1965

Water Resources Data for Maryland and Delaware

Part 2. Water Quality Records

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Prepared in cooperation with the States of Maryland and Delaware and with other agencies

United States Department of the Interior
Geological Survey-Water Resources Division

WATER RESOURCES DATA FOR MARYLAND AND DELAWARE

1965

Part 2. Water Quality Records

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
District Chief, Water Resources Division
U.S. Geological Survey
724 York Road
Towson, Maryland 21204

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

Water Resources Data for Maryland and Delaware, 1965

Part 1. Surface Water Records

CONTENTS

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

ILLUSTRATION

WATER RESOURCES DATA FOR MARYLAND AND DELAWARE, 1965

Part 2. Water Quality Records

INTRODUCTION

Water-resources investigations of the U.S. Geological Survey include the collection of water quality data on the chemical and physical characteristics of surface- and ground-water supplies of the Nation. These data for the 1965 water year for the quality of surface waters in Maryland and Delaware are presented in this report. The data were collected 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 chief, Harrisburg, Pa.

Water quality information is presented for chemical quality, fluvial sediment, and water temperatures. The chemical quality includes concentrations of individual dissolved constituents and certain properties or characteristics such as hardness, specific conductance, and pH. Fluvial sediment information is given for suspended-sediment discharges and concentrations and for particle-size distribution of suspended sediment. Water temperature data represent once-daily observations except for stations where a continuous temperature recorder furnishes information from which daily minimums and maximums are obtained.

The Geological Survey has published the annual series of water-supply papers, "Quality of Surface Waters of the United States," from 1941 through 1963 which contained the chemical quality, temperature, and suspended sediment data of the water. Each volume covered an area whose 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 paper series. (See table, p. 10.) These publications are available in most public libraries. Beginning with the 1964 water year, water quality records for surface water obtained by the Geological survey were published in

a new series of annual releases on a state boundary basis. This report is primarily for local and immediate use, and its distribution is limited. The data for the 1964 and 1965 water years will be combined and published in Geological Survey Water-Supply Papers, Nos. 1954 and 1956.

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,
Roy L. Orndorff, 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 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. In this report it represents the total fluids measured in the stream.

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 at the time of sampling is reported instead of the daily mean, the heading of the discharge column is "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 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 solution in terms of the interreacting values of the electrically charged particles, or ions. 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. (See table, p. 4.)

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.

Conversion factors: Parts per million to equivalents per million

Ion	Multiply by
Aluminum (Al^{+3})	0.11119
Barium (Ba^{+2})	.01456
Bicarbonate (HCO_3^{-1})	.01639
Bromide (Br^{-1})	.01251
Calcium (Ca^{+2})	.04990
Carbonate (CO_3^{-2})	.03333
Chloride (Cl^{-1})	.02821
Chromium (Cr^{+6})	.11539
Cobalt (Co^{+2})	.03394
Copper (Cu^{+2})	.03148
Fluoride (F^{-1})	.05264
Hydrogen (H^{+1})	.99209
Hydroxide (OH^{-1})	.05880
Iodide (I^{-1})	.00788
Iron (Fe^{+3})	.05372
Lead (Pb^{+2})	.00965
Lithium (Li^{+1})	.14411
Magnesium (Mg^{+2})	.08226
Manganese (Mn^{+2})	.03640
Nickel (Ni^{+2})	.03406
Nitrate (NO_3^{-1})	.01613
Nitrite (NO_2^{-1})	.02174
Phosphate (PO_4^{-3})	.03159
Potassium (K^{+1})	.02557
Sodium (Na^{+1})	.04350
Strontium (Sr^{+2})	.02283
Sulfate (SO_4^{-2})	.02083
Zinc (Zn^{+2})	.03060

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 agrees closely with recommendations made by the American Geophysical Union

Subcommittee on sediment terminology (Lane and others, 1947, p. 937). The classification is as follows:

Clay: Smaller than 0.004 mm.
Silt: Between 0.004 and 0.062 mm.
Sand: Betwen 0.062 and 2.0 mm.
Gravel: Between 2.0 and 64.0 mm.

The particle-size distributions given in this report are not necessarily representative of the particle sizes of sediment in transport in the natural stream. Most of the organic matter is removed and the sample is subjected to mechanical and chemical dispersion before analysis of the silt and clay.

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 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; 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 that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water; it includes chemical and biochemical precipitates and decomposed organic material such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are: Degree of slope, length of slope, soil characteristics, land usage, and quantity and intensity of precipitation.

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 is 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 dissolved-solids content in the water. The following general relations are applicable:

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

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

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." 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 that continuously and automatically records, on a chart, the water temperature of a stream. "Temperature recorder" is the term used to indicate the location of the thermograph.

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, 1965, is called the "1965 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 whose complete identification number is 01-4821.00.

COLLECTION AND EXAMINATION OF SAMPLES

Water samples for analyses usually are collected at or near points on streams where gaging stations are maintained by the U.S. Geological Survey for measurement of water discharge. Discharge records for streams in Maryland and Delaware have been released in the report "Water Resources Data for Maryland and Delaware, 1965, Part 1. Surface Water Records."

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

Data on the quality of surface water were collected daily at some sites and less frequently at other sites; the locations of the sites are shown on the map on page 67.

Solutes

The methods of collecting and compositing water samples for determining the kinds and concentrations

of solutes are described by Rainwater and Thatcher (1960). One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled at several verticals across the channel to determine accurately the solute load.

The daily chemical-quality data in this report, were collected by continuous recorders of selected water-quality parameters--specific conductance and dissolved oxygen. At sites where chemical quality data were collected less frequently than daily, the data represent the conditions only at the time of sampling.

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 not reflect normal variations in water temperature. Most large streams have a small diurnal variation in water temperature; small, 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 average of maximum daily and minimum daily temperatures.

Sediment

At some stations, suspended-sediment samples were collected daily with depth-integrating cable-suspended samplers from a fixed sampling point at one vertical in the cross section. A hand sampler was used at many stations during periods of low flow. Depth-integrated samples were collected periodically at many verticals in the cross section to determine the ratio of the cross sectional distribution of the concentration of suspended sediment to the daily sampling verticals.

During periods of high or rapidly changing flow, samples were taken twice or more often throughout the day at most stations. For periods when no samples were collected, daily loads of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

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

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

WATER SUPPLY PAPERS

The table below shows the annual series of Water-Supply Papers that give information on quality of surface waters in Maryland and Delaware. Data for North Atlantic slope basins are given in part 1, and for Ohio River basin in part 3.

Water-supply paper numbers and parts, water years 1941-65

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	----	----
1943	970	----	1955	1400	----	----
1944	1022	----	1956	1450	----	----
1945	1030	----	1957	1520	----	----
1946	1050	----	1958	1571	----	----
1947	1102	----	1959	----	1641	1642
1948	----	1132	1960	----	A1741	A1742
1949	----	1162	1961	----	1881	A1882
1950	----	1186	1962	----	1941	1942
1951	----	1197	1963	----	1947	1948
1952	----	1250	1964-65		B1954	C1956

A In preparation.
B Part 1 to be published.
C Part 3 to be published.

SELECTED REFERENCES

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: Minneapolis, Minn., St. Anthony Falls Hydraulic Lab.,

Report 12, 1957, Some fundamentals of particle-size analysis: Washington, U.S. Govt. Printing Office, 55 p.

Report AA, 1959, Federal Inter-agency sedimentation instruments and reports: Minneapolis, Minn., St. Anthony Falls Hydraulic Lab., 41 p.

Report 13, 1961, The single stage sampler for suspended sediment: Washington, U.S. Govt. Printing Office, 105 p.

Report 14, 1963, Determinations of fluvial sediment discharge: Washington, U.S. Govt. Printing Office, 151 p.

1-4785. WHITE CLAY CREEK ABOVE NEWARK, DEL.

LOCATION.--At gaging station on right bank at downstream wingwall of abandoned bridge, 0.9 mile downstream from small tributary, 1.7 miles southeast of Delaware-Maryland-Pennsylvania State corner, 2.1 miles downstream from Delaware State Line, and 2.2 miles north of Newark, New Castle County. Sediment samples collected at bridge, 0.8 mile upstream from gaging station.
DRAINAGE AREA.--66.7 square miles.
RECORDS AVAILABLE.--Sediment records: October 1964 to September 1965.

Periodic determinations of suspended-sediment discharge and particle-size, water year October 1964 to September 1965
(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 temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters										Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Oct. 14, 1964	1405	54		20	1	0.1												
Oct. 16	1050	55		21	3	.2												
Oct. 22	1410	52		24	3	.2												
Oct. 24	1145	46		25	3	.2												
Oct. 27	1705	56		26	2	.1												
Oct. 30	1510	57		26	2	.1												
Nov. 4	1430	50		25	1	.1												
Nov. 7	1530	49		25	1	.1												
Nov. 9	1400	49		25	1	.1												
Nov. 13	1500	54		25	1	.1												
Nov. 20	1410	51		33	1	.1												
Nov. 23	1640	--		29	1	.1												
Nov. 27	1300	47		39	15	1.6												
Jan. 26, 1965	1500	34		71	20	3.8												
Jan. 26	1530	34		73	34	6.7												
Jan. 29	1200	35		52	5	.7												
Feb. 1	1215	38		50	7	.9												
Feb. 4	1330	34		44	4	.5												
Feb. 8	1300	42		268	320	230												
Feb. 11	1300	45		112	30	9.1												
Feb. 15	1330	38		70	4	.8												
Feb. 18	1330	36		65	2	.4												
Feb. 22	1340	40		57	1	.2												
Feb. 25	1300	40		201	150	81		27	38	47	67	78	88	98	100			SBWC
Feb. 28	1330	35		67	30	5.4												
Mar. 2	1345	45		60	1	.2												
Mar. 5	1400	45		394	92	98												
Mar. 9	1300	45		65	5	.9												
Mar. 12	1330	40		57	4	.6												
Mar. 16	1330	45		54	2	.3												

Mar. 19, 1965	1345	50		68	5	0.9											
Mar. 23	1400	45		60	1	.2											
Mar. 26	1300	45		199	150	81											
Mar. 30	1400	45		80	10	2.2											
Apr. 2	1330	45		75	5	1.0											
Apr. 6	1300	45		61	< 1	.1											
Apr. 9	1330	50		75	< 1	T											
Apr. 13	1400	50		55	< 1	T											
Apr. 16	1330	50		87	6	1.4											
Apr. 20	1400	50		67	5	.9											
Apr. 23	1400	55		57	4	.6											
Apr. 26	1300	50		62	3	.5											
Apr. 30	1430	55		52	1	.1											
May 3	1400	65		49	6	.8											
May 7	1330	55		52	10	1.4											
May 10	1330	65		50	18	2.4											
May 14	1330	60		41	6	.7											
May 21	1300	65		38	8	.8											
May 24	1400	65		39	12	1.3											
May 28	1300	70		58	40	6.3											
May 31	1400	60		53	12	1.7											
June 4	1300	60		43	40	4.6											
June 7	1300	65		36	20	1.9											
June 11	1330	65		39	35	3.7											
June 14	1400	65		36	8	.8											
June 18	1330	60		34	15	1.4											
June 21	1330	65		29	5	.4											
June 25	1400	70		32	22	1.9											
June 28	1330	75		25	10	.7											
July 9	1430	75		18	20	1.0											

T Less than 0.05 ton.

1-4785. WHITE CLAY CREEK ABOVE NEWARK, DEL.--Continued

Periodic determinations of suspended-sediment discharge and particle-size, water year October 1964 to September 1965--Continued
(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 temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters										Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
July 12, 1965	1330	65		68	130	24												
July 16	1400	75		31	12	1.0												
July 19	1400	75		29	14	1.1												
July 23	1330	75		38	9	.9												
July 26	1300	75		25	13	.9												
July 30	1400	70		22	12	.7												
Aug. 2	1300	70		67	15	2.7												
Aug. 6	1300	70		23	11	.7												
Aug. 9	1400	75		28	22	1.7												
Aug. 13	1300	75		18	12	.6												
Aug. 16	1300	75		18	24	1.2												
Aug. 20	1430	75		23	30	1.9												
Aug. 23	1330	70		27	39	2.8												
Aug. 27	1300	70		20	20	1.1												
Aug. 30	1330	65		14	18	.7												
Sept. 3	1300	65		18	17	.8												
Sept. 6	1300	65		16	20	.9												
Sept. 10	1330	70		14	6	.2												
Sept. 17	1330	70		15	12	.5												
Sept. 20	1400	75		15	11	.4												
Sept. 24	1330	75		16	12	.5												
Sept. 27	1400	65		15	4	.2												

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 1965.
EXTREMES, 1964-65.--Water temperatures: Maximum, 82°F July 26 and Aug. 10, 17; minimum, freezing point on several days in January and February.
EXTREMES, 1953-65.--Water temperatures: Maximum, 87°F July 17, Aug. 2, 6, 1955, and July 19, 1963; minimum, freezing point on several days during winter months.

Temperature (°F) of water, water year October 1964 to September 1965

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	64	64	62	61	57	56	54	55	55	52	51	53	55	56	57	61	62	59	55	53	53	52	50	51	53	54	55	56	57	53	56
Minimum	58	60	62	60	56	53	52	50	50	51	48	46	48	51	51	54	57	59	55	53	51	50	48	46	45	47	50	51	53	53	49	52
November																																
Maximum	52	51	51	52	51	52	51	50	51	50	52	52	54	54	51	52	52	50	50	53	50	43	39	40	50	52	51	47	48	46	--	50
Minimum	47	47	49	48	47	50	48	47	47	47	48	49	50	50	48	49	49	48	48	50	43	38	36	37	39	50	47	45	46	40	--	46
December																																
Maximum	40	37	42	46	47	46	41	38	40	38	40	44	45	46	42	37	40	41	36	37	37	39	39	43	47	50	51	48	44	44	43	42
Minimum	36	36	37	42	46	41	38	35	37	36	36	40	44	42	37	36	37	36	34	35	36	37	37	39	43	47	48	44	42	43	42	39
January																																
Maximum	42	39	38	36	37	39	37	41	43	43	35	34	36	36	34	33	33	33	33	33	32	32	35	35	36	39	39	37	35	34	33	36
Minimum	39	37	36	34	35	37	35	37	41	34	34	33	34	34	33	33	33	33	33	32	32	32	32	34	35	36	37	34	34	33	32	34
February																																
Maximum	32	33	33	33	33	33	37	43	44	44	45	46	46	44	39	40	42	44	44	38	39	39	37	39	42	41	38	41	--	--	--	40
Minimum	32	32	33	32	32	32	33	37	43	43	42	44	44	39	36	37	40	42	38	34	35	37	34	35	39	37	35	37	--	--	--	37
March																																
Maximum	41	44	44	47	47	44	46	46	46	45	43	43	43	43	45	46	45	43	48	45	41	42	46	47	47	43	47	48	47	47	46	45
Minimum	39	40	42	43	43	41	41	43	44	43	40	39	38	39	42	41	40	40	43	39	36	38	41	45	43	42	42	41	45	43	41	41
April																																
Maximum	47	46	47	48	50	51	51	53	53	54	52	57	56	54	53	53	54	53	53	53	57	61	59	57	55	52	53	54	59	61	--	54
Minimum	41	43	40	41	42	48	49	48	51	48	48	50	51	48	49	49	47	50	49	47	49	54	55	52	50	49	51	52	52	53	--	49
May																																
Maximum	62	64	68	70	69	65	64	58	64	69	72	70	69	67	68	68	70	69	70	70	68	68	72	70	66	72	75	74	72	67	65	68
Minimum	57	58	60	62	62	60	58	57	58	62	67	66	65	62	62	63	66	65	64	67	64	64	66	64	63	66	70	71	67	62	60	63
June																																
Maximum	70	70	69	67	68	70	74	77	75	76	76	76	74	70	67	64	64	63	66	70	73	76	79	76	74	73	72	76	78	76	--	72
Minimum	64	67	66	62	62	64	67	71	72	72	71	72	70	66	64	62	61	62	61	63	66	70	72	72	68	66	66	67	72	73	--	67
July																																
Maximum	76	74	75	78	74	74	72	77	80	78	77	72	75	80	78	79	79	80	78	76	75	73	74	78	80	82	77	76	77	76	75	77
Minimum	70	67	69	70	70	68	68	70	73	77	69	68	70	74	77	74	75	76	74	70	68	68	70	72	76	76	75	72	71	70	69	71
August																																
Maximum	73	75	74	74	74	76	80	80	80	82	77	77	77	77	80	81	82	81	81	80	76	74	72	73	71	74	77	78	72	68	67	76
Minimum	71	71	70	68	71	71	74	75	76	77	74	70	71	72	74	75	76	77	77	74	70	71	70	68	68	70	72	72	66	64	62	72
September																																
Maximum	70	71	70	69	69	70	71	72	73	76	74	71	68	70	70	73	72	76	78	76	78	78	78	76	73	66	64	62	63	63	--	71
Minimum	65	68	66	65	64	65	65	66	69	70	71	68	67	67	68	69	70	71	73	74	74	74	74	73	66	62	60	58	58	61	--	67

1-4815. BRANDYWINE CREEK AT WILMINGTON, DEL.

LOCATION.--At gaging station on right bank 0.2 mile downstream from Henry Clay Bridge, in Wilmington, New Castle County, and 4.2 miles upstream from mouth. Sediment samples are collected at the Henry Clay Bridge.
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, July 1962 to September 1965.
EXTREMES, 1964-65.--Sediment concentrations: Maximum daily, 1,200 ppm Feb. 8; minimum daily, 3 ppm Feb. 16.
Sediment loads: Maximum daily, 22,000 tons Feb. 8; minimum daily, 1 ton Nov. 6, 24, and Aug. 21.
EXTREMES, 1946-61, 1962-65.--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 Jan. 17-22, 30, 31, and Feb. 1-6. Published and unpublished chemical-quality data and specific conductance, pH, and temperature of sediment samples available in the district office at Towson, Md. Streamflow records for water year October 1964 to September 1965 available in the subdistrict office at Dover, Del.

Chemical analyses, in parts per million, water year October 1964 to September 1965

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^{+1}	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Oct. 9, 1964	98	--		--	--	--	--	A17	--	68	29	16	--	10	152	80	25		242	6.7	4
Nov. 30	143	--		--	--	--	--	A12	--	50	26	13	--	11	137	69	28		203	6.4	15
Feb. 8, 1965	5910	6.8		0.01	0.00	8.8	2.7	6.6	4.0	16	17	9.8	0.3	10	84	33	20		118	6.4	18
Mar. 30	725	--		--	--	--	--	A9.7	--	39	22	10	--	9.8	108	56	24		168	6.8	7
June 25	138	--		--	--	--	--	A17	--	64	25	14	--	7.0	140	67	15		210	7.3	10
July 28	103	7.9		.00	.00	20	6.6	17	2.6	76	29	15	.2	5.9	152	76	17		237	7.1	10
Aug. 26	110	15		.00	.00	18	6.1	15	2.8	65	26	14	.4	6.7	137	70	20		210	7.1	10
Sept. 28	94	8.7		.00	.00	18	5.4	13	4.2	58	26	14	.3	5.6	132	68	20		210	6.9	12

A Calculated Na plus K, reported as Na.

