--	--	--	--	--	--	--	--	--	--	
Minimum	--	56	57	55	58	63	63	64	67	71	66	63	69	70	70	66	61	61	68	--	--	--	--	--	--	--	--	--	--	--	--	--	
July																																	
Maximum	79	81	82	78	78	81	78	71	73	78	73	78	81	73	70	75	77	81	81	83	85	86	86	79	84	82	81	85	84	85	83	83	80
Minimum	71	71	71	72	65	63	63	68	67	67	66	69	67	65	66	67	68	68	70	72	72	73	72	73	73	71	73	72	73	70	66	69	
August																																	
Maximum	79	79	76	71	78	81	78	79	76	76	74	74	68	69	72	70	73	75	69	73	77	78	75	77	79	73	77	75	77	79	78	75	
Minimum	67	70	71	68	68	67	66	70	64	64	66	68	64	61	58	59	62	65	62	60	64	67	70	66	65	68	66	67	69	69	72	66	
September																																	
Maximum	72	76	76	76	76	75	76	76	77	77	79	73	68	67	66	68	70	66	66	63	62	70	72	65	63	65	63	63	57	61	--	69	
Minimum	66	65	62	64	67	62	62	62	64	64	66	63	58	54	54	58	58	63	62	62	62	61	59	55	53	57	57	56	57	--	--	61	

POTOMAC RIVER BASIN--Continued

1-5985. NORTH BRANCH POTOMAC RIVER AT LUKE, MD.

LOCATION.--Temperature recorder at gaging station on right bank 0.2 mile downstream from Savage River, and 0.5 mile northwest of Luke, Allegany County.

DRAINAGE AREA.--404 square miles.

RECORDS AVAILABLE.--Water temperatures: December 1961 to December 1962, July to September 1963, December 1963 to September 1964.

EXTREMES, 1963-64.--Water temperatures: Maximum, 85°F June 20, 21, 23, 27, and July 23; minimum, freezing point on many days during winter months.

EXTREMES, 1961-64.--Water temperatures: Maximum, 86°F Aug. 6, 1962; minimum, freezing point on many days during winter months.

REMARKS.--Records fair, probably because of friction in recorder. Recorder stopped Oct. 1 to Dec. 4. No temperature record

Mar. 14-31; range in temperature 37°F to 48°F.

Temperature (°F) of water, December 1963 to September 1964
(Continuous ethyl alcohol-actuated thermograph)

Month	Day																															Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
December																																
Maximum	--	--	--	--	35	35	35	35	35	35	34	33	34	34	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33
Minimum	--	--	--	--	34	35	35	35	34	34	33	33	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33
January																																
Maximum	32	32	34	35	35	35	38	36	36	34	33	33	32	32	32	32	32	32	32	32	32	32	32	32	33	34	35	34	32	32	32	33
Minimum	32	32	32	34	35	35	35	36	34	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	33	32	32	32	32	33
February																																
Maximum	34	35	35	33	36	36	36	36	35	35	36	34	34	36	36	35	34	35	32	33	34	33	34	34	34	34	34	34	34	--	--	35
Minimum	32	34	33	33	33	34	34	34	34	35	34	34	34	34	34	34	34	34	32	32	33	33	33	34	34	34	34	34	34	--	--	34
March																																
Maximum	36	38	38	37	41	41	44	44	46	46	42	39	42	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Minimum	34	34	37	37	37	39	39	42	42	42	39	38	38	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
April																																
Maximum	40	41	44	43	44	44	47	47	45	47	50	51	51	54	55	53	57	59	59	59	57	54	57	58	57	56	55	55	55	50	--	51
Minimum	36	38	38	39	40	44	44	45	42	44	46	48	50	50	53	49	49	54	59	57	54	52	54	54	53	53	52	50	49	--	48	
May																																
Maximum	49	49	53	58	59	61	61	61	65	65	65	63	63	62	57	63	66	68	68	71	71	69	72	73	73	72	71	71	66	69	68	64
Minimum	48	48	49	52	53	55	57	60	60	61	60	60	62	57	54	57	61	60	61	65	63	62	65	67	66	61	66	60	55	57	61	59
June																																
Maximum	65	66	65	66	69	69	69	74	79	81	81	79	79	78	81	78	74	75	83	85	85	83	85	81	81	83	85	82	83	81	--	78
Minimum	61	59	60	57	61	64	65	66	69	71	70	67	72	72	73	73	65	65	71	75	75	77	77	77	70	69	71	69	69	73	--	69
July																																
Maximum	78	80	82	78	76	78	76	72	74	80	80	75	72	76	77	79	83	82	84	84	83	82	85	83	79	80	79	81	78	79	77	79
Minimum	73	72	72	71	67	66	66	69	68	70	70	69	68	67	70	70	72	74	72	75	76	75	74	71	73	73	72	69	69	71	71	71
August																																
Maximum	76	78	73	69	75	77	78	80	75	76	74	74	70	72	72	70	75	75	71	71	77	80	76	77	78	74	76	78	78	81	82	75
Minimum	67	70	68	67	66	66	65	71	67	66	69	70	66	64	61	63	65	67	65	63	68	70	73	70	68	70	69	71	72	75	77	68
September																																
Maximum	76	76	76	76	76	75	75	76	77	76	78	72	69	66	66	67	70	69	66	66	64	66	67	65	62	64	63	63	57	60	--	69
Minimum	70	68	65	66	70	65	65	66	66	67	70	67	62	58	58	61	61	66	66	64	64	64	60	59	57	55	58	57	57	57	--	63

POTOMAC RIVER BASIN--Continued

1-6130. POTOMAC RIVER AT HANCOCK, MD.

LOCATION.--Temperature recorder at gaging station on left bank 0.2 mile downstream from Little Tonoloway Creek, 0.5 mile downstream from bridge on U.S. Highway 522 at Hancock, Washington County, and 1.1 miles upstream from Tonoloway Creek (formerly called Great or Big Tonoloway Creek).

DRAINAGE AREA.--4,073 square miles.

RECORDS AVAILABLE.--Water temperatures: July 1952 to February 1964.

EXTREMES, October 1963 to February 1964.--Water temperatures: Minimum, freezing point on many days during winter months.

EXTREMES, July 1952 to February 1964.--Water temperatures: Maximum, 93°F July 22, 1952; minimum, freezing point on many days during winter months.

REMARKS.--Records fair, probably because of friction in recorder. Recorder stopped Mar. 1 to Sept. 30.

Temperature (°F) of water, October 1963 to February 1964
(Continuous ethyl alcohol-actuated thermograph)

		Day																															Average	
Month		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
October																																		
Maximum		67	69	68	69	67	67	68	67	67	65	65	66	65	63	62	62	63	64	65	65	62	62	65	65	64	65	64	61	57	53	64		
Minimum		60	61	63	63	60	59	60	62	62	59	59	60	58	56	56	55	56	57	58	59	59	59	59	60	60	60	61	57	53	51	59		
November																																		
Maximum		52	52	51	48	50	50	52	52	52	52	52	48	47	46	47	51	54	56	53	54	53	53	53	48	45	45	46	48	46	--	50		
Minimum		52	49	47	45	47	50	50	52	52	52	52	48	47	46	45	44	46	49	53	49	50	50	52	48	45	43	41	42	46	42	--	48	
December																																		
Maximum		42	42	41	41	39	39	39	38	37	37	36	36	36	36	35	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	35	
Minimum		41	41	41	39	39	39	38	37	37	36	36	35	36	35	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	35	
January																																		
Maximum		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	36	36	37	37	37	36	36	33		
Minimum		32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	33	36	36	37	36	35	35	33		
February																																		
Maximum		35	36	36	36	37	37	37	37	36	36	35	35	37	37	36	36	36	36	34	34	36	36	35	36	35	34	35	35	34	--	--	36	
Minimum		35	35	35	35	35	36	36	37	35	35	35	34	35	35	35	35	35	34	33	33	34	35	34	34	34	33	33	33	33	--	--	35	

POTOMAC RIVER BASIN--Continued

1-6195. ANTITAM CREEK NEAR SHARPSBURG, MD.

LOCATION.--Temperature recorder at gaging station on left bank 400 feet downstream from Burnside Bridge, 1 mile southeast of Sharpsburg, Washington County, and 4 miles upstream from mouth.

DRAINAGE AREA.--281 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1962 to September 1964.

EXTREMES, 1963-64.--Water temperatures: Maximum, 81°F July 20-22; minimum, freezing point on many days in December and January.

EXTREMES, 1962-64.--Water temperatures: Maximum, 83°F June 28 and July 1-3, 1963; minimum, freezing point on many days during winter months.

REMARKS.--Records poor, probably because of friction in recorder.

Chemical analyses, in parts per million, water year October 1963 to September 1964

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Color
																Calcium, magnesium	Non-carbonate				
Oct. 14, 1963..	60	2.3		0.14	0.01	71	14	17	4.6	258	31	20	0.3	0.4	A288	235	24		504	7.0	20
Mar. 11, 1964..	855	7.5		.87	.04	46	7.8	4.2	2.5	143	22	6.9	.0	8.7	201	147	30		328	7.1	--
June 24.....	181	7.0		.16	.01	61	15	6.0	3.4	213	25	10	.3	12	272	212	38		419	7.7	2
Sept. 17.....	290	4.2		.07	.00	71	15	11	3.8	240	34	21	.4	11	286	239	43		486	7.7	--

A Calculated from determined constituents.

POTOMAC RIVER BASIN--Continued

1-6195. ANTIETAM CREEK NEAR SHARPSBURG, MD.--Continued

Temperature (°F) of water, water year October 1963 to September 1964
(Continuous ethyl alcohol-actuated thermograph)

Month	Day																															Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October																																
Maximum	63	62	63	63	62	58	59	59	59	58	56	56	55	53	52	52	52	54	55	55	55	55	57	57	57	57	58	58	57	53	50	57
Minimum	62	61	62	62	58	57	58	58	58	56	54	55	53	52	51	51	52	52	54	54	55	55	55	56	56	57	57	57	53	50	49	55
November																																
Maximum	49	49	49	48	48	50	51	51	51	51	50	50	47	45	44	44	47	50	51	51	49	49	50	50	47	44	42	42	47	47	--	48
Minimum	49	49	48	47	47	48	49	51	51	50	50	47	45	44	44	44	44	47	50	49	49	48	48	47	44	42	42	42	44	--	47	
December																																
Maximum	44	42	40	40	39	39	39	38	38	38	38	37	37	37	36	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	35
Minimum	42	40	40	39	39	39	39	38	38	38	37	37	37	36	33	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	35
January																																
Maximum	32	32	32	32	32	32	33	34	35	34	34	33	33	33	32	32	32	32	32	32	36	39	39	40	41	42	42	41	41	41	41	35
Minimum	32	32	32	32	32	32	32	33	34	33	33	33	33	32	32	32	32	32	32	32	32	36	39	39	40	42	41	41	41	41	37	35
February																																
Maximum	38	38	38	38	38	39	39	39	39	39	39	38	37	39	39	40	40	40	38	39	39	39	39	39	39	39	40	40	39	--	--	39
Minimum	38	38	38	37	37	38	39	39	39	39	39	38	36	37	39	39	40	38	37	38	39	39	38	38	39	39	39	39	39	--	--	38
March																																
Maximum	41	43	44	44	47	47	47	46	50	50	50	49	46	46	46	47	48	48	47	45	45	45	46	49	51	53	53	50	50	50	47	47
Minimum	39	41	43	44	44	47	45	46	46	50	49	46	46	46	46	46	47	47	45	45	45	45	46	49	51	49	49	50	47	45	46	
April																																
Maximum	46	46	47	48	50	51	51	51	51	52	55	56	56	60	60	60	61	64	64	63	61	56	57	59	60	60	60	59	59	57	--	56
Minimum	45	46	46	47	48	50	50	51	50	50	52	55	56	56	60	56	58	61	63	61	56	55	55	57	59	59	59	59	57	54	--	54
May																																
Maximum	54	56	59	61	63	63	64	65	65	65	65	65	64	64	63	65	66	66	68	69	69	68	69	69	69	69	67	67	64	64	65	65
Minimum	53	53	55	57	59	61	62	63	65	65	63	63	64	63	61	61	64	64	66	68	66	66	68	68	69	67	67	64	62	63	64	63
June																																
Maximum	65	63	63	63	64	64	64	67	69	72	72	70	70	70	72	72	69	69	71	73	75	76	77	77	77	75	75	75	74	76	--	71
Minimum	62	62	63	61	61	64	63	64	67	69	70	68	69	70	70	69	68	67	69	71	73	75	76	76	75	72	73	73	72	73	--	69
July																																
Maximum	76	76	76	76	74	72	72	72	71	73	74	75	74	74	75	76	78	78	80	81	81	81	80	80	80	78	75	76	78	78	77	76
Minimum	75	75	75	74	71	70	70	71	70	70	72	74	72	73	74	74	75	77	78	79	80	80	80	78	78	75	74	74	76	77	77	74
August																																
Maximum	75	73	73	72	74	74	74	74	74	72	69	71	71	68	66	66	68	69	69	68	69	73	73	74	74	74	73	73	74	75	76	72
Minimum	73	72	72	71	71	72	72	72	72	69	69	69	68	66	64	65	65	68	67	65	67	69	73	73	72	73	72	72	74	75	70	
September																																
Maximum	75	73	71	70	72	71	70	70	71	72	72	72	68	63	61	63	65	66	66	66	65	65	65	67	66	64	64	64	62	62	--	67
Minimum	73	70	67	67	70	69	67	67	69	69	70	68	63	60	59	60	63	65	66	65	64	63	64	65	64	61	62	62	61	62	--	65

POTOMAC RIVER BASIN--Continued

1-6385. POTOMAC RIVER AT POINT OF ROCKS, MD.

LOCATION.--At gaging station at bridge on U.S. Highway 15 at Point of Rocks, Frederick County, 0.3 mile downstream from Catoctin Creek (Virginia), and 6 miles upstream from Monocacy River.

DRAINAGE AREA.--9,651 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1960 to September 1964.

Sediment records: October 1960 to September 1964.

EXTREMES, 1963-64.--Water temperatures: Maximum, 92°F Aug. 24; minimum, freezing point on several days during December.

Sediment concentrations: Maximum daily, 728 ppm May 1; minimum daily, 1 ppm on many days during August and September.

Sediment loads: Maximum daily, 150,000 tons May 1; minimum daily, 2 tons Sept. 3, 4, 16-18.

EXTREMES, 1960-64.--Water temperatures: Maximum, 92°F Aug. 24, 1964; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 1,180 ppm Feb. 20, 1961; minimum daily, 1 ppm on many days.

Sediment loads: Maximum daily, 276,000 tons Feb. 20, 1961; minimum daily, 2 tons Sept. 3-4, 16-18, 1964.

REMARKS.--Flow affected by ice Dec. 20 to Jan. 5, Jan. 9, 11, 12, 15-19.

Chemical analyses, in parts per million, water year October 1963 to September 1964

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Color
																Calcium, magnesium	Non-carbonate				
Oct. 14, 1963..	800	0.6		0.20	0.04	48	12	25	2.5	144	73	24	0.2	0.1	262	170	52		441	7.3	
Mar. 11, 1964..	36000	5.9		1.1	.00	21	3.5	2.4	1.3	53	21	3.3	.0	4.0	101	67	24		163	7.0	
June 23.....	3420	2.8		.54	.10	49	11	10	2.6	146	46	14	.2	3.2	242	167	48		361	7.4	2
Sept. 16.....	680	1.8		.20	.00	42	15	48	2.7	132	121	31	.2	.3	335	166	58		538	7.3	

Temperature (°F) of water, water year October 1963 to September 1964
(Once-daily measurement at approximately 1700)

Month	Day																															Aver- age	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
October	67	67	65	65	63	70	67	65	67	67	67	64	60	68	65	65	65	65	67	65	67	60	65	68	65	67	68	62	56	50	58	65	
November	55	42	45	50	51	54	53	52	53	54	55	55	48	47	45	48	53	54	52	50	53	54	55	52	44	49	48	48	---	---	---	51	
December	44	43	41	40	48	40	42	40	38	37	38	37	37	35	34	---	32	32	32	32	33	---	---	---	---	---	---	---	---	---	---	---	---
January.....	---	---	---	---	---	---	33	---	35	33	34	34	---	---	33	35	34	34	34	35	38	42	35	35	38	36	37	37	33	38	37	---	
February.....	38	38	37	38	40	38	40	38	38	37	37	37	37	38	33	34	49	---	34	37	36	35	35	37	---	38	34	36	38	---	---	37	
March.....	39	42	---	41	45	45	46	40	50	43	48	40	45	49	44	46	47	45	46	45	35	44	46	49	52	52	51	52	50	46	47	46	
April.....	47	40	42	47	50	46	49	49	49	54	54	55	55	58	58	58	67	65	62	58	56	54	55	51	57	58	56	59	51	54	---	54	
May.....	52	53	55	60	62	59	62	70	69	69	71	69	69	62	68	74	72	74	75	75	74	72	79	78	---	71	77	75	73	73	73	69	
June.....	68	72	70	71	74	68	74	76	79	81	79	77	79	81	82	70	75	79	82	85	84	85	80	83	82	84	85	84	85	87	---	79	
July.....	85	85	85	80	78	83	81	73	89	83	83	75	78	81	82	82	85	80	86	84	84	85	87	83	79	80	84	85	87	84	83	83	
August.....	---	81	75	76	80	82	80	82	77	75	78	77	73	74	76	72	78	76	75	76	81	83	84	92	83	80	80	79	81	80	82	79	
September.....	80	79	---	81	80	79	79	79	80	81	84	73	67	70	72	73	75	75	69	66	69	71	73	70	61	68	70	65	61	63	---	73	

POTOMAC RIVER BASIN--Continued

1-6385. POTOMAC RIVER AT POINT OF ROCKS, MD.--Continued

Suspended sediment, water year October 1963 to September 1964
(Where no daily concentrations are reported, loads are estimated)

Day	OCTOBER			NOVEMBER			DECEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	1180	C 4	13	1000	C 5	14	5370	18 S	329
2..	1220	C 4	13	1040	C 5	14	9080	33 S	824
3..	1260	C 4	14	1060	C 5	14	9000	33 S	821
4..	1200	C 4	13	1080	C 5	15	6700	17	308
5..	1160	C 4	13	1080	C 5	15	5250	C 9	128
6..	1140	C 4	12	1240	6	20	4190	C 9	102
7..	1100	C 4	12	2680	9	68	3790	C 9	92
8..	1060	C 4	11	5000	28 S	382	3300	C 9	80
9..	980	C 4	11	7630	27	556	3510	C 7	66
10..	1000	C 3	8	7480	15	303	3540	C 7	67
11..	960	C 3	8	6180	11	184	4120	7	78
12..	940	C 3	8	4470	11	133	4540	7	86
13..	940	C 3	8	3270	C 10	88	4720	7	89
14..	840	C 3	7	2840	C 10	77	4360	9	106
15..	820	C 4	9	2340	C 10	63	4060	9	99
16..	880	C 4	10	2110	C 10	57	3760	9	91
17..	900	C 4	10	1950	C 10	53	3420	9	83
18..	900	C 4	10	1820	C 5	25	2840	9	69
19..	920	C 4	10	1890	C 5	26	2510	3	20
20..	920	C 3	7	1840	C 5	25	2400	5	32
21..	920	C 3	7	1890	C 5	26	2200	3	18
22..	940	C 3	8	1820	C 5	25	2100	5	28
23..	940	C 3	8	1820	C 4	20	2400	--	30
24..	940	C 3	8	1740	C 4	19	2400	--	30
25..	980	C 3	8	1590	C 4	17	2300	--	20
26..	1000	C 3	8	1500	C 4	16	2500	--	30
27..	1000	C 3	8	1460	C 4	16	2700	--	30
28..	980	C 4	11	1500	C 4	16	2600	--	20
29..	980	C 4	11	1800	4	22	2700	--	20
30..	920	C 4	10	2740	7	52	2400	--	10
31..	920	C 4	10	--	--	--	2300	--	10
Total	30840	--	304	75860	--	2361	117060	--	3816
Day	JANUARY			FEBRUARY			MARCH		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	2400	--	10	11500	17	528	7600	6	123
2..	2600	--	10	10300	16	445	7860	9	191
3..	2800	--	20	9520	10	257	12300	21 S	786
4..	3000	--	40	8880	10	240	40500	172 S	21800
5..	4000	--	80	8200	10	221	72000	419 S	82000
6..	5900	--	100	9430	33 S	946	83400	422	95000
7..	9440	15	388	12100	29	947	78600	437 S	93000
8..	12800	32	1110	15400	42 S	1790	48000	227 S	30300
9..	18000	74 S	3870	16300	56	2500	35400	106 S	10200
10..	22400	119 S	7500	14200	21	805	32000	81 S	6980
11..	30000	263 S	21600	12200	14	461	39000	102 S	10800
12..	29000	177 S	14300	10800	9	262	43300	162	19100
13..	18900	112 S	5700	9560	C 10	258	31700	94	8080
14..	11000	88	2610	8840	C 10	239	25100	44	2980
15..	8000	77	1660	8480	C 10	229	22300	30	1810
16..	7500	63	1280	8760	14	331	22600	31	1890
17..	7000	40	756	9120	12	295	22800	31	1910
18..	7000	23	435	9640	10	260	19800	31	1660
19..	7000	16	302	10900	12	353	17300	22	1030
20..	7560	10	204	10600	12	343	15600	18	758
21..	8860	14	335	10500	8	227	14500	16	626
22..	14000	43 S	1860	9920	10	268	14000	18	680
23..	23300	106	6670	8800	7	166	13900	19	713
24..	25600	115	7950	7860	C 6	127	13400	18	651
25..	25400	84	5760	7330	C 6	119	12500	17	574
26..	35600	149 S	15800	6880	C 6	111	11800	29	924
27..	45500	275	33800	7030	C 4	76	11200	17	514
28..	31000	182 S	15500	7290	C 4	79	10600	28	801
29..	22100	86 S	5190	7480	C 4	81	10000	20	540
30..	17000	44	2020	--	--	--	9640	20	521
31..	13300	18	646	--	--	--	9160	17	420
Total	477960	--	163206	287820	--	12964	807860	--	397362

S Computed by subdividing day.
C Composite period.

POTOMAC RIVER BASIN--Continued

1-6385. POTOMAC RIVER AT POINT OF ROCKS, MD.--Continued

Suspended sediment, water year October 1963 to September 1964--Continued
(Where no daily concentrations are reported, loads are estimated)

Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	8800	13	309	73700	728	S 150000	3020	5	41
2..	8440	11	251	46900	167	S 21900	3080	9	75
3..	8520	40	920	32300	82	S 7170	3050	7	58
4..	8760	14	331	25000	51	3440	3050	5	41
5..	9960	17	457	20400	34	1870	2890	C 5	39
6..	11500	20	621	17300	28	1310	2970	C 5	40
7..	11100	20	599	14800	20	799	2990	C 5	40
8..	12300	22	731	13000	16	562	2990	C 8	64
9..	15200	29	1190	11700	15	474	3050	C 8	66
10..	16300	30	1320	10700	14	404	3000	C 8	65
11..	14600	25	986	9680	16	418	3100	C 8	67
12..	12600	20	680	8800	10	238	2860	C 6	46
13..	11200	21	635	8200	14	310	2840	C 6	46
14..	10700	18	520	8200	16	354	2510	C 6	41
15..	12400	17	569	9240	17	424	2490	C 6	40
16..	14200	17	652	9520	12	308	2390	C 6	39
17..	13800	19	708	8440	12	273	2200	C 8	48
18..	12800	17	588	7440	13	261	2510	C 8	54
19..	11700	18	569	6700	10	181	2200	C 8	48
20..	11300	18	549	6290	10	170	2460	C 8	53
21..	15900	33	S 1500	5860	12	190	2790	C 8	60
22..	36300	183	S 18600	5360	13	188	3160	C 3	26
23..	33000	163	S 14800	4890	11	145	3420	C 3	28
24..	24500	80	S 5330	4640	10	125	3020	C 3	24
25..	19500	40	2110	4540	12	147	2710	C 3	22
26..	16400	28	1240	3990	10	108	2760	C 3	22
27..	14100	27	1030	3790	8	82	2440	C 4	26
28..	12700	20	686	3600	8	78	2200	C 4	24
29..	15100	32	S 1350	3420	5	46	2180	C 4	24
30..	47500	356	S 55900	3270	6	53	2060	C 4	22
31..	--	--	--	3130	4	34	--	--	--
Total	471180	--	115731	394800	--	192062	82690	--	1289
Day	JULY			AUGUST			SEPTEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	1930	C 4	21	1320	C 7	25	1040	C 1	3
2..	1840	C 4	20	1340	C 7	25	940	C 1	3
3..	1740	C 4	19	1550	C 7	29	800	C 1	2
4..	1570	C 4	17	1780	C 7	34	860	C 1	2
5..	1630	C 4	18	1820	C 5	25	1020	C 1	3
6..	1550	C 4	17	1860	C 5	25	1160	C 1	3
7..	1480	C 4	16	1720	C 5	23	1200	C 1	3
8..	1610	C 4	17	1740	C 5	23	1140	C 1	3
9..	1670	C 6	27	1630	C 5	22	1000	C 1	3
10..	1740	C 6	28	1630	C 5	22	880	C 1	3
11..	1690	C 6	27	1690	C 5	23	800	C 3	7
12..	1590	C 6	26	1630	C 5	22	710	C 3	6
13..	7720	240	S 6290	1500	C 1	4	695	C 3	6
14..	3130	30	254	1340	C 1	4	680	C 3	6
15..	3100	24	201	1240	C 1	3	665	C 3	6
16..	2660	19	136	1200	C 1	3	680	C 1	2
17..	2940	19	151	1140	C 1	3	695	C 1	2
18..	2660	14	101	1300	C 1	4	740	C 1	2
19..	2340	11	69	1320	C 1	4	884	C 1	3
20..	2060	8	44	1260	C 1	3	1060	C 1	3
21..	1860	9	45	1200	C 1	3	1120	C 1	3
22..	1820	9	44	1220	C 1	3	1320	3	11
23..	1690	10	46	1180	C 2	6	1530	11	46
24..	1550	9	38	1140	C 2	6	1500	11	45
25..	1550	10	42	1000	C 2	5	1570	4	17
26..	1690	8	37	1140	C 2	6	1550	7	30
27..	2290	7	43	1060	C 2	6	1400	3	12
28..	2200	15	89	1040	C 4	11	1320	1	4
29..	1930	17	89	1020	C 4	11	1440	39	152
30..	1670	12	54	1180	C 4	13	1610	2	9
31..	1420	9	35	1300	C 4	14	--	--	--
Total	66320	--	6061	42490	--	410	32009	--	400

Total discharge for year (cfs-days).....2886889
Total load for year (tons).....895966

S Computed by subdividing day.
C Composite period.