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

Suspended sediment, water year October 1964 to September 1965

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	136	14	5	104	11	3	126	12	4
2	169	15	7	105	11	3	119	10	3
3	318	44	38	107	11	3	125	8	3
4	145	31	12	108	11	3	193	12	6
5	122	29	10	108	8	2	385	26	27
6	112	26	8	106	5	1	663	42	75
7	105	22	6	105	6	2	395	25	27
8	98	18	5	106	7	2	227	14	9
9	98	15	4	107	8	2	198	6	3
10	101	12	3	106	8	2	173	5	2
11	97	12	3	106	7	2	162	5	2
12	100	12	3	107	6	2	527	26 A	37
13	98	12	3	106	6	2	735	32 A	64
14	99	10	3	106	8	2	356	10 A	10
15	100	9	2	102	8	2	255	7	5
16	99	8	2	104	8	2	203	6	3
17	294	30	24	105	10	3	193	6	3
18	319	39	34	104	9	3	196	6	3
19	172	20	9	108	8	2	163	6	3
20	138	13	5	133	10	4	178	6	3
21	120	11	4	156	10	4	176	5	2
22	115	13	4	126	8	3	173	5	2
23	111	15	4	110	6	2	172	5	2
24	108	14	4	106	4	1	174	5	2
25	110	13	4	163	20	9	193	5	3
26	110	13	4	1190	480 S	1900	225	7	4
27	111	12	4	339	65	59	846	180 S	940
28	107	11	3	195	35	18	1730	510 S	2800
29	108	10	3	160	18	8	568	60	92
30	110	10	3	143	14	5	376	20	20
31	105	10	3	--	--	--	314	13	11
Total	4135	--	226	4831	--	2056	10519	--	4170

	JANUARY			FEBRUARY			MARCH		
1	262	9	6	200	5	3	377	10	10
2	258	6	4	200	5	3	353	9	9
3	318	6	5	190	5	3	344	10	9
4	254	6	4	180	5	2	340	11	10
5	251	5	3	170	5	2	875	230 S	820
6	243	5	3	200	5	3	1220	300	990
7	223	5	3	968	220 B	2000	606	45	74
8	287	10	8	5910	1200 S	22000	493	13	17
9	416	18	20	1140	140	430	448	10	12
10	495	19	25	797	33	71	415	8	9
11	399	14	15	940	47 S	120	384	8	8
12	327	5	4	697	23	43	359	8	8
13	307	5	4	610	14	23	349	8	8
14	290	4	3	520	8	11	349	8	8
15	204	4	2	469	5	6	361	8	8
16	199	4	2	447	3	4	349	8	8
17	175	4	2	430	5	6	334	7	6
18	170	5	2	411	8	9	408	6	7
19	165	5	2	395	7	7	459	6	7
20	160	4	2	318	6	5	436	5	6
21	180	4	2	358	6	6	383	5	5
22	210	4	2	365	6	6	387	4	4
23	288	5	4	292	5	4	379	4	4
24	367	5	5	304	5	4	408	5	6
25	352	5	5	608	45	74	422	7	8
26	388	7	7	845	120	270	651	14	25
27	450	20	24	426	14	16	733	20	40
28	350	22	21	401	14	15	506	9	12
29	311	16	13	--	--	--	612	12	20
30	205	7	4	--	--	--	725	16	31
31	200	5	3	--	--	--	514	5	7
Total	8704	--	209	18791	--	25146	14979	--	2196

S Computed by subdividing day.
A Computed from partly estimated-concentration graph.
B Computed from estimated-concentration graph.

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

Suspended sediment, water year October 1964 to September 1965--Continued

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	454	4	5	318	6	5	191	10	5
2	509	7	10	322	6	5	191	11	6
3	545	9	13	323	6	5	550	33	S 52
4	468	8	10	305	6	5	311	18	15
5	423	7	8	294	6	5	213	14	8
6	405	6	7	315	8	7	183	13	6
7	509	10	14	310	7	6	173	12	6
8	552	12	18	332	8	7	165	12	5
9	517	11	15	314	7	6	187	20	10
10	458	11	14	300	7	6	173	20	9
11	410	11	12	278	7	5	162	18	8
12	398	10	11	256	6	4	162	20	9
13	363	12	12	248	8	5	145	18	7
14	339	10	9	236	8	5	136	16	6
15	354	8	8	234	7	4	136	18	7
16	562	14	21	229	6	4	149	16	6
17	471	14	18	291	8	6	153	14	6
18	391	9	10	261	8	6	153	14	6
19	464	10	13	225	10	6	153	14	6
20	452	9	11	213	11	6	151	14	6
21	385	8	8	198	11	6	137	12	4
22	364	8	8	198	10	5	131	12	4
23	347	7	7	198	10	5	124	12	4
24	359	6	6	200	11	6	141	17	6
25	343	6	6	207	13	7	138	17	6
26	390	7	7	204	13	7	124	17	6
27	447	9	11	215	12	7	116	17	5
28	389	9	9	292	19	15	113	17	5
29	358	8	8	269	16	12	114	17	5
30	340	7	6	263	14	10	118	20	6
31	--	--	--	205	10	6	--	--	--
Total	12766	--	315	8053	--	194	5093	--	240

	JULY			AUGUST			SEPTEMBER		
1	117	22	7	109	14	4	93	11	3
2	108	20	6	245	19	13	332	32	29
3	105	18	5	176	13	6	182	20	10
4	131	23	8	120	9	3	118	18	6
5	414	160	S 390	196	23	12	104	17	5
6	404	250	270	170	21	10	100	16	4
7	154	48	20	128	16	6	97	14	4
8	136	18	7	113	15	5	93	11	3
9	127	10	3	115	14	4	91	8	2
10	120	10	3	121	14	5	91	7	2
11	1760	260	S 1700	108	12	3	90	7	2
12	959	160	410	100	12	3	89	7	2
13	275	45	33	95	10	3	131	13	5
14	194	24	13	166	22	10	157	22	9
15	165	19	8	129	15	5	126	17	6
16	151	16	7	107	11	3	110	12	4
17	137	14	5	97	10	3	101	10	3
18	138	12	4	93	8	2	96	10	3
19	169	20	9	94	7	2	95	11	3
20	149	16	6	93	6	2	95	11	3
21	122	15	5	87	6	1	94	10	3
22	116	14	4	141	16	6	90	9	2
23	116	12	4	170	21	10	88	8	2
24	118	12	4	159	20	9	93	10	3
25	119	12	4	118	16	5	272	25	18
26	114	12	4	110	15	4	131	18	6
27	106	12	3	117	14	4	105	17	5
28	103	10	3	107	12	3	94	16	4
29	100	10	3	94	10	3	92	13	3
30	183	--	E 20	85	8	2	92	11	3
31	117	35	11	83	8	2	--	--	--
Total	7227	--	2979	3846	--	153	3542	--	157

Total discharge for year (cfs-days) 102486
Total load for year (tons) 38041

E Estimated.
S Computed by subdividing day.

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

Particle-size analyses of suspended sediment, water year October 1964 to September 1965
(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 temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters										Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Feb. 8, 1965	1530	40		7100	620			32	48	59	78	88	94	98	100			SCBW
Feb. 8	1530	40		7100	620			13	25	37	60	88	94	98	100			BN
July 11	1600	62		3010	320			57	73	91	98	99	100	--	--			SCPW

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 1965.
Water temperatures: October 1956 to September 1965.
EXTREMES, 1964-65.--Specific conductance: Maximum daily, 12,300 micromhos Nov. 23; minimum daily, 200 micromhos Feb. 19, 20, 23, 24, 27.
Dissolved oxygen: Maximum daily, 12.6 ppm Feb. 25; minimum daily, 0.3 ppm May 4.
Water temperatures: Maximum, 80°F on several days during July and August; minimum, freezing point Feb. 1, 4-7.
EXTREMES, 1956-65.--Specific conductance (1963-65): Maximum daily, 12,800 micromhos Nov. 1, 1963; minimum daily, 200 micromhos Feb. 19, 20, 23, 24, 27, 1965.
Dissolved oxygen (1963-65): Maximum daily, 12.9 ppm Feb. 13, 19, 1964; minimum daily, 0.1 ppm May 30 and June 2, 13, 1964.
Water temperatures: Maximum, 84°F on several days in 1961; minimum, freezing point on many days during winter months.
REMARKS.--Records of daily specific conductance for period August 1955 to September 1963 and of daily dissolved oxygen for the period November 1962 to September 1963 available in the Water Resources Division office, Trenton, N. J.

Specific conductance (micromhos at 25°C), dissolved oxygen, in parts per million, and temperature (°F), water year October 1964 to September 1965

Day	OCTOBER									NOVEMBER								
	Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)			Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)		
	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
1	10200	5850	7737	4.6	1.6	3.0	66	65	66	9000	6600	7817						
2	10300	5950	7867	3.7	1.4	2.0	65	65	65	8200	7000	--						
3	9700	5550	7394	2.7	1.2	--	65	65	--	--	--	--						
4	9350	5450	7340	--	--	--	--	--	--	--	--	--						
5	9500	5400	7350	--	--	--	--	--	--	--	--	--						
6	9500	5750	7467	--	--	--	--	--	--	9100	7200	--						
7	9600	5700	7625	--	--	--	--	--	--	9600	7400	8396						
8	10400	6200	8067	--	--	--	--	--	--	9500	7300	8350						
9	10300	6200	8042	5.9	1.6	3.7	62	62	62	9400	7200	8288						
10	9400	5700	7529	6.2	3.5	4.8	62	62	62	9500	7200	8263						
11	9100	5400	6992	--	--	--	--	--	--	9500	7400	8388						
12	10000	6000	7654	--	--	--	--	--	--	9400	7400	8467						
13	9400	5600	7283	--	--	--	--	--	--	9500	7600	8442						
14	9900	5800	--	--	--	--	--	--	--	9100	7100	8146						
15	9600	5900	7592	7.2	3.0	--	61	61	--	9200	7400	8200						
16	10200	6000	7796	5.6	2.4	4.4	61	61	61	9500	7300	8363						
17	10200	6400	8013	6.6	2.8	4.9	61	61	61	9400	7400	8483						
18	10400	6100	8075	4.3	3.1	--	61	61	--	9600	7500	8575						
19	10200	5700	7829	--	--	--	--	--	--	10200	7500	8792						
20	10200	5800	7667	--	--	--	--	--	--	10200	7600	9113						
21	10500	6200	8200	--	--	--	--	--	--	9700	7100	8617						
22	9800	5800	7721	--	--	--	--	--	--	9200	6900	7917						
23	10800	6000	7817	--	--	--	--	--	--	12300	7000	8775						
24	10200	5900	7821	--	--	--	--	--	--	10200	7200	--						
25	9800	6000	7758	--	--	--	--	--	--	11600	7600	9679						
26	9800	5800	7692	--	--	--	--	--	--	11100	7800	9429						
27	9800	6200	7813	--	--	--	--	--	--	10000	6600	8388						
28	9500	6200	7871	--	--	--	--	--	--	10800	6800	8688						
29	9700	6700	8063	--	--	--	--	--	--	10400	6800	8483						
30	9200	6800	8013	--	--	--	--	--	--	10300	6700	8167						
31	9000	6800	7921	--	--	--	--	--	--	--	--	--						

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

Specific conductance (micromhos at 25°C), dissolved oxygen, in parts per million, and temperature (°F), water year October 1964 to September 1965--Continued

Day	DECEMBER									JANUARY								
	Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)			Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)		
	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
1	9000	6100	7546				--	--	--	4500	1500	2779	--	--	--	44	43	43
2	10200	6200	7813				--	--	--	6400	2100	3671	--	--	--	43	41	42
3	10000	6100	7733				--	--	--	5100	1500	2725	--	--	--	43	42	42
4	10300	6400	8042				46	45	--	4100	1500	2529	--	--	--	42	41	41
5	10000	6400	7975				46	45	45	5800	1900	3438	--	--	--	41	40	40
6	9800	5800	7704				45	45	45	5000	1900	--	--	--	--	41	40	40
7	9400	5700	7258				45	44	--	5800	2300	--	--	--	--	41	40	40
8	9400	5600	7254				44	44	--	5500	1900	3708	--	--	--	41	40	40
9	8800	5300	6917				45	44	44	5100	1600	3292	--	--	--	42	41	41
10	9000	5400	6942				44	44	--	4400	1500	2946	--	--	--	42	40	41
11	9100	5700	7083				--	--	--	5100	1800	3404	--	--	--	41	39	40
12	8800	5400	6792				--	--	--	5300	1700	3229	--	--	--	40	39	40
13	8400	5100	6588				--	--	--	4500	1400	2829	--	--	--	40	39	40
14	8500	4900	6504				45	43	--	4100	900	2333	--	--	--	40	39	--
15	7600	3850	5933				44	44	44	4300	1000	2217	--	--	--	39	38	--
16	7500	4000	5729				43	43	--	4800	1400	3038	--	--	--	--	--	--
17	8000	4200	5915				42	42	--	6000	1800	3646	--	--	--	--	--	--
18	6900	2750	5033				42	42	42	6300	1700	3854	--	--	--	35	34	--
19	8400	3100	5404				42	40	41	5200	1400	--	--	--	--	35	34	--
20	8700	3900	5746				41	40	40	5000	1400	3221	9.6	7.3	--	35	33	--
21	8500	3900	5921				40	39	40	4600	1400	2917	9.9	7.8	8.9	35	34	34
22	8000	4800	6373				40	39	--	4800	1600	3092	9.5	7.5	--	35	34	34
23	8900	4800	6725				40	39	--	4600	1700	3150	10.2	7.6	9.2	35	34	35
24	9000	5000	6675				40	40	40	5400	2500	3979	11.1	9.2	--	35	35	35
25	8600	5000	6858				41	40	41	5800	2300	3700	11.1	9.1	10.1	35	35	35
26	8200	4700	6425				42	41	42	5400	1900	3646	10.7	8.6	9.7	35	35	35
27	8000	4500	6046				43	42	42	5200	2100	3283	10.1	8.7	--	36	35	35
28	7200	3800	5338				43	42	43	4500	1100	2767	10.1	7.5	--	36	35	35
29	6600	3300	4750				43	42	43	4300	1200	2604	10.7	8.5	--	35	35	35
30	6600	3300	4767				44	43	43	4500	1400	2779	10.2	7.8	--	35	34	--
31	6300	2600	4321				44	43	44	5000	1700	3042	--	--	--	--	--	--
	FEBRUARY									MARCH								
1	5500	1900	3408	11.4	8.8	--	33	32	--	850	250	440	10.7	9.2	--	38	37	--
2	4900	1800	3142	10.8	8.0	9.5	33	33	33	1200	250	575	10.6	9.1	9.7	38	37	37
3	4400	1600	2992	11.1	8.2	9.9	33	33	33	1500	300	694	10.2	8.6	9.3	38	37	38
4	4200	1500	2663	10.7	7.8	9.4	33	32	33	1600	300	723	10.0	8.7	--	39	38	38
5	4600	1600	2938	10.8	7.9	9.6	33	32	32	1950	350	933	--	--	--	39	39	39
6	4200	1700	3057	10.9	10.2	--	32	32	32	1600	300	869	--	--	--	41	39	40
7	5400	2100	3450	--	--	--	33	32	33	1100	250	602	--	--	--	42	40	41
8	5000	600	2588	--	--	--	36	33	34	1100	250	575	--	--	--	42	40	41
9	1800	400	892	7.8	5.3	--	38	35	37	800	300	483	8.1	6.2	--	42	41	41
10	1200	350	646	7.4	4.9	5.9	38	36	37	900	300	471	8.5	6.1	7.5	42	41	41
11	700	300	396	6.4	4.8	5.5	38	37	38	400	250	304	8.8	6.5	7.7	43	41	42
12	300	300	--	8.0	5.0	6.0	38	38	38	700	300	371	9.4	6.9	8.1	42	41	41
13	--	--	--	8.4	5.5	6.7	39	38	38	900	300	421	9.8	7.1	8.1	42	41	41
14	--	--	--	8.5	6.4	7.4	39	38	38	900	300	460	9.4	6.6	7.9	42	41	41
15	600	250	--	8.6	7.5	--	39	37	38	800	300	442	9.1	6.4	7.4	42	41	42
16	500	250	319	7.9	6.6	--	39	38	38	1900	300	621	9.0	6.5	7.7	42	41	42
17	500	250	310	8.0	6.6	7.3	39	39	39	1900	300	644	--	--	--	--	--	--
18	700	250	369	7.8	7.0	7.3	39	38	39	1900	350	858	9.0	6.9	--	42	42	--
19	500	200	306	8.9	7.4	8.0	39	39	39	1600	300	800	9.2	6.3	7.8	42	42	42
20	500	200	252	--	--	--	39	38	--	1400	350	725	8.9	6.2	7.6	42	42	42
21	1000	250	475	--	--	--	--	--	--	1100	300	623	8.8	5.9	7.5	42	41	42
22	500	250	313	--	--	--	--	--	--	900	300	563	8.9	5.8	7.6	42	41	41
23	350	200	281	9.7	8.7	--	37	37	--	900	300	571	9.3	7.0	8.1	42	41	42
24	550	200	360	10.0	8.7	9.4	37	36	37	1000	350	625	9.6	7.0	8.2	42	42	42
25	2000	300	940	12.6	9.2	11.3	37	36	37	1000	350	613	9.5	6.8	7.9	43	42	42
26	500	250	354	12.0	11.0	11.5	38	37	37	900	350	581	9.0	6.5	7.6	43	42	42
27	550	200	354	12.1	11.0	11.5	37	36	37	600	350	431	7.8	5.6	7.0	44	42	43
28	850	250	475	11.7	10.8	--	37	36	--	850	300	450	8.0	6.1	7.1	44	43	43
29	--	--	--	--	--	--	--	--	--	1000	300	521	8.5	6.0	7.0	44	43	43
30	--	--	--	--	--	--	--	--	--	800	300	467	8.5	5.6	7.1	45	43	44
31	--	--	--	--	--	--	--	--	--	600	300	421	8.0	5.2	6.7	44	44	44

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

Specific conductance (micromhos at 25°C), dissolved oxygen, in parts per million, and temperature (°F), water year October 1964 to September 1965--Continued