POTOMAC RIVER BASIN--Continued

1-6385. POTOMAC RIVER AT POINT OF ROCKS, MD.--Continued

Particle-size analyses of suspended sediment, water year October 1963 to September 1964
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (°F)	Sam- pling point	Discharge (cfs)	Sediment concent- ration (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis
							Percent finer than size indicated, in millimeters										
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	
Jan. 11, 1964.....	1300	34		D 30000	272	--	42	62	78	90	94	95	99	99			SBWC
Jan. 27.....	1410	38		46700	292	--	28	50	71	90	96	99	100	100			SBWC
Mar. 7.....	1330	45		79600	445	17	33	57	75	84	94	97	99	100			SBWC
May 1.....	0830	52		80000	868	27	47	67	82	92	96	98	100	--			SBWC
May 1.....	1515	51		72200	473	14	24	44	68	88	96	98	99	100			SBN
May 1.....	1515	51		72200	473	31	43	68	82	92	97	99	100	--			SBWC

D Daily mean discharge.

POTOMAC RIVER BASIN--Continued

1-6430. MONOCACY RIVER AT JUG BRIDGE, NEAR FREDERICK, MD.

LOCATION.--At Riech's Ford Bridge, 1 mile downstream from U.S. Highway 40, 1.2 miles downstream from gaging station, and 2 miles southeast of Frederick, Frederick County.

DRAINAGE AREA.--817 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1960 to September 1964.

Sediment records: October 1960 to September 1964.

EXTREMES, 1963-64.--Water temperatures: Maximum, 85°F July 19; minimum, freezing point Dec. 17 and Jan. 12.

Sediment concentrations: Maximum daily, 1,180 ppm July 13; minimum daily, 1 ppm on many days in April, August, and September.

Sediment loads: Maximum daily, 19,400 tons Jan. 10; minimum daily, less than 0.50 ton on many days in August and September.

EXTREMES, 1960-64.--Water temperatures: Maximum, 85°F July 26, 1963 and July 19, 1964; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 1,180 ppm July 13, 1964; minimum daily, 1 ppm on many days during 1960-64.

Sediment loads: Maximum daily, 20,000 tons Mar. 7, 1963; minimum daily, less than 0.50 ton on many days during 1960-64.

REMARKS.--Flow affected by ice or no gage height record during Dec. 15-24, 27-31, Jan. 13-22, 24-31 and Feb. 1-26. No appreciable inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1963 to September 1964

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Color
																Calcium, magnesium	Non-carbonate				
Oct. 14, 1963..	50	1.9		0.38	0.11	40	7.1	8.8	4.6	123	19	13	0.2	13	176	129	28		300	7.7	
Mar. 19, 1964..	1000	7.5		.22	.03	20	4.1	4.4	1.5	48	19	6.7	.1	8.3	109	67	28		176	6.8	
June 23.....	183	4.2		.16	.02	31	5.0	5.3	2.3	98	13	7.4	.1	6.6	138	98	18		213	7.3	4
Sept. 16.....	65	4.7		.16	.00	46	7.5	11	3.9	149	19	18	.2	11	197	146	24		336	7.2	

Temperature (°F) of water, water year October 1963 to September 1964
(Once-daily measurement at approximately 1900)

Month	Day																																Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		
October	62	64	64	59	65	63	63	61	61	58	59	64	61	61	59	59	--	60	61	62	59	5	61	62	61	63	64	57	53	49	52	60	
November	52	47	47	--	52	53	54	53	53	54	50	47	44	44	44	44	53	54	53	49	51	53	55	49	47	42	45	47	48	43	--	49	
December	39	38	38	37	38	37	39	39	37	36	36	38	37	33	33	33	--	32	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
January	--	--	--	33	34	35	37	34	34	34	34	32	--	--	--	--	--	--	--	--	34	34	33	36	38	35	36	36	34	36	37	--	
February	38	40	37	38	--	37	38	38	41	36	33	33	34	37	37	39	36	34	34	37	--	34	33	36	35	35	36	--	36	--	--	36	
March	40	41	39	38	40	44	--	45	52	50	48	43	44	44	45	48	50	44	44	44	41	43	46	46	53	51	41	52	48	45	--	45	
April	43	42	46	49	52	46	48	50	50	52	55	58	55	57	56	56	64	67	62	55	50	50	55	57	56	58	56	58	53	50	--	54	
May	50	51	57	60	62	65	67	69	69	68	69	68	65	64	65	67	68	69	74	72	70	70	75	78	73	74	72	67	--	68	72	67	
June	64	65	64	68	72	65	71	71	76	80	75	75	76	78	78	75	75	75	78	83	81	79	--	78	78	81	80	78	78	84	--	75	
July	83	82	81	79	73	79	77	72	77	79	81	77	72	73	78	79	80	82	85	83	81	80	84	80	77	77	78	84	84	84	80	79	
August	75	78	67	73	75	77	75	77	74	71	74	68	71	72	74	70	75	--	70	72	77	82	82	79	80	78	74	80	79	80	--	75	
September	76	75	75	79	80	77	69	73	79	78	82	70	67	65	68	64	71	72	--	62	68	70	71	70	66	66	69	61	59	60	--	70	

POTOMAC RIVER BASIN--Continued

1-6430. MONOCACY RIVER AT JUG BRIDGE, NEAR FREDERICK, MD.--Continued

Suspended sediment, water year October 1963 to September 1964
(Where no daily concentrations are reported, loads are estimated)

Day	OCTOBER			NOVEMBER			DECEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	165	C 11	5	60	C 4	1	1500	139	S 676
2..	104	C 11	3	76	C 4	1	539	35	51
3..	86	C 11	3	78	C 4	1	350	15	14
4..	80	C 12	3	88	C 4	1	282	C 10	8
5..	65	C 12	2	80	C 4	1	235	C 10	6
6..	63	C 5	1	109	6	2	200	C 10	5
7..	62	C 5	1	752	250	S 521	174	C 10	5
8..	60	C 5	1	700	158	S 321	188	24	S 13
9..	58	C 61	10	294	45	36	1250	106	S 426
10..	58	C 61	10	162	20	9	1090	106	S 332
11..	56	C 61	9	118	C 11	3	515	46	64
12..	56	C 61	9	97	C 11	3	400	C 7	8
13..	56	C 37	6	88	C 11	3	408	C 7	8
14..	56	C 37	6	82	C 11	2	372	C 7	7
15..	56	C 37	6	80	C 11	2	230	C 7	4
16..	56	C 37	6	78	C 8	2	200	C 7	4
17..	58	C 37	6	78	C 8	2	180	--	3
18..	58	C 9	1	76	C 8	2	160	--	3
19..	58	C 9	1	74	C 8	2	140	--	3
20..	58	C 9	1	74	C 8	2	130	--	2
21..	60	C 9	1	72	C 8	2	120	--	2
22..	56	C 9	1	74	C 8	2	120	--	2
23..	56	C 10	2	95	C 8	2	130	--	2
24..	58	C 10	2	151	C 8	3	150	--	3
25..	56	C 10	2	190	C 8	4	171	--	3
26..	58	C 10	2	134	10	4	181	--	3
27..	60	C 10	2	116	--	3	178	--	3
28..	58	C 5	2	99	9	2	160	--	3
29..	58	C 5	1	218	68	S 64	150	--	3
30..	56	C 5	1	2860	414	S 3220	140	--	3
31..	56	--	1	--	--	--	130	--	2
Total	2001	--	106	7253	--	4223	10173	--	1671
Day	JANUARY			FEBRUARY			MARCH		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	134	--	3	850	C 22	50	575	4	6
2..	165	--	3	850	C 22	50	618	23	S 44
3..	207	--	4	700	C 22	42	2190	501	S 3360
4..	256	12	8	650	C 22	39	5300	290	4150
5..	426	12	14	650	--	50	7980	312	S 7540
6..	530	--	40	2000	400	2180	7160	350	S 8000
7..	819	100	S 238	3500	530	5020	2780	95	B 710
8..	1240	170	570	2000	90	490	2170	38	223
9..	2280	810	S 7670	1200	30	97	2120	42	241
10..	11300	591	19400	1100	C 10	30	2160	65	379
11..	2330	85	S 587	1000	C 10	27	2640	216	1540
12..	1340	10	36	900	C 10	24	1700	70	321
13..	600	--	19	900	C 10	24	1830	23	114
14..	450	--	15	900	C 10	24	1820	30	147
15..	500	--	16	900	C 10	24	2820	132	1010
16..	500	--	16	1200	C 10	32	2080	40	225
17..	480	--	16	1300	20	70	1540	16	67
18..	450	--	15	1100	44	131	1300	14	51
19..	450	--	15	900	25	61	1100	9	27
20..	650	--	21	1000	10	27	1000	8	22
21..	2000	160	864	900	--	20	1020	18	50
22..	3500	260	260	800	6	13	1520	18	74
23..	2740	100	739	700	6	11	2650	76	544
24..	2100	45	256	700	6	11	2300	45	280
25..	7000	450	8510	600	6	10	1650	25	111
26..	5000	410	5540	600	6	10	1440	20	78
27..	3000	70	567	620	6	10	1380	16	60
28..	2000	C 14	76	570	--	9	1110	20	60
29..	1100	C 14	42	505	6	8	990	13	35
30..	900	C 14	34	--	--	--	938	19	23
31..	800	C 14	30	--	--	--	912	--	20
Total	55247	--	47824	29595	--	8594	66793	--	29512

S Computed by subdividing day.

B Computed from estimated-concentration graph.

C Composite period.

POTOMAC RIVER BASIN--Continued

1-6430. MONOCACY RIVER AT JUG BRIDGE, NEAR FREDERICK, MD.--Continued

Suspended sediment, water year October 1963 to September 1964--Continued
(Where no daily concentrations are reported, loads are estimated)

Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	856	6	14	5670	110	S 1830	250	13	9
2..	826	1	2	2950	60	478	262	10	7
3..	1260	9	31	2180	24	142	258	15	10
4..	1180	12	38	1840	19	95	238	21	14
5..	874	C 7	16	1580	20	86	220	11	7
6..	832	C 7	16	1350	15	55	234	20	13
7..	1070	C 7	20	1200	13	42	258	30	21
8..	1460	22	87	1090	15	44	254	20	4
9..	1660	30	134	990	16	43	254	15	10
10..	1140	14	B 43	886	15	36	250	10	7
11..	984	C 9	24	792	21	45	195	14	7
12..	886	C 9	22	738	11	22	171	11	5
13..	820	C 9	20	710	12	23	162	5	2
14..	1400	37	S 172	880	19	45	160	6	3
15..	3520	307	2920	782	14	30	174	16	8
16..	1880	132	S 704	655	13	23	177	41	20
17..	1430	35	135	605	12	20	158	39	17
18..	1220	20	66	630	34	58	152	38	16
19..	1110	15	45	540	16	23	150	42	17
20..	1320	18	S 68	485	16	21	168	40	21
21..	5010	354	S 5870	440	14	17	171	46	21
22..	5170	211	S 3400	410	23	26	177	26	13
23..	2740	48	S 358	395	14	15	183	40	B 20
24..	2050	26	144	370	17	17	152	27	8
25..	1650	17	76	346	15	14	140	20	8
26..	1400	11	42	310	14	12	125	10	13
27..	1260	11	37	292	16	13	118	7	2
28..	1340	13	47	284	12	9	110	8	2
29..	3410	225	S 2400	279	13	10	105	6	2
30..	7060	272	S 5210	270	14	10	102	9	2
31..	--	--	--	258	12	8	--	--	--
Total	56818	--	22161	30207	--	3316	5528	--	312
Day	JULY			AUGUST			SEPTEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	102	5	1	108	40	12	102	C 1	T
2..	102	3	1	95	16	4	82	C 1	T
3..	100	3	1	309	173	S 219	80	C 1	T
4..	102	3	1	560	255	S 404	70	C 1	T
5..	105	5	1	284	80	61	65	C 1	T
6..	92	5	1	183	36	18	60	C 1	T
7..	86	14	3	140	19	7	55	C 1	T
8..	148	70	S 31	122	15	5	55	C 1	T
9..	127	30	14	110	18	5	60	C 1	T
10..	165	18	8	102	17	5	60	C 1	T
11..	138	18	7	102	16	4	55	1	T
12..	122	10	3	112	8	2	60	3	1
13..	2970	1180	S 10600	112	17	5	63	1	T
14..	1090	433	S 1500	105	15	4	60	C 1	T
15..	620	294	S 505	100	3	1	56	C 1	T
16..	333	158	142	98	10	3	58	C 1	T
17..	195	88	46	100	8	2	58	C 1	T
18..	155	48	20	100	--	2	56	C 1	T
19..	135	43	16	150	--	10	63	--	T
20..	125	32	11	142	15	6	92	C 1	T
21..	118	22	7	102	8	2	86	C 1	T
22..	118	19	6	95	6	2	80	C 1	T
23..	118	18	6	90	C 1	T	72	C 1	T
24..	115	16	5	86	C 1	T	68	C 1	T
25..	115	20	6	84	C 1	T	65	C 1	T
26..	115	23	7	82	C 1	T	60	C 1	T
27..	118	14	4	80	C 1	T	60	C 1	T
28..	120	16	5	80	C 1	T	74	1	T
29..	118	19	6	82	C 1	T	152	13	5
30..	115	19	6	82	--	T	--	--	8
31..	112	32	10	90	--	T	--	--	--
Total	8344	--	12980	4087	--	785	2222	--	19

Total discharge for year (cfs-days).....278268

Total load for year (tons).....131503

S Computed by subdividing day.
T Less than 0.50 ton.

B Computed from estimated-concentration graph.
C Composite period.

POTOMAC RIVER BASIN--Continued

1-6430. MONOCACY RIVER AT JUG BRIDGE, NEAR FREDERICK, MD.--Continued

Particle-size analyses of suspended sediment, water year October 1963 to September 1964
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (°F)	Sam- pling point	Discharge (cfs)	Sediment concent- ration (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis	
							Percent finer than size indicated, in millimeters											
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000		2.000
Jan. 10, 1964.....	0715	34		9950	817		--	39	58	77	90	95	97	99	100	--		SBWC
Jan. 25.....	1115	38		D 7000	266		--	29	47	69	84	93	96	98	100	--		SBWC
Jan. 26.....	1000	35		D 5000	427		--	36	54	76	90	96	97	99	99	100		SBWC
Feb. 7.....	1650	39		D 3500	397		--	47	64	82	93	96	98	99	99	--		SBWC
Mar. 4.....	0730	38		5440	312		20	33	51	71	89	94	98	99	100	--		SBWC
Apr. 15.....	1730	56		3550	329		38	58	76	89	98	98	99	99	100	--		SBWC
Apr. 21.....	1645	49		6570	575		30	48	66	84	93	95	98	98	99	100		SBWC
Apr. 29.....	2045	53		5210	227		23	40	55	68	85	93	97	99	100	--		SBWC
July 13.....	1930	72		2630	1220		32	52	77	94	99	100	--	--	--	--		SBWC

D Daily mean discharge.

POTOMAC RIVER BASIN--Continued

1-6452. WATTS BRANCH AT ROCKVILLE, MD.

LOCATION.--Temperature recorder at gaging station on left bank 0.2 mile south of State Highway 28 and 1.3 miles west of post office in Rockville, Montgomery County.

DRAINAGE AREA.--3.70 square miles.

RECORDS AVAILABLE.--Water temperatures: September 1957 to September 1964.

EXTREMES, 1963-64.--Water temperatures: Maximum, 79°F July 19, 23; minimum, 33°F Feb. 11.

EXTREMES, 1957-64.--Water temperatures: Maximum, 88°F June 29, 30, 1959; minimum, freezing point on many days during winter months.

Temperature (°F) of water, water year October 1963 to September 1964
(Continuous ethyl alcohol-actuated thermograph)

Month	Day																															Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October																																
Maximum	61	62	63	62	59	59	61	59	60	58	58	60	57	56	56	56	58	59	60	61	61	56	61	61	59	62	62	58	54	52	52	59
Minimum	52	53	54	55	51	50	52	54	52	50	50	52	49	47	47	48	48	52	52	53	52	55	54	53	52	56	55	52	51	45	45	51
November																																
Maximum	52	51	49	48	50	53	54	54	55	53	53	49	46	45	46	46	52	52	53	48	52	51	55	52	45	43	48	48	54	43	--	50
Minimum	50	46	44	42	46	50	52	51	50	47	48	45	41	40	42	40	46	47	48	44	47	46	51	44	41	40	42	43	43	41	--	45
December																																
Maximum	42	42	42	42	42	42	42	43	42	41	41	41	42	42	36	36	36	36	36	35	35	35	35	35	35	36	37	37	36	36	35	38
Minimum	40	39	41	39	41	39	39	39	39	38	39	38	39	36	35	35	35	35	35	35	35	35	35	34	34	35	35	36	35	35	35	37
January																																
Maximum	35	35	37	38	38	39	39	39	39	39	38	35	34	34	34	34	35	36	37	36	38	43	43	44	48	44	42	41	39	41	38	38
Minimum	34	34	34	34	34	35	34	36	36	35	34	34	34	34	34	34	34	34	34	34	35	36	37	39	41	39	37	35	34	35	35	35
February																																
Maximum	42	42	40	40	44	40	44	42	42	43	39	38	38	42	39	39	42	37	38	42	41	41	40	42	39	44	42	40	42	--	--	41
Minimum	38	38	35	34	36	38	39	38	35	38	33	34	34	38	35	35	34	34	34	36	34	34	34	34	34	34	34	34	34	--	--	35
March																																
Maximum	43	47	41	43	56	50	49	47	60	62	52	47	52	49	50	55	56	49	51	49	46	48	54	56	59	61	55	57	54	46	49	51
Minimum	35	37	39	41	43	41	41	42	45	46	43	43	40	42	44	42	44	40	39	42	39	39	41	42	47	47	42	44	46	40	38	42
April																																
Maximum	50	45	55	55	56	49	53	52	54	58	60	60	55	56	60	62	67	69	62	56	51	52	64	63	56	61	55	57	55	50	--	57
Minimum	42	40	44	42	42	47	47	47	44	42	45	46	51	53	50	45	50	52	55	51	49	49	49	53	48	47	47	53	50	48	--	48
May																																
Maximum	51	62	59	64	67	67	67	69	66	69	68	65	65	62	58	67	66	68	70	70	66	69	72	71	70	68	69	60	66	64	66	66
Minimum	49	48	49	51	51	51	52	54	57	56	54	55	57	55	51	50	54	54	55	58	53	53	56	58	58	53	56	55	52	51	54	54
June																																
Maximum	56	60	63	62	66	64	67	69	72	76	72	68	68	73	75	71	69	69	74	76	77	73	68	72	73	74	75	75	74	76	--	70
Minimum	54	53	51	51	54	56	56	59	59	61	61	56	60	61	62	60	55	55	61	64	64	64	64	64	61	59	60	62	61	62	--	59
July																																
Maximum	74	75	77	70	72	74	72	67	71	74	77	70	72	73	76	76	77	73	79	78	77	76	79	74	68	69	76	78	78	78	75	74
Minimum	65	65	65	64	60	59	60	64	62	61	62	64	67	64	63	64	64	65	66	66	67	68	69	68	66	64	64	67	68	68	63	65
August																																
Maximum	67	74	70	69	72	74	73	72	71	64	69	73	66	68	68	66	71	68	70	70	73	77	74	74	77	76	73	71	73	74	76	71
Minimum	62	64	64	62	62	63	60	66	61	61	63	65	60	59	56	59	62	62	60	58	63	66	68	65	66	66	65	65	66	67	69	63
September																																
Maximum	75	72	71	72	74	76	72	71	72	73	78	70	64	65	64	67	69	67	66	63	67	65	67	67	63	62	64	61	57	57	--	68
Minimum	66	63	59	60	63	60	60	60	60	61	67	62	56	53	53	56	58	61	63	61	60	57	57	58	54	53	54	54	54	55	--	59

POTOMAC RIVER BASIN--Continued

1-6505. NORTHWEST BRANCH ANACOSTIA RIVER NEAR COLESVILLE, MD.

LOCATION.--At gaging station on right bank 400 feet upstream from bridge on State Highway 183, 1.5 miles southwest of Colesville, Montgomery County, 3 miles upstream from Burnt Mills, and 10 miles upstream from Sligo Branch.

DRAINAGE AREA.--21.3 square miles.

RECORDS AVAILABLE.--Sediment records: October 1962 to September 1964.

EXTREMES, 1963-64.--Sediment concentrations: Maximum daily, 2,600 ppm Jan. 9; minimum daily, not determined.

Sediment loads: Maximum daily, 2,000 tons (estimated) Jan. 7; minimum daily, less than 0.05 ton on many days in October, August, and September.

EXTREMES, 1962-64.--Sediment concentrations: Maximum daily, 3,950 ppm Aug. 20, 1963; minimum daily, not determined.

Sediment loads: Maximum daily, 3,810 tons Aug. 20, 1963; minimum daily, less than 0.05 ton on many days each year.

REMARKS.--Flow affected by ice Dec. 15-17, Jan. 11-21, and Feb. 4, 12, 13, 22-25, 28-29.

Suspended sediment, water year October 1963 to September 1964

(Where no daily concentrations are reported, loads are estimated)

Day	OCTOBER			NOVEMBER			DECEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	5.7	24	0.4	6.9	27	S	0.8	24	1
2..	5.0	20	B	15	110	S	5	17	.5
3..	4.7	10	B	5.7	20	B	.3	15	.4
4..	4.1	8	.1	4.7	6	.1	17	110	5
5..	4.1	7	B	4.7	--	.1	12	50	2
6..	4.1	7	B	.1	60	1800	S	730	.7
7..	3.9	7	B	.1	260	1100	S	1200	.3
8..	3.4	6	B	.1	23	41	S	3	240
9..	3.4	--	.1	14	--	.4	50	240	69
10..	3.6	--	.1	11	--	.3	18	--	.7
11..	3.6	5	T	9.5	--	.2	14	--	.5
12..	3.6	--	T	8.6	--	.2	17	--	.6
13..	3.4	--	T	8.6	--	.2	17	13	.6
14..	3.4	--	T	7.7	--	.2	19	--	.7
15..	3.4	--	T	7.3	8	.2	14	--	.5
16..	3.4	--	T	7.3	--	.1	12	--	.4
17..	3.4	--	T	7.3	--	.1	10	--	.3
18..	3.1	4	T	7.3	--	.1	10	--	.3
19..	3.4	--	T	6.9	--	.1	11	--	.3
20..	3.4	--	T	6.9	--	.1	10	8	.2
21..	3.6	--	.1	6.9	--	.1	9	--	.2
22..	3.6	--	.1	6.9	5	.1	9	--	.2
23..	3.9	--	.1	22	450	S	69	9	.2
24..	3.9	--	.1	21	46	3	10	--	.2
25..	3.9	9	.1	11	--	.3	11	--	.3
26..	3.6	--	.1	9.5	--	.3	13	--	.3
27..	3.6	--	.1	9.0	--	.3	13	9	.3
28..	3.9	--	.1	8.6	--	.3	12	--	.3
29..	3.6	--	.1	110	1700	S	750	10	.2
30..	3.4	--	.1	120	420	S	230	9	.2
31..	3.9	--	.1	--	--	--	8	--	.2
Total	117.0	--	3.0	807.3	--	2994.9	448	--	326.6

S Computed by subdividing.

T Less than 0.50 ton.

B Computed from estimated-concentration graph.