Day	APRIL									MAY								
	Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)			Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)		
	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
1	1000	300	487	8.4	5.2	6.7	44	43	44	900	250	452	5.0	1.2	3.1	56	56	56
2	1200	350	637	8.6	5.0	6.9	44	44	44	950	300	481	5.5	1.0	2.9	57	56	56
3	800	300	491	7.9	4.7	6.4	45	43	44	1000	290	505	4.9	.7	2.4	58	57	58
4	1300	300	633	8.4	5.5	6.8	45	44	45	1200	280	541	4.4	.3	2.1	60	58	59
5	1200	300	629	--	--	--	--	--	--	1420	300	599	4.1	.6	2.5	60	60	60
6	1200	300	647	--	--	--	--	--	--	1150	300	629	4.3	.7	2.4	61	60	60
7	1700	350	741	--	--	--	--	--	--	1300	340	674	4.2	1.0	2.6	60	60	60
8	1500	350	712	--	--	--	--	--	--	1300	330	692	4.4	1.1	2.7	60	59	60
9	1100	350	710	5.7	4.2	--	48	47	--	1120	310	651	3.5	.7	2.2	61	60	60
10	1100	350	654	--	--	--	--	--	--	1000	310	629	3.1	1.0	2.1	63	60	61
11	1100	350	670	--	--	--	--	--	--	1250	320	672	4.1	1.0	2.2	63	62	63
12	1600	350	750	7.5	4.7	--	50	49	--	1360	330	720	4.1	1.1	2.4	64	63	63
13	850	300	518	7.6	4.7	6.3	50	49	50	1280	360	743	4.5	1.2	2.6	64	64	64
14	1200	300	529	7.6	5.7	--	49	49	--	1640	380	816	5.7	1.8	3.5	64	63	64
15	1450	350	725	9.4	6.8	--	50	50	--	1600	390	863	5.7	2.1	3.8	65	64	64
16	1200	300	616	9.1	5.7	7.4	50	50	50	1700	410	872	5.3	2.0	3.6	65	64	65
17	800	300	502	8.2	5.8	--	51	50	--	1650	420	920	5.3	2.1	3.6	66	65	66
18	1000	300	545	--	--	--	--	--	--	1680	430	906	5.6	1.8	3.5	66	66	66
19	850	300	491	--	--	--	--	--	--	1800	480	995	5.5	2.1	3.6	67	66	67
20	700	300	464	--	--	--	--	--	--	1600	450	950	4.8	2.0	3.2	68	67	68
21	600	300	435	6.5	3.3	--	53	52	--	1600	480	1017	4.2	2.2	3.3	68	68	68
22	600	300	397	6.9	3.4	5.2	54	52	53	1600	490	1002	4.3	2.0	3.2	68	68	68
23	500	300	389	--	--	--	--	--	--	1450	460	941	3.5	1.6	2.6	69	68	69
24	550	300	395	--	--	--	--	--	--	1750	520	1075	3.6	2.0	2.7	69	68	68
25	600	300	395	--	--	--	--	--	--	1750	510	1127	2.9	1.8	2.2	69	68	68
26	500	300	393	--	--	--	--	--	--	1900	550	1154	2.1	1.3	1.6	70	69	69
27	500	300	393	5.3	2.3	--	54	53	--	--	--	--	1.6	.6	--	71	70	--
28	600	300	400	4.8	1.6	3.6	54	54	54	2700	690	--	--	--	--	72	71	--
29	650	250	385	4.9	1.4	3.1	55	54	54	2800	640	1472	--	--	--	71	71	71
30	800	250	395	5.2	1.4	3.0	55	55	55	2870	690	1532	--	--	--	71	70	71
31	--	--	--	--	--	--	--	--	--	3400	720	1697	--	--	--	71	70	71
	JUNE									JULY								
1	4300	800	1802	--	--	--	72	70	71	7600	2900	4783	7.0	3.4	5.4	75	75	75
2	4100	850	1993	--	--	--	72	72	72	7800	3200	5116	7.0	3.6	5.5	75	75	75
3	3500	900	2100	--	--	--	72	71	71	7900	3300	5358	7.1	4.4	5.9	75	75	75
4	3300	1000	2070	--	--	--	71	71	71	6900	3300	5091	6.8	3.9	5.5	75	75	75
5	3800	900	2045	--	--	--	71	70	71	7300	3500	5275	6.5	3.8	5.4	76	75	76
6	3200	1000	2050	--	--	--	72	71	72	6800	3250	4871	6.7	3.4	5.0	77	76	76
7	3300	1000	2083	--	--	--	73	72	73	7200	3600	5216	7.3	3.5	5.5	76	76	76
8	3400	1100	2095	--	--	--	75	73	74	7200	3600	5229	6.9	3.9	5.5	77	76	77
9	3300	1100	2191	5.7	2.4	--	74	74	74	7500	3600	5312	7.5	3.7	5.7	78	77	78
10	3400	1100	2179	5.5	2.4	3.9	75	75	75	7300	3700	5291	6.7	4.0	5.4	79	78	78
11	3800	1100	2137	6.1	2.1	--	75	75	--	6500	3500	4925	6.2	3.5	4.8	78	77	78
12	3600	1200	2233	6.1	2.5	4.1	76	75	76	6300	3100	4537	5.7	2.7	4.5	78	77	77
13	4200	1200	2316	6.0	2.7	4.2	76	75	75	6400	3100	4504	5.7	2.9	4.4	78	77	77
14	3900	1400	2516	6.2	2.8	4.8	75	74	75	6800	3100	4558	6.1	3.1	4.7	79	78	78
15	4500	1500	2795	7.0	3.3	5.2	74	74	74	6600	3000	4434	5.8	3.0	4.5	79	79	79
16	4900	1800	2912	6.8	4.4	5.8	73	71	72	6400	3200	4681	5.9	3.3	4.7	79	79	79
17	4400	1900	3104	7.3	5.0	6.2	71	70	71	6600	3200	4858	5.8	3.5	4.9	80	79	79
18	5000	1700	3083	6.9	3.9	5.4	71	70	71	7000	3400	4933	6.1	3.9	5.1	80	80	80
19	4700	1800	--	6.2	3.4	5.1	70	70	70	6400	3700	--	5.4	4.7	--	80	79	--
20	--	--	--	6.3	3.4	5.0	71	70	70	7100	3600	5233	6.4	4.6	--	79	79	--
21	--	--	--	6.2	3.4	5.0	72	71	71	6800	3500	5091	6.5	4.4	5.5	79	78	79
22	4500	1900	--	5.9	3.0	4.7	73	72	72	7400	3800	5368	6.9	4.6	5.6	78	78	78
23	5700	2000	3550	6.8	3.2	4.8	74	73	73	7500	3700	5397	6.9	4.7	5.7	78	77	78
24	5700	2100	3595	6.2	3.5	4.7	74	74	74	8000	3800	5435	6.9	4.8	5.7	78	78	78
25	6000	2200	3700	7.3	3.1	4.9	74	74	74	7750	3700	5341	6.4	4.3	5.4	79	78	79
26	6400	2200	3887	7.9	3.4	5.3	74	74	74	8600	3750	5378	6.0	4.0	--	79	79	--
27	7200	2300	4091	8.1	3.8	5.4	75	74	74	8200	3900	5621	--	--	--	--	--	--
28	6800	2400	4022	7.9	4.0	5.8	75	74	74	8300	4000	5875	6.4	4.6	--	80	80	--
29	7200	2400	4262	7.6	4.0	5.5	76	75	75	8500	4050	5831	6.9	3.6	5.4	80	79	79
30	6800	2700	4458	7.5	3.7	5.4	75	75	75	8900	4200	6059	6.9	3.6	5.3	79	79	79
31	--	--	--	--	--	--	--	--	--	8600	4200	6158	6.3	3.3	5.2	79	79	79

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

Specific conductance (micromhos at 25°C), dissolved oxygen, in parts per million, and temperature (°F), water year October 1964 to September 1965--Continued

Day	AUGUST									SEPTEMBER								
	Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)			Specific conductance (micromhos at 25°C)			Dissolved oxygen (ppm)			Temperature (°F)		
	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
1	9680	4950	7169	6.1	3.9	--	79	79	--	10800	6490	8413	7.9	6.0	6.9	74	73	73
2	9460	4950	7301	--	--	--	78	78	--	9460	5310	7308	8.2	4.4	6.5	75	74	74
3	8910	5170	7002	6.4	3.7	--	78	78	78	9200	5680	7377	8.2	4.8	6.5	75	73	74
4	9130	4840	6811	6.9	3.9	5.4	78	78	78	9320	5910	7437	8.0	4.8	6.6	75	73	74
5	8580	5000	6677	6.9	4.3	5.5	78	78	78	10100	5900	7544	8.4	5.0	6.7	74	73	73
6	8800	5060	6672	7.2	4.1	5.8	79	78	78	9370	5880	7535	8.1	5.0	6.7	74	73	73
7	8800	4950	6539	7.4	4.5	6.0	79	79	79	11200	6050	7795	7.5	3.0	6.3	74	73	73
8	9130	5210	6800	7.6	5.0	6.5	80	79	79	9900	6120	7950	7.4	4.0	5.6	74	73	74
9	8400	5260	6768	7.5	5.0	6.7	80	80	80	9860	5770	7787	7.5	4.9	6.0	74	73	74
10	7620	4590	6242	7.6	5.1	6.4	80	80	80	10300	6470	--	8.2	5.1	6.8	76	74	75
11	7500	4480	5998	7.4	4.6	6.4	80	80	80	11000	6170	8122	7.2	4.7	6.0	75	75	75
12	8290	4480	6047	7.6	5.0	6.5	80	80	80	11000	6470	8345	6.9	4.8	5.8	75	73	74
13	7870	4670	6162	7.8	5.2	6.6	80	80	80	11700	6820	8970	6.0	3.7	--	73	73	73
14	8320	4620	6195	8.8	5.2	6.9	--	--	--	11200	6720	8632	--	--	--	73	73	73
15	8440	4790	6375	7.3	5.5	--	--	--	--	11400	6800	8861	--	--	--	73	72	73
16	7980	4790	6488	7.8	5.5	6.7	--	--	--	10600	6470	8420	5.5	3.7	--	74	73	74
17	8210	5070	6620	6.8	6.2	--	--	--	--	10900	6660	8531	5.6	3.5	5.0	74	73	74
18	8440	5130	6785	--	--	--	--	--	--	10800	6570	8438	6.9	4.3	5.6	74	74	74
19	8320	5130	6777	--	--	--	--	--	--	11800	6450	8516	6.3	4.6	5.5	75	74	75
20	8440	5020	6642	--	--	--	--	--	--	11800	6890	8931	5.4	4.6	--	75	75	--
21	9120	5020	6774	--	--	--	--	--	--	11500	6810	8772	--	--	--	--	--	--
22	8890	5240	6904	--	--	--	--	--	--	11900	6760	8779	--	--	--	--	--	--
23	9740	5050	6870	--	--	--	--	--	--	11300	7010	8887	7.4	5.6	--	77	76	--
24	10400	4910	6855	--	--	--	79	78	--	11200	6900	8993	6.7	4.4	5.7	77	76	77
25	10700	5020	7088	7.0	4.5	--	79	78	78	10300	6400	8512	5.6	3.5	4.9	76	75	76
26	10100	5220	7465	7.0	4.8	6.1	79	78	78	10800	6340	8633	6.0	3.9	5.2	75	74	75
27	11100	5340	7515	6.5	4.2	5.8	79	78	79	10600	6050	8318	8.6	4.3	6.8	74	72	73
28	10700	5450	7852	6.7	4.8	5.9	79	78	79	11200	6580	8735	8.9	6.5	7.9	72	72	72
29	10300	4990	7197	7.6	4.1	6.0	78	76	77	11000	6580	8635	9.2	6.5	7.8	72	71	71
30	9280	5340	7260	7.6	4.8	6.3	76	75	75	11400	6570	8932	8.1	5.3	6.9	71	70	71
31	9630	5450	7619	7.7	4.8	6.5	75	74	75	--	--	--	--	--	--	--	--	--

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 1965.
EXTREMES, 1964-65.--Specific conductance: Maximum daily, 23,300 micromhos Dec. 2; minimum daily, 2,200 micromhos Apr. 22.
EXTREMES, 1963-65.--Specific conductance: Maximum daily, 35,400 micromhos Nov. 7, 1963; minimum daily, 300 micromhos Mar. 18, 19, 1964.
REMARKS.--Records of daily specific conductance for period June 1956 to September 1963 available in the Water Resources Division office, Trenton, N. J.

Specific conductance (micromhos at 25°C), water year October 1964 to September 1965

Day	October		November		December		January		February		March	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
1..	19400	14500	18300	15000	20000	15500	15700	10300	19400	12200	--	--
2..	19700	15000	18300	15200	23300	16000	20100	10200	16400	11800	--	--
3..	19800	14200	19100	15600	21800	15400	17100	10100	17400	10900	--	--
4..	17800	14200	18700	15600	22900	15700	16900	10200	17000	10000	12100	5600
5..	17400	13900	20400	15800	22200	16700	20400	12800	12300	10000	12700	5500
6..	17800	14400	20000	15900	22200	16000	19400	12000	--	--	11900	5500
7..	17500	14400	19900	15900	22600	16200	18800	12500	--	--	9800	4500
8..	18400	14700	19100	15800	22600	16000	18900	12600	--	--	11300	4000
9..	18400	14800	21100	15400	21500	16100	17700	11200	--	--	10000	3700
10..	17300	13500	21700	16500	21500	15600	16900	10200	--	--	10800	3900
11..	17500	13500	21600	16600	21600	16000	19400	11200	--	--	--	--
12..	21500	13800	21500	17000	20600	15700	19600	12100	--	--	--	--
13..	20900	15000	21600	16900	20400	14900	17500	10900	--	--	--	--
14..	22100	14900	21400	16400	21700	15300	15800	9800	--	--	--	--
15..	22100	15900	21800	16600	19300	14400	16300	9100	--	--	--	--
16..	23000	15800	22000	16800	20400	14100	18600	11100	--	--	--	--
17..	22600	18000	21300	17400	21000	14200	20800	12200	--	--	--	--
18..	22400	16800	21700	17300	18400	11900	20200	12600	--	--	--	--
19..	20600	16500	23000	17500	21100	13300	17700	11700	--	--	--	--
20..	20600	16400	21800	16800	21800	14000	16400	10700	--	--	--	--
21..	21700	16800	21500	16200	22000	13900	16800	10500	--	--	--	--
22..	19900	15800	20600	15600	22500	14800	16000	10600	--	--	--	--
23..	20400	15700	21400	15400	21900	16200	16000	10000	--	--	--	--
24..	20000	15600	20400	15200	21100	15300	18800	11500	--	--	--	--
25..	19600	15500	22400	16000	20500	15200	18700	11200	--	--	--	--
26..	19300	14900	22600	18000	19800	14600	18200	11600	--	--	--	--
27..	19600	15300	20500	15800	18800	14800	17600	10900	--	--	--	--
28..	19300	15000	21600	16200	18600	13900	17100	9900	--	--	--	--
29..	19200	15300	20400	16400	18500	12600	17600	9900	--	--	--	--
30..	18900	15500	21800	16100	18500	11900	18200	10400	--	--	--	--
31..	18400	15200	--	--	16100	10800	18300	11500	--	--	--	--
Average	19800	15200	20900	16200	20800	14700	18000	11000	--	--	--	--

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

Specific conductance (micromhos at 25°C), water year October 1964 to September 1965--Continued

Day	April		May		June		July		August		September	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
1	--	--	9900	3000	13600	6500	17700	10700	--	--	18100	13500
2	--	--	11000	3000	13800	6700	18300	11100	--	--	17200	11000
3	--	--	9500	3100	13200	6500	17600	11400	--	--	18000	11600
4	--	--	9400	3100	13400	6600	16000	10900	17800	12500	18200	12400
5	--	--	9910	3000	13200	6000	16000	11300	18200	12400	19000	12800
6	--	--	9700	3200	12000	6400	15100	10600	18000	12500	18500	12600
7	--	--	8090	3400	12400	6700	16700	11400	17800	11800	19300	12800
8	--	--	9300	3400	12800	6600	15600	10800	17700	11500	18900	13100
9	--	--	8300	3200	12200	6700	16000	10500	18100	11500	19200	12600
10	--	--	7200	3300	12900	6700	15000	10000	16600	10600	18200	13200
11	--	--	9200	3400	13500	6700	14400	9600	16600	10800	18400	12700
12	10800	5200	10200	3400	14200	6900	16100	9800	16100	11200	18200	13200
13	8600	3300	9400	3700	14500	7200	15600	9800	16200	11100	18700	13500
14	12800	3000	11600	3900	14400	7700	16000	10200	17200	11400	18100	13300
15	13000	3700	10500	4200	14200	8300	15700	9500	17400	11600	18400	13600
16	11700	3900	9600	3900	13800	9200	15800	9900	17400	11500	17300	13200
17	9400	3100	10500	4200	14900	9000	16000	10000	17300	12000	18500	13600
18	10100	2900	10000	4000	15500	8600	15200	10400	17400	12400	18300	13600
19	8800	3200	11100	4200	15200	8900	14600	10000	17300	13000	19200	13200
20	8800	3000	10300	4400	17000	8900	15800	11000	17400	12200	19700	14000
21	8400	2500	10600	4600	17300	9100	15000	10800	18500	12100	18600	14100
22	7600	2200	10600	4700	16000	9100	16800	11400	16800	12700	19500	13600
23	7400	2400	9600	4200	17000	9200	16800	11100	17500	12200	19700	13900
24	8400	2600	10900	4900	16800	10000	17100	11200	19500	12500	18900	14000
25	9050	3300	11600	4900	18000	9900	17300	10700	19800	12500	18500	13200
26	8500	2800	12300	5300	17800	10300	18500	10800	19300	12600	18700	13300
27	8900	2990	13800	5800	17700	10800	18400	11200	18800	12700	17500	13100
28	9300	2990	13000	6500	17700	10600	18000	11300	18500	12700	18600	13700
29	9700	3300	14000	6100	17300	10100	17500	11300	17700	11900	18300	13900
30	9400	2900	13800	6100	17000	10300	18500	11600	16800	12100	19200	14200
31	--	--	14000	6400	--	--	18300	11700	18200	12300	--	--
Average	--	--	10600	4210	15000	8210	16500	10700	17700	12000	18600	13200

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 1965.
EXTREMES, 1964-65.--Water temperatures: Maximum, 88°F July 26 and Aug. 18; minimum, freezing point on several days during January and February.
EXTREMES, 1963-65.--Water temperatures: Maximum, 88°F July 26 and Aug. 18, 1965; minimum, freezing point on several days during winter months.

Temperature (°F) of water, water year October 1964 to September 1965
(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	67	67	68	67	66	64	63	63	63	62	59	59	60	61	61	61	62	63	62	61	59	58	57	56	56	58	59	60	60	60	59	61
Minimum	64	65	65	65	62	60	60	59	60	58	56	56	57	58	58	60	61	61	61	58	56	57	55	53	53	54	56	57	58	58	57	59
November																																
Maximum	59	59	58	58	58	58	57	57	56	57	57	58	58	58	57	58	57	56	56	56	55	52	50	49	51	52	52	52	52	51	--	55
Minimum	57	56	56	56	56	55	54	54	55	54	55	56	57	56	55	56	56	55	55	54	52	47	46	46	49	50	51	49	51	47	--	53
December																																
Maximum	48	45	45	46	46	44	43	--	--	--	--	--	46	46	44	43	43	43	40	39	39	40	40	40	44	46	46	45	44	45	45	44
Minimum	42	40	43	45	43	40	40	--	--	--	--	--	44	44	42	38	40	38	36	38	37	37	38	39	40	43	45	44	43	43	44	41
January																																
Maximum	44	43	43	40	41	41	41	42	--	43	41	41	40	40	37	37	36	34	33	34	35	36	36	36	37	39	38	37	37	35	35	38
Minimum	42	41	40	38	36	39	38	40	--	40	39	39	39	37	35	34	32	32	32	33	32	32	35	36	35	35	37	35	35	32	32	36
February																																
Maximum	34	34	34	35	33	36	38	42	41	41	42	43	43	41	40	40	41	42	42	40	39	38	38	38	40	40	39	44	--	--	--	39
Minimum	32	32	32	32	32	32	34	37	38	39	39	40	41	38	37	37	38	39	38	35	37	36	35	35	38	38	36	37	--	--	--	36
March																																
Maximum	43	42	42	43	43	44	44	44	--	--	--	--	--	--	--	46	45	44	45	45	42	43	45	47	46	47	47	49	51	50	49	--
Minimum	39	39	40	41	41	41	40	42	--	--	--	--	--	--	--	40	43	42	43	42	39	39	42	45	44	44	44	44	47	48	46	--
April																																
Maximum	49	48	48	50	52	51	51	53	54	55	53	56	55	55	53	54	56	57	57	55	58	62	61	59	56	58	58	58	58	60	--	55
Minimum	45	46	45	45	46	49	49	49	51	50	50	51	52	51	51	51	52	53	54	53	52	55	57	56	54	54	56	55	55	55	--	51
May																																
Maximum	61	62	66	66	68	68	67	66	69	72	74	71	70	69	69	72	73	74	74	74	74	75	79	76	76	79	80	81	79	74	73	72
Minimum	57	58	60	62	56	64	64	63	64	65	67	67	65	65	65	66	68	69	69	70	70	70	72	72	71	73	74	74	74	71	71	67
June																																
Maximum	77	77	77	75	76	76	78	80	79	81	81	81	80	78	76	73	70	70	71	75	76	--	--	81	80	79	80	82	83	82	--	78
Minimum	71	73	73	71	71	72	63	76	76	76	77	78	78	75	72	69	68	67	68	69	71	--	--	77	76	75	75	76	77	78	--	73
July																																
Maximum	82	79	--	--	--	--	--	--	86	87	84	81	83	84	84	85	86	86	86	83	84	83	83	86	86	88	86	86	85	84	83	--
Minimum	77	76	--	--	--	--	--	--	81	82	81	78	78	79	81	80	81	81	82	80	80	80	80	81	82	83	83	82	82	80	80	--
August																																
Maximum	82	82	83	83	84	85	85	85	85	85	--	84	85	85	85	86	87	88	87	87	85	84	84	83	82	83	--	--	--	--	--	--
Minimum	79	78	79	80	80	81	82	82	82	82	--	81	81	81	82	82	83	83	84	83	82	82	81	81	80	79	--	--	--	--	--	--
September																																
Maximum	--	78	78	78	78	78	79	80	80	87	82	82	78	79	78	81	81	82	84	84	84	85	84	83	81	78	77	74	74	74	--	80
Minimum	--	75	75	75	75	77	75	76	77	77	79	77	76	76	76	77	78	78	79	80	80	81	81	81	78	75	74	72	71	72	--	77

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

LOCATION.--Temperature recorder at gaging station on left bank, 0.6 mile downstream from bridge on State Highway 38 in Kitzmiller, Garrett County, and 1.5 miles downstream from Wolfden Run.
DRAINAGE AREA.--225 square miles.
RECORDS AVAILABLE.--Water temperatures: August 1961 to September 1965.
EXTREMES, 1964-65.--Water temperatures: Maximum, 89°F Aug. 15, 16, 18; minimum, freezing point on many days in January and February.
EXTREMES, 1961-65.--Water temperatures: Maximum, 89°F Aug. 15, 16, 18, 1965; minimum, freezing point on many days during winter months.
REMARKS.--Records fair, probably because of friction in recorder.