POTOMAC RIVER BASIN--Continued

1-6505. NORTHWEST BRANCH ANACOSTIA RIVER NEAR COLESVILLE, MD.--Continued

Suspended sediment, water year October 1963 to September 1964--Continued
(Where no daily concentrations are reported, loads are estimated)

Day	JANUARY			FEBRUARY			MARCH		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	15	80	3	24	---	5	27	---	2
2..	24	100	6	22	---	4	48	---	40
3..	36	100	8	17	---	2	100	500 S	150
4..	51	---	10	15	---	2	54	88	13
5..	36	---	4	16	---	1	43	---	3
6..	42	---	100	75	2000 S	680	26	18	1
7..	200	---	2000	72	130 S	29	23	---	.6
8..	33	---	5	38	---	3	25	---	.8
9..	299	2600 S	1900	25	---	2	34	26	2
10..	48	120 S	22	20	---	1	25	---	1
11..	22	---	2	18	---	1	20	---	.6
12..	16	---	1	17	---	1	20	---	.4
13..	13	---	.8	17	30 B	1	19	4	.2
14..	17	---	1	21	13	.7	25	30	2
15..	15	---	1	24	20 B	1	29	---	2
16..	14	---	.9	51	---	40	22	---	1
17..	14	24	.9	44	100 B	10	21	---	1
18..	14	---	.9	30	60 B	5	18	---	.5
19..	15	---	1	48	120	16	17	---	.4
20..	60	560 S	150	51	100 B	10	17	7	.3
21..	120	290 S	100	35	18	2	29	58 S	6
22..	47	48	6	24	---	1	115	980 S	440
23..	32	---	1	20	---	.9	53	140	24
24..	25	16	1	18	---	.8	31	30 B	3
25..	181	1000 S	790	18	---	.8	26	20 B	1
26..	42	63	7	34	---	10	25	10 B	.7
27..	26	---	4	32	---	4	22	10	.6
28..	22	---	4	23	12	.7	20	---	.8
29..	18	---	3	22	---	.7	20	---	.8
30..	18	---	3	---	---	---	22	21	1
31..	16	60	3	---	---	---	22	---	1
Total	1531	---	5141.5	871	---	835.6	998	---	700.7
Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	23	---	1	39	41	4	9.0	---	0.2
2..	26	48 S	4	29	---	2	9.5	---	.2
3..	37	40	4	24	---	1	9.0	---	.2
4..	24	---	1	22	---	1	8.6	---	.1
5..	21	---	1	21	---	.9	8.1	4	.1
6..	37	120 S	16	19	---	.8	13	---	10
7..	47	---	30	19	---	.7	13	50 B	2
8..	91	700 S	230	18	14	.7	12	150 S	8
9..	44	72 S	10	17	---	.6	9.5	50	1
10..	29	14	1	15	---	.5	8.6	40 B	.9
11..	24	---	.7	15	---	.5	6.9	30 B	.6
12..	22	---	.6	15	---	.5	6.9	28	.5
13..	22	---	.6	22	480 S	47	6.9	20 B	.4
14..	40	40 B	4	20	40 B	2	11	70 B	2
15..	30	---	1	15	20	1.8	11	200 B	6
16..	23	---	.9	15	---	.7	12	100 B	3
17..	22	11	.7	14	---	.6	7.3	40 B	.8
18..	20	---	.5	13	---	.5	6.9	30 B	.6
19..	22	---	1	13	---	.4	8.1	80	2
20..	31	---	20	12	---	.4	16	---	10
21..	46	---	20	11	---	.3	7.3	50 B	1
22..	29	---	2	12	10	.3	6.9	40 B	.7
23..	24	---	1	11	---	.3	6.9	30 B	.6
24..	22	17	1	11	---	.3	12	200 B	7
25..	20	---	.8	10	---	.3	9	90 B	2
26..	19	---	.5	9.5	---	.2	6.5	50	.9
27..	19	5	.3	9.0	---	.2	6.1	30 B	.5
28..	24	---	.7	8.6	---	.2	5.4	20 B	.3
29..	24	---	.7	9.0	---	.2	5.0	20 B	.3
30..	114	1200 S	530	8.6	---	.2	4.7	20 B	.3
31..	---	---	---	8.6	---	.2	---	---	---
Total	976	---	885.0	485.3	---	68.3	263.1	---	62.2

S Computed by subdividing day.

B Computed from estimated-concentration graph.

POTOMAC RIVER BASIN--Continued

1-6505. NORTHWEST BRANCH ANACOSTIA RIVER NEAR COLESVILLE, MD.--Continued

Suspended sediment, water year October 1963 to September 1964--Continued
(Where no daily concentrations are reported, loads are estimated)

Day	JULY				AUGUST				SEPTEMBER			
	Mean discharge (cfs)	Suspended sediment			Mean discharge (cfs)	Suspended sediment			Mean discharge (cfs)	Suspended sediment		
		Mean concentration (ppm)	Tons per day			Mean concentration (ppm)	Tons per day			Mean concentration (ppm)	Tons per day	
1..	4.4	10	B	0.1	2.2	--	0.1		1.7	--		T
2..	4.4	10	B	.1	4.1	2300	20		1.5	--		T
3..	4.4	10	B	.1	18	2300	S	240	1.1	--		T
4..	5.0	20	B	.3	9.5	200	S	7	1.0	--		T
5..	4.4	--		.1	4.4	30	B	.4	.9	--		T
6..	3.9	--		.1	3.6	20	B	.2	.9	--		T
7..	3.6	--		.1	5.4	400	B	30	.8	--		T
8..	13	870	S	54	8.6	--		10	1.0	--		T
9..	6.9	90		2	3.6	--		.2	.8	--		T
10..	5.4	50		.7	3.4	--		.1	.8	--		T
11..	4.7	40	B	.5	3.9	--		.1	.8	8		T
12..	4.7	30	B	.4	3.6	--		.1	.9	--		T
13..	19	710	S	91	2.9	--		.1	1.1	--		T
14..	6.1	40	B	.7	2.7	8		.1	1.5	--		T
15..	4.7	30	B	.4	2.9	--		.1	1.5	--		T
16..	4.1	20	B	.2	3.1	--		.1	1.1	--		T
17..	3.9	22		.2	4.4	--		.1	.8	--		T
18..	3.9	--		.2	3.6	--		.1	1.0	8		T
19..	3.9	--		.2	3.4	--		.1	4.7	--	5	
20..	3.6	--		.2	2.5	--		.1	5.7	100	S	2
21..	3.6	--		.2	2.3	13		.1	2.3	--		.2
22..	3.6	--		.2	2.0	--		.1	2.0	--		.1
23..	3.6	--		.2	1.9	--		.1	2.2	--		T
24..	3.6	18		.2	1.9	--		.1	1.6	--		T
25..	3.9	--		.2	1.9	--		.1	1.4	--		T
26..	4.1	--		.2	1.6	--		T	1.3	--		T
27..	3.9	--		.2	1.5	--		T	1.4	--		T
28..	3.1	--		.1	1.5	10		T	3.6	--		1
29..	3.1	--		.2	2.0	--		.1	10	390	S	18
30..	3.4	--		.3	2.0	--		.1	24	950	S	88
31..	2.2	13		.1	2.2	--		.1	--	--		--
Total	151.9	--		153.7	116.6	--		309.9	79.4	--		114.9

Total discharge for year (cfs-days).....6844.6
Total load for year (tons).....11596.3

S Computed by subdividing day.
T Less than 0.05 ton.
B Computed from estimated-concentration graph.

MISCELLANEOUS ANALYSES OF STREAMS IN NORTH ATLANTIC SLOPE BASINS

Chemical analyses, in parts per million, water year October 1963 to September 1964

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Color
																Calcium, magnesium	Non-carbonate				
DELAWARE RIVER BASIN																					
1-4778. SHELLPOT CREEK AT WILMINGTON, DEL. ✓																					
Oct. 19, 1963..	0.8							20		110	31	20		2.0		108	18		300	7.6	7
Sept. 30, 1964.	A9.4	7.1		0.02	0.00	16	5.8	18	4.5	47	28	21	0.2	8.2	143	64	26		231	6.8	20
1-4780. CHRISTINA RIVER AT COOCHS BRIDGE, DEL. ✓																					
Oct. 19, 1963..	1.3							14		44	11	17		7.6		48	12		155	6.7	6
Sept. 30, 1964.	B22	6.0		0.02	0.00	6.4	4.4	4.8	3.5	22	15	7.0	0.1	3.1	72	34	16		99	6.5	35
LITTLE MILL CREEK AT ELSMERE, DEL.																					
Oct. 19, 1963..	1.6							39		128	29	37		2.2		104	0		375	7.0	8
CHRISTINA RIVER AT NEWPORT, DEL.																					
Sept. 30, 1964.		7.7		0.02	0.32	19	13	56	8.0	45	39	104	0.1	8.6	327	101	64		537	6.5	25
1-4785. WHITE CLAY CREEK ABOVE NEWARK, DEL. --																					
Oct. 19, 1963..	17							12		96	13	12		4.1		86	8		210	7.5	8
WHITE CLAY CREEK NEAR STANTON, DEL.																					
Sept. 30, 1964.		7.0		0.02	0.00	14	6.3	5.7	6.0	37	25	12	0.1	5.4	118	61	31		168	6.6	40
1-4823. RED LION CREEK AT RED LION, DEL.																					
Sept. 30, 1964.		10		0.03	0.00	8.0	8.8	6.8	6.0	18	36	14	0.1	4.3	124	56	41		176	6.3	40
APPOQUINIMINK CREEK NEAR ODESSA, DEL.																					
Sept. 30, 1964.		9.2		0.00	0.00	64	157	1300	52	56	271	2250	0.4	3.0	4360	806	760		7450	6.9	12

1-4832. BLACKBIRD CREEK AT BLACKBIRD, DEL.

Oct. 19, 1963..	0.7							9.4		36	5.2	8.9		2.4		29	0		93	6.8	28
Sept. 30, 1964.	C25	8.1		0.00	0.00	31	58	432	20	24	117	820	0.2	5.0	1660	316	297		2920	6.3	25

ST. JONES RIVER BASIN

1-4837. ST. JONES RIVER AT DOVER, DEL.

Oct. 18, 1963..	0.4							44		156	27	16		41		116	0		426	7.0	14
Sept. 28, 1964.	28	5.8		0.41	0.00	10	5.8	24	3.5	48	30	20	0.2	6.3	152	49	10		231	6.4	35

MURDERKILL RIVER BASIN

1-4840. MURDERKILL RIVER NEAR FELTON, DEL.

Nov. 1, 1963...	6.8							21		46	13	16		26		49	12		198	6.4	22
Sept. 28, 1964.	D2.6	27		0.00	0.00	18	4.1	10	3.8	51	15	8.0	0.1	30	154	62	20		208	6.3	8

MISPILLION RIVER BASIN

1-4841. BEAVERDAM BRANCH AT HOUSTON, DEL.

Nov. 1, 1963...	0.5							8.5		19	0.0	6.6		9.6		14	0		63	6.7	27
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MISPILLION RIVER AT MILFORD, DEL.

Sept. 28, 1964.		12		0.02	0.05	16	27	235	11	35	52	410	0.1	3.0	873	151	123		1520	6.4	20
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CEDAR CREEK BASIN

1-4842. CEDAR CREEK NEAR LINCOLN, DEL.

Sept. 28, 1964.		10		0.00	0.00	16	40	320	11	28	73	595	0.2	4.0	1180	205	182		2180	6.9	30
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A Mean daily (discharge range from 39 cfs to 1.2 cfs during day).

B Mean daily (discharge range from 57 cfs to 2.3 cfs during day).

C Mean daily (discharge range from 11 cfs to 43 cfs during day).

D Mean daily (discharge range from 1.8 cfs to 5.1 cfs during day).

MISCELLANEOUS ANALYSES OF STREAMS IN NORTH ATLANTIC SLOPE BASINS--Continued

Chemical analyses, in parts per million, water year October 1963 to September 1964--Continued

Chemical analyses, in parts per million, water year October 1963 to September 1964--Continued																					
Date of collection	Discharge (cfs)	Silica (SiO ₂)	Alum-inum (Al)	Iron (Fe)	Man-ga-nese (Mn)	Cal-cium (Ca)	Mag-ne-sium (Mg)	Sodium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acid-ity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Col-or
																Cal-cium, magne-sium	Non-carbon-ate				
BROADKILL RIVER BASIN																					
1-4843. SOWBRIDGE BRANCH NEAR MILTON, DEL.																					
Oct. 28, 1963..	3.0							9.0		19	2.6	11		4.9		18	3		76	6.5	10
INDIAN RIVER BASIN																					
1-4845. STOCKLEY BRANCH AT STOCKLEY, DEL.																					
Oct. 28, 1963..	1.4							7.8		16	0.4	11		9.8		20	7		88	6.6	50
INDIAN RIVER AT MILLSBORO, DEL.																					
Sept. 28, 1964.		12		0.00	0.00	143	468	3670	109	70	931	6570	0.2	4.0	12900	2280	2230		19800	6.5	12
POCOMOKE RIVER BASIN																					
1-4850. POCOMOKE RIVER NEAR WILLARDS, MD.																					
Sept. 29, 1964.	5.0	26		2.4	0.00	3.9	1.3	8.8	1.6	28	3.4	7.0	0.0	0.3	74	15	0		74	6.7	
POCOMOKE RIVER AT SNOW HILL, MD.																					
Sept. 29, 1964.		8.6		0.68	0.00	4.6	2.3	13	3.0	30	9.2	13	0.1	1.7	81	21	0		114	6.7	
1-4855. NASSAWANGO CREEK NEAR SNOW HILL, MD.																					
Sept. 29, 1964.	1.6	25		3.1	0.00	2.2	1.3	10	3.0	16	1.4	8.8	0.0	9.8	82	11	0		82	6.4	
NANTICOKE RIVER BASIN																					
1-4875. TRAP POND OUTLET NEAR LAUREL, DEL.																					
Oct. 28, 1963..	0.4							9.0		18	2.4	7.8		4.7		13	0		62	6.6	15
1-4885. MARSHY HOPE CREEK NEAR ADAMSVILLE, DEL.																					
Nov. 1, 1963...	14							6.4		27	4.4	8.0		2.2		26	4		85	6.6	8

MARSHY HOPE CREEK NEAR WOODENHAWK, DEL.

Sept. 29, 1964.		15		0.05	0.00	5.2	1.9	6.2	1.8	18	7.6	9.2	0.2	3.2	68	21	6		129	6.5	12
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MARSHY HOPE CREEK AT BROOKEVIEW, MD.

Sept. 29, 1964.											470				924				1670		
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CHOPTANK RIVER BASIN

1-4910. CHOPTANK RIVER NEAR GREENSBORO, MD.

June 11, 1964..	14.0	13		1.1	0.02	8.8	2.9	5.3	1.7	24	13	7.7	0.1	3.3	77	34	15		98	6.7	4
Sept. 10.....	8.8	6.0		.00	.00	15	2.8	6.0	2.3	43	13	8.5	.1	5.3	83	49	14		125	6.7	5

CHOPTANK RIVER AT GREENSBORO, MD.

Sept. 10, 1964.		5.5		0.00	0.01	13	3.5	8.2	2.4	44	12	9.5	0.1	3.7	85	47	11		138	6.6	
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CHOPTANK RIVER 1 MILE BELOW GREENSBORO, MD.

Sept. 10, 1964.												39			121				245		
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CHOPTANK RIVER AT SMITH'S LANDING, MD.

Sept. 9, 1964..												206			435				800		
Sept. 10.....												316			634				1170		

CHOPTANK RIVER AT DENTON, MD.

Sept. 10, 1964.												526			1010				1870		
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CHOPTANK RIVER NEAR WILLISTON, MD.

Sept. 10, 1964.		1.1		0.02	0.00	46	69	647		43	156	1140	0.1	0.2	2210	401	366		3690	6.6	
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TUCKAHOE CREEK AT HILLSBORO, MD.

Sept. 10, 1964.		18		0.01	0.00	11	1.8	5.4	2.0	31	8.0	6.6	0.1	6.2	75	35	10		105	6.5	
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MISCELLANEOUS ANALYSES OF STREAMS IN NORTH ATLANTIC SLOPE BASINS--Continued

Chemical analyses, in parts per million, water year October 1963 to September 1964--Continued

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Alum-inum (Al)	Iron (Fe)	Man-ga-nese (Mn)	Cal-cium (Ca)	Mag-ne-sium (Mg)	Sodium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acid-ity as H ⁺	Specific conduct-ance (micro-mhos at 25°C)	pH	Col-or
																Cal-cium, magne-sium	Non-carbon-ate				
CHOPTANK RIVER BASIN--Continued																					
TUCKAHOE CREEK, HILLSBORO, MD. BRIDGE AT ROUTE 328, MD.																					
Sept. 10, 1964.												864			1640				2950		
CHOPTANK RIVER AT GANEY WHARF, MD.																					
Sept. 10, 1964.												1340			2510				4430		
1-4920. BEAVERDAM BRANCH AT MATTHEWS, MD.																					
June 11, 1964..	0.3	12		1.1	0.01	14	2.9	5.4	1.7	39	12	8.8	0.1	5.5	94	47	15		125	6.9	4
CHOPTANK RIVER AT DOVER BRIDGE, MD.																					
Sept. 10, 1964.												2660			4940				8220		
CHESTER RIVER BASIN																					
CHESTER RIVER AT MILLINGTON, MD.																					
Sept. 29, 1964.		7.6		0.58	0.07	8.4	3.6	6.5	3.0	28	9.6	13	0.0	4.3	74	36	13		118	7.2	
1-4935. MORGAN CREEK NEAR KENNEDYVILLE, MD.																					
June 10, 1964..	4.5	12		2.0	0.10	9.5	2.1	3.3	1.8	34	2.8	5.7	0.1	3.5	65	32	4		89	6.9	1
ELK RIVER BASIN																					
1-4950. BIG ELK CREEK AT ELK MILLS, MD.																					
June 10, 1964..	34	12		0.20	0.01	6.6	2.3	5.7	2.0	22	8.0	6.5	0.1	5.8	66	26	8		89	6.9	3
NORTHEAST RIVER BASIN																					
1-4960. NORTHEAST CREEK AT LESLIE, MD.																					
June 9, 1964...	11	17		0.39	0.02	6.8	4.9	4.8	1.6	44	5.2	4.9	0.1	3.7	76	37	1		104	6.8	3

SUSQUEHANNA RIVER BASIN

SUSQUEHANNA RIVER ABOVE GARRETT ISLAND AT PERRYVILLE, MD.

Aug. 20, 1964..											13							420	7.3
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SUSQUEHANNA RIVER AT PERRY POINT HOSPITAL AT PERRYVILLE, MD.

Aug. 20, 1964..											13							412	7.3
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BUSH RIVER BASIN

1-5815. BYNUM RUN AT BELAIR, MD.

June 9, 1964...	4.3	19		0.36	0.02	16	6.3	5.5	1.2	64	9.6	7.3	0.2	5.6	117	66	14	157	6.7	5
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WINTERS RUN OFF ROUTE 24 ON SINGER ROAD, NEAR EDGEWOOD, MD.

June 9, 1964...	39	12		0.74	0.20	6.6	3.5	4.3	1.7	28	7.4	5.9	0.1	4.6	68	31	8	92	6.8	3
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GUNPOWDER RIVER BASIN

1-5851. WHITE MARSH RUN AT WHITE MARSH, MD.

Aug. 20, 1964..	2.3	3.8		1.0	0.04	11	5.0	14	3.1	38	10	22	0.2	10	102	48	17	170	6.3
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BACK RIVER BASIN

1-5853. STEMMERS RUN AT ROSEVILLE, MD.

Aug. 20, 1964..	0.6	9.9		0.82	0.40	19	6.0	24		57	26	29	0.2	12	172	72	26	268	6.5
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PATAPSCO RIVER BASIN

1-5875. SOUTH BRANCH PATAPSCO RIVER AT HENRYTON, MD.

Oct. 31, 1963..	14	7.7		0.07	0.00	8.0	3.4	4.2	2.1	39	4.6	5.4	0.0	0.6	60	34	2	94	6.7	5
June 4, 1964...	39	7.2		.20	.10	6.1	2.4	3.5	1.4	24	5.0	4.9	.0	5.6	54	25	6	75	6.6	2

1-5890. PATAPSCO RIVER AT HOLLOFIELD, MD.

June 4, 1964...	71	8.0		0.60	0.02	10	2.2	5.2	1.4	35	7.2	5.7	0.1	3.1	66	34	6	99	6.5	5
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MISCELLANEOUS ANALYSES OF STREAMS IN NORTH ATLANTIC SLOPE BASINS--Continued

Chemical analyses, in parts per million, water year October 1963 to September 1964--Continued

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Alum- inum (Al)	Iron (Fe)	Man- ga- nese (Mn)	Cal- cium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acid- ity as H ⁺	Specific conduct- ance (micro- mhos at 25°C)	pH	Col- or
																Cal- cium, magne- sium	Non- carbon- ate				
PATAPSCO RIVER BASIN--Continued																					
1-5893. GWYNNS FALLS AT VILLA NOVA, MD.																					
Aug. 20, 1964..	8.6	3.3		0.52	0.06	20	7.1	6.1	2.9	76	11	13	0.0	2.6	116	79	17		192	7.0	
SEVERN RIVER BASIN																					
SEVERN RIVER NEAR ODENTON, MD.																					
Aug. 19, 1964..	1.6	6.8		0.44	0.01	62	2.1	3.0	2.1	9	13	5.2	0.1	4.6	51	24	17		77	6.2	
SOUTH RIVER BASIN																					
1-5900. NORTH RIVER NEAR ANNAPOLIS, MD.																					
Aug. 19, 1964..	3.6	18		1.7	0.02	4.6	2.6	1.6	1.1	13	9.2	3.1	0.2	0.1	55	22	12		53	6.3	
PATUXENT RIVER BASIN																					
PATUXENT RIVER OPPOSITE BROOME ISLAND, MD.																					
Oct. 4, 1963E..		1.9		0.00	0.02	187	589	F4890		70	210	8650	0.7	0.0	16100	2890	2890		22300	6.8	
Jan. 20, 1964E.		2.0		.00	.00	212	590	F4990		73	230	8830	.8	3.2	17100	2960	2900		24900	7.1	
Jan. 20G.....		1.2		.00	.00	246	640	F5450		69	360	9650	.9	.0	19000	3250	3190		26800	6.9	
Apr. 13E.....		--		--	--	--	--	--		--	--	5270	--	--	--	--	--		14300	--	
Apr. 13G.....		--		--	--	--	--	--		--	--	5440	--	--	--	--	--		15100	--	
PATUXENT RIVER OPPOSITE ST. LEONARD CREEK, MD.																					
Oct. 4, 1963...		1.9		0.00	0.02	192	605	F5020		73	240	8880	0.8	0.0	16100	2970	2910		22800		
Jan. 20, 1964E.		1.5		.00	.00	234	623	F5440		74	320	9600	.8	.0	18300	3150	3090		26800		
Apr. 13.....		3.7		.03	.04	144	394	F3110		58	804	5560	.4	.4	10900	1980	1930		16500		
Apr. 13E.....		--		--	--	--	--	--		--	--	5450	--	--	--	--	--		14900		
Apr. 13G.....		--		--	--	--	--	--		--	--	5550	--	--	--	--	--		14900		

POTOMAC RIVER BASIN

SAND SPRING RUN ABOUT 2 MILES ABOVE MOUTH, AT FROSTBURG, MD.

Sept. 25, 1964.	0.15	6.3		0.25	0.94	25	5.2	24	1.7	14	58	48	0.1	2.2	188	84	73		317	7.3	0
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SAND SPRING RUN ABOUT 3/4 MILE ABOVE MOUTH, AT FROSTBURG, MD.

Sept. 24, 1964.	0.14			0.45						14					180	86			298	6.5	
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GEORGES CREEK AT BORDEN SHAFT, MD.

June 23, 1964..												50		0.9					600	7.8	
Sept. 24.....	0.55	2.0		2.2	0.36	22	5.8	36	11	26	35	39	0.2	54	264	79	58		385	6.2	40

WINEBRENNER RUN AT MIDLOTHIAN, MD.

Sept. 24, 1964.	0.05			0.32						3					134	73			207	5.3	
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STAUB RUN AT CARLOS, MD.

Sept. 25, 1964.	0.03	5.4		0.04	0.00	6.8	1.5	0.4	0.8	16	12		0.5	0.1	0.3	34	23	10		55	6.6	2
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GEORGES CREEK AT OCEAN, MD.

Sept. 24, 1964.	0.34	4.7		2.3	0.73	26	3.2	41	11	27	33	43	0.2	58	271	78	56		403	6.9	30
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MATTHEW RUN AT ROUTE 55, AT MILLER, MD.

Sept. 25, 1964.	0.09	4.9		0.03	0.00	18	3.2	0.4	0.9	54	14		0.5	0.1	0.3	68	58	14		116	7.9	2
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UNNAMED TRIBUTARY TO NEFF RUN, ABOUT 3/4 MILE NORTHEAST OF MILLER, MD. AT ROUTE 55

Sept. 25, 1964.	0.02			0.09						36						46	33			75	7.1	
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UNNAMED TRIBUTARY TO NEFF RUN, 1,000 FEET ABOVE MOUTH AND 3/4 MILE SOUTHWEST OF MILLER, MD.