Chemical analyses, in parts per million, water year October 1964 to September 1965

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^{+1}	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Oct. 21, 1964..	97	5.9	--	1.7	0.00	17	6.7	1.4	1.3		91	2.1	0.0	0.0	128	70	70	0.5	255	3.9	--
May 18, 1965A..	105		1.7	.40	.66						97	2.2				76	76	.8	218	4.6	0
Sept. 27B.....	29		6.2	1.6	2.2						202	6.0				145	145	1.3	552	3.8	2

A Phosphate (PO_4) 0.07.
B Phosphate (PO_4) 0.00.

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

Temperature (°F) of water, water year October 1964 to September 1965
(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	63	64	58	56	53	54	54	51	48	51	52	54	56	54	56	54	56	54	50	48	49	47	48	50	52	52	52	52	53	50	53
Minimum	57	57	57	56	52	49	45	45	48	45	42	42	44	46	47	49	54	52	50	46	42	44	44	41	42	44	46	46	49	49	46	48
November																																
Maximum	50	50	49	50	50	48	48	45	48	48	49	52	54	52	50	54	54	47	46	46	42	36	36	36	38	43	44	44	43	40	--	46
Minimum	44	44	44	44	45	45	42	41	42	42	44	44	49	45	42	48	47	46	46	42	36	36	36	36	36	38	43	42	40	36	--	42
December																																
Maximum	36	36	36	43	45	44	38	36	38	38	38	43	43	42	39	36	36	36	36	36	36	36	36	39	43	44	44	44	42	44	44	40
Minimum	36	36	36	36	43	38	36	36	36	36	36	38	42	39	36	36	36	36	36	36	36	36	36	36	39	43	44	42	41	41	40	38
January																																
Maximum	40	39	39	37	36	38	37	41	41	41	34	33	32	32	32	32	32	32	32	32	32	32	32	34	34	36	36	32	32	32	32	35
Minimum	36	35	37	36	35	36	35	35	41	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	34	34	32	32	32	32	32	33
February																																
Maximum	32	32	32	32	32	32	32	37	37	40	40	41	40	35	34	34	36	36	35	32	33	33	32	32	32	32	32	35	--	--	--	34
Minimum	32	32	32	32	32	32	32	32	37	37	39	39	35	33	33	33	34	34	32	32	32	32	32	32	32	32	32	32	--	--	--	33
March																																
Maximum	38	37	38	38	38	36	36	38	38	38	36	36	37	36	36	38	38	40	40	38	34	38	40	40	38	38	38	43	43	44	42	38
Minimum	33	36	37	38	36	34	35	36	38	36	34	34	34	34	35	35	34	34	36	34	34	34	37	38	38	38	38	38	43	42	38	36
April																																
Maximum	41	41	41	42	46	46	52	50	50	48	48	50	50	47	47	46	50	52	52	50	52	54	54	52	47	52	52	49	50	55	--	49
Minimum	37	39	36	38	41	45	44	47	47	44	46	47	44	42	46	44	44	48	48	48	48	51	52	47	46	46	49	48	47	48	--	45
May																																
Maximum	55	61	62	64	61	63	64	68	69	69	68	63	65	65	68	69	69	71	70	70	66	73	72	72	70	74	73	71	68	63	68	67
Minimum	52	54	56	57	58	59	60	61	61	63	63	59	55	54	55	60	62	59	58	64	62	59	63	65	63	63	68	65	61	55	53	60
June																																
Maximum	74	73	71	70	72	76	76	79	78	76	79	75	75	75	66	61	58	59	70	74	72	78	80	74	77	75	76	76	81	74	--	73
Minimum	58	63	64	58	57	61	64	67	67	68	68	69	64	61	61	58	58	55	56	59	62	65	69	66	62	61	63	65	70	70	--	63
July																																
Maximum	78	77	76	80	72	78	74	79	80	77	73	76	79	80	78	78	76	79	78	76	77	77	78	83	79	83	77	81	77	78	70	78
Minimum	64	63	69	67	70	67	69	68	67	71	68	66	66	68	71	67	66	69	69	65	63	63	68	70	75	70	70	69	66	67	64	68
August																																
Maximum	76	73	76	77	80	85	83	79	80	75	81	83	83	85	89	89	88	89	78	85	75	83	79	78	80	80	78	75	73	75	77	80
Minimum	68	68	62	60	63	69	69	72	73	71	69	66	68	72	73	76	76	75	74	69	67	70	70	68	68	70	68	63	57	57	61	68
September																																
Maximum	73	77	76	74	76	80	80	77	81	82	75	69	66	75	72	74	78	80	81	83	82	81	78	72	66	65	63	66	68	69	--	75
Minimum	63	60	60	60	61	64	62	62	66	64	67	64	63	65	64	66	68	68	68	69	69	68	68	66	59	53	55	57	54	56	--	63

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 September 1965.
EXTREMES, 1964-65.--Water temperatures: Maximum, 84°F July 24, 26; minimum, freezing point on many days during December to February.
EXTREMES, 1961-65.--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. No temperature record Nov. 18 to Dec. 10. No temperature record Mar. 30 to Apr. 1; range 40°F to 44°F.

Temperature (°F) of water, water year October 1964 to September 1965
(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	64	65	59	57	54	53	53	51	50	50	51	54	55	54	55	56	56	56	52	49	50	50	48	50	52	52	53	53	55	51	54
Minimum	60	60	59	57	54	50	48	47	49	47	46	44	47	49	50	51	55	54	52	49	46	47	47	46	46	46	48	49	51	53	49	50
November																																
Maximum	50	51	50	51	52	50	49	47	49	49	50	53	54	51	49	53	53	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Minimum	47	46	47	47	47	48	46	45	45	45	47	47	50	48	45	49	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
December																																
Maximum	--	--	--	--	--	--	--	--	--	--	34	39	40	40	38	32	32	32	32	32	32	32	32	34	38	40	42	42	40	41	41	--
Minimum	--	--	--	--	--	--	--	--	--	--	33	34	39	38	32	32	32	32	32	32	32	32	32	32	34	38	40	40	40	39	40	--
January																																
Maximum	40	38	38	36	36	37	37	41	41	40	34	34	33	33	32	32	33	33	34	34	34	34	34	34	35	36	36	34	34	33	32	35
Minimum	36	36	36	35	35	36	36	36	40	34	34	32	32	32	32	32	32	33	33	34	34	34	34	34	34	35	34	34	33	32	32	34
February																																
Maximum	32	32	32	32	32	32	32	34	35	37	38	40	41	37	35	35	36	36	36	33	34	34	33	32	32	33	33	38	--	--	--	34
Minimum	32	32	32	32	32	32	32	32	34	35	37	38	37	35	34	34	35	36	33	32	32	32	32	32	32	32	33	33	--	--	--	33
March																																
Maximum	40	40	41	40	40	39	38	39	39	39	37	37	39	39	38	40	40	41	41	41	38	40	41	41	41	41	40	42	44	--	--	40
Minimum	37	40	40	40	39	38	37	38	39	37	35	36	36	38	38	38	37	37	41	38	37	37	40	41	41	40	40	39	42	--	--	38
April																																
Maximum	--	41	41	42	46	46	49	52	52	52	51	52	52	50	49	49	51	53	53	52	54	58	59	58	52	54	54	54	53	58	--	51
Minimum	--	40	38	39	41	45	45	49	51	48	50	50	50	45	48	49	46	51	51	50	50	54	58	52	50	50	53	52	51	52	--	49
May																																
Maximum	58	64	66	67	66	66	64	65	67	70	71	69	67	68	71	71	72	73	73	73	71	70	74	74	72	74	74	74	71	66	70	69
Minimum	56	56	60	62	62	62	63	63	65	67	69	63	59	60	61	65	69	66	66	70	67	65	68	69	68	69	70	69	65	60	58	64
June																																
Maximum	76	76	74	71	74	74	76	78	81	80	81	80	79	79	71	67	63	64	73	76	77	81	81	79	80	77	79	82	82	79	--	76
Minimum	62	68	68	64	62	66	69	71	73	73	72	75	71	67	67	63	62	61	61	66	69	70	72	72	73	68	69	70	75	75	--	68
July																																
Maximum	80	77	77	81	77	81	79	81	83	81	77	77	81	82	82	82	82	83	82	82	81	82	80	84	82	84	78	81	77	77	73	80
Minimum	71	71	73	73	74	73	74	73	73	76	74	73	73	74	77	74	74	75	75	73	72	72	74	75	78	74	75	73	72	71	71	74
August																																
Maximum	76	75	76	76	79	80	80	78	77	73	78	78	75	77	79	79	78	79	75	76	71	78	74	71	72	76	74	72	67	67	67	75
Minimum	71	71	69	64	68	72	71	72	73	70	69	65	69	70	71	72	71	71	71	69	69	69	71	69	68	69	67	66	60	60	62	69
September																																
Maximum	67	70	68	68	70	72	72	71	72	75	71	69	67	76	75	73	75	76	76	77	77	75	72	70	65	64	62	62	64	64	--	70
Minimum	65	60	59	62	62	64	64	64	66	67	69	66	66	66	69	69	69	69	69	69	70	69	68	65	60	55	55	56	56	58	--	64

1-6030. NORTH BRANCH POTOMAC RIVER NEAR CUMBERLAND, MD.

LOCATION.--At Wiley Ford Bridge, 2 miles south of Cumberland, Allegany County, and 2.1 miles downstream from Wills Creek.
DRAINAGE AREA.--875 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1964 to September 1965.
Water temperatures: October 1964 to September 1965.
Sediment records: October 1964 to September 1965.
EXTREMES, 1964-65.--Water temperatures: Maximum, 90°F Aug. 16-18; minimum, freezing point on several days in January and February.
Sediment concentrations: Maximum daily, 880 ppm Jan. 3; minimum daily, 10 ppm July 24.
Sediment loads: Maximum daily, 13,000 tons Jan. 3; minimum daily, 4 tons July 24, 25, 28, and Sept. 11.

Chemical analyses, in parts per million, December 1964 to September 1965

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^{+1}	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Dec. 17, 1964..	1200	4.9				27	5.0	17	1.7	48	56	18	0.1	1.6	155	88	49		258	6.9	--
Feb. 1, 1965...	1030	5.4				30	7.1	8.8	1.2	30	73	15	.1	1.3	182	104	80		267	6.6	--
Mar. 1.....	1720	5.2		0.05	0.00	32	7.3	18	1.2	40	81	20	.1	1.6	188	110	77		312	6.8	8
Mar. 5.....	9550	5.3				35	4.5	6.5	1.9	78	43	7.6	.1	4.2	167	106	42		249	7.6	3
Mar. 27.....	8860	5.3				30	3.4	5.2	.9	58	42	5.5	.1	3.3	135	89	42		208	7.3	3
Apr. 1.....	4840	4.6		.01	.00	26	3.6	5.1	.2	48	45	6.4	.1	.5	118	80	41		197	7.1	6
May 1.....	1880	4.0				26	6.1	8.0	1.0	27	68	12	.1	.0	161	90	68		239	6.5	--
May 18 A.....	450	--	0.0	.02	.16	--	--	--	--	64	122	14	--	--	--	164	112		378	7.4	5
June 1.....	246	1.4				77	16	36	3.0	74	186	55	.2	.0	478	259	198		663	6.8	--
July 1.....	152	6.8				98	16	71	4.7	85	235	107	.3	.5	636	311	241		905	6.9	--
Aug. 1.....	175	6.7				77	12	98	7.2	93	223	107	.3	2.1	603	242	166		927	6.8	--
Sept. 1 B.....	138	5.1				49	45	62	4.6	89	242	93	.3	.1	586	309	236		891	7.5	--

A Phosphate (PO_4) 0.03.
B Phosphate (PO_4) 0.90.

1-6030. NORTH BRANCH POTOMAC RIVER NEAR CUMBERLAND, MD.--Continued

Temperature (°F) of water, water year October 1964 to September 1966
(Once-daily measurement at approximately 1800)

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	--	--	--	--	--	--	--	--	60	58	55	55	57	60	59	59	62	65	60	57	55	57	57	55	57	56	57	61	62	62	59	--
November	60	55	57	59	58	57	56	54	52	55	57	59	62	60	57	60	58	59	56	53	47	42	40	44	47	46	47	47	47	42	--	53
December	38	40	41	42	44	43	41	38	40	39	40	45	45	44	39	36	38	35	37	38	40	40	40	40	44	43	44	44	43	41	43	41
January	40	40	40	37	39	38	39	49	44	40	36	38	36	33	32	32	32	32	32	32	32	38	40	37	38	38	38	34	33	32	37	37
February	32	32	32	32	32	40	38	38	40	40	42	48	42	38	40	40	42	44	37	36	36	37	36	40	36	34	36	40	--	--	--	38
March	48	46	44	48	40	39	40	43	44	40	38	38	40	42	42	46	38	48	50	40	38	44	44	48	40	40	46	48	50	47	44	43
April	42	40	48	48	46	50	50	56	56	56	54	56	50	54	50	50	58	56	52	56	60	60	60	54	50	56	54	54	56	60	--	53
May	62	60	70	72	70	70	70	66	70	72	74	68	70	72	70	72	74	76	76	76	70	72	76	75	76	78	78	76	74	68	74	72
June	80	78	76	78	78	80	85	85	85	86	86	86	82	83	75	70	68	69	76	76	78	85	86	80	84	82	82	86	86	80	--	80
July	84	84	84	86	80	84	83	--	86	80	78	84	86	86	86	84	86	85	82	86	86	86	85	86	86	86	86	85	85	84	82	84
August	80	80	80	80	84	82	86	84	80	80	82	86	82	86	88	90	90	90	85	86	80	85	83	84	84	86	84	80	75	76	80	83
September	76	82	82	81	78	80	82	81	86	86	82	70	76	80	80	82	84	87	86	85	86	88	87	74	72	70	67	70	72	74	--	80

1-6030. NORTH BRANCH POTOMAC RIVER NEAR CUMBERLAND, MD.--Continued

Suspended sediment, water year October 1964 to September 1965
(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	481	--	20	190	21	11	502	36	49
2	300	--	20	180	22	11	422	42	48
3	215	--	10	166	24	11	422	64	73
4	180	--	10	157	25	11	733	60	S 160
5	152	--	9	147	19	8	1660	140	630
6	157	--	10	147	20	8	1170	55	170
7	161	--	10	143	18	7	932	26	65
8	152	--	9	143	17	7	770	24	50
9	147	22	9	143	17	7	702	22	42
10	143	22	8	143	22	8	605	32	52
11	152	23	9	143	26	10	538	34	49
12	152	22	9	152	26	11	645	34	59
13	143	32	12	152	25	10	1340	47	170
14	143	34	13	147	28	11	1160	34	110
15	138	32	12	143	21	8	1420	48	180
16	147	32	13	147	23	9	1190	34	110
17	190	24	12	161	29	13	1120	24	73
18	480	59	S 91	415	61	68	728	26	51
19	486	60	S 81	328	70	62	728	38	75
20	300	27	22	273	34	25	598	30	48
21	220	20	12	441	36	43	661	60	110
22	185	24	12	323	49	43	582	37	58
23	157	28	12	225	36	22	545	30	44
24	152	26	11	166	35	16	530	33	47
25	143	27	10	236	50	32	677	42	77
26	138	26	10	1080	130	S 640	1000	22	59
27	138	30	11	1340	100	S 380	1250	30	100
28	152	29	12	815	48	110	1540	47	200
29	152	32	13	629	32	54	1340	32	120
30	152	30	12	552	26	39	1480	38	150
31	161	23	10	--	--	--	1430	36	140
Total	6169	--	514	9427	--	1695	28420	--	3369

	JANUARY			FEBRUARY			MARCH		
1	1320	32	110	1040	29	81	1580	33	140
2	968	23	60	1110	56	170	2020	70	380
3	4850	880	S 13000	824	40	89	2000	38	210
4	2880	82	640	694	29	54	1840	44	220
5	2040	42	230	728	28	55	7230	500	S 11000
6	2110	44	250	878	31	73	5900	120	1900
7	1750	30	140	1840	110	550	4810	62	810
8	2510	100	680	6250	340	5700	4030	44	480
9	3300	100	890	6420	160	2800	3240	36	310
10	2670	41	300	6210	130	2200	2860	36	280
11	2260	25	150	5380	70	1000	2080	23	130
12	1880	27	140	5010	69	930	1810	21	100
13	1300	24	84	3830	41	420	1590	25	110
14	1180	34	110	2990	32	260	1450	20	78
15	896	32	77	2150	25	150	1390	20	75
16	896	30	73	1710	22	100	1280	33	110
17	833	33	74	1450	26	100	1220	40	130
18	770	30	62	1320	25	89	1330	43	150
19	762	34	70	1210	27	88	2450	81	S 550
20	702	29	55	1010	33	90	2360	48	310
21	728	23	45	968	23	60	1820	28	140
22	702	26	49	977	30	79	1650	30	130
23	1310	79	S 370	878	32	76	1740	25	120
24	6220	410	S 7100	1250	30	100	3750	150	S 1700
25	5830	150	2400	1310	46	160	5850	220	S 3700
26	4630	76	950	1630	44	190	7260	220	S 4200
27	4800	95	1200	1280	26	90	8530	260	S 6200
28	3760	36	370	1280	20	69	6140	110	1800
29	2790	25	190	--	--	--	6310	120	2000
30	2090	20	110	--	--	--	7410	150	3000
31	1350	18	66	--	--	--	6000	110	1800
Total	70087	--	30045	61627	--	15823	108930	--	42263

S Computed by subdividing day.