Sept. 25, 1964.	0.02			0.12						39						56	35			94	6.9	
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GEORGES CREEK AT MIDLAND, MD.

July 23, 1964..	0.65	0.1		0.31		33	9.4	13	3.9	60	79	15	0.2	1.9	216	121	72		319	6.8	3
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E Sample 5 feet below surface.

F Calculated Na plus K, reported as Na.

G Near bottom.

MISCELLANEOUS ANALYSES OF STREAMS IN NORTH ATLANTIC SLOPE BASINS--Continued

Chemical analyses, in parts per million, water year October 1963 to September 1964--Continued

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Color	
																Calcium, magnesium	Non-carbonate					
POTOMAC RIVER BASIN--Continued																						
LAUREL RUN AT MOSCOW, MD.																						
Sept. 24, 1964.	0.15			0.05						36					607	463			825	6.8		
BUTCHER RUN AT ROUTE 36, AT BARTON, MD.																						
Sept. 24, 1964.	0.05			0.06						72					256	185			402	6.6		
GEORGES CREEK AT ROUTE 36, AT BARTON, MD.																						
Sept. 24, 1964.	4.1	8.6		0.06	0.02	126	45	10	3.4	37	446	11	0.4	1.2	728	498	467		902	7.1		
MOORES RUN AT BARTON, MD.																						
Sept. 25, 1964.	0.60			0.36						0					881	535			1030	4.5		
UNNAMED TRIBUTARY TO GEORGES CREEK, ABOUT 1/2 MILE SOUTHWEST OF BARTON, MD.																						
Sept. 25, 1964.	0.3			0.08						0					1140	740			1280	4.4		
MILL RUN ABOUT 700 FEET ABOVE CONFLUENCE WITH MICHAELS RUN, NEAR MILL RUN, MD.																						
Sept. 25, 1964.	0.20			2.3											1300	584		1.7	1590	3.0		
MICHAELS RUN ABOVE CONFLUENCE WITH MILL RUN, NEAR MILL RUN, MD.																						
Sept. 25, 1964.	0.01			2.7											1300	800		2.0	1590	3.0		
MILL RUN AT MORRISSON, MD.																						
Sept. 25, 1964.	0.13			14											1570	860		2.6	1960	2.7		
GEORGES CREEK AT REYNOLDS, MD.																						
Sept. 24, 1964.	4.4	11		4.0	1.9	146	53	9.4	3.4		581	9.3	0.4	2.1	885	582	582	0.2	1080	4.1		
1-5990. GEORGES CREEK AT FRANKLIN, MD.																						
June 23, 1964..	62	13		1.4		150	48	7.4	3.6	1	612	5.9	0.4	1.4	937	570	570		1110	4.0	2	
Sept. 25.....	5.7	12		6.1	3.3	178	63	11	3.6		724	9.1	.4	1.6	1110	703	703	0.3	1300	3.8		

ELKLICK RUN AT ROUTE 36, AT GILMORE, MD.

Sept. 24, 1964.	0.79			0.48					108					132	105			226	7.3	
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GEORGES CREEK AT ROUTE 36, AT GILMORE, MD.

Sept. 24, 1964.	0.92	6.8		0.55	0.60	37	8.4	18	4.7	61	80	23	2.0	6.3	222	127	77		356	6.6	5
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UNNAMED TRIBUTARY TO GEORGES CREEK, ABOUT 700 FEET DOWNSTREAM FROM MOUTH OF ELKLICK RUN, AT GILMORE, MD.

Sept. 25, 1964.	0.01			0.07						1					127	77			201	4.6	
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GEORGES CREEK AT ROUTE 36, ABOVE LONACONING, MD.

Sept. 24, 1964.																			1040		
Sept. 25.....	1.2	15		3.2	0.36	164	54	11	3.2	2	610	12	0.5	1.8	950	631	630		1100	4.9	

HILL RUN AT LONACONING, MD.

Sept. 25, 1964.	0.05			0.24						2					417	287			558	5.0	
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KOONTZ RUN ABOUT 2 MILES UPSTREAM FROM MOUTH NEAR LONACONING, MD.

Sept. 25, 1964.	0.02			0.23						90					102	79			186	7.2	
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KOONTZ RUN AT ROUTE 36 AT LONACONING, MD.

Sept. 25, 1964.	0.37			0.53						14					878	590			1050	6.0	
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GEORGES CREEK AT ROUTE 36, AT PEKIN, MD.

Sept. 24, 1964.	3.4	10		0.16	0.93	129	45	9 8	3.4	32	462	11	0.4	0.8	748	508	482		915	7.1	
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LAUREL RUN ABOVE CUCUMBER HOLLOW, NEAR MOSCOW, MD.

Sept. 24, 1964.	0.04			0.01						62					155	129			257	7.1	
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CUCUMBER HOLLOW ABOVE MOUTH, NEAR MOSCOW, MD.

Sept. 24, 1964.	0.02			0.14						32					55	43			97	6.9	
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MISCELLANEOUS ANALYSES OF STREAMS IN NORTH ATLANTIC SLOPE BASINS--Continued

Chemical analyses, in parts per million, water year October 1963 to September 1964--Continued

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Color
																Calcium, magnesium	Non-carbonate				
POTOMAC RIVER BASIN--Continued																					
WILLS CREEK AT CORRIGANVILLE, MD.																					
July 22, 1964..		2.3		0.08		15	4.5	2.2	1.8	50	17	2.9	0.0	0.1	84	56	15		130	7.2	7
HOFFMAN TUNNEL AT ROUTE 55, NEAR CLARYSVILLE, MD.																					
Sept. 25, 1964.	10.3	12		12	0.32	132	51	3.5	1.6	20	496	4.2	0.5	0.1	766	539	523		934	5.7	5
1-6015. WILLS CREEK NEAR CUMBERLAND, MD.																					
June 24, 1964..	41	6.1		0.51		91	17	4.2	1.9	52	243	6.4	0.2	1.0	440	297	254		572	6.9	2
1-6030. NORTH BRANCH POTOMAC RIVER NEAR CUMBERLAND, MD.																					
Oct. 14, 1963..	170	6.4		0.79	0.06	84	13	75	3.9	101	166	114	0.1	0.4	529	261	178		840	7.3	80
Mar. 11, 1964..	9590	4.4		1.4	.10	14	2.7	7.3	1.3	30	32	2.9	.0	1.2	86	46	22		147	6.7	--
June 24.....	509	6.6		.70	.20	56	10	28	3.2	58	128	44	.2	3.1	359	182	135		500	6.9	7
Sept. 16.....	175	6.0		.81	.23	80	14	68	4.4	98	178	106	.3	.3	530	258	177		821	6.8	--
1-6040. EVITTS CREEK NEAR CUMBERLAND, MD.																					
June 24, 1964..	2.3	2.9		0.39		38	6.8	1.7	1.8	131	17	1.9	0.2	0.3	150	123	16		245	7.5	4
SIDELING HILL CREEK AT U.S. 40, NEAR HANCOCK, MD.																					
July 14, 1964..	9.6	3.4		0.03		10	2.2	7.4	2.2	27	9.6	13	0.0	0.3	72	34	12		108	6.7	6
1-6125. LITTLE TONOLOWAY CREEK NEAR HANCOCK, MD.																					
July 14, 1964..	2.3	6.8		0.11		12	2.9	5.6	2.1	32	14	9.8	0.0	1.0	84	42	16		121	7.7	5
1-6130. POTOMAC RIVER AT HANCOCK, MD.																					
July 14, 1964..	686	1.0		0.36		52	9.1	26	2.6	88	91	41	0.1	0.3	316	167	95		464	7.2	6
TONOLOWAY CREEK AT HANCOCK, MD.																					
July 14, 1964..	16	2.8		0.01		21	4.0	3.0	2.3	65	17	4.4	0.1	0.9	103	69	16		156	7.2	7
LICKING CREEK NEAR HANCOCK, MD.																					
July 15, 1964..	50	3.7		0.03		34	11	1.9	2.1	140	13	3.6	0.0	2.2	145	130	16		254	7.6	6

1-6145. CONOCOCHEAGUE CREEK NEAR FAIRVIEW, MD.

Oct. 14, 1963..	51	0.4		0.16	0.00	59	13	13	3.3	215	22	18	0.1	0.8	236	200	24		420	6.9	60
Mar. 11, 1964..	2120	6.6		1.1	.10	27	4.7	2.9	1.6	80	17	5.0	.2	8.0	119	87	22		195	8.1	--
June 24.....	210	5.6		.12	--	51	10	6.2	2.5	173	20	10	.1	8.4	230	170	28		349	7.2	5
Sept. 17.....	56	.7		.07	.00	58	13	14	3.0	218	24	22	.1	2.3	240	198	20		415	7.5	--

POTOMAC RIVER AT WILLIAMSPORT, MD.

Apr. 20, 1964..								3.8		48	29			0.3					165	7.0	
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1-6180. POTOMAC RIVER AT SHEPHERDSTOWN, W. VA.

Apr. 21, 1964..	9440							3.8		72				1.9					201	7.4	
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POTOMAC RIVER AT BRUNSWICK, MD.

Apr. 21, 1964..								9.1		109				2.7					270	7.4	
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1-6370. LITTLE CATOCTIN CREEK AT HARMONY, MD.

Oct. 31, 1963..		15		0.41	0.01	14	4.9	5.8		56	9.6	6.6	0.1	2.0	92	55	9		141	7.0	
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1-6375. CATOCTIN CREEK NEAR MIDDLETOWN, MD.

Oct. 31, 1963..	22	7.0		0.44	0.01	17	6.0	11		67	11	14	0.1	4.9	115	67	12		191	6.9	
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1-6395. BIG PIPE CREEK AT BRUCEVILLE, MD.

Oct. 30, 1963..	10	3.5		7.1	0.01	22	4.1	4.4		80	6.4	5.4	0.1	1.8	90	72	7		165	7.4	
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1-6405. OWENS CREEK AT LANTZ, MD.

Oct. 30, 1963..	0.4	18		0.32	0.00	7.0	2.8	2.9	0.9	36	4.6	2.0	0.0	0.0	60	29	0		78	7.4	5
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1-6410. HUNTING CREEK AT JIMTOWN, MD.

Oct. 30, 1963..	2.2	12		0.21	0.01	21	6.0	11		86	7.8	9.4	0.1	9.0	123	77	7		208	7.0	
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MISCELLANEOUS ANALYSES OF STREAMS IN NORTH ATLANTIC SLOPE BASINS--Continued

Chemical analyses, in parts per million, water year October 1963 to September 1964--Continued

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Color
																Calcium, magnesium	Non-carbonate				
POTOMAC RIVER BASIN--Continued																					
1-6415. FISHING CREEK NEAR LEWISTOWN, MD.																					
Oct. 29, 1963..	1.5	5.9		0.09	0.00	1.8	0.0	0.6	0.6	6	0.0	1.0	0.0	0.0	19	4	0		16	6.0	5
1-6425. LINGANORE CREEK NEAR FREDERICK, MD.																					
Oct. 29, 1963..	9.0	3.1		0.24	0.01	19	5.5	3.2		78	5.4	4.4	0.0	1.8	84	70	6		157	7.3	
1-6450. SENECA CREEK AT DAWSONVILLE, MD.																					
Oct. 14, 1963..	20	9.0	0.5	1.1	0.12	7.5	2.8	4.0	2.4	36	3.0	4.6	0.1	1.3	53	30	1		88	6.9	3
Mar. 11, 1964..	120	8.3		.38	.03	7.6	2.2	4.0	1.3	20	8.0	5.6	.1	5.3	56	28	12		93	6.6	
June 23.....	42	11		.72	--	7.4	2.8	3.8	2.1	31	3.6	5.2	.0	5.2	63	30	5		84	6.6	
Sept. 16.....	10	8.9		.45	.00	7.0	2.3	4.2	2.2	33	3.0	4.9	.1	2.8	49	27	0		80	6.9	
1-6465. POTOMAC RIVER NEAR WASHINGTON, D. C.																					
Oct. 14, 1963..	1000	0.3		0.77	0.04	40	12	32	3.0	120	90	22	0.2	0.0	264	150	52		439	7.3	4
June 25, 1964..	3370	4.0		.17	.10	34	10	16	2.6	111	51	13	.1	.9	212	128	37		318	7.8	
Sept. 18.....	6900	1.5		.16	.00	39	13	44	2.7	118	109	30	.2	.2	305	150	54		484	7.2	
1-6535. HENSON CREEK AT OXON HILL, MD.																					
Aug. 12, 1964..	1.4	7.7		2.0	0.02	12	5.6	7.9	2.8	42	16	16	0.2	1.0	119	53	19		157	6.8	
PISCATAWAY CREEK AT PISCATAWAY, MD.																					
Aug. 12, 1964..	H2.0	6.9		0.67	0.02	20	5.8	22		42	33	29	0.4	14	171	74	40		266	6.6	
1-6580. MATTAWOMAN CREEK NEAR POMONKEY, MD.																					
May 22, 1964...	15	8.8	0.1	0.99	0.01	4.0	1.0	3.4	0.7	6	8.0	5.2	0.1	0.2	47	14	9		49	5.8	15
GILBERT SWAMP RUN AT NEWPORT, MD.																					
Aug. 12, 1964..	H0.5	3.8		1.6	0.05	6.6	1.8	2.6	1.8	24	3.6	5.0	0.1	0.4	52	24	5		66	6.6	

1-6610. CHAPTICO CREEK AT CHAPTICO, MD.