1-6030. NORTH BRANCH POTOMAC RIVER NEAR CUMBERLAND, MD.--Continued

Suspended sediment, water year October 1964 to September 1965--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	4980	60	810	1900	35	180	246	16	11
2	3370	39	350	1700	20	92	252	15	10
3	2770	34	250	1450	32	130	390	21	22
4	2140	27	160	1270	32	110	365	26	26
5	1870	21	110	1110	28	84	312	24	20
6	1750	36	170	1120	29	88	241	20	13
7	2090	71	400	1220	38	130	215	16	9
8	1760	46	220	1200	80	260	225	21	13
9	1950	47	250	1050	38	110	225	22	13
10	2140	57	330	986	30	80	215	22	13
11	1900	22	110	905	30	73	215	22	13
12	2360	54	340	842	38	86	215	24	14
13	2250	62	380	770	29	60	215	34	20
14	2000	53	290	702	27	51	200	29	16
15	1820	50	250	637	32	55	185	34	17
16	2460	71	470	582	21	33	185	39	19
17	2460	59	390	545	29	43	200	35	19
18	2050	52	290	516	32	45	210	36	20
19	1990	71	380	467	38	48	210	37	21
20	2020	48	260	422	36	41	190	36	18
21	1820	38	190	390	27	28	180	32	16
22	1640	39	170	402	18	20	161	29	13
23	1480	46	180	422	18	21	166	28	13
24	1380	40	150	371	32	32	161	23	10
25	1640	42	190	359	35	34	157	20	8
26	3540	190	S 2000	384	30	31	157	20	8
27	3930	110	1200	422	25	28	152	22	9
28	3540	88	840	340	24	22	147	22	9
29	2850	52	400	312	20	17	147	22	9
30	2220	41	250	267	17	12	143	21	8
31	--	--	--	246	15	10	--	--	--
Total	70170	--	11780	23309	--	2054	6282	--	430

Day	JULY			AUGUST			SEPTEMBER		
1	152	18	7	180	20	10	124	23	8
2	152	18	7	180	21	10	119	15	5
3	161	19	8	166	28	13	119	15	5
4	161	22	10	152	26	11	119	19	6
5	161	22	10	138	22	8	119	22	7
6	157	16	7	134	19	7	119	21	7
7	166	17	8	200	27	15	124	31	10
8	170	22	10	180	22	11	134	22	8
9	152	22	9	215	31	18	119	18	6
10	143	25	10	246	34	23	119	17	5
11	189	31	16	200	39	21	119	14	4
12	454	34	42	152	34	14	269	130	S 110
13	289	26	20	134	35	13	300	90	73
14	195	20	11	134	41	15	230	55	34
15	161	21	9	138	36	13	180	63	31
16	143	23	9	138	32	12	147	66	26
17	143	25	10	138	24	9	138	34	13
18	143	22	8	138	20	7	138	31	12
19	143	22	8	138	18	7	134	30	11
20	134	21	8	129	19	7	138	21	8
21	134	18	7	124	38	13	152	30	12
22	138	17	6	161	44	19	143	37	14
23	152	11	5	180	41	20	134	33	12
24	161	10	4	157	47	20	201	63	S 40
25	147	11	4	147	34	13	241	110	72
26	143	13	5	225	25	15	200	95	51
27	138	13	5	200	42	23	157	73	31
28	134	12	4	152	60	25	138	63	23
29	134	15	5	129	62	22	134	66	24
30	129	19	7	129	42	15	134	100	36
31	143	16	6	124	29	10	--	--	--
Total	5122	--	285	4958	--	439	4642	--	704

Total discharge for year (cfs-days).....399143
Total load for year (tons).....109401

S Computed by subdividing day.

1-6030. NORTH BRANCH POTOMAC RIVER NEAR CUMBERLAND, MD.--Continued

Particle-size analyses of suspended sediment, water year October 1964 to September 1965
(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 temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters											Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Jan. 24, 1965.....	1220	36		7750	631		12	23	36	49	67	84	89	96	99	100	--	SBWC
Mar. 5.....	1300	40		9500	718		9	14	24	39	65	74	81	90	97	100	--	SBN
Mar. 5.....	1300	40		9500	718		16	28	43	57	69	74	81	90	97	100	--	SBWC
Mar. 25.....	1830	40		7330	325		10	18	30	40	52	66	73	82	95	100	--	SBWC
Mar. 27.....	1130	46		8860	228		7	9	18	31	66	72	79	88	98	99	100	SBN
Mar. 27.....	1130	46		8860	228		6	19	34	49	65	72	79	88	98	99	100	SBWC
Mar. 30.....	0100	50		8090	197		7	14	21	29	37	41	46	56	92	100	--	SBWC

1-6195. ANTIETAM 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 1965.
EXTREMES, 1964-65.--Water temperatures: Maximum, 81°F July 9-11; minimum, 34°F Jan. 20-24.
EXTREMES, 1962-65.--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, August to September 1965.

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^{+1}	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Aug. 4, 1965...	82	4.5				69	15	13	3.7	237	33	20	0.4	8.0	305	234	40		488	7.2	
Aug. 9.....	143	--				70	6.4	A31	--	224	36	25	--	6.6	316	201	--		490	8.3	
Sept. 10.....	75	4.0				83	6.1	12	4.0	233	36	18	.3	9.5	295	232	41		491	7.7	

A Calculated Na plus K, reported as Na.

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

Temperature (°F) of water, water year October 1964 to September 1965
(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	62	61	62	62	61	58	56	54	54	54	53	52	51	53	53	55	56	58	58	56	54	52	52	51	50	52	53	54	54	55	55	55
Minimum	61	61	61	60	58	56	54	52	53	53	52	49	49	51	53	53	55	56	56	54	52	52	51	49	49	50	52	53	53	53	53	54
November																																
Maximum	53	52	51	52	52	52	52	50	49	49	50	51	53	52	52	52	52	52	51	51	49	45	41	40	45	48	49	49	49	48	--	50
Minimum	51	50	51	51	51	52	50	49	49	49	49	50	51	52	50	50	52	51	51	49	45	41	40	39	40	45	48	49	48	41	--	48
December																																
Maximum	41	39	39	41	43	43	42	40	40	40	41	45	47	47	45	40	39	39	38	36	36	37	38	40	45	47	47	47	45	43	43	42
Minimum	39	38	38	39	41	42	40	39	39	39	39	41	45	45	40	39	38	38	36	36	36	36	37	38	40	45	47	45	43	43	43	40
January																																
Maximum	43	42	41	39	38	38	38	40	43	43	39	36	36	36	36	35	35	35	35	35	34	34	34	37	39	39	39	38	37	36	35	38
Minimum	42	41	39	38	36	37	38	38	40	39	36	36	36	36	35	35	35	35	35	34	34	34	34	34	37	39	38	37	36	35	35	37
February																																
Maximum	35	35	35	35	36	36	37	44	42	43	46	47	47	46	43	42	44	44	44	42	41	42	40	40	43	43	39	42	--	--	--	41
Minimum	35	35	35	35	35	35	35	37	41	42	43	46	46	43	42	42	42	44	42	39	39	40	39	39	40	39	37	38	--	--	--	39
March																																
Maximum	44	44	45	46	46	44	45	46	47	47	47	46	47	48	48	49	49	48	49	49	49	47	48	50	50	49	49	53	53	53	53	48
Minimum	42	44	44	45	44	41	42	45	46	47	46	46	46	47	48	48	47	47	48	49	46	46	47	48	49	49	49	49	53	53	52	47
April																																
Maximum	52	51	51	51	54	55	55	59	59	58	58	60	60	58	57	56	57	58	58	58	60	64	64	63	61	59	59	59	62	63	--	58
Minimum	51	51	50	51	51	54	55	55	58	57	58	58	58	56	56	56	55	57	58	57	57	60	63	60	58	57	59	59	59	62	--	57
May																																
Maximum	63	66	70	71	71	70	68	66	67	70	72	72	71	69	70	72	73	73	73	74	74	71	73	73	71	73	74	75	75	72	69	71
Minimum	63	63	66	69	70	68	66	65	65	67	70	71	69	68	69	70	72	73	72	73	71	70	71	71	70	70	73	74	72	69	67	69
June																																
Maximum	71	72	72	72	71	74	77	78	78	78	78	78	78	77	75	73	69	68	68	71	74	77	79	79	78	77	76	78	80	80	--	75
Minimum	68	71	72	70	70	71	74	77	78	78	77	77	77	75	73	69	68	67	67	68	71	74	77	78	76	75	76	76	78	80	--	74
July																																
Maximum	80	78	78	78	79	79	79	79	81	81	81	79	77	79	79	79	79	80	80	79	78	76	76	78	80	80	80	79	78	77	76	79
Minimum	78	77	77	77	78	79	79	79	79	81	79	76	77	77	79	79	79	79	79	78	76	75	75	76	78	80	79	78	76	76	75	78
August																																
Maximum	75	75	75	73	74	76	78	78	78	78	78	77	76	76	78	79	80	80	80	80	78	75	75	75	75	74	75	76	76	72	70	76
Minimum	75	75	73	72	73	74	76	78	78	78	77	75	76	74	76	78	79	80	80	78	75	74	74	75	74	74	74	75	72	70	69	75
September																																
Maximum	70	70	70	69	69	69	70	70	73	75	75	75	73	71	72	73	73	74	75	76	77	77	77	76	74	70	67	64	62	63	--	72
Minimum	68	69	69	69	69	69	69	70	70	73	75	73	71	70	70	72	72	73	74	75	76	77	76	74	70	67	64	62	62	62	--	70

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.--Chemical analyses: December 1964 to September 1965.
Water temperatures: October 1960 to September 1965.
Sediment records: October 1960 to September 1965.
EXTREMES, 1964-65.--Water temperatures: Maximum, 86°F July 14, 18, 25; minimum, freezing point on several days in January and February.
Sediment concentrations: Maximum daily, 670 ppm Mar. 6; minimum daily, 1 ppm Oct. 5-10.
Sediment loads: Maximum daily, 150,000 tons Mar. 6; minimum daily, 5 tons Oct. 10.
EXTREMES, 1960-65.--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.

Chemical analyses, in parts per million, December 1964 to September 1965

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^{+1}	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Dec. 16, 1964	7860	5.1		0.13	0.00	34	5.1	6.8	2.0	84	35	8.3	0.1	1.9	143	106	37		242	6.8	--
Jan. 26, 1965	46900	7.1				26	5.1	4.4	1.9	66	28	5.4	.2	6.0	126	86	32		193	7.5	--
Feb. 1	11300	6.6		.00	.00	22	4.1	4.8	.4	56	28	6.2	.0	4.2	105	22	27		173	6.9	5
Mar. 1	15300	5.7		.02	.00	24	4.9	5.4	1.2	68	27	6.8	.0	3.6	127	80	25		193	7.0	10
Mar. 7	69200	6.1				21	2.8	3.2	1.9	50	21	4.8	.1	5.6	108	64	23		153	7.4	--
Apr. 1	21900	7.3		.00	.00	22	4.1	4.2	.6	55	28	5.1	.0	3.2	104	72	27		167	6.9	5
May 6	8520	4.2				25	5.0	4.9	1.0	66	28	6.1	.1	.0	126	83	29		186	7.7	--
June 2	2810	1.1				37	7.9	11	1.7	107	44	11	.2	.0	183	125	38		291	7.2	--
July 2	1400	1.4				41	13	20	1.8	121	65	19	.2	.2	236	155	56		380	7.2	--
Aug. 1	1020	1.8				42	12	38	2.5	119	98	29	.2	.0	297	154	--		472	7.0	--
Aug. 9	1120	--				38	10	A37	--	104	83	28	--	.3	255	138	--		417	8.3	--
Sept. 3	1040	1.8				41	12	31	2.8	116	83	31	.1	.4	269	152	57		443	7.7	--

A Calculated Na plus K, reported as Na.

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

Temperature (°F) of water, water year October 1964 to September 1965
(Once-daily measurement at approximately 1700)

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	63	64	65	63	62	61	64	59	58	54	54	61	59	60	60	60	60	63	55	55	55	55	56	53	49	57	57	—	61	52	52	58
November	55	55	65	55	53	50	54	52	52	54	54	55	56	54	52	56	54	53	50	48	45	47	42	43	47	49	47	48	43	40	—	51
December	38	34	40	42	43	39	39	39	39	39	41	44	39	43	34	39	39	34	34	35	35	33	35	38	45	46	46	43	39	43	43	39
January	39	43	38	38	39	39	38	42	40	35	37	39	37	35	—	32	32	—	—	35	36	37	35	32	34	36	36	39	35	32	32	36
February	32	32	32	32	32	40	39	45	38	38	43	47	42	40	42	43	43	44	38	36	—	35	37	38	39	35	38	43	—	—	—	39
March	42	42	43	46	41	39	43	44	44	41	42	43	44	45	43	47	39	42	45	41	43	45	41	39	41	39	44	47	47	46	47	43
April	48	42	—	49	52	47	49	53	52	52	54	49	53	—	52	55	59	56	53	58	61	63	59	56	55	60	58	55	59	62	—	54
May	60	64	72	72	63	70	65	65	71	74	72	71	74	73	74	74	76	71	78	72	70	71	78	70	76	80	79	77	75	77	75	72
June	72	75	73	75	76	79	82	82	80	80	83	83	79	73	71	65	66	69	71	79	79	82	84	78	—	79	80	84	85	80	—	77
July	82	—	81	85	85	83	80	81	85	80	75	78	80	86	83	85	85	86	—	71	75	76	—	82	86	81	80	80	82	77	77	81
August	77	76	74	74	76	79	80	—	80	79	75	75	72	80	82	84	82	81	81	77	—	75	78	74	73	75	77	80	70	67	70	77
September	70	70	71	70	72	72	70	72	75	77	79	72	60	70	73	75	74	73	83	79	74	78	77	78	69	70	60	61	54	65	—	71

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

Suspended sediment, water year October 1964 to September 1965

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..	1670	2	9	1590	C 2	9	5620	23	350
2..	2390	3	19	1630	C 2	9	4500	20	240
3..	3820	3	31	1550	C 2	8	3870	15	160
4..	4630	3	38	1570	C 2	8	3500	11	100
5..	3450	1	9	1570	C 2	8	3550	9	86
6..	2890	C 1	8	1510	C 2	8	3950	9	96
7..	2510	C 1	7	1440	C 2	8	6500	13	230
8..	2340	C 1	6	1430	C 2	8	7450	12	240
9..	2060	C 1	6	1440	C 2	8	7440	18	360
10..	1860	C 1	5	1470	C 2	8	6690	14	250
11..	1720	C 2	9	1400	C 3	11	5760	13	200
12..	1550	C 2	8	1380	C 3	11	5370	12	170
13..	1480	C 2	8	1400	C 3	11	5210	13	180
14..	1460	C 2	8	1340	C 3	11	6520	12	210
15..	1360	C 2	7	1360	C 3	11	7730	14	290
16..	1320	C 3	11	1400	C 3	11	7920	C 11	240
17..	1420	C 3	12	1350	C 3	11	7340	C 11	220
18..	1820	C 3	15	1430	C 3	12	6520	C 11	190
19..	2640	6	43	1450	C 3	12	5650	C 9	140
20..	2580	5	35	1420	C 3	12	4820	C 9	120
21..	4370	9	110	1410	C 2	8	4240	9	100
22..	4120	6	67	1460	C 2	8	3860	9	94
23..	3390	4	37	1570	C 2	8	3580	9	87
24..	2840	C 3	23	1570	C 2	8	3490	8	75
25..	2390	C 3	19	1700	C 2	9	3350	8	72
26..	2220	C 3	18	2520	5	33	3230	7	61
27..	2110	C 3	17	3970	15	160	3330	6	54
28..	2040	C 2	11	6640	22	S 410	3990	6	65
29..	1840	C 2	10	9800	32	850	5600	9	140
30..	1670	C 2	9	7330	18	360	7320	13	260
31..	1670	C 2	9	--	--	--	7630	14	290
Total	73630	--	624	67100	--	2049	165530	--	5370

	JANUARY			FEBRUARY			MARCH		
1..	7460	15	300	11700	26	820	15900	29	1200
2..	6770	11	200	9520	11	280	13900	26	980
3..	6490	9	160	8000	C 10	220	12700	25	860
4..	6400	12	210	7000	C 10	190	12200	18	560
5..	14500	52	2000	6000	C 10	160	25900	130	9100
6..	11800	60	1900	6000	4	65	79900	670	S 150000
7..	9760	90	2400	7960	8	170	68100	460	S 89000
8..	9080	46	1100	16400	65	2900	42000	170	S 20000
9..	8680	21	490	36000	290	28000	31700	78	6700
10..	11400	22	680	42800	310	36000	25800	51	3600
11..	12100	24	780	36800	180	18000	21600	43	2500
12..	11100	20	600	33900	100	9200	18400	34	1700
13..	10700	19	550	28100	61	4600	15800	28	1200
14..	10300	14	390	23300	41	26000	14000	23	870
15..	9160	9	220	18900	34	1700	12700	20	690
16..	8170	C 10	220	15800	27	1200	11600	19	600
17..	7220	C 10	190	13700	19	700	10900	16	470
18..	6360	C 10	170	12200	16	530	10500	13	370
19..	6220	C 9	150	11100	16	480	10400	14	390
20..	6040	C 9	150	9880	13	350	13500	21	770
21..	5860	C 9	140	8960	12	290	19500	31	1600
22..	5860	C 9	140	8320	15	340	17300	28	1300
23..	5910	5	80	7750	13	270	15000	22	890
24..	10700	16	S 570	7250	11	220	14000	17	640
25..	39000	490	S 6500	9110	22	540	14700	15	600
26..	46900	420	53000	15800	41	1700	21200	28	1600
27..	39200	180	S 20000	20000	130	7000	39100	120	S 14000
28..	29500	92	7300	19400	90	4700	43900	220	26000
29..	23500	54	3400	--	--	--	34200	110	10000
30..	18300	36	1800	--	--	--	28200	57	4300
31..	14500	18	700	--	--	--	26700	41	2900
Total	418940	--	106490	451650	--	123225	741300	--	355390

S Computed by subdividing day.
C Composite period.

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

Suspended sediment, water year October 1964 to September 1965--Continued

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	23100	41	2600	15400	24	1000	2960	20	160
2	20000	31	1700	13400	21	760	2810	18	140
3	17500	22	1000	11900	19	610	3070	21	170
4	15400	17	710	10900	19	560	2800	19	140
5	13500	19	690	9640	19	490	2720	18	130
6	12200	18	590	8710	25	590	2770	18	130
7	11700	17	540	8260	25	560	2600	17	120
8	12200	17	560	8370	20	450	2640	16	110
9	12600	18	610	9200	19	470	4120	30 S	360
10	12100	20	650	10500	18	510	3780	22 S	240
11	13300	27	970	9940	19	510	2870	14	110
12	14500	28	1100	9180	18	450	2580	19	130
13	13900	28	1100	8640	18	420	2460	19	130
14	17000	33	1500	7700	20	420	2320	15	94
15	15000	28	1200	6930	18	340	2260	16	98
16	14100	28	1100	6420	19	330	2180	31	180
17	13500	26	950	6110	19	310	2000	12	65
18	13800	23	860	5690	22	340	2010	10	54
19	13100	20	710	5130	22	300	1970	11	59
20	12500	22	740	4690	20	250	2050	15	83
21	13000	23	810	4460	18	220	2070	23	130
22	14100	22	840	4110	15	170	1860	24	120
23	13200	23	820	4000	16	170	1930	18	94
24	12000	22	710	4220	36	410	1890	12	61
25	11400	23	710	4240	24	270	1790	17	82
26	11500	22	680	4060	16	180	1810	16	78
27	14900	28	1100	4030	16	170	1650	13	58
28	23000	46	2900	4080	23	250	1540	12	50
29	21100	42	2400	3870	22	230	1400	13	49
30	18000	31	1500	3640	18	180	1460	10	39
31	--	--	--	3320	20	180	--	--	--
Total	443900	--	32350	220740	--	12100	70370	--	3464
	JULY			AUGUST			SEPTEMBER		
1	1450	12	47	1060	7	20	1310	6	21
2	1410	15	57	969	7	18	1210	4	13
3	1400	10	38	915	3	7	1030 C	8	22
4	1150	10	31	969	7	18	1030 C	8	22
5	1440	13	51	1240	8	27	999 C	8	21
6	1370	10	37	1300	11	39	903 C	4	10
7	1370	11	41	1290	8	28	814 C	4	9
8	1420	12	46	1200	7	23	886 C	4	10
9	1300	11	39	1110	7	21	772 C	4	8
10	1450	14	55	1390	10	38	734 C	4	8
11	2580	630 S	5800	1520	14	7	787 C	4	8
12	2050	81	450	1620	13	57	857 C	3	7
13	1790	40	190	1460	10	39	1020 C	3	8
14	1810	47	230	1340	17	62	1030 C	3	8
15	1760	49	230	1230	8	27	1280 C	17	59
16	2170	49	290	984	7	19	1510 C	17	69
17	2060	37	210	1130	5	15	1500 C	17	69
18	1810	27	130	1270	5	17	1370 C	17	63
19	1560	22	93	991	5	13	1420 C	17	65
20	1480	32	130	994	6	16	1330 C	17	61
21	1340	32	120	948	7	18	1520 C	4	16
22	1380	29	110	956	11	28	1430 C	4	15
23	1260	28	95	935	6	15	1180 C	4	13
24	1200	20	65	994	8	21	1380 C	9	34
25	1160	16	50	1050	7	20	1360 C	9	33
26	1140	21	65	1660	96 S	500	1440 C	9	35
27	1110	28	84	1660	14	63	1360 C	6	22
28	1050	21	60	1600	8	35	1360 C	6	22
29	1040	17	48	1340	5	18	1320 C	6	21
30	1020	14	39	1330	10	36	1390 C	6	23
31	1030	10	28	1400	12	45	--	--	--
Total	45560	--	8959	37865	--	1360	35532	--	795

TOTAL DISCHARGE FOR YEAR (CFS-DAYS) 2772117
TOTAL LOAD FOR YEAR (TONS) 652176

S Computed by subdividing day.
C Composite period.

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

Particle-size analyses of suspended sediment, water year October 1964 to September 1965
(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 temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters											Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Jan. 26, 1965.....	1000	34		46900	500		26	37	57	76	95	99	100	100	--			SBWC
Jan. 26.....	1000	34		46900	500		15	20	32	51	94	99	100	100	--			SBNC
Mar. 7.....	1015	40		69800	470		34	44	63	82	90	94	98	99	100			SBWC
Mar. 7.....	1015	40		69800	470		19	26	43	63	89	97	99	100	--			BNC
Mar. 27.....	1900	44		43600	172		22	28	49	61	84	92	98	100	100			SBWC

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.--Chemical analyses: December 1964 to September 1965.
Water temperatures: October 1960 to September 1965.
Sediment records: October 1960 to September 1965.
EXTREMES, 1964-65.--Water temperatures: Maximum, 86°F on several days during July to September; minimum, freezing point on Jan. 4, 14, 29, 31.
Sediment concentrations: Maximum daily, 1,100 ppm Mar. 5; minimum daily, 1 ppm on several days in October and November.
Sediment loads: Maximum daily, 29,000 tons Feb. 8; minimum daily, less than 0.50 ton on many days in October, November, and September.
EXTREMES, 1960-65.--Water temperatures: Maximum, 86°F on several days during July to September 1965; 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.
Sediment loads: Maximum daily, 29,000 tons Feb. 8, 1965; minimum daily, less than 0.50 ton on many days.
REMARKS.--Flow affected by ice or no gage-height record Jan. 7 to Mar. 11. No appreciable inflow between sampling point and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, December 1964 to September 1965

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^{+1}	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
Dec. 16, 1964..	254	8.6		0.16	0.00	29	5.7	7.4	3.3	78	26	11	0.1	8.5	136	96	32		229	7.4	--
Feb. 8, 1965...	13310	5.1				13	1.8	3.1	3.4	18	15	7.0	.2	8.4	87	40	25		100	7.1	--
Mar. 4.....	750	8.2				20	4.9	5.5	.8	56	20	8.0	.1	9.2	105	70	24		172	6.8	7
Mar. 5.....	11200	6.0				13	2.8	3.3	2.8	27	17	5.7	.1	8.7	93	44	22		114	7.2	--
Apr. 3.....	926	6.0				20	4.4	4.9	1.0	57	18	7.4	.0	8.4	105	68	22		170	6.9	5
May 3.....	460	1.3				22	4.6	5.6	1.2	73	16	7.4	.1	.2	107	74	14		175	6.7	--
June 2.....	292	4.4				28	5.4	6.1	2.0	90	15	8.8	.2	4.7	146	92	18		212	6.7	--
Aug. 2.....	105	.8				40	4.6	7.2	3.2	124	16	12	.2	6.4	170	119	18		271	7.3	--
Aug. 9A.....	67	--				43	6.9	B12	--	150	16	15	--	.8	180	136	--		318	7.8	--
Sept. 1.....	63	5.2				40	6.8	12	4.9	131	21	16	.2	5.3	183	128	21		310	7.1	--

A Phosphate (PO_4) 1.4.
B Calculated Na plus K, reported as Na.

POTOMAC RIVER BASIN--Continued

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

Temperature (°F) of water, water year October 1964 to September 1965
(Once-daily measurement at approximately 1800)

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	60	62	65	62	59	58	55	54	--	51	51	52	52	55	57	59	58	65	55	53	53	54	51	50	53	56	--	55	55	54	--	56
November	--	53	53	49	54	49	50	50	50	48	51	53	54	52	54	54	53	52	49	48	41	38	38	40	45	47	46	46	47	39	--	48
December	36	35	38	40	41	41	37	37	36	37	41	46	46	41	37	35	38	34	33	33	35	--	37	37	44	47	45	44	41	44	43	39
January	38	39	37	32	38	40	39	40	48	38	35	34	33	32	--	--	--	--	--	--	--	--	--	--	35	34	33	35	32	--	32	--
February	--	--	--	--	--	--	--	42	42	40	41	47	40	37	38	41	44	44	38	34	38	35	37	37	38	33	36	43	--	--	--	--
March	43	43	44	47	40	39	42	44	45	43	41	43	41	45	43	46	39	41	45	40	41	43	47	46	42	44	43	48	50	49	48	44
April	49	45	46	48	53	49	51	59	54	55	53	59	50	54	52	51	60	56	54	58	62	67	--	56	51	60	57	55	63	67	--	55
May	62	71	73	77	66	70	60	61	69	76	71	73	75	71	69	76	73	70	75	70	67	73	78	68	72	80	78	76	72	67	74	71
June	73	73	68	72	72	76	79	79	77	75	80	78	78	77	68	61	61	--	--	--	--	--	--	--	--	73	74	79	80	79	--	--
July	81	81	80	81	--	77	79	80	84	83	70	80	80	84	78	86	83	84	79	81	81	75	83	86	--	79	84	85	77	--	75	81
August	75	75	76	81	80	86	86	86	83	78	74	81	83	83	83	83	81	84	83	83	76	76	78	75	75	75	82	82	73	74	74	79
September	75	73	74	69	75	77	80	79	83	86	76	68	68	76	77	78	76	81	81	83	85	83	80	78	71	72	65	67	67	70	--	76

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

Suspended sediment, water year October 1964 to September 1965
(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	171	13	6	86	--	T	152	5	2
2	232	63 S	50	92	C 2	T	138	3	1
3	230	66 S	43	95	C 2	1	138	4	1
4	186	27	14	95	C 2	1	238	12 S	9
5	132	13	5	90	C 2	T	416	34 S	41
6	112	C 3	1	88	C 2	T	530	33	47
7	100	C 3	1	90	C 1	T	460	20	25
8	88	C 3	1	86	C 1	T	302	9	7
9	84	C 3	1	90	C 1	T	226	7	4
10	86	C 3	1	90	C 1	T	192	4	2
11	80	C 1	T	90	C 1	T	171	4	2
12	78	C 1	T	90	C 2	T	310	44 S	45
13	76	C 1	T	90	C 2	T	600	50	81
14	76	C 1	T	90	C 2	T	572	29	45
15	78	C 2	T	88	C 2	T	365	12	12
16	80	C 2	T	90	C 2	T	262	9	6
17	92	C 2	T	95	C 3	1	212	C 9	5
18	100	C 2	1	92	C 3	1	195	C 9	5
19	108	C 1	T	102	C 3	1	150	C 9	4
20	112	C 1	T	120	C 3	1	177	--	4
21	110	C 1	T	120	C 3	1	171	6	3
22	110	C 1	T	112	C 4	1	174	--	2
23	95	C 1	T	108	C 4	1	158	--	2
24	92	C 1	T	102	C 4	1	174	5	2
25	86	C 1	T	147	6	2	171	16	7
26	84	C 1	T	793	100 S	250	186	8	4
27	84	--	T	754	75 S	160	379	120 S	220
28	88	C 2	T	342	21	19	1600	320	1400
29	88	C 2	T	226	12	7	1030	100 S	300
30	90	C 2	T	180	6	3	620	32	54
31	88	C 2	T	--	--	--	495	20	27
Total	3316	--	130	4733	--	456	10964	--	2369

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	400	12	13	460	--	10	920	15	37
2	370	12	12	380	--	10	820	12	27
3	425	9	10	320	--	9	800	9	19
4	400	6	6	260	--	4	760	8	16
5	315	6	5	250	--	4	6000	1100 S	25000
6	306	4	3	280	--	3	15500	500 S	22000
7	290	4	3	700	--	100	4000	120	1300
8	400	26	28	10700	990	29000	2800	62	470
9	750	51	100	3100	230	1900	2100	42	240
10	700	38	72	2400	160	1000	1600	26	110
11	580	20	31	4000	320	3500	1400	22	83
12	590	27	43	2500	56	380	1230	13	43
13	620	32	54	1800	28	140	1100	C 9	27
14	520	25	35	1200	18	58	1000	C 9	24
15	380	--	20	1100	20	59	958	C 9	23
16	400	--	20	1100	12	36	868	C 9	21
17	360	--	20	1000	10	27	804	--	20
18	370	--	20	900	C 15	36	900	38	92
19	350	--	10	800	C 15	32	1330	28	100
20	340	--	10	600	C 15	24	1800	40	190
21	320	--	10	640	C 2	3	1170	24	76
22	320	--	7	640	C 2	3	1080	14	41
23	450	--	10	500	C 2	3	1010	C 8	22
24	1300	--	300	520	6	8	990	C 8	21
25	2300	200	1200	800	150 S	500	1110	14	42
26	1700	100	460	4000	450 S	5000	2570	210	1500
27	1400	78	290	1600	68	290	3060	110	910
28	1100	48	140	1000	26	70	1730	34	160
29	820	18	40	--	--	--	1570	27	110
30	540	16	23	--	--	--	1590	20	86
31	500	12	16	--	--	--	1230	11	37
Total	19016	--	3011	43550	--	42209	63800	--	52847

S Computed by subdividing day.
T Less than 0.50 ton.
C Composite period.

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

Suspended sediment, water year October 1964 to September 1965--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	1060	10	29	515	21	29	212	11	6
2	1020	C 5	14	490	52	69	222	74 S	53
3	964	C 5	13	470	56	71	468	220	280
4	850	C 5	11	435	31	36	375	60	61
5	792	C 9	19	410	24	27	375	22	15
6	754	C 9	18	395	22	23	195	23	12
7	782	C 9	19	485	60	79	174	38	18
8	765	C 9	19	724	42	82	194	31 S	19
9	738	14	28	615	22	37	395	170	180
10	680	18	33	510	20	28	292	89	70
11	625	15	25	460	52	65	206	52	29
12	600	14	23	400	40	43	174	39	18
13	550	—	20	370	16	16	150	34	14
14	510	19	26	346	13	12	140	31	12
15	525	16	23	328	—	10	135	—	10
16	721	16	31	350	30	28	142	38	15
17	700	17	32	385	64	67	158	56	24
18	575	13	20	400	28	30	168	40	18
19	610	16	26	342	13	12	171	—	22
20	695	14	26	302	44	36	158	53	23
21	625	42	71	292	50	39	142	—	10
22	560	22	33	274	18	13	138	24	9
23	530	—	30	297	14	11	130	30	11
24	535	32	46	338	48	44	150	—	20
25	575	23	36	333	26	23	130	48	17
26	710	72	140	306	8	1	120	48	16
27	732	40	79	284	15	12	118	48	15
28	665	17	31	279	58	44	112	43	13
29	610	12	20	274	22	16	110	41	12
30	550	15	22	250	64	43	108	38	11
31	—	—	—	230	54	34	—	—	—
Total	20608	—	963	11889	—	1086	5633	—	1033

Day	JULY			AUGUST			SEPTEMBER		
1	102	65	18	118	200	64	63	80	14
2	95	91	23	110	55	16	63	100	17
3	95	76	19	115	60	19	65	80	14
4	92	42	10	103	60	17	67	480	87
5	90	34	8	368	370 S	500	62	40	7
6	86	28	7	78	52	11	62	10	2
7	88	23	5	72	40	8	60	12	2
8	95	18	5	72	10	2	60	32	5
9	88	10	2	68	10	2	62	22	4
10	90	10	2	70	11	2	58	4	1
11	548	640 S	1300	67	16	3	60	3	T
12	465	120	150	82	22	5	65	34	6
13	206	53	29	80	38	8	102	28	8
14	140	49	19	76	—	8	108	16	5
15	112	55	17	70	—	8	152	98	40
16	95	55	14	67	—	8	125	57	19
17	88	43	10	65	44	8	95	70	18
18	82	44	10	65	26	5	80	58	13
19	82	37	8	72	22	4	72	16	3
20	100	—	6	70	28	5	72	8	2
21	88	16	4	62	12	2	68	6	1
22	78	20	4	60	12	2	70	13	2
23	82	—	4	60	12	2	67	25	5
24	100	14	4	82	12	3	72	14	3
25	92	—	6	90	8	2	115	78	2
26	92	—	8	76	6	1	165	24	11
27	86	43	10	94	8	2	108	20	6
28	80	7	2	76	12	2	88	24	6
29	76	7	2	67	18	3	78	19	4
30	70	—	2	65	10	2	74	20	4
31	72	17	3	62	8	1	—	—	—
Total	3755	—	1711	2682	—	725	2458	—	311

TOTAL DISCHARGE FOR YEAR (CFS-DAYS).....193004
TOTAL LOAD FOR YEAR (TONS).....106851

S Computed by subdividing day.
T Less than 0.50 ton.
C Composite period.

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

Particle-size analyses of suspended sediment, water year October 1964 to September 1965
(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 temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters										Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Nov. 26, 1964	1550	48		798	111		30	51	79	95	99	99	100	--				SBWC
Dec. 28	1715	44		1830	295		--	34	55	78	98	99	100	--				SBWC
Feb. 8, 1965	1710	42		13310	734		--	48	72	89	97	99	100	--				SBWC
Feb. 8	1710	42		13310	734		--	33	51	74	97	99	100	--				SBN
Mar. 5	1900	40		11200	1580		22	36	54	74	91	96	99	100				SBWC
Mar. 5	1900	40		11200	1580		--	22	37	54	79	96	99	100				SBN

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 1965.
EXTREMES, 1964-65.--Water temperatures: Maximum, 86°F Aug. 17; minimum, freezing point Dec. 16, 18, 19, and Feb. 26, 27.
EXTREMES, 1957-65.--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 1964 to September 1965
(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	56	59	61	57	56	55	55	53	54	52	52	52	54	56	54	56	56	60	54	52	52	53	51	51	52	54	55	56	55	56	53	55
Minimum	53	56	54	54	51	49	48	46	47	48	45	44	46	48	48	51	55	53	51	50	46	47	46	44	44	46	48	49	51	50	47	49
November																																
Maximum	52	53	51	52	52	51	50	50	51	51	52	53	56	54	51	53	52	51	49	52	45	39	39	42	52	50	49	47	48	43	--	50
Minimum	45	46	47	45	46	48	44	44	44	44	46	46	50	48	44	49	47	46	48	45	39	37	35	36	42	48	45	44	43	37	--	44
December																																
Maximum	37	37	42	45	46	43	38	38	40	38	43	46	46	46	38	35	40	40	33	35	36	38	38	41	50	52	50	44	42	46	45	42
Minimum	35	35	37	42	43	38	35	34	36	34	35	43	44	38	33	32	34	32	32	33	33	35	35	38	41	45	43	40	39	42	40	37
January																																
Maximum	40	41	40	39	40	42	40	44	47	44	40	41	41	39	36	35	35	35	35	36	39	40	41	38	44	44	43	41	41	37	37	40
Minimum	38	40	35	34	34	38	36	39	44	35	36	36	36	35	35	35	35	35	35	35	36	36	36	36	38	39	37	36	36	36	36	36
February																																
Maximum	37	38	37	37	37	40	41	49	45	43	47	48	47	40	41	43	44	44	39	34	42	39	38	39	42	37	37	47	--	--	--	41
Minimum	36	36	36	36	36	36	38	41	43	42	42	45	40	36	34	34	37	37	33	33	34	33	33	33	35	32	32	34	--	--	--	36
March																																
Maximum	47	45	44	47	44	43	46	44	46	44	44	45	46	46	46	50	44	42	49	42	44	47	49	49	46	46	49	53	53	53	51	47
Minimum	40	36	40	41	38	37	37	40	40	38	35	36	35	36	38	38	35	36	40	36	34	36	40	45	42	39	41	39	46	43	40	39
April																																
Maximum	52	47	53	52	56	50	48	60	54	59	51	64	55	60	50	58	61	60	53	58	63	67	62	55	52	61	57	55	64	67	--	57
Minimum	40	43	40	40	40	48	46	47	49	46	48	50	48	44	48	49	46	50	50	49	48	53	55	52	50	49	53	52	50	50	--	48
May																																
Maximum	62	69	72	74	66	67	61	59	67	73	71	66	69	66	69	70	71	72	72	70	64	71	72	67	72	75	74	75	70	69	71	69
Minimum	55	54	56	58	59	58	56	55	57	58	61	59	56	54	55	58	63	60	58	62	62	59	62	62	61	62	64	66	62	57	60	59
June																																
Maximum	74	76	70	71	71	74	76	76	76	79	78	75	75	72	65	62	63	66	70	76	67	80	79	74	77	76	77	79	79	73	--	74
Minimum	60	64	62	58	58	60	64	66	67	67	66	67	64	61	62	60	59	59	59	61	63	67	67	67	65	62	63	65	67	68	--	63
July																																
Maximum	78	75	75	79	78	79	76	80	82	81	74	75	77	82	76	79	82	82	80	78	76	78	78	82	84	84	78	78	77	75	78	79
Minimum	64	61	65	64	68	67	67	68	68	71	68	66	67	67	70	68	69	70	68	65	62	63	67	69	72	71	70	68	66	65	65	67
August																																
Maximum	73	78	76	78	80	82	83	82	78	80	78	80	79	81	82	85	86	83	79	80	75	74	77	72	73	76	75	76	69	68	68	78
Minimum	68	68	64	64	69	68	70	72	73	70	68	64	66	69	69	71	73	73	72	70	65	70	69	67	67	69	67	66	61	60	61	68
September																																
Maximum	72	72	71	70	70	72	71	73	75	76	71	68	66	70	72	74	71	76	78	77	79	78	78	74	68	65	64	62	65	66	--	71
Minimum	64	64	62	62	62	64	62	63	66	67	68	66	64	64	66	66	67	67	68	70	70	70	70	68	62	58	58	56	58	59	--	64

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

LOCATION.--At gaging station 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 (revised).--21.1 square miles.
RECORDS AVAILABLE.--Sediment records: October 1962 to September 1965.
EXTREMES, 1964-65.--Sediment concentrations: Maximum daily, 4,340 ppm Aug. 26; minimum daily, not determined.
Sediment loads: Maximum daily, 4,670 tons Mar. 5; minimum daily, less than 0.05 ton on many days during year.
EXTREMES, 1962-65.--Sediment concentrations: Maximum daily, 4,340 ppm Aug. 26, 1965; minimum daily, not determined.
Sediment loads: Maximum daily, 4,670 tons Mar. 5, 1965; minimum daily, less than 0.05 ton on many days each year.
REMARKS.--Flow affected by ice Dec. 19, Jan. 14, 15, 28-31, and Feb. 1, 20, 23, 24, 27.