Aug. 12, 1964..	1.4	11		1.6	0.02	9.5	1.8	2.7	1.1	33	4.0	4.6	0.1	0.6	56	31	4		77	6.8
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ST. CLEMENT CREEK AT CLEMENTS, MD.

Aug. 12, 1964..	H1.0	12		1.2	0.05	13	1.8	3.3	1.1	45	4.4	5.4	0.1	0.5	75	40	3		99	6.8
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McINTOSH RUN AT ROUTE 5, NEAR LEONARDTOWN, MD.

Aug. 12, 1964..		3.2		0.03	0.00	10	2.4	3.8	1.3	36	5.2	5.8	0.1	0.8	71	35	6		89	6.7
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1-6615. ST. MARYS RIVER AT GREAT MILLS, MD.

May 22, 1964...	7.5	7.8		3.0	0.00	2.5	0.5	3.7	0.7	7	2.8	6.0	0.1	0.6	49	8	0		41	6.7	70
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H Estimated.

MISCELLANEOUS ANALYSES OF STREAMS IN NORTH ATLANTIC SLOPE BASINS--Continued

Periodic determinations of suspended-sediment discharge, water year October 1963 to September 1964
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water;
P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water tem- per- ature (°F)	Sam- pling point	Discharge (cfs)	Sediment concentra- tion (ppm)	Sediment discharge (tons per day)	Suspended sediment										Method of analysis
							Percent finer than size indicated, in millimeters										
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	

POTOMAC RIVER BASIN

1-6504.5. WEST FORK OF NORTHWEST BRANCH ANACOSTIA RIVER AT LAYHILL, MD.

Nov. 1, 1963.....	2305	49		0.3	20	0											
Nov. 2.....	0625	48		.2	28	0											
Nov. 6.....	1955	54		14	541	20											
Nov. 6.....	2050	54		26	398	28											
Nov. 6.....	2240	53		59	346	55											
Nov. 6.....	2320	53		72	269	52											
Nov. 7.....	0030	53		72	191	37											
Nov. 7.....	0150	54		69	133	25											
Nov. 7.....	0615	54		49	58	7.7											
Nov. 7.....	0710	54		45	46	5.6											
Nov. 7.....	0745	--		42	41	4.6											
Nov. 7.....	1205	55		17	27	1.2											
Jan. 9, 1964.....	1425	--		64	180	31											
Jan. 9.....	1625	39		37	96	9.6											
Feb. 6.....	1500	39		30	278	23											
Mar. 3.....	0955	40		11	49	1.5											
July 8.....	1335	--		.03	44	0											
Aug. 3.....	1650	68		.3	71	.1											
Aug. 3.....	1810	67		10	292	7.9											
Aug. 3.....	2100	67		2.4	154	1.0											
Sept. 29.....	2030	59		1.2	74	.2											
Sept. 30.....	1045	59		3.1	48	.4											

1-6504.7. NORTHWEST BRANCH ANACOSTIA RIVER TRIBUTARY AT LUTES, MD.

Nov. 1, 1963.....	0835	52		E	1	195	0.5										
Nov. 1.....	2250	50		E	6	14000	230										
Nov. 1.....	2320	50		E	5	3370	40										
Nov. 2.....	0545	48		E	1	232	.6										
Nov. 6.....	1915	55			16	13500	583										
Nov. 6.....	1940	55			22	19300	1150										

1-6504.7. NORTHWEST BRANCH ANACOSTIA RIVER TRIBUTARY AT LUTES, MD.--Continued

Nov. 6, 1963.....	2010	55		25	12500	844											
Nov. 6.....	2100	--		28	13900	1050											
Nov. 6.....	2155	55		33	11400	1020											
Nov. 6.....	2220	--		35	12400	1170											
Nov. 6.....	2320	55		30	7250	587											
Nov. 7.....	0045	54		10	6030	163											
Nov. 7.....	0105	54		10	7250	196											
Nov. 7.....	0650	54		10	3890	105											
Nov. 7.....	0820	--	E	4	5080	50											
Jan. 9, 1964.....	1220	38		31	16300	1360											
Jan. 9.....	1300	39		19	14800	759											
Jan. 9.....	1355	39		12	6290	204											
Jan. 9.....	1545	40		6.0	3200	52											
Feb. 6.....	1440	41		8.0	6240	135											
Mar. 3.....	1005	40		3.9	4520	48											
Apr. 8.....	1100	--		4.1	4180	46											
June 8.....	1630	73	E	6	4190	70											
July 8.....	1325	--	E	3	30000	240											
Aug. 3.....	1700	67		45	16600	2020											
Aug. 3.....	1825	67		5.7	3020	46											
Aug. 3.....	2220	67		1.6	345	1.5											
Sept. 29.....	2015	61		2.7	2440	18											
Sept. 30.....	0740	60		2.0	837	4.5											

E Estimated.

PART 3. OHIO RIVER BASIN

MONONGAHELA RIVER BASIN

3-765. YOUGHIOGHENY RIVER AT FRIENDSVILLE, MD.

LOCATION.--Temperature recorder at gaging station on left bank 0.7 mile upstream from bridge on State Highway 42 at Friendsville, Garrett County, and 1.5 miles upstream from Bear Creek.

DRAINAGE AREA.--295 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1962 to September 1964.

EXTREMES, 1963-64.--Water temperatures: Maximum, 83°F July 22, 27, 28; minimum, freezing point on many days during winter months.

EXTREMES, 1962-64.--Water temperatures: Maximum, July 22, 27, 28, 1964; minimum, freezing point on many days during winter months.

REMARKS.--Records fair, probably because of friction in recorder.

Temperature (°F) of water, water year October 1963 to September 1964
(Continuous ethyl alcohol-actuated thermograph)

Month	Day																																	Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
October																																		
Maximum	59	61	63	60	58	56	57	57	57	57	57	57	56	55	56	57	58	58	59	58	58	58	58	61	59	61	59	59	57	51	51	58		
Minimum	55	56	59	57	52	50	51	56	52	51	53	54	50	48	52	52	53	54	55	54	52	54	55	56	56	55	56	50	49	49	49	53		
November																																		
Maximum	52	51	46	47	50	51	51	49	49	48	49	48	47	45	44	44	47	50	50	47	50	49	50	49	43	44	46	45	44	40	--	48		
Minimum	51	45	43	41	47	50	48	48	47	46	47	46	44	42	41	43	44	46	47	44	47	47	49	43	40	42	44	43	40	37	--	45		
December																																		
Maximum	37	39	39	39	39	39	37	36	36	35	36	36	37	36	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34		
Minimum	36	36	37	36	37	37	36	35	35	33	34	35	36	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34		
January																																		
Maximum	32	32	32	32	32	32	34	35	36	35	32	32	32	32	32	32	32	32	32	33	35	35	36	35	36	35	36	36	34	35	35	34		
Minimum	32	32	32	32	32	32	32	33	34	32	32	32	32	32	32	32	32	32	32	32	32	32	33	34	35	35	35	34	32	33	32	33		
February																																		
Maximum	35	35	35	34	36	35	35	35	32	34	34	32	34	34	33	32	35	35	32	32	32	32	32	32	32	32	32	32	32	--	--	33		
Minimum	35	35	32	32	32	35	35	32	32	32	32	32	32	33	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	--	--	32		
March																																		
Maximum	32	36	36	36	37	39	42	41	43	43	41	38	40	41	41	42	42	42	41	40	40	39	42	44	45	47	43	46	46	44	39	41		
Minimum	32	32	34	35	36	37	39	41	41	41	38	37	36	39	41	40	41	39	37	39	39	38	37	39	42	42	40	40	42	38	37	38		
April																																		
Maximum	42	41	42	43	46	46	47	48	45	47	50	51	51	52	51	50	54	58	58	57	55	55	57	57	57	57	57	58	56	52	--	51		
Minimum	38	38	41	41	42	45	45	44	43	43	45	47	48	48	48	45	46	48	56	53	52	51	51	51	50	52	54	52	52	50	--	47		
May																																		
Maximum	51	54	56	59	60	61	63	63	66	64	63	62	62	59	61	63	64	65	67	69	67	68	70	72	72	66	66	63	63	64	63	63		
Minimum	50	50	51	53	54	54	57	58	60	61	59	57	59	54	55	61	61	59	63	59	60	61	67	63	59	63	59	55	57	59	58	58		
June																																		
Maximum	61	63	61	64	66	67	69	70	72	72	74	73	73	73	78	71	68	70	73	73	73	74	77	73	72	73	75	73	76	76	--	71		
Minimum	59	58	59	57	59	62	63	66	65	67	66	64	67	68	69	65	61	62	68	68	68	69	68	69	65	65	66	64	67	70	--	65		
July																																		
Maximum	73	73	76	72	73	76	73	70	71	75	76	72	69	70	72	74	77	78	82	82	82	83	81	81	81	80	83	83	80	78	77	77		
Minimum	68	68	68	68	66	66	66	66	66	67	67	69	66	64	65	67	68	69	70	73	75	74	74	73	73	72	74	73	73	70	68	69		
August																																		
Maximum	76	76	74	70	75	76	73	73	72	72	74	71	67	68	71	68	73	73	69	69	73	76	76	75	76	71	73	74	76	79	79	73		
Minimum	67	70	69	66	68	68	67	69	65	65	66	67	64	62	61	61	64	67	64	62	65	68	62	69	67	67	66	68	68	70	72	66		
September																																		
Maximum	73	73	72	73	73	72	73	75	75	75	75	69	68	66	65	66	69	67	66	66	66	68	68	66	63	63	65	63	60	60	--	68		
Minimum	66	65	63	64	67	62	62	64	66	66	67	63	59	55	58	60	62	65	65	63	63	61	63	62	59	56	59	58	58	58	--	62		

MISCELLANEOUS ANALYSES OF STREAMS IN OHIO RIVER BASIN

Chemical analyses, in parts per million, water year October 1963 to September 1964

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃		Total acidity as H ⁺	Specific conductance (micro-mhos at 25°C)	pH	Color	
																Calcium, magnesium	Non-carbonate					
YOUGHIOGHENY RIVER BASIN																						
3-754. LAUREL RUN AT CRELLIN, MD.																						
Mar. 11, 1964..	200	5.2	0.4	2.5	0.32	6.0	2.6	0.3	0.5		49	0.3	0.1	0.0	86	25	15	0.5	205	3.6	0	
Sept. 1.....	.8	24		3.6	1.1	38	16	1.0	1.6		320	.5	.2	.3	488	160	160	3.7	1100	2.9		
YOUGHIOGHENY RIVER ABOVE MOUTH OF LITTLE YOUGHIOGHENY RIVER, NEAR OAKLAND, MD.																						
Sept. 1, 1964..	10	3.9		0.00	0.06	15	3.0	2.9	1.9	3	50	2.9	0.0	0.8	84	50	48		138	5.6		
LITTLE YOUGHIOGHENY RIVER NEAR OAKLAND, MD.																						
Sept. 1, 1964..	2.0	2.2		0.36	0.03	21	1.3	16	4.5	66	14	15	0.2	15	131	58	4		212	6.4		
3-755. YOUGHIOGHENY RIVER NEAR OAKLAND, MD.																						
Mar. 11, 1964..	1260	3.6		1.4	0.12	3.8	1.5	1.1	0.7		14	2.2	0.1	1.0	34	15	15	0.0	58	4.6	1	
YOUGHIOGHENY RIVER ABOVE MILLERS RUN, MD.																						
Sept. 2, 1964..	6.2	1.6		0.04	0.02	12	6.8	6.6	2.6	2	44	7.1	0.1	3.9	102	58	43		168	6.0		
3-780. CASSELMAN RIVER AT GRANTSVILLE, MD.																						
Aug. 31, 1964..	4.8	2.7		0.01	0.08	26	8.8	3.6	1.6	24	83	3.5	0.1	0.2	144	101	82		237	6.6		

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