Suspended sediment, water year October 1964 to September 1965
(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	5.2	72	B 1	4.1	--	T	5.1	--	0.1
2	9.3	360	S 15	4.0	--	T	5.2	--	.1
3	5.6	--	.1	3.9	--	T	6.5	25	.4
4	4.3	--	.1	3.8	--	T	8.5	75	2
5	3.8	--	.1	3.8	--	T	12	420	S 60
6	3.3	--	T	3.8	1	T	31	510	S 110
7	3.1	--	T	3.8	--	T	10	20	.5
8	3.1	--	T	3.8	--	T	7.6	--	.2
9	3.1	5	T	3.8	--	T	6.9	--	.2
10	2.9	--	T	3.8	--	T	6.4	--	.2
11	2.9	--	T	4.0	--	T	6.1	--	.2
12	3.0	--	T	3.9	--	T	119	1920	S 1110
13	3.2	--	T	3.8	1	T	25	65	S 5
14	3.2	--	T	3.7	--	T	14	--	.8
15	3.1	--	T	4.2	--	T	10	--	.3
16	3.9	--	.6	5.7	--	T	9.0	--	.2
17	13	--	5	6.8	--	T	9.1	--	.2
18	5.4	15	B .2	4.2	--	T	8.3	--	.1
19	4.4	5	B .1	4.7	2	T	7.2	30	B .5
20	4.4	--	T	7.1	--	1	10	48	B 1
21	4.1	--	T	5.1	--	.1	10	30	B .8
22	3.8	--	T	4.2	--	.1	9.2	7	.2
23	3.7	3	T	4.2	--	.1	9.1	--	.1
24	3.9	--	T	4.3	--	.1	9.2	--	.1
25	3.8	--	T	37	1890	S 460	9.0	--	.1
26	4.3	--	T	26	410	S 49	13	30	B 1
27	4.0	--	T	8.5	--	.2	54	1180	S 360
28	3.9	--	T	6.5	--	.2	41	300	S 42
29	4.4	--	T	5.8	--	.1	17	71	B 3
30	4.3	3	T	5.6	--	.1	14	66	B 2
31	4.4	--	T	--	--	--	11	50	B 1
Total	134.8	--	23.0	193.9	--	511.4	513.4	--	1702.3

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

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

Suspended sediment, water year October 1964 to September 1965--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	10	20	B	0.5	10	---		0.1	13	---		0.3
2	11	10		.3	10	---		.1	12	---		.3
3	9.7	---		.3	8.9	---		.1	12	---		.2
4	8.9	---		.2	8.4	---		.1	13	---		.2
5	8.6	---		.2	8.5	---		.1	533	3030	S	4670
6	8.4	---		.2	9.9	---		.1	59	250	S	47
7	8.0	---		.2	152	2830	S	2240	31	50	B	4
8	27	430	S	30	74	420	S	140	24	30		2
9	24	200	S	18	27	90	B	7	21	---		1
10	40	80		9	34	---		10	19	10		.5
11	26	35		2	27	80	A	6	16	---		.4
12	20	---		.8	20	40	B	2	15	---		.3
13	17	---		.5	17	11		.5	15	6		.2
14	14	7		.3	15	---		.4	15	---		.2
15	10	20	B	.5	15	---		.4	14	---		.2
16	11	8		.2	15	---		.4	14	---		.2
17	11	---		.2	15	---		.3	15	---		.2
18	11	---		.2	14	---		.3	24	110		7
19	11	---		.2	12	---		.2	33	35		3
20	12	45	A	1	9.5	---		.1	23	---		.9
21	10	20	B	.5	12	---		.2	21	45	A	3
22	14	76	S	4	11	5		.1	21	35	B	2
23	35	660	S	170	10	---		.1	18	10		.5
24	120	790	S	410	9.5	---		.1	16	---		.2
25	38	125		13	30	340	S	34	27	---		4
26	27	---		2	18	30		1	140	1230	S	680
27	20	---		.8	14	15		.6	33	100	A	9
28	14	---		.4	13	---		.4	23	---		.6
29	12	7		.2	---	---		---	33	75	S	8
30	11	---		.1	---	---		---	24	15	B	1
31	10	---		.1	---	---		---	20	---		.5
Total	609.6	---		665.9	619.7	---		2444.7	1297	---		5446.9

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	18	---		0.5	14	---		0.4	7.0	---		0.2
2	21	30	B	2	13	11		.4	12	770	S	44
3	18	20	A	1	13	---		.4	22	280	S	18
4	17	---		.5	12	---		.3	9.6	40	A	1
5	16	---		.4	12	---		.3	7.7	---		.3
6	17	---		1	12	---		.3	7.1	---		.2
7	24	---		3	15	---		.3	6.6	---		.2
8	19	---		.5	13	8		.3	6.3	---		.2
9	24	44	S	3	13	---		.3	7.2	---		.2
10	18	8	B	.4	11	---		.2	6.5	---		.2
11	17	---		.2	11	---		.2	5.5	---		.1
12	16	---		.2	10	---		.2	5.6	---		.2
13	14	---		.2	9.5	---		.2	7.2	35	B	.7
14	13	---		.2	9.2	---		.2	5.4	---		.1
15	19	---		2	8.9	9		.2	6.0	15	B	.2
16	24	20	B	1	9.7	---		.7	7.6	20	B	.4
17	17	9	B	.4	13	---		1	7.6	25	B	.5
18	15	5	B	.2	9.2	---		.2	8.1	15	A	.3
19	22	15	A	.9	8.6	---		.2	6.8	---		.2
20	19	---		.5	8.1	---		.2	6.0	---		.2
21	16	---		.3	7.9	---		.2	5.4	---		.1
22	15	---		.3	8.3	8		.2	4.7	---		.1
23	15	8		.3	7.8	---		.2	4.7	---		.1
24	15	9		.3	11	---		12	6.4	30	B	.5
25	17	---		.4	8.4	15	B	.3	5.4	15		.2
26	19	---		.5	7.8	---		.2	4.4	---		.1
27	17	---		.4	7.4	15	B	.3	4.4	---		.1
28	16	---		.4	8.2	45	A	1	4.1	---		.1
29	15	---		.4	20	310	S	26	3.7	---		.1
30	14	---		.3	8.7	---		.2	3.7	---		.1
31	---	---		---	7.7	---		.2	---	---		---
Total	527	---		21.7	328.4	---		47.3	204.7	---		68.9

S Computed by subdividing day.
A Computed from partly estimated-concentration graph.
B Computed from estimated-concentration graph.

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

Suspended sediment, water year October 1964 to September 1965--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	3.7	---	0.1	3.3	---	0.4	3.7	---	0.1
2	3.4	---	.1	2.8	8	.1	4.2	---	.1
3	3.8	---	.2	1.9	---	T	3.1	---	.1
4	3.8	---	.1	6.1	---	99	2.9	---	.1
5	3.3	---	.1	24	---	150	2.9	---	T
6	3.5	---	.1	3.7	60	B .6	2.9	---	T
7	3.1	---	T	2.7	35	B .3	2.8	5	T
8	2.9	---	T	2.8	30	B .2	2.7	---	T
9	2.6	---	T	6.8	---	1	2.6	---	T
10	5.2	---	4	3.0	---	.1	2.5	---	T
11	50	1330	S 660	2.4	---	.1	2.3	---	T
12	9.4	100	B 3	2.3	---	.1	6.8	---	10
13	5.5	---	.1	1.9	---	T	29	---	90
14	4.8	---	.1	1.9	---	T	7.5	60	B 1
15	4.2	---	.1	2.5	---	.1	5.0	25	.3
16	3.8	10	.1	1.8	7	T	4.1	---	.1
17	3.4	---	.1	1.3	---	T	3.6	---	.1
18	3.2	---	.1	1.3	15	.1	3.6	---	.1
19	3.7	---	.1	2.0	68	S .5	3.4	---	T
20	2.7	---	.1	2.1	20	B .1	3.4	---	T
21	2.5	---	.1	2.4	---	.4	3.2	3	T
22	2.5	---	.1	9.4	110	S 4	3.0	---	T
23	2.3	---	T	3.8	60	A .6	2.8	---	T
24	2.2	---	T	2.8	30	B .2	12	710	S 70
25	2.2	---	T	2.7	15	B .1	5.4	140	B 2
26	2.0	---	T	208	4340	S 3800	3.8	40	B .4
27	1.9	7	T	26	550	S 53	3.6	---	.1
28	1.8	---	T	6.2	90	B 1.5	3.4	---	.1
29	1.7	---	T	4.0	20	B .2	3.4	---	.1
30	1.7	---	T	3.6	10	.1	3.4	---	.1
31	1.5	---	T	3.5	---	.1	---	---	---
Total	148.3	---	669.1	349.0	---	4113.0	143.0	---	175.1

Total discharge for year (cfs-days).....5068.8
Total load for year (tons).....15889.1

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

MISCELLANEOUS ANALYSES OF STREAMS IN NORTH ATLANTIC SLOPE BASINS

Chemical analyses, in parts per million, water year October 1964 to September 1965

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 $CaCO_3$		Phosphate (PO_4)	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
DELAWARE RIVER BASIN																					
1-4831.5. WIGGINS MILLPOND OUTLET AT TOWNSEND, DEL.																					
Aug. 9, 1965...	1.4							A7.6		47	66	9.0		2.9	95	44	6		126	6.5	3
ST. JONES RIVER BASIN																					
1-4836.5. FORK BRANCH AT DUPONT, DEL.																					
Aug. 9, 1965...	0.01							A6.9		87	14	6.0		2.1	159	81	10		191	7.9	40
1-4836.8. MAIDSTONE BRANCH AT DUPONT, DEL.																					
Aug. 9, 1965...	1.7							A13		41	10	10		3.7	113	33	0		128	7.0	15
1-4837. ST. JONES RIVER AT DOVER, DEL.																					
Feb. 6, 1965...	15.4							A11		12	28	12		8.2	113	38	28		139	6.1	33
Apr. 1.....	44.9							A8.0		11	19	8.5		5.4	88	28	19		106	6.2	40
May 14.....	8.0							A9.7		12	18	15		6.7	101	34	24		128	5.8	25
June 14.....	1.6							A22		42	19	24		7.2	131	46	12		207	6.3	10
Sept. 3.....	1.8	13		0.00	0.00	14	3.9	20	3.2	44	24	26	0.2	5.1	141	52	15		220	6.5	15
MURDERKILL RIVER BASIN																					
1-4840.2. BROWNS BRANCH NEAR HOUSTON, DEL.																					
Aug. 10, 1965..	5.3							A13		36	13	10		16	132	42	13		167	7.0	5
1-4840.5. PRATT BRANCH NEAR FELTON, DEL.																					
Aug. 10, 1965..	0.62							A7.4		11	12	8.5		9.5	80	25	16		99	6.3	6

A Calculated Na plus K, reported as Na.

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

Chemical analyses, in parts per million, water year October 1964 to September 1965--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 $CaCO_3$		Phosphate (PO_4)	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
BROADKILL RIVER BASIN																					
1-4843.7. PEMBERTON BRANCH NEAR MILTON, DEL.																					
July 24, 1965..	4.1							A6.4		12	16	6.5		4.6	59	10	0		59	6.3	7
1-4844. BEAVERDAM CREEK NEAR MILTON, DEL.																					
July 24, 1965..	8.9							A12		7	54	12		19	96	17	12		108	5.5	5
INDIAN RIVER BASIN																					
1-4845.5. PEPPER CREEK AT DAGSBORO, DEL.																					
July 24, 1965..	1.7							A9.7		32	15	13		5.9	130	44	18		153	7.7	35
NANTICOKE RIVER BASIN																					
1-4870. NANTICOKE RIVER NEAR BRIDGEVILLE, DEL.																					
Dec. 2, 1964...	29.6	--		--	--	--	--	A8.3	--	11	4.4	7.4	--	11	62	15	6		73	5.9	3
Jan. 8, 1965...	72.0	--		--	--	--	--	A8.7	--	10	10	6.0	--	9.7	70	16	8		80	5.8	8
Feb. 18.....	92.2	--		--	--	--	--	A9.7	--	10	9.6	7.0	--	9.8	73	15	7		80	6.0	7
Mar. 26.....	125	--		--	--	--	--	A8.7	--	11	9.4	7.0	--	7.2	69	16	7		78	6.1	15
June 24.....	42.9	--		--	--	--	--	A12	--	18	7.0	9.5	--	8.4	75	16	1		87	6.0	5
Aug. 13.....	36.6	18		0.00	0.00	4.8	1.5	15	3.1	25	10	16	0.0	2.9	95	18	0		125	6.3	10
Sept. 10.....	39.5	20		.91	.00	6.4	1.9	14	6.8	47	28	18	.1	.3	100	24	0		154	6.6	32
1-4877. CHIPMAN POND BRANCH NEAR LAUREL, DEL.																					
Aug. 10, 1965..	6.4							A7.6		18	4.4	6.0		9.2	66	19	4		83	6.3	5
NANTICOKE RIVER AT STATE HIGHWAY 313, AT SHARPTOWN, MD.																					
Dec. 8, 1964...		12				18	8.3	59	5.5	20	52	97	0.1	3.4	277	79	63		474	6.3	
MARSHYHOPE CREEK UPSTREAM FROM SKINNERS RUN, NEAR FEDERALSBURG, MD.																					
Dec. 8, 1964...		14				5.6	2.7	8.8	2.7	16	13	13	0.0	3.9	71	25	12		109	6.2	

A Calculated Na plus K, reported as Na.

CHOPTANK RIVER BASIN

1-4910. CHOPTANK RIVER NEAR GREENSBORO, MD.

Feb. 1, 1965...	112	19				9.0	2.1	5.6	1.4	10	23	7.8	0.1	2.9	89	31	23		107	6.2	--
Feb. 25.....	87	17				9.8	1.3	5.7	1.5	13	20	7.9	.1	2.4	81	30	20		102	6.2	--
Mar. 25.....	165	15				7.6	1.9	5.7	.6	11	20	7.9	.2	1.5	78	27	18		95	6.2	12
Apr. 20.....	70	15				6.8	2.2	5.8	1.2	16	15	7.8	.2	2.2	93	26	13		91	6.8	4
May 14.....	52	9.1		2.6	0.16	9.5	2.3	6.2	1.7	25	13	9.2	.1	1.4	83	33	13		106	6.6	70
June 1.....	24	9.9				8.2	3.3	6.0	1.6	28	13	9.3	.2	.9	73	34	11		106	6.4	13
July 26.....	10	9.7				11	2.6	5.6	1.4	30	12	10	.1	2.1	85	38	12		112	6.8	--
Sept. 14.....	28	13				10	2.7	5.0	2.2	27	14	7.2	.2	1.7	79	36	14		101	6.4	--

POTOMAC RIVER BASIN

1-5950. NORTH BRANCH POTOMAC RIVER AT STEYER, MD.

Oct. 21, 1964 B.	20	8.4		3.3	0.00	27	11	2.4	1.8		169	2.2	0.1	0.1	247	112	112		533	3.2	
May 18, 1965...	39			2.4	1.1					0	135	2.0				50	50		331	3.5	0

1-5975. SAVAGE RIVER BELOW SAVAGE RIVER DAM, NEAR BLOOMINGTON, MD.

Oct. 21, 1964..	12	3.9		0.34	0.00	24	3.9	2.4	1.2	20	57	2.7	0.0	0.1	98	76	60		166	6.9	
May 18, 1965...	47			.00	.00					20	13	2.0				22	6	0.08	66	7.2	5

1-5990. GEORGES CREEK AT FRANKLIN, MD.

May 18, 1965...	41		2.1	0.25	1.5					2	374	4.0				344	342	0.02	685	4.7	0

NORTH BRANCH POTOMAC RIVER AT KEYSER, W. VA.

Oct. 21, 1964..		6.5				94	6.8	110	6.6	116	226	127	0.2	0.5	641	263	168		997	6.8	

1-6000. NORTH BRANCH POTOMAC RIVER AT PINTO, MD.

Oct. 21, 1964..	161	6.1		0.80	0.00	79	10	56	5.2	77	185	79	0.2	0.5	459	240	177		721	6.8	

B Total acidity 1.3.

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

Chemical analyses, in parts per million, water year October 1964 to September 1965--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 $CaCO_3$		Phosphate (PO_4)	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
POTOMAC RIVER BASIN--Continued																					
1-6015. WILLS CREEK NEAR CUMBERLAND, MD.																					
May 18, 1965...	152		0.0	0.00	0.40					40	195	4.0				232	199	0.04	462	7.1	0
1-6090. TOWN CREEK NEAR OLDTOWN, MD.																					
Dec. 16, 1964..		5.7		0.08	0.00	23	0.6	2.2	1.3	47	24	2.5	0.0	1.0	84	60	22		133	6.8	
1-6100. POTOMAC RIVER AT PAW PAW, W. VA.																					
Oct. 22, 1964..	898	5.2		0.07	0.00	48	7.8	14	2.5	86	86	17	0.1	0.4	224	152	82		369	7.0	
FIFTEENMILE CREEK AT U.S. 40, NEAR PRATT, MD.																					
Dec. 16, 1964..		5.9		0.06	0.00	38	2.6	3.3	1.0	10	13	4.1	0.0	0.8	40	20	12		62	6.7	
1-6130. POTOMAC RIVER AT HANCOCK, MD.																					
Aug. 9, 1965...	390					50	8.8	A44		C92	104	51		0.3	316	161		0.04	505	8.4	
1-6145. CONOCOCHEAGUE CREEK AT FAIRVIEW, MD.																					
Aug. 9, 1965...	135					49	9.4	A15		164	24	17		3.7	221	161		0.72	355	8.3	
1-6180. POTOMAC RIVER AT SHEPHERDSTOWN, W. VA.																					
Oct. 22, 1964..	2280	2.5		0.11	0.00	42	10	23	2.5	138	78	10	0.0	0.8	226	146	33		384	7.2	
Aug. 9, 1965...						46	8.8	A21		116	63	22		6.5	229	151		0.06	371	8.2	
1-6465. POTOMAC RIVER NEAR WASHINGTON, D. C.																					
Aug. 9, 1965D..	E975					31	9.4	A43		95	93	24		0.3	254	116	36	0.03	412	8.0	
Aug. 19.....	937							A38		106	90	25		.2	274	134	47	.07	417	7.9	
Aug. 19F.....	E975							A41		100	88	27		.6	274	123	41	.00	413	7.2	

A Calculated Na plus K, reported as Na.
C Includes equivalent of 4 ppm of carbonate (CO_3).
D Sampled at Great Falls, Md.
E Daily mean discharge.
F Sampled at Three Sisters Island.

ANACOSTIA RIVER AT ALTERNATE U.S. 1, AT BLADENSBURG, MD.

Aug. 19, 1965..								A53		37	78	36		12	302	57	27	4.9	355	6.4

ANACOSTIA RIVER AT SOUTH CAPITOL STREET BRIDGE, AT WASHINGTON, D. C.

Aug. 19, 1965..								A36		96	71	30		4.7		120	42	0.62	397	7.0

POTOMAC RIVER AT BUOY N-2 AT HAINS POINT, AT WASHINGTON, D. C.

Aug. 19, 1965G.								A38		98	83	28		2.2		126	46	0.35	415	7.1

1-6525.9. POTOMAC RIVER AT ALEXANDRIA, VA.

Aug. 19, 1965H.								A40		96	75	32		9.7	--	122	40	3.5	420	6.8
Aug. 19I.....								A38		87	76	30		11	290	119	48	2.0	411	6.8
Aug. 19J.....								A37		104	76	31		4.3	--	130	45	1.8	405	7.0
Aug. 19K.....								A38		90	78	31		3.1	262	119	45	3.4	414	7.0
Aug. 19L.....								A40		92	81	30		3.2	258	118	43	2.2	406	6.9
Aug. 19M.....								A40		84	71	32		16	302	115	46	3.0	409	6.9
Aug. 19N.....								A38		94	69	34		11	--	123	46	2.4	399	6.9

POTOMAC RIVER AT FORT WASHINGTON, MD.

Aug. 19, 1965G.								A32		86	60	34		10	265	120	50	1.0	379	6.8
Aug. 19P.....								A37		94	62	33		1.7	236	110	33	1.1	404	7.1
Aug. 19Q.....								A36		88	59	35		8.4	260	112	40	.85	383	6.9

1-6536. PISCATAWAY CREEK AT PISCATAWAY, MD.

Aug. 19, 1965..								A36		63	61	38		8.6	257	97	46	3.1	367	7.1

A Calculated Na plus K, reported as Na.
G Sampled at 2 foot depth.
H Sampled at 2 foot depth near Maryland side below District of Columbia Sewage Treatment Plant.
I Sampled at 2 foot depth near center, below District of Columbia Sewage Treatment Plant.
J Sampled at bottom near center, below District of Columbia Sewage Treatment Plant.
K Sampled at 2 foot depth near Virginia side below District of Columbia Sewage Plant.
L Sampled at bottom near Virginia side below District of Columbia Sewage Plant.
M Sampled at bottom near center of channel opposite Jones Point.
N Sampled at 2 foot depth near Maryland side opposite Jones Point.
P Sampled at 2 foot depth near Virginia side.
Q Sampled near bottom.

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

Chemical analyses, in parts per million, water year October 1964 to September 1965--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 $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Phosphate (PO_4)	Specific conductance (micromhos at 25°C)	pH	Color
POTOMAC RIVER BASIN--Continued																					
POTOMAC RIVER AT MOUTH OF PISCATAWAY CREEK, MD.																					
Aug. 18, 1965..								A35		98	61	32		2.6		114	34	1.4	383	7.0	
POTOMAC RIVER AT GUNSTON COVE, NEAR ACCOTINK, VA.																					
Aug. 19, 1965..								A48		76	54	64		4.3	289	108	46	0.56	446	7.1	
POTOMAC RIVER AT HALLOWING POINT, NEAR GUNSTON HALL, VA.																					
Aug. 18, 1965R.								A52		79	54	71		4.5	--	112	48	0.49	467	6.9	
Aug. 19G.....								A56		78	54	81		.0	305	112	48	.11	503	6.8	
Aug. 19Q.....								A57		70	53	83		4.2	353	109	52	.42	511	6.9	
MATTAWOMAN CREEK AT BRIDGE ON STATE HIGHWAY 425, AT MASON SPRINGS, MD.																					
Aug. 19, 1965..								A37		28	16	57		0.5	173	40	17	0.66	257	6.6	
POTOMAC RIVER AT SANDY POINT, NEAR DONCASTER, MD.																					
Aug. 18, 1965R.								A699		27	202	1200		6.2	--	410	388	0.08	3530	7.0	
Aug. 19G.....								A859		20	202	1220		.5	2770	82	66	.00	3980	7.5	
Aug. 19.....								A1360		14	295	1960		.4	4230	119	108	.00	5920	6.3	
POTOMAC RIVER AT MARYLAND POINT, NEAR RIVERSIDE, MD.																					
Aug. 18, 1965R.								A1680		18	425	2930		6.1	--	935	920	0.11	7960	6.4	
Aug. 19S.....								A1400		15	357	2380		.1	5000	700	688	.24	6910	6.6	
Aug. 19P.....								A1340		16	345	2340		.1	4880	750	737	.40	6860	6.6	
Aug. 19Q.....								A2370		18	485	3400		.8	7030	160	145	.00	9640	6.3	
Aug. 19G.....								A2060		15	435	2950		.2	6240	149	137	.00	8550	6.5	

A Calculated Na plus K, reported as Na.
G Sampled at 2 foot depth.
P Sampled at 2 foot depth near Virginia side.
Q Sampled near bottom.
R Sampled at 2 foot depth near Maryland side.
S Sampled near bottom near Virginia side.

PORT TOBACCO CREEK AT PORT TOBACCO, MD.

Aug. 19, 1965T.								A24		10	11	57		0.3	180	47	39	0.09	224	6.6	
Aug. 19U.....								A27		48	16	19		3.2	141	26	0	2.3	178	6.5	
Aug. 20V.....								A1820		58	411	3170		5.1	--	995	947	.22	8790	6.8	

PORT TOBACCO RIVER AT CHAPEL POINT, NEAR PORT TOBACCO, MD.

Aug. 20, 1965..								A2420		22	584	4250		6.5		1360	1340	0.12	11000	6.6	

POTOMAC RIVER AT U.S. HIGHWAY 301 BRIDGE, NEAR MORGANTOWN, MD.

Aug. 20, 1965R.								A2880		32	710	5080		8.2		1680	1650	0.13	13200	6.7	
Aug. 20G.....								A2850		32	695	4950		8.5		1550	1520	.13	12800	6.8	
Aug. 20Q.....								A3070		44	776	5400		5.5		1800	1760	.14	13600	6.9	

ZEKIAH SWAMP RUN, STATE ROUTE 6 BRIDGE, AT NEWTOWN, MD.

Aug. 19, 1965..								A6.4		21	4.5	7.5		1.0		19	2	0.61	62	6.4	

1-6610. CHAPTICO CREEK AT CHAPTICO, MD.

Sept. 23, 1965.	1.5	11				8.5	2.4	2.7	1.8	35	4.0	4.8	0.1	0.0	61	31	3	0.04	81	6.7	

A Calculated Na plus K, reported as Na.
G Sampled at 2 foot depth.
Q Sampled near bottom.
R Sampled at 2 foot depth near Maryland side.
T Sampled at Md. Rt. 225 bridge.
U Sampled at Md. Rt. 6 bridge.
V Outside marina.

Periodic determinations of suspended-sediment discharge, water year October 1964 to September 1965
(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 temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters										Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
POTOMAC RIVER BASIN																	
1-6504.5. BEL PRE CREEK AT LAYHILL, MD. (Formerly published as West Fork of Northwest Branch Anacostia River at Layhill, Md.)																	
Nov. 25, 1964	1745	--		7.8	108	2.3											
Nov. 25	2130	--		18	84	4.1											
Dec. 27	1650	49		11	148	4.4											
Dec. 27	1820	48		22	193	11											
Dec. 27	2115	47		28	192	15											
Dec. 27	2300	47		21	120	6.8											
Dec. 28	1135	45		1.9	277	1.4											
Feb. 25, 1965	0610	43		.2	11	T											
Feb. 25	0740	44		1.0	53	.1											
Feb. 25	0900	45		2.0	81	.4											
Feb. 25	1240	42		4.0	42	.5											
Feb. 25	1630	47		2.9	52	.4											
Feb. 26	1130	36		.2	11	T											
Mar. 5	0025	44		1.2	97	.3											
Mar. 5	0200	43		8.6	230	5.3											
Mar. 5	0405	43		42	717	81											
Mar. 5	0535	44		185	1860	929											
Mar. 5	0720	--		260	1650	1160											
Mar. 5	0840	43		160	750	324											
Mar. 5	1015	43		84	457	100											
Mar. 5	1140	43		58	321	50											
Mar. 5	1315	49		57	275	42											
Mar. 5	1435	47		55	228	34											
Mar. 5	2310	39		15	76	3.1											
Mar. 8	1535	45		1.9	12	.1											
Mar. 26	0730	41		68	863	160											
May 29	0310	64		.4	188	.2											
May 29	0435	65		1.0	145	.4											
May 29	0600	63		1.8	185	.9											
May 29	0745	64		2.2	135	.8											

T Less than 0.05 ton.

1-6504.5. BEL PRE CREEK AT LAYHILL, MD.--Continued

May 29, 1965.....	1030	--		2.9	358	2.8
May 29.....	1630	--		.9	436	1.1
June 3.....	1005	54		4.3	991	12
June 3.....	1230	64		2.6	1100	7.7
June 3.....	1450	66		1.6	703	3.0
June 4.....	1000	60		.3	1290	1.0
Aug. 5.....	0820	70		.4	583	.6
Aug. 5.....	1355	72		.1	338	.1
Aug. 19.....	1525	76	E	.1	69	T
Aug. 22.....	1230	--		1.3	1250	4.4
Aug. 22.....	1325	72		.8	1070	2.3
Aug. 26.....	0345	69		91	4270	1000
Aug. 26.....	0445	69		82	2790	620
Aug. 26.....	0550	70		62	2540	430
Aug. 26.....	0855	--		3.6	1330	13
Aug. 26.....	1550	77		4.2	779	8.8
Aug. 26.....	1640	--		70	4090	770
Aug. 26.....	1830	71		200	7260	3900
Aug. 26.....	1920	71		160	5520	2390
Aug. 26.....	2155	71		80	2580	560
Aug. 27.....	1700	--		.6	675	1.1
Sept. 13.....	0940	64		5.0	760	10
Sept. 13.....	1430	65		2.8	798	6.0
Sept. 24.....	1740	69		3.4	2160	20

E Estimated.
T Less than 0.05 ton.

Periodic determinations of suspended-sediment discharge, water year October 1964 to September 1965--Continued
(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 temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters											Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
POTOMAC RIVER BASIN--Continued																		
1-6504.7. LUTES RUN AT LUTES, MD. (Formerly published as Northwest Branch Anacostia River Tributary at Lutes, Md.)																		
Nov. 25, 1964	1450	54		9.2	3080	77												
Nov. 25	1550	54		22	4750	280												
Nov. 25	1705	54		11	3140	93												
Nov. 25	1800	55		12	3640	120												
Nov. 25	2115	55		5.0	833	11												
Feb. 7, 1965	1100	38		4.6	5180	64												
Feb. 7	1245	40		5.5	4900	73												
Feb. 7	1450	43		18	8300	400												
Feb. 7	1515	42		27	8920	650												
Feb. 7	1600	43		34	9620	880												
Feb. 7	1710	43		22	5040	300												
Feb. 7	1750	43		15	3490	140												
Feb. 7	1825	45		11	2870	85												
Feb. 7	1925	43		7.0	2070	39												
Feb. 7	2225	42		3.1	916	8												
Mar. 5	0525	44	E	170	12700	5800												
Mar. 5	0625	--	E	150	5150	2100												
Mar. 5	0810	44		58	4240	660												
Mar. 5	1040	44		33	5280	470												
Mar. 5	1200	49		28	1280	97												
Mar. 5	1445	48		34	1060	97												
Mar. 26	0535	40		35	5290	500												
Mar. 26	0625	41		13	2510	88												
Mar. 26	0715	41		7.6	854	18												
Mar. 26	0820	42		3.7	486	5												
Mar. 26	0950	43		2.4	389	3												
Mar. 26	1150	45		2.0	213	1												
June 2	1846	--		7.9	4080	87												
June 2	2230	70		7.6	1670	34												
July 3	1515	--		3.1	3680	31												

E Estimated.

POTOMAC RIVER BASIN--Continued

1-6504.7. LUTES RUN AT LUTES, MD.--Continued

July 11, 1965.....	1405	72			19	2810	140											
July 11.....	1440	71			8.1	1250	27											
Aug. 18.....	1555	77			2.6	1570	11											
Aug. 19.....	1435	79			5.4	3320	48											
Aug. 19.....	1500	79			2.8	1640	12											
Aug. 19.....	1605	77			1.3	1120	4											
Aug. 26.....	1600	73		E	250	7880	5300											
Aug. 26.....	1625	73			57	7660	1200											
Aug. 26.....	1750	70		E	200	4180	2300											
Aug. 26.....	1845	70			13	2140	75											
Sept. 24.....	1520	--			5.1	4290	59											
Sept. 24.....	1625	--			10	2660	72											
Sept. 24.....	1700	71			2.5	1940	13											

E Estimated.

3-0765. 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 1-1/2 miles upstream from Bear Creek.
DRAINAGE AREA.--295 square miles.
RECORDS AVAILABLE.--Water temperatures: October 1962 to September 1965.
EXTREMES, 1964-65.--Water temperatures: Maximum, 81°F July 14 and Aug. 16; minimum, freezing point on many days in January and February.
EXTREMES, 1962-65.--Water temperatures: Maximum observed, 83°F 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 1964 to September 1965
(Continuous ethyl alcohol-actuated thermograph)

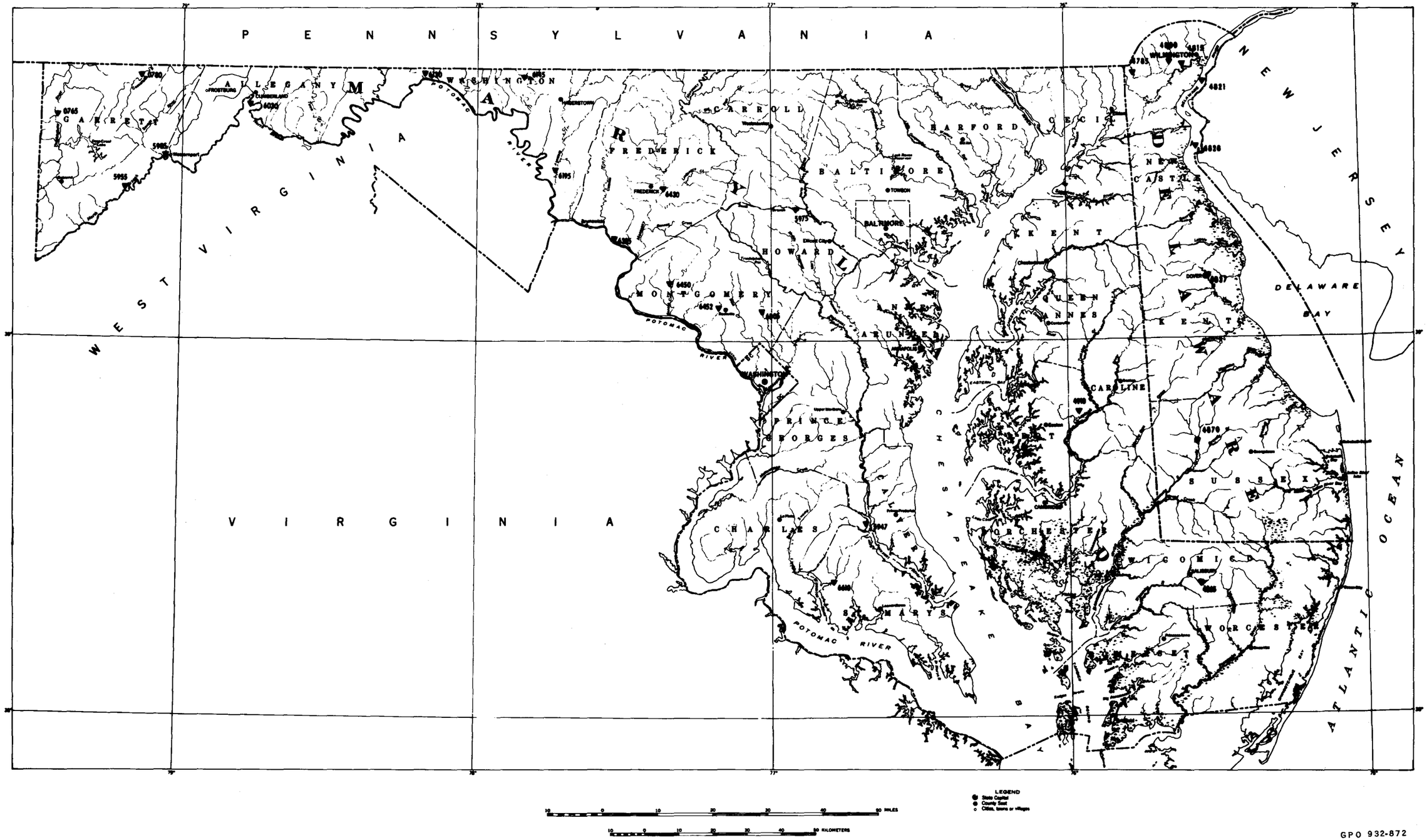
Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
October																																
Maximum	59	64	64	60	59	54	53	55	52	51	51	51	55	56	56	57	57	58	56	51	50	51	50	49	49	51	52	54	53	54	51	54
Minimum	57	59	59	57	53	50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

MISCELLANEOUS ANALYSES OF STREAMS IN OHIO RIVER BASIN

Chemical analyses, in parts per million, water year October 1964 to September 1965

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 $CaCO_3$		Phosphate (PO_4)	Specific conductance (micromhos at 25°C)	pH	Color
																Calcium, magnesium	Noncarbonate				
YOUGHIOGHENY RIVER BASIN																					
3-0755. YOUGHIOGHENY RIVER NEAR OAKLAND, MD.																					
May 18, 1965...	76		0.2	0.50	0.15					12	28	1.5				28	18	0.03	92	6.7	0
3-0766. BEAR CREEK NEAR FRIENDSVILLE, MD.																					
May 18, 1965...	27		0.0	0.03	0.00					23	8.4	4.0				21	2	0.06	66	7.0	0
3-0780. CASSELMAN RIVER AT GRANTSVILLE, MD.																					
May 18, 1965...	35	--		0.20	0.00	--	--	--	--	25	26	5.2	--	--	--	42	22	3.1	122	6.2	5
Aug. 10.....	6.6	1.0	0.1			28	7.5	6.1	3.8	41	67	9.8	0.2	0.0	154	101	68	--	249	6.3	6
Sept. 15.....	16	4.0				18	4.9	2.8	2.1	13	54	5.4	.2	.4	106	55	55	.16	172	6.1	--

INDEX



GPO 932-872

Plate 1. — Map showing location of quality of water stations